

PubMed „polarized light therapy“ cikkek kivonatai

1. Masui. 2009 Nov;58(11):1401-6.

[Phototherapy for chronic pain treatment]

[Article in Japanese]

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Three types of machines are used in the field of phototherapy for chronic pain. One type is an instrument for low reactive level laser therapy (LLLT), one is an instrument for linear polarized infrared light irradiation (SUPER LIZER), and the last one is an instrument for Xenon light irradiation (beta EXCEL Xe10). The available machines for LLLT all project laser by semiconductor. The newest machine (MEDILASER SOFT PULSE10) has peak power of 10 W and mean power of 1 W. This machine is as safe as 1 W machine and is effective twice as deep as the 1 W machine. The irradiation by low reactive level laser induces hyperpolarization, decreased resistance of neuronal membrane, and increased intra-cellular ATP concentrations. The effects of low reactive level laser might be induced by the activation of ATP-dependent K channel. The significant analgesic effects of 1 W and 10 W LLLT were reported with double blind test. The significant analgesic effects of linear polarized near infrared light irradiation with double blind test were also reported. The effects of low reactive level laser upon the sympathetic nerve system were thought to result from its normalization of the overloaded sympathetic nerve system.

PMID: 19928507 [PubMed - indexed for MEDLINE]

2. Photomed Laser Surg. 2009 Oct 26. [Epub ahead of print]

Healing of Surgical Wounds Made with lambda970-nm Diode Laser Associated or Not with Laser Phototherapy (lambda655 nm) or Polarized Light (lambda400-2000 nm).

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Abstract Objective: The aim of this study was to analyze the effect of two phototherapies, laser and polarized light, on diode laser (970nm) wounds. Background Data: Lasers have been used in surgery, and some wavelengths may cause thermal damage to the tissue and affect healing. Several studies have shown that some wavelengths are effective in improving healing. Coherent and noncoherent light have been successfully used on the modulation of biological phenomena of several origins. Animals and Methods: Thirty-one Wistar rats were divided into 3 groups (GI to GIII). A 20-mm x 2-mm wound was created on the dorsum of each animal with a diode laser (Sirolaser, Sirona((R)), Bensheim, Germany). Group GI acted as control. On GII, laser light (lambda655 nm, 30 mW, phi approximately 3 mm, 12 J/cm(2)) was used and on GIII illumination with polarized light (lambda400-2000 nm, 40 mW, phi approximately 5.5 cm, 12 J/cm(2)) was used, every other day (GII) or daily (GIII) for 7 days. The animals were killed at 0, 7, and 14 days after surgery. Specimens were taken, routinely processed, stained and immunomarked [HE (hematoxylin-eosin), sirius red, alpha-smooth muscle actin

(SMA)], and underwent histological analysis. Results: GII showed better response at day 14 when re-epithelialization was in a more advanced stage. The number of myofibroblasts was significantly different over the healing time (7 to 14 days); this number was smaller than that observed on G1. On GIII at day 7, the number of myofibroblasts was significantly higher than for GII. At day 14, a more pronounced deposition of collagen matrix was also seen, and inflammation was discrete and more advanced for GIII. Conclusion: The results of the present study showed that the effect of the use of laser light was more evident at early stages of healing and that the use of polarized light improved the resolution of the inflammatory reaction, increased the deposition of collagen, increased the number of myofibroblasts, and quickened re-epithelialization during the experimental time.

PMID: 19857050 [PubMed - as supplied by publisher]

3. BMC Oral Health. 2009 Oct 2;9:25.

In vitro effect of fluoride oral hygiene tablets on artificial caries lesion formation and remineralization in human enamel.

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BACKGROUND: Aim of this in-vitro-study was to assess the remineralization potential of a tooth cleaning tablet with different fluoride content. METHODS: Twenty three caries free impacted third molars were examined, enamel surfaces were wax coated leaving two 3 x 4 mm windows for exposure to demineralization/remineralization cycles. The teeth were randomly assigned to 4 groups of 5 control and 6 experimental teeth. Demineralization by standardised HEC-gel, pH 4.7 at 37 degrees C for 72 h, was alternated by rinsing in remineralization solution, pH 7.0 at 37 degrees C for 72 h, total challenge time 432 h. The negative control group N was treated during remineralization cycles with saline; positive control group P was treated with remineralization solution; experimental group D1 was exposed to remineralization solution containing Denttabs-tablets with 1450 ppm F; experimental group D2 was exposed to remineralization solution and Denttabs-tablets with 4350 ppm F. Each tooth was cut into serial sections and analyzed by polarized light microscopy for assessment of the different zones of white-spot lesions in 3 representative sections. Statistical analysis was based on the Mann-Whitney-Test. RESULTS: Both control groups N(-) and P(+) exhibited characteristic white-spot lesions. The remineralization and the demineralization inhibition of the lesions increased considerably from N<P < D1<D2. Denttabs-2 administration showed partial/total remineralization including lamination and/or disappearance of the body of the lesion. The different results of all 4 groups were statistically highly significant (p < 0.01) with both tests. CONCLUSION: Based on these results the novel Denttabs formulation represents a highly effective oral hygiene product and the remineralization is correlated to the fluoride content.

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4. J Alzheimers Dis. 2009 Sep 11. [Epub ahead of print]

Copper Abolishes the beta-Sheet Secondary Structure of Preformed Amyloid Fibrils of Amyloid-beta$_{42}$

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The observation of the co-deposition of metals and amyloid-beta₄₂ (Abeta₄₂) in brain tissue in Alzheimer's disease prompted a myriad of investigations into the role played by metals in the precipitation of this peptide. Copper is bound by monomeric Abeta₄₂ and upon precipitation of the copper-peptide complex thereby prevents Abeta₄₂ from adopting a beta-sheet secondary structure. Copper is also bound by beta-sheet conformers of Abeta₄₂, and herein we have investigated how this interaction affects the conformation of the precipitated peptide. Copper significantly reduced the thioflavin T fluorescence of aged, fibrillar Abeta₄₂ with, for example, a 20-fold excess of the metal resulting in a ca 90% reduction in thioflavin T fluorescence. Transmission electron microscopy showed that copper significantly reduced the quantities of amyloid fibrils while Congo red staining and polarized light demonstrated a copper-induced abolition of apple-green birefringence. Microscopy under cross-polarized light also revealed the first observation of spherulites of Abeta₄₂. The size and appearance of these amyloid structures were found to be very similar to spherulites identified in Alzheimer's disease tissue. The combined results of these complementary methods strongly suggested that copper abolished the beta-sheet secondary structure of pre-formed, aged amyloid fibrils of Abeta₄₂. Copper may protect against the presence of beta-sheets of Abeta₄₂ in vivo, and its binding by fibrillar Abeta₄₂ could have implications for Alzheimer's disease therapy.

PMID: 19749401 [PubMed - as supplied by publisher]

5. Photomed Laser Surg. 2009 Oct;27(5):813-8.

The effects of light-emitting diode irradiation at 610 nm and 710 nm on murine T-cell subset populations.

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OBJECTIVE: The aim of this study was to investigate the effects of light-emitting diode (LED) irradiation (radiant power, 0.047 mW; irradiation area, 1.13 cm²) at 610 nm and 710 nm on T-lymphocyte subset populations and cytokine expression using an in vivo rat model. **BACKGROUND DATA:** The proliferation of CD4⁺ T lymphocytes was induced by polychromatic visible polarized light at the range of 540-780 nm in a previous study, but the specific target wavelength for this effect has not yet been identified. **METHODS:** Before and after 4 weeks of LED phototherapy, whole blood samples were collected from 610 nm, 710 nm, and control groups. The percentages of CD4⁺ and CD8⁺ T lymphocyte populations were determined by flow cytometry. The transcript levels of representative cytokines of CD4⁺ T-cell (interleukin [IL]-4, interferon [IFN]γ) and proinflammatory cytokines (IL-1β, IL-6) were assessed with the reverse transcriptase-polymerase chain reaction. **RESULTS:** The population of CD4⁺ T cells increased significantly in 710 nm group on day 28 (p < 0.05), but it did not increase in the 610 nm or control group. The population of CD8⁺ T cells did not show any significant change after irradiation in all groups. The mRNA expression of IL-4 increased in both the 610 nm and 710 nm groups compared to the control group, but IFNγ was not detected in any group. The transcripts of IL-1β and IL-6 were slightly induced in the 710 nm group. **CONCLUSION:** The in vivo irradiation of 710 nm wavelength LED

significantly increases the population of murine CD4+ T cells, which suggests that this new phototherapeutic regimen might be promising for CD4+ T lymphocyte-mediated immune modulation therapy.

PMID: 19715464 [PubMed - in process]

6. J Trauma. 2009 Nov;67(5):1073-9.

Effect of polarized light emitting diode irradiation on wound healing.

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BACKGROUND: We propose a new phototherapy using polarized light from light emitting diode (LED). The purpose of this study is to clarify the effect of polarized LED irradiation on wound healing. METHODS: Five groups were classified: control (C), unpolarized (U), linearly polarized (L), right circularly polarized (RC), and left circularly polarized (LC) LED irradiation. In vitro study, fibroblast cell cultures were irradiated, and cellular proliferation was evaluated with a WST-8 assay. In vivo study, full-thickness skin defect of 20 mm diameter was created on the dorsal side of rats. The ratio of the residual wound area was measured, and expression of type 1 and type 3 procollagen mRNA in granulation tissue was determined by real-time reverse transcription polymerase chain reaction method. RESULTS: The cellular proliferation rates of group RC and L were significantly higher than other groups. The ratio of the residual wound area of group RC and L was significantly reduced than group C and U. Expression of type 1 procollagen mRNA in group RC was found to be significantly increased about 1.5-fold in comparison with the group C. There were no significant differences for type 3 procollagen. CONCLUSIONS: The right circularly polarized light and linearly polarized light promoted the process of wound healing by increasing the proliferation of fibroblasts, and the right circularly polarized light increased the expression of type 1 procollagen mRNA. The effectiveness of right circularly polarized light suggests that some optical active material, which has a circular dichroic spectrum, takes part in a biochemical reaction.

PMID: 19680158 [PubMed - indexed for MEDLINE]

7. Wilderness Environ Med. 2009 Summer;20(2):169-75.

Eye problems in mountain and remote areas: prevention and onsite treatment--official recommendations of the International Commission for Mountain Emergency Medicine ICAR MEDCOM.

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Although eyes are not frequently injured in the mountains, they are exposed to many adverse factors from the environment. This article, intended for first responders, paramedics, physicians, and mountaineers, is the consensus opinion of the International Commission for Mountain Emergency Medicine (ICAR-MEDCOM). Its aim is to give practical advice on the management of eye problems in mountainous and remote areas. Snow blindness and minor injuries, such as conjunctival and corneal foreign bodies, could immobilize a person and put him or her at risk of other injuries. Blunt or penetrating trauma can result in the loss of sight in the eye; this may be preventable if the injury is managed properly. In almost all cases of severe eye trauma, protecting the eye and arranging an immediate

evacuation are necessary. The most common eye problems, however, are due to ultraviolet light and high altitude. People wearing contact lenses and with previous history of eye diseases are more vulnerable. Any sight-threatening eye problem or unexplained visual loss at high altitude necessitates descent. Wearing appropriate eye protection, such as sunglasses with sidepieces and goggles with polarized or photochromic lenses, could prevent most of the common eye problems in mountaineering.

PMID: 19594215 [PubMed - indexed for MEDLINE]

8. *Vojnosanit Pregl.* 2009 Jun;66(6):482-6.

Ursodeoxycholic acid for treatment of cholestasis in patients with hepatic amyloidosis.

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BACKGROUND: Amyloidosis represents a group of different diseases characterized by extracellular accumulation of pathologic fibrillar proteins in various tissues and organs. Severe amyloid deposition in the liver parenchyma has extrahepatic involvement predominantly in the kidney or heart. We evaluated the effect of ursodeoxycholic acid, in four patients with severe hepatic amyloidosis of different etiologies, who presented with increased alkaline phosphatase and gamma-glutamyl transferase. **CASE REPORT:** The study included four patients who presented with amyloidosis-associated intrahepatic cholestasis. Three of them had renal amyloidosis which developed 1-3 years before cholestasis occurred, the remaining one having intrahepatic cholestasis as the primary sign of the disease. Amyloidosis was identified from liver biopsies in all patients by its specific binding to Congo red and green birefringence in polarized light. The biochemical nature and the class of amyloid deposits were identified immunohistochemically. In addition to their regular treatment, the patients received 750 mg ursodeoxycholic acid per day. After 2-4 weeks all patients had a significant decrease of serum alkaline phosphatase and gamma-glutamyl transferase, and their general status significantly improved. **CONCLUSION:** Treatment with ursodeoxycholic acid may be beneficial in patients with hepatic amyloidosis, and do extend indications for the use of ursodeoxycholic acid in amyloidotic cholestatic liver disease.

PMID: 19583148 [PubMed - indexed for MEDLINE]

9. *Photomed Laser Surg.* 2009 Jun;27(3):447-52.

The effects of lasers and fluoride on the acid resistance of decalcified human enamel.

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OBJECTIVE: In order to preserve the maximum amount of healthy enamel and increase the acid resistance of decalcified enamel, a CO(2) laser, an Nd:YAG laser, and acidulated phosphate fluoride (APF) were used to treat incipient carious lesions, then their effects were compared. **MATERIALS AND METHODS:** One hundred and sixty samples of human caries-free premolars were immersed in pH-cycling solution (pH = 5) for 2 d for decalcified lesion formation. Then the tooth samples were randomly

divided into eight groups and the lesions were treated using the different modalities: a control group, an APF only group, an APF = Nd:YAG laser group, and APF = CO(2) laser group, an Nd:YAG laser = APF group, a CO(2) laser = APF group, a CO(2) laser only group, and an Nd:YAG laser only group. The energy density setting for the two types of lasers was 83.33 J/cm². After treatment the tooth samples were immersed in pH-cycling solution again for 2 d for acid challenge. As for the acid-resistance evaluation, the calcium concentration dissolved from the enamel surface was analyzed by an electrolyte analyzer. Scanning electron microscopy (SEM) was used to assess morphologic changes and polarized light microscopy (PLM) was used to evaluate optical changes in the lesions. RESULTS: The control group showed a statistically significantly ($p < 0.05$) higher calcium concentration compared with all the other groups. The APF group also had a statistically significantly higher calcium concentration ($p < 0.05$) than did the laser groups. However, there was no statistically significant difference in any of the laser groups whether combined with fluoride or not ($p > 0.05$). Upon SEM analysis, melted surfaces and crater-like holes 1-20 microm in diameter were found in the CO(2) laser and Nd:YAG laser groups. On PLM, positive birefringence and reversal of birefringence after acid challenge of the lased enamel were seen. CONCLUSIONS: Using lasers and fluoride on decalcified enamel appears to increase the enamel's acid resistance, and the effects of the lasers were better than those of fluoride treatment.

PMID: 19569955 [PubMed - indexed for MEDLINE]

10. Fiziol Zh. 2009;55(3):81-93.

Antinociceptive effects of color polarized light in animal with formalin test.

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Our recent results show the efficacy of pain suppression by exposure of antinociceptive acupuncture points (APs) to white polarized (P) light. But it is known that white light contains electromagnetic waves of different length (colors) and, possibly, not all of them produce a similar effect. There are no comparative data about analgesic effects of the different colors of P light now. The purpose of this study was to clear up a question if analgesic effects of low-intensive P light depend on the color of light/wavelength. Formalin-induced pain behavior (licking of the painful area) was tested in control mice and mice exposed to one of the color of P light (red, orange, yellow, green, blue, violet) on the painful area or AP E-36. Exposure of the painful area or AP E-36 to color P light evoked a statistically significant decrease of the licking time in mice to 31.5-64.1% and 36.1-54.4% respectively. The red light was the most effective for pain behavior depression, analgesia averaged 64.1% and 54.4% accordingly. The analgesic effects of red light in compare to three "cold" colors (blue, green, and violet) and white light was more pronounced in case of its application on the painful area than on AP E-36. In conclusion, the intensity of analgesic effects of P lights strongly depends on its color (wavelength).

PMID: 19526860 [PubMed - indexed for MEDLINE]

11. Can J Ophthalmol. 2009 Jun;44(3):317-9.

Oculoleptomeningeal amyloidosis in 3 individuals with the transthyretin variant Tyr69His.

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OBJECTIVE: To describe 3 cases of oculoleptomeningeal amyloidosis (OLMA). **DESIGN:** Descriptive case series. **PARTICIPANTS:** Three siblings who presented with floaters and decreased visual acuity. **METHODS:** A complete ophthalmologic examination, magnetic resonance imaging, cytological, and genetic studies were carried out in clinical practice. Each sibling was treated by means of pars plana vitrectomy. Vitreous samples stained with Congo Red revealed apple-green birefringence when viewed under polarized light. **RESULTS:** In each case, visual acuity improved greatly after pars plana vitrectomy. A Tyr69His mutation in the transthyretin (TTR) gene was genetically confirmed in 2 of the siblings. **CONCLUSIONS:** This report adds to the literature regarding OLMA and its association with a Tyr69His mutation in the TTR gene. Despite no proven therapy at this time, symptomatic treatment with pars plana vitrectomy appears to be beneficial.

PMID: 19491989 [PubMed - indexed for MEDLINE]

12. Photomed Laser Surg. 2009 Jun;27(3):513-20.

Comparing the effects of exercise program and low-level laser therapy with exercise program and polarized polychromatic non-coherent light (bioptron light) on the treatment of lateral elbow tendinopathy.

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BACKGROUND DATA: The use of low-level laser therapy (LLLT) and polarized polychromatic non-coherent light as supplements to an exercise program has been recommended for the management of lateral elbow tendinopathy (LET). **OBJECTIVE:** To investigate whether an exercise program supplemented with LLLT is more successful than an exercise program supplemented with polarized polychromatic non-coherent light in treating LET. **MATERIALS AND METHODS:** Patients with unilateral LET for at least 4 wk were sequentially allocated to receive either an exercise program with LLLT or an exercise program with polarized polychromatic non-coherent light. The exercise program consisted of eccentric and static stretching exercises of wrist extensors. In the LLLT group a 904-nm Ga-As laser was used in continuous mode, and the power density was 130 mW/cm², and the dose was 0.585 J/point. In the group receiving polarized polychromatic non-coherent light the Bioptron 2 was used to administer the dose perpendicularly to the lateral epicondyle at three points at an operating distance of 5-10 cm for 6 min at each position. The outcome measures were pain and function and were evaluated at baseline, at the end of the treatment (week 4), and 3 mo after the end of treatment (week 16). **RESULTS:** Fifty patients met the inclusion criteria. At the end of treatment there was a decline in pain and a rise in function in both groups compared with baseline ($p < 0.0005$ on the paired t-test). There were no significant differences in the reduction of pain and the improvement of function between the groups at the end of treatment and at the 3-mo follow-up ($p > 0.0005$ on the independent t-test). **CONCLUSIONS:** The results suggest that the combination of an exercise program with LLLT or polarized polychromatic non-coherent light is an adequate treatment for patients with LET. Further research to establish the relative and absolute effectiveness of such a treatment approach is needed.

PMID: 19473072 [PubMed - indexed for MEDLINE]

13. Australas Phys Eng Sci Med. 2009 Mar;32(1):21-5.

Evaluation of the magnitude of EBT Gafchromic film polarization effects.

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Gafchromic EBT film, has become a main dosimetric tools for quantitative evaluation of radiation doses in radiation therapy application. One aspect of variability using EBT Gafchromic film is the magnitude of the orientation effect when analysing the film in landscape or portrait mode. This work has utilized a > 99% plane polarized light source and a non-polarized diffuse light source to investigate the absolute magnitude of EBT Gafchromic films polarization or orientation effects. Results have shown that using a non-polarized light source produces a negligible orientation effect for EBT Gafchromic film and thus the angle of orientation is not important. However, the film exhibits a significant variation in transmitted optical density with angle of orientation to polarized light producing more than 100% increase, or over a doubling of measured OD for films irradiated with x-rays up to dose levels of 5 Gy. The maximum optical density was found to be in a plane at an angle of 14 degrees +/- 7 degrees (2 SD) when the polarizing sheet is turned clockwise with respect to the film. As the magnitude of the orientation effect follows a sinusoidal shape it becomes more critical for alignment accuracy of the film with respect to the polarizing direction in the anticlockwise direction as this will place the alignment of the polarizing axes on the steeper gradient section of the sinusoidal pattern. An average change of 4.5% per 5 degrees is seen for an anticlockwise polarizer rotation where as the effect is 1.2% per 5 degrees for an clockwise polarizer rotation. This may have consequences to the positional accuracy of placement of the EBT Gafchromic film on a scanner as even a 1 degree alignment error can cause an approximate 1% error in analysis. The magnitude of the orientation effect is therefore dependant on the degree of polarization of the scanning light source and can range from negligible (diffuse LED light source) through to more than 100% or doubling of OD variation with a fully linear polarized light source.

PMID: 19400549 [PubMed - in process]

14. Zhongguo Dang Dai Er Ke Za Zhi. 2009 Apr;11(4):291-5.

[Effect of resveratrol on myocardial fibrosis in mice with chronic viral myocarditis]

[Article in Chinese]

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OBJECTIVE: Some research has shown that resveratrol can ameliorate myocardial injury and improve cardiac function in mice with acute viral myocarditis (VMC), and can inhibit cardiac fibroblast proliferation and myofibroblast differentiation in vitro. This study was designed to investigate whether resveratrol has similar effects in the mouse model of chronic VMC. **METHODS:** One hundred mice were inoculated with 0.3 mL of Coxsackievirus B3 1*10⁶ TCID₅₀. Thirty days later, the survivors (n=62) were used as a model of chronic VMC, and were randomly assigned to 4 groups: untreated VMC, and low- (10 mg/kg), middle- (100 mg/kg) and high-dose (1 000 mg/kg) resveratrol-treated VMC (once daily, for 30 days). Ten mice which received neither Coxsackievirus B3 nor resveratrol treatment served as the control group. After 30 days of resveratrol treatment, the mice were sacrificed. Serum concentrations of collagenous pre-peptides (PINP, PICP and PIIINP) were assessed using ELISA. Hematoxylin-eosin staining,

picosirius red staining and circularly polarized light were used to examine the histochemistry of myocardial collagen. RESULTS: The myocardial collagen volume fraction in the high-dose (0.74+/-0.19) and the middle-dose (1.07+/-0.12) resveratrol-treated VMC groups was significantly lower than that in the untreated VMC (2.33+/-0.18) and the low-dose resveratrol-treated VMC (2.17+/-0.19) groups (P<0.05). Compared with the untreated VMC group, serum concentrations of PICP and PIIINP in the high-dose and the middle-dose resveratrol-treated VMC groups were significantly reduced (P<0.05), while PINP concentrations increased significantly (P<0.05). CONCLUSIONS: Resveratrol can inhibit hyperplasia of myocardial collagen in the mouse model of chronic VMC, acting as an effective anti-fibrotic agent in the myocardium.

PMID: 19374815 [PubMed - indexed for MEDLINE]

15. J Biophotonics. 2009 Mar;2(3):145-56.

Mueller matrix decomposition for polarized light assessment of biological tissues.

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The Mueller matrix represents the transfer function of an optical system in its interactions with polarized light and its elements relate to specific biologically or clinically relevant properties. However, when many optical polarization effects occur simultaneously, the resulting matrix elements represent several "lumped" effects, thus hindering their unique interpretation. Currently, no methods exist to extract these individual properties in turbid media. Here, we present a novel application of a Mueller matrix decomposition methodology that achieves this objective. The methodology is validated theoretically via a novel polarized-light propagation model, and experimentally in tissue simulating phantoms. The potential of the approach is explored for two specific biomedical applications: monitoring of changes in myocardial tissues following regenerative stem cell therapy, through birefringence-induced retardation of the light's linear and circular polarizations, and non-invasive blood glucose measurements through chirality-induced rotation of the light's linear polarization. Results demonstrate potential for both applications.

PMID: 19343695 [PubMed - indexed for MEDLINE]

16. Joint Bone Spine. 2009 May;76(3):254-9. Epub 2009 Mar 21.

Prevalence of subclinical amyloidosis in Tunisian patients with rheumatoid arthritis.

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INTRODUCTION: Secondary amyloidosis is a serious complication of rheumatoid arthritis (RA). Symptoms are late to occur, so that screening is in order, most notably in patients with long-standing RA. The objectives of our study were to determine the prevalence of subclinical amyloidosis in RA patients by abdominal fat aspiration biopsy (AFAB) and minor salivary gland biopsy (MSGB) and to identify factors associated with subclinical amyloidosis. METHODS: We prospectively studied 107 consecutive patients with RA (94 women and 13 men)

recruited between March 2005 and January 2006. Clinical and laboratory findings, imaging study results, and treatment were recorded for each patient. AFAB and MSGB were performed routinely. Amyloid deposits were identified by polarized light microscopy after Congo red staining. RESULTS: The prevalence of subclinical amyloidosis was 21.5% by AFAB and 3.7% by MSGB. Factors associated with subclinical amyloidosis were a longer time to diagnosis (P=0.03), extraarticular manifestations (P=0.019), proteinuria >0.3 g/24 h (P=0.024), and absence of methotrexate therapy (P=0.046). Subclinical amyloidosis was not associated with age, sex, RA duration, joint deformities, DAS28 score, Health Assessment Questionnaire score, Steinbrocker radiological stage, rheumatoid factor, erythrocyte sedimentation rate, C-reactive protein, creatinine, or hemoglobin. CONCLUSION: The prevalence of subclinical amyloidosis by AFAB is high (21.5%). AFAB is more sensitive than MSGB for detecting subclinical amyloidosis. A simple screening tool such as AFAB should be used, particularly in patients with risk factors. Subclinical amyloidosis requires close monitoring to ensure the early detection and treatment of symptomatic amyloidosis.

PMID: 19303802 [PubMed - indexed for MEDLINE]

17. J Coll Physicians Surg Pak. 2009 Feb;19(2):130-2.

Renal amyloidosis in juvenile rheumatoid arthritis.

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We report a case of a rare disorder of renal amyloidosis occurring as a complication of juvenile rheumatoid arthritis in a 16-year-old adolescent male. He presented with generalized edema and hypertension. The laboratory work-up showed nephrotic-range proteinuria and hypoalbuminemia and normal renal function despite bilateral shrunken kidneys revealed by the abdominal ultrasound. His renal biopsy showed deposition of amyloid fibrils in the form of homogenous eosinophilic material within the glomeruli demonstrating the pathognomonic apple-green birefringence by polarized light microscopy.

PMID: 19208322 [PubMed - indexed for MEDLINE]

18. J Biomed Mater Res B Appl Biomater. 2009 Aug;90(2):635-40.

Microbiological or chemical models of enamel secondary caries compared by polarized-light microscopy and energy dispersive X-ray spectroscopy.

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Different secondary caries models may present different results. The purpose of this study was to compare different in vitro secondary caries models, evaluating the obtained results by polarized-light microscopy (PLM), scanning electron microscopy (SEM), and energy dispersive X-ray spectroscopy (EDS). Standardized human enamel specimens (n = 12) restored with different materials (Z250 conventional composite resin-CRZ, Freedom polyacid-modified composite resin-CRF, Vitremer resin-modified glass-ionomer-GIV, and Fuji IX conventional glass-ionomer cement-GIF) were submitted to microbiological (MM) or chemical caries models (CM). The control group was not submitted to any caries model. For MM, specimens

were immersed firstly in sucrose broth inoculated with Streptococcus mutans ATCC 35688, incubated at 37 degrees C/5% CO(2) for 14 days and then in remineralizing solution for 14 days. For CM, specimens were submitted to chemical pH-cycling. Specimens were ground, submitted to PLM and then were dehydrated, gold-sputtered and submitted to SEM and EDS. Results were statistically analyzed by Kruskal-Wallis and Student-Newman-Keuls tests (alpha = 0.05). No differences between in vitro caries models were found. Morphological differences in enamel demineralization were found between composite resin and polyacid-modified composite resin (CRZ and CRF) and between the resin-modified glass-ionomer and the glass-ionomer cement (GIF and GIV). GIF showed higher calcium concentration and less demineralization, differing from the other materials. In conclusion, the glass-ionomer cement showed less caries formation under both in vitro caries models evaluated.

PMID: 19204918 [PubMed - indexed for MEDLINE]

19. Dent Mater. 2009 Jun;25(6):721-8. Epub 2009 Jan 23.

Polarization-sensitive optical coherence tomographic imaging of artificial demineralization on exposed surfaces of tooth roots.

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BACKGROUND AND OBJECTIVES: The purpose of this study was to assess the potential of polarization-sensitive optical coherence tomography (PS-OCT) to non-destructively measure the depth and severity of artificial demineralization on exposed root surfaces and measure the degree of inhibition by topical fluoride. Although PS-OCT imaging studies have demonstrated the utility of PS-OCT for imaging carious lesions on enamel and dentin surfaces the influence of the cementum layer that is present on intact root surfaces has not been investigated. **MATERIALS AND METHODS:** In this study, extracted human tooth roots were partitioned into three sections with one partition treated with topical fluoride, one partition protected from demineralization with acid resistant varnish, and one partition exposed to a demineralization solution, producing artificial lesions approximately 200- μ m deep in root dentin. The lesion depth, remaining cementum thickness and the integrated reflectivity for lesion areas were measured with PS-OCT. These measurements were also compared with more established methods of measuring demineralization, namely transverse microradiography (TMR) and polarized light microscopy (PLM). **RESULTS:** PS-OCT was able to measure a significant increase in the reflectivity between lesion areas and sound root surfaces. In contrast to dentin, the cementum layer manifests minimal reflectivity in the PS-OCT images allowing non-destructive measurement of the remaining cementum thickness. The reflectivity of the cementum layer did not increase significantly after substantial demineralization, however it did manifest considerable shrinkage in a fashion similar to dentin and that shrinkage could be measured with OCT. **SIGNIFICANCE:** This study demonstrates that PS-OCT can be used to measure demineralization non-destructively on root surfaces and assess inhibition of demineralization by anti-caries agents.

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PMID: 19167052 [PubMed - indexed for MEDLINE]

20. Vojnosanit Pregl. 2008 Dec;65(12):906-12.

The effects of polarized light therapy in pressure ulcer healing.

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BACKGROUND/AIM: Neglecting polarized light as an adjuvant therapy for pressure ulcers and methodology distinctions in the trials engaging polarized light are the reasons for many dilemmas and contradictions. The aim of this study was to establish the effects of polarized light therapy in pressure ulcer healing. METHODS: This prospective randomized single-blind study involved 40 patients with stage I-III of pressure ulcer. The patients in the experimental group (E) were subjected, besides polarized light therapy, to standard wound cleaning and dressing. Standard wound cleaning and dressing were the only treatment used in the control group (C). A polarized light source was a Biopton lamp. Polarized light therapy was applied for six min daily, five times a week, four weeks. The Pressure Ulcer Scale for Healing (PUSH) was used in the assessment of outcome. Statistic analysis included Mann Whitney Test, Fisher Exact Test, Wilcoxon Signed Rank test. RESULTS: There were significant differences between the groups at the end of the treatment regarding the surface of pressure ulcer (E: 10.80 +/- 19.18; C: 22,97 +/- 25,47; p = 0.0005), rank of pressure ulcer (E: 5.90 +/- 2.48; C: 8.6 +/- 1.05; p = 0.0005) and total PUSH score (E: 7.35 +/- 3.17; C: 11.85 +/- 2.35; p = 0,0003). The patients in the experimental group had significantly better values of the parameters monitored than the patients in the control group. CONCLUSION: After a four-week polarized light therapy 20 patients with stage I-III ulcer had significant improvement in pressure ulcer healing, so it could be useful to apply polarized light in the treatment of pressure ulcers.

PMID: 19160985 [PubMed - indexed for MEDLINE]

21. Stomatologija (Mosk). 2008;87(6):38-40.

[Microcirculation changes after polarized polychromatic light use in preoperative period in cases of face cosmetic operations]

[Article in Russian]

Ishmamet'ev II, Deriabin EI, Zharov VV, Ishmamet'ev IL, Tochilova ER.

Action of polarized polychromatic light used in preoperative period in cases of face cosmetic operations was studied upon microcirculatory bed status in operative zone. Morphometry showed that number of vessels in vision field in patients of the study group came to 173% of the such in the control group, vessel's area - 251% of the such in the control group. The data received confirmed that polarized polychromatic light use in preoperative period is effective method to improve microcirculatory bed status in operative zone.

PMID: 19156105 [PubMed - indexed for MEDLINE]

22. J Appl Oral Sci. 2009 Jan-Feb;17(1):61-5.

Influence of microleakage, surface roughness and biofilm control on secondary caries formation around composite resin restorations: an in situ evaluation.

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This study was carried out to evaluate in situ the influence of microleakage,

surface roughness and biofilm control on caries formation around composite resin restorations. During 28 days, 12 volunteers wore palatal devices containing bovine enamel slabs restored with composite resin. Restorations were made without leakage, when the adhesive system was applied, or with leakage, when adhesive system was omitted. Half of the restorations in each group were finished and the remaining were finished and polished. In one side of the palatal device, biofilm was left to accumulate over the restored slabs, and in the other side dental slabs were brushed, to allow biofilm removal. There was an extraoral application of 20% sucrose solution (8x/day) over the enamel slabs. The formation of caries lesions (white spots) was evaluated by visual inspection under stereomicroscopy. Additionally, the dental slabs were sectioned and observed under polarized light microscopy. Data were submitted to Kruskal-Wallis test and Spearman's correlation test at 5% significance level. Polishing and bonding were not significant factors regarding white spot formation ($p>0.05$). Biofilm control (brushing) was associated with reduction of caries formation close to the restorations ($p<0.01$). Polarized light microscopy confirmed the visual inspection findings. These results suggest that while microleakage and surface roughness did not influence caries lesion formation, biofilm control may prevent the enamel demineralization.

PMID: 19148408 [PubMed - indexed for MEDLINE]

23. J Photochem Photobiol B. 2009 Mar 3;94(3):164-70. Epub 2008 Dec 7.

Effects of linear polarized infrared light irradiation on the transcriptional regulation of IL-8 expression in IL-1beta-stimulated human rheumatoid synoviocytes involves phosphorylation of the NF-kappaB RelA subunit.

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Although recent clinical studies have shown that laser therapy acts as an anti-inflammatory effector in the treatment of some diseases, little is known about the mechanism by which it acts in rheumatoid arthritis (RA) patients. The purpose of our work was to examine how irradiation with linear polarized infrared light (LPIL) suppresses inflammatory responses in the MH7A rheumatoid fibroblast-like synoviocyte cell line. We initially confirmed the effects of two disease-modifying anti-rheumatic treatments, LPIL irradiation and dexamethasone (Dex) administration, under experimental inflammatory conditions using gene chip technology. We found that LPIL exerted a smaller effect on gene transcription than Dex; however, IL-1beta-inducible target genes such as the CXCL type chemokines IL-8, IL-1beta and IL-6 were all clearly suppressed by LPIL to the same degree as by Dex. We also found that IL-1beta-induced release of IL-8 from MH7A cells was completely blocked by pretreatment with the (IL-8) inhibitor Bay11-7085, indicating that activation of NF-kappaB signaling plays an important role in the secretion of IL-8. Although the levels of NFkB1 and RELA transcription were unaffected by IL-1beta stimulation, phosphorylation of RelA S276 was suppressed by both LPIL and Dex. Thus LPIL likely exerts its anti-inflammatory effects by inhibiting the release of the inflammatory chemokine IL-8. A fuller understanding of the anti-inflammatory mechanism of LPIL in rheumatoid synoviocytes could serve as the basis for improved treatment of RA patients in the future.

PMID: 19135383 [PubMed - indexed for MEDLINE]

24. J Voice. 2008 Dec 24. [Epub ahead of print]

Laryngeal Amyloidosis Causing Hoarseness and Airway Obstruction.

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Amyloidosis constitutes a fraction of 1% of benign localized laryngeal tumors and may occasionally be associated with systemic disease. A chronic, insidious, progressive, recurrent disease characterized by hoarseness, dyspnea, and stridor, it is caused by extracellular deposition of insoluble, abnormal tissue injurious fibrils. Submucosal lesions occur frequently in the vestibular folds and ventricles, less commonly in the subglottis and aryepiglottic folds and least on the vocal folds. Apple green birefringence under polarized light after Congo red staining, electron microscopic fibrillar structure, and a beta-pleated sheet structure observed by x-ray diffraction are confirmatory. Two presented cases add to the small literature review of similar patients. Case 1 was a 70-year-old man with severe hoarseness, incomplete glottic closure, ovoid concentric stenosis of the inferior glottis and subglottis, who initially was not diagnosed by several laryngologists and speech therapists. He required multiple microlaryngoscopic excisions and dilations. Because low dose radiation induces plasma cell apoptosis in other diseases, external beam radiation therapy (EBRT) was hypothesized to eliminate amyloidogenic plasma cells. Case 2 was a 46-year-old welder with progressive dyspnea for 2-3 years and hoarseness, voice loss, and stridor over 6-7 months. Masses caused airway obstruction of the anterior commissure, vestibular, and vocal folds, with extension to the subglottis. Two phonomicrosurgical CO(2) laser-assisted resections relieved upper airway obstruction and restored voice. Conservative surgical intervention and long-term followup are essential. Further studies are needed to determine if a radiation dose response relationship exists to control laryngeal amyloidosis.

PMID: 19111441 [PubMed - as supplied by publisher]

25. Br J Dermatol. 2009 Apr;160(4):801-9. Epub 2008 Dec 1.

Rainbow pattern in Kaposi's sarcoma under polarized dermoscopy: a dermoscopic pathological study.

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Comment in:

Br J Dermatol. 2009 Aug;161(2):474-5.

BACKGROUND: We found previously that the features of Kaposi's sarcoma (KS) under polarized dermoscopy are characterized by a bluish-reddish coloration, a scaly surface, small brown globules and, most distinctively, the multicoloured 'rainbow pattern'. **OBJECTIVES:** To evaluate the significance of the rainbow pattern on dermoscopy as a diagnostic feature in KS, and to demonstrate that it is associated with the unique vascular structure of the tumour. **METHODS:** More than 100 lesions from seven patients with histologically proven KS were examined with polarized light dermoscopy. Sixty-three patients with various other cutaneous vascular and nonvascular tumours were also examined. KS lesions exhibiting the rainbow pattern and KS lesions lacking the rainbow pattern on dermoscopy were excised, and dermoscopic features were compared with histopathological structures. The dermoscopic patterns of other vascular tumours were also compared with histological features. In addition, the changes in dermoscopic features and histological structures were assessed before and after surgical therapy in one

patient with KS. RESULTS: On the basis of evaluations with polarized dermoscopy, the rainbow pattern was found to be a highly specific dermoscopic feature for KS. Histology of KS lesions showing the rainbow pattern under polarized light dermoscopy demonstrated a vascular lumen-rich pattern of closely arranged 'back-to-back' vascular structures, whereas histology of KS lesions without the rainbow pattern showed a vascular lumen-poor pattern with vascular lumina separated further apart by intervening stromal and cellular tissue. Other vascular tumours did not exhibit the rainbow pattern and were characterized histologically by variably sized vascular structures separated by substantial amounts of stromal and cellular tissue. In one patient with KS, disappearance of the rainbow pattern was associated with obliteration of the vascular structure following surgical ablation therapy. CONCLUSIONS: The rainbow pattern in KS is associated with the vascular lumen-rich histological subtype, is not manifest in the vascular lumen-poor subtype and disappears following total tumour removal. Therefore, the underlying structural arrangement of the vessels in KS may determine whether or not the rainbow pattern can be seen on polarized dermoscopy.

PMID: 19067686 [PubMed - indexed for MEDLINE]

26. Rev Med Chil. 2008 Sep;136(9):1175-8. Epub 2008 Nov 12.

[Evaluation of sublingual microcirculation in septic shock. Report of one patient treated with high volume hemofiltration]

[Article in Spanish]

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Microcirculation is severely compromised in sepsis, with a reduction of capillary density and flow impairment. These alterations have important prognostic implications, being more severe in non-survivors to septic shock. Today microcirculation may be assessed bedside, non-invasively using polarized light videomicroscopy a technique known as SDF (side dark field). We report a 54 year-old man with an extramembranous nephropathy that developed a necrotizing fasciitis associated to septic shock, in whom microcirculation was periodically assessed during his management. The patient was treated with fluids, vasoactive drugs, antibiotics and was operated for exploration and debridement. As the patient persisted in refractory shock despite treatment, high-volume hemofiltration was started. Before hemofiltration the patient had severe microcirculatory alterations that improved during and after the procedure. Physiologic endpoints of high-volume hemofiltration in septic shock remain unknown, but it has the capacity to clear inflammatory mediators. Since microcirculatory alterations are in part secondary to these mediators, their removal is beneficial. Like other authors, we found no relation between microcirculation and other haemodynamic and perfusion variables.

PMID: 19030663 [PubMed - indexed for MEDLINE]

27. J Endourol. 2008 Dec;22(12):2723-31.

Protective effect of a potent antioxidant, pomegranate juice, in the kidney of rats with nephrolithiasis induced by ethylene glycol.

Tugcu V, Kemahli E, Ozbek E, Arinci YV, Uhri M, Erturkuner P, Metin G, Seckin I, Karaca C, Ipekoglu N, Altug T, Cekmen MB, Tasci AI.

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PURPOSE: We aimed to study the protective effects of pomegranate juice (PJ) on ethylene glycol (EG)-induced crystal deposition in renal tubules, renal toxicity, and inducible nitric oxide synthase (iNOS) and nuclear factor-kappaB activities in rat kidneys. **MATERIALS AND METHODS:** Fifty-six rats were divided into four equal groups: Control, EG, EG + 50 microL PJ/d (PJ50), and EG + 100 microL PJ/d (PJ100). Rats were sacrificed on days 10 and 45. Tissue sections were evaluated under light and polarized microscopy for the presence and degree of crystal deposition and toxicity in the kidneys. Crude extracts of the cortex were used to determine reduced glutathione (GSH), nitric oxide (NO), and malondialdehyde (MDA) levels. **RESULTS:** In the EG group, crystal depositions were more evident and mild crystalization was observed in proximal tubules on day 10; severe crystalization and granulovacuolar epithelial cell degeneration were observed on day 45. There was limited or no crystal formation in the EG + PJ-given groups. There were completely normal renal and tubular structures in the control group. There was no significant difference between the four groups in serum levels of sodium, potassium, blood urea nitrogen, and creatinine in any sampling time. Hyperoxaluria, a marked increase in MDA and NO levels, and decrease of GSH were observed in the EG-given groups compared with the others. There were marked iNOS and p65 expressions in only the EG-given rats compared with control and PJ groups, immunohistochemically. **CONCLUSION:** This experiment shows the protective effect of PJ in the EG-induced crystal depositions in renal tubules.

PMID: 19025399 [PubMed - indexed for MEDLINE]

28. J Biomed Opt. 2008 Sep-Oct;13(5):054027.

Nondestructive assessment of the inhibition of enamel demineralization by CO2 laser treatment using polarization sensitive optical coherence tomography.

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Studies have shown that lasers can be used to modify the chemical composition of tooth enamel to render it less soluble. The purpose of this study was to determine if polarization-sensitive optical coherence tomography (PS-OCT) can be used to nondestructively assess the inhibition of demineralization after CO2 laser irradiation. Human and bovine enamel specimens were irradiated by a microsecond pulsed CO2 laser operating at a wavelength of 9.3 microm. Some specimen areas were also treated with topical fluoride to create six treatment groups on each sample, including protected surface (no demineralization), protected +laser, laser, fluoride, laser+fluoride, and unprotected surface. Samples were placed in an artificial demineralization solution to create lesions approximately 100-200 microm in depth and were subsequently scanned with a PS-OCT system to assess lesion severity before sectioning for analysis by polarized light microscopy and transverse microradiography for comparison. PS-OCT was able to measure a significant reduction in the integrated reflectivity due to inhibition by the laser on both human and bovine enamel even though the laser modification of the enamel surface did cause an increase in reflectivity and decrease in optical penetration. This study shows that the PS-OCT is well suited for the clinical assessment of caries inhibition after laser treatments.

PMID: 19021407 [PubMed - indexed for MEDLINE]

29. Otolaryngol Pol. 2008;62(5):643-8.

[Head and neck amyloidosis]

[Article in Polish]

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INTRODUCTION: Amyloid is a pathological protein which can accumulate in almost every tissue, consequently resulting in illness (amyloidosis). Amyloid has a red color when the slice preparation is stained with Congo red staining and under polarized light exhibits a characteristic apple-green color. Over 26 different proteins, that can form amyloid, have been described. AL, AA and ATTR amyloidosis are the most frequent type of amyloidosis. Head and neck is a rare region for amyloidosis, which can be localized and/or systemic. Early diagnosis and precise classification of the amyloidosis is essential for treatment planning. Various treatment strategies: antiinflammatory management, chemotherapy, immunotherapy, surgery, gene therapy, to name just a few, are already readily available or are currently being explored or researched. MATERIAL AND METHODS: Three cases are presented here: an elderly women with tongue and neck tumor and two patients with laryngeal tumors. The biopsy of the lingual and laryngeal tumor and ultrasonography in the first case have been performed in the ENT-Department and Ambulance. RESULTS: In the Internal Medicine Department the patient with lingual and neck tumor, due to symptoms such as: swallowing disorders, dysarthria, painful joints swelling and carpal syndrome in anamnesis, previously underwent an examination in order to rule out scleroderma. The investigation appeared to be negative. The histopathology investigation of the lingual tumor identified amyloidosis. USG has not revealed any significant findings. The two patients with laryngeal tumor, except for hoarseness, has not manifested other symptoms suggesting general illness. The biopsy established that there was localized amyloidosis. CONCLUSION: Diagnosis of amyloidosis and its correct classification continue to pose a great challenge. Two factors play a pivotal role in the identification of local or systemic amyloidosis: the local and/or systemic manifestation and Congo red staining as a gold diagnostic standard.

PMID: 19004276 [PubMed - indexed for MEDLINE]

30. J Dent. 2008 Nov;36(11):900-6. Epub 2008 Sep 25.

In vitro remineralization effects of grape seed extract on artificial root caries.

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Grape seed extract (GSE) contains proanthocyanidins (PA), which has been reported to strengthen collagen-based tissues by increasing collagen cross-links. We used an in vitro pH-cycling model to evaluate the effect of GSE on the remineralization of artificial root caries. Sound human teeth fragments obtained from the cervical portion of the root were stored in a demineralization solution for 96 h at 37 degrees C to induce artificial root caries lesions. The fragments were then divided into three treatment groups including: 6.5% GSE, 1,000 ppm fluoride (NaF), and a control (no treatment). The demineralized samples were pH-cycled through treatment solutions, acidic buffer and neutral buffer for 8 days at 6 cycles per day. The samples were subsequently evaluated using a microhardness tester, polarized light microscopy (PLM) and confocal laser

scanning microscopy (CLSM). Data were analyzed using ANOVA and Fisher's tests ($p < 0.05$). GSE and fluoride significantly increased the microhardness of the lesions ($p < 0.05$) when compared to a control group. PLM data revealed a significantly thicker mineral precipitation band on the surface layer of the GSE-treated lesions when compared to the other groups ($p > 0.05$), which was confirmed by CLSM. We concluded that grape seed extract positively affects the demineralization and/or remineralization processes of artificial root caries lesions, most likely through a different mechanism than that of fluoride. Grape seed extract may be a promising natural agent for non-invasive root caries therapy.

PMCID: PMC2583354

PMID: 18819742 [PubMed - indexed for MEDLINE]

31. J Cosmet Dermatol. 2008 Sep;7(3):180-8.

An assessment of the efficacy of blue light phototherapy in the treatment of acne vulgaris.

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BACKGROUND: Acne vulgaris is a common skin condition that affects 8 out of 10 people. It varies from mild to severe, and different treatments target various aspects of the disease. Propionibacterium acnes, one of the culprits involved in the pathogenesis of acne vulgaris, is the main target of all major medical treatments used. Studies conducted in recent years have shown favorable effects within the visible light spectrum for the treatment of acne vulgaris. **OBJECTIVE:** In this study, we have evaluated the use of intense blue light within the spectral range of 415-425 nm (peak 420 nm) in the treatment of acne vulgaris. **METHODS:** Twenty-one patients with mild to moderate facial acne were treated with blue light phototherapy. All patients were given 14-min treatment sessions twice a week for 4 weeks. Acne severity was assessed using the Leeds Technique for grading and lesion counts. Disability was assessed using the Dermatology Life Quality Index (DLQI). In addition, standard digital and cross-polarized light photographs were taken and graded by a blinded evaluator. Visual analog scale (VAS) scores and cultures for P. acnes were carried out before starting the treatment and upon completion of the treatment. **RESULTS:** Significant improvement was achieved in the Leeds Acne Grade ($P = 0.001$). The inflammatory ($P = 0.001$) and noninflammatory ($P = 0.06$) lesion counts also improved significantly. A similar change was noted in the DLQI ($P = 0.001$); a degree of significance was also achieved in the patients' and the investigators' VAS scores ($P = 0.01$ and $P = 0.001$, respectively). P. acnes colony counts failed to show a significant decrease at the end of the treatment and remained almost constant ($P = 0.660$). **CONCLUSIONS:** We believe that blue light does appear to have some role in the management of acne and may be beneficial for the treatment of a select group of mild to moderate acne patients.

PMID: 18789052 [PubMed - indexed for MEDLINE]

32. Photomed Laser Surg. 2009 Apr;27(2):261-7.

Effect of visible and infrared polarized light on the healing process of full-thickness skin wounds: an experimental study.

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OBJECTIVE AND BACKGROUND DATA: Polarized light has already been experimentally and clinically used in an effort to promote wound healing, but the findings have been equivocal. The aim of this study was to evaluate the effect of visible and infrared polarized light of a specific range of wavelength (580–3400 nm) on the secondary healing of full-thickness skin wounds in rats. **MATERIALS AND METHODS:** Forty male Wistar rats were used, divided in two groups of 20 animals each. A standardized open full-thickness skin wound was created on the back of each animal. In the first group the rats were exposed to polarized light (40 mW/cm² and 2.4 J/cm²) for 7 min on a daily basis (total daily dose = 16.8 J/cm²), while the second group acted as controls. Clinical and histological evaluation of wound healing were performed on days 5, 10, 15, and 20 post-wound. The size of the wounds was measured with the use of planimetry, whereas epithelialization, inflammatory response, neovascularization, and collagen formation were histologically assessed. **RESULTS:** According to our findings, the group exposed to light therapy showed statistically significantly faster epithelialization seen on days 10 and 15 post-wound compared to controls, as well as better quality of the healing process (although not statistically significantly) at all time points. **CONCLUSION:** In conclusion, this specific fraction of polarized light seems to have beneficial effects on wound healing, leading to faster epithelialization and qualitatively better wound healing.

PMID: 18687058 [PubMed - indexed for MEDLINE]

33. Photomed Laser Surg. 2008 Aug;26(4):307-13.

Effect of 670-nm laser therapy and dexamethasone on tissue repair: a histological and ultrastructural study.

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OBJECTIVE: In this study we investigated the role of extracellular matrix elements and cells during the wound healing phases following the use of low-level laser therapy (LLLTL) and anti-inflammatory drugs. **BACKGROUND DATA:** There are few scientific studies that characterize the possible interactions of LLLTL and anti-inflammatory medications. **MATERIALS AND METHODS:** Thirty-two rats submitted to a wound inflicted with a 6-mm-diameter punch. The animals were divided into four groups: sham treated, those treated with the GaAlAs laser (4 J/cm², 9 mW, lambda = 670 nm, spot size 28.27 x 10(2) cm²), those treated with dexamethasone (2 mg/kg), and those treated with both LLLTL and dexamethasone. After 3 and 5 d, the cutaneous wounds were assessed by histopathology using polarized light and ultrastructural assessment using transmission electron microscopy. Changes seen in polymorphonuclear inflammatory cells, edema, mononuclear cells, and collagen fiber deposition were semi-quantitatively evaluated. **RESULTS:** The laser-treated group demonstrated increased collagen content and better arrangement of the extracellular matrix (p < 0.05). Fibroblasts in these tissues were increased in number and were more synthetically active. In the dexamethasone group, the collagen was shown to be non-homogenous and disorganized, with a scarcity of fibroblasts. In the group treated with both types of therapy, fibroblasts were more common and they exhibited vigorous rough endoplasmic reticulum, but they had less collagen production compared to those seen in the laser group. **CONCLUSION:** LLLTL alone accelerates post-surgical tissue repair and reduces edema and the polymorphonuclear infiltrate even in the presence of dexamethasone.

PMID: 18665765 [PubMed - indexed for MEDLINE]

34. Photomed Laser Surg. 2008 Aug;26(4):361-6.

The effects of daily irradiation with polychromatic visible polarized light on human lymphocyte populations.

Lim JH, Lee J, Lee IS, Kim YJ, Song EY, Choi YS, Yun YM.

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OBJECTIVE: The goal of this randomized, placebo controlled, double-blind study was to investigate the effects of transcutaneous irradiation with polychromatic visible polarized light (540-780 nm; 68% polarization; power density 3.0 E-10 W/cm²) on a subset population of human lymphocytes using flow cytometry.

BACKGROUND DATA: The biomodulation and therapeutic effects of visible light of different wavelengths are well known, but the immunological effects of polychromatic visible polarized light have not been investigated sufficiently.

METHODS: Before and after 28 consecutive days of irradiation, blood samples were collected from the subjects and the population count of the lymphocyte subset was measured. **RESULTS:** The absolute count of total lymphocytes, CD3(+) lymphocytes, and CD3(+)CD4(+) lymphocytes increased by 7% (p = 0.023), 9% (p = 0.058), and 13% (p = 0.021), respectively. Yet the absolute count of WBCs, CD3(+)CD8(+), CD19(+), and CD16(+)56(+) lymphocytes did not change significantly. **CONCLUSION:** The application of polychromatic visible polarized light with the aforementioned features increases the CD3(+)CD4(+) lymphocyte population. It is suggested that this regimen may be useful for the promotion of natural defenses in cell-mediated immunity.

PMID: 18647093 [PubMed - indexed for MEDLINE]

35. Photomed Laser Surg. 2008 Aug;26(4):289-99.

The use of light photobiomodulation on the treatment of second-degree burns: a histological study of a rodent model.

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OBJECTIVE: The aim of this investigation was to compare, by light microscopy, the effects of the use of laser photobiomodulation (LPBM) and polarized light (PL) on second-degree burns on rodents. **BACKGROUND DATA:** Burns are severe injuries that result in the loss of tissue fluids, destruction of tissues, infection, and shock. With severe and widespread third-degree burns death may occur. Several light sources have been suggested as being effective for improving wound healing. **MATERIALS AND METHODS:** Forty five rats were used in this study. A second-degree burn was created on the dorsum of each animal, and the animals were divided into four groups: PL (400-2000 nm, 40 mW, 2.4 J/cm²/min); LPBM-1 (780 nm, 35/40 mW, theta approximately 2 mm, 4 x 5 J/cm²); LPBM-2 (660 nm, 35/40 mW, theta approximately 2 mm, 4 x 5 J/cm²); and untreated animals acted as controls. The treatment was started immediately post-burn at four points around the burned area (laser: 5 J/cm² per site). The illumination with PL was performed according to the manufacturer's instructions. Treatments were repeated at 24-h intervals for 7 d. The animals were sacrifice at 3, 5, and 7 d post-burn. The specimens were routinely cut and stained and analyzed by light microscopy using hematoxylin and eosin and Sirius red. **RESULTS:** The analysis of the results demonstrated that the

damaged tissue was able to efficiently absorb and process the light at all tested wavelengths. LPBM at 660 nm showed better results at early stages of wound healing. However, the use of 780-nm laser light had beneficial effects throughout the experimental period, with the animals growing newly-formed tissue similar to normal dermis. CONCLUSION: Despite our findings that the use of both types of light energy improved the healing of second-degree burns at the early stages, long-term assessment is needed to verify if this improvement will influence the final results of treatment.

PMID: 18647088 [PubMed - indexed for MEDLINE]

36. J Photochem Photobiol B. 2008 Sep 18;92(3):144-52. Epub 2008 Jul 7.

Influence of laser photobiomodulation upon connective tissue remodeling during wound healing.

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The modulation of collagen fibers during experimental skin wound healing was studied in 112 Wistar rats submitted to laser photobiomodulation treatment. A standardized 8mm-diameter wound was made on the dorsal skin of all animals. In half of them, 0.2ml of a silica suspension was injected along the border of the wound in order to enhance collagen deposition and facilitate observation. The others received saline as vehicle. The treatment was carried out by means of laser rays from an aluminum-gallium arsenide diode semiconductor with 9mW applied every other day (total dose=4J/cm²) on the borders of the wound. Tissue sections obtained from four experimental groups representing sham-irradiated animals, laser, silica and the association of both, were studied after 3, 7, 10, 15, 20, 30 and 60 days from the laser application. The wounded skin area was surgically removed and submitted to histological, immunohistochemical, ultrastructural, and immunofluorescent studies. Besides the degree and arrangement of collagen fibers and of their isotypes, the degree of edema, the presence of several cell types especially pericytes and myofibroblasts, were described and measured. The observation of Sirius-red stained slides under polarized microscopy revealed to be of great help during the morphological analysis of the collagen tissue dynamic changes. It was demonstrated that laser application was responsible for edema regression and a diminution in the number of inflammatory cells (p<0.05). An evident increase in the number of actin-positive cells was observed in the laser-treated wounds. Collagen deposition was less than expected in silica-treated wounds, and laser treatment contributed to its better differentiation and modulation in all irradiated groups. Thus, laser photobiomodulation was able to induce several modifications during the cutaneous healing process, especially in favoring newly-formed collagen fibers to be better organized and compactedly disposed.

PMID: 18602833 [PubMed - indexed for MEDLINE]

37. Lasers Surg Med. 2008 Jul;40(5):342-9.

Non-destructive assessment of inhibition of demineralization in dental enamel irradiated by a lambda=9.3-microm CO₂ laser at ablative irradiation intensities with PS-OCT.

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BACKGROUND AND OBJECTIVE: Polarization sensitive optical coherence tomography (PS-OCT) has great promise for the non-destructive assessment of the efficacy of anti-carries agents such as fluoride and thermal laser treatments on enamel surfaces. The purpose of this study was to demonstrate that PS-OCT can be used to measure demineralization in craters/incisions prepared in enamel by a CO(2) laser operating at the high irradiation intensities required for cavity preparations. MATERIALS AND METHODS: Incisions in bovine enamel surfaces were produced by a CO(2) laser used with a water spray. The laser was operated at $\lambda=9.3$ microm with a pulse duration of 15 micros and an incident fluence of 20 J/cm(2). The laser treatments were also combined with topical fluoride treatments. A PS-OCT system operating at 1,310 nm was used to acquire polarization resolved images of six areas including sound and laser-ablated+topical fluoride treated zones on each sample. After imaging the teeth, they were sectioned and the thin sections were examined with polarized light microscopy (PLM) and transverse microradiography (TMR). The integrated reflectivity and lesion depth derived from the PS-OCT scans, the integrated mineral loss and depth measured using TMR and the lesion depth measured with PLM were acquired for each area on the fifteen samples for comparison. RESULTS: The integrated reflectivity and depth in the areas treated by the laser and fluoride were significantly lower ($P<0.05$) than for the untreated enamel. Similar results were observed for TMR and PLM. CONCLUSIONS: These results suggest that PS-OCT has great potential for the non-destructive "in vivo" assessment of the inhibition of demineralization by lasers at ablative irradiation intensities with and without topical fluoride application.

PMID: 18563781 [PubMed - indexed for MEDLINE]

38. *Kidney Int.* 2008 Oct;74(7):919-24. Epub 2008 Jun 18.

Acidic polyanion poly(acrylic acid) prevents calcium oxalate crystal deposition.

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Acidic macromolecules inhibit calcium oxalate nucleation, growth, aggregation and attachment to cells in vitro. To test for such an effect in vivo we used osmotic minipumps to continuously infuse several doses of the 5.1 kDa poly(acrylic acid) (pAA(5.1)) into rats fed a diet which causes renal calcium oxalate crystal deposition. Although kidneys of rats receiving the saline control contained calcium oxalate crystals, measured by polarized light microscopy, those of animals given pAA(5.1) had significantly lower numbers of crystals in various zones of the kidney. Delivery of pAA(5.1) to urine was confirmed by measuring excretion of infused biotinylated pAA(5.1). Both the derivatized and unlabelled pAA(5.1) had the same effects on crystallization in vitro. Our study shows that acidic polymers hold promise as effective therapies for kidney stones likely through prevention of calcium oxalate crystal aggregate formation.

PMCID: PMC2566899

PMID: 18563053 [PubMed - indexed for MEDLINE]

39. *Clin Orthop Relat Res.* 2008 Jul;466(7):1618-24. Epub 2008 May 8.

Addition of nitric oxide through nitric oxide-paracetamol enhances healing rat achilles tendon.

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Nitric oxide is an important messenger molecule in many physiological processes. The addition of NO via NO-flurbiprofen enhances the material properties of healing tendon, however, flurbiprofen has a detrimental effect on healing. We asked if NO delivered by a cyclooxygenase 3 inhibitor (paracetamol/acetaminophen) would enhance healing in a rat Achilles tendon healing model. Rats were injected subcutaneously daily with NO-paracetamol, paracetamol or vehicle from two days before surgery to the day of tissue harvesting. Paracetamol had no effect on tendon healing compared with vehicle alone. NO-paracetamol did not change the failure load, but did decrease the water content, enhance the collagen content, reduce the cross-sectional area and improve the ultimate stress of healing tendon compared with paracetamol and vehicle. The collagen organization of the healing tendon in the NO-paracetamol group, as determined by polarized light microscopy, was enhanced. Our data suggests NO-paracetamol increases the total collagen content and enhances organization while decreasing the cross-sectional area of healing rat Achilles tendon and is consistent with human clinical trials where NO has improved the symptoms and signs of tendinopathy.

PMCID: PMC2505261

PMID: 18463933 [PubMed - indexed for MEDLINE]

40. Gene Ther. 2008 Aug;15(16):1139-46. Epub 2008 Apr 24.

Ex vivo adenoviral transfer of bone morphogenetic protein 12 (BMP-12) cDNA improves Achilles tendon healing in a rat model.

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The aim of our study was to evaluate the histological and biomechanical effects of BMP-12 gene transfer on the healing of rat Achilles tendons using a new approach employing a genetically modified muscle flap. Biopsies of autologous skeletal muscle were transduced with a type-five, first-generation adenovirus carrying the human BMP-12 cDNA (Ad.BMP-12) and surgically implanted around experimentally transected Achilles tendons in a rat model. The effect of gene transfer on healing was evaluated by mechanical and histological testing after 1, 2, 4 and 8 weeks. One week after surgery, the maximum failure load of the healing tendons was significantly increased in the BMP-12 group, compared with the controls, and the tendon stiffness was significantly higher at 1, 2 and 4 weeks. Moreover, the size of the rupture callus was increased in the presence of BMP-12 and there was evidence of accelerated remodeling of the lesion in response to BMP-12. Histological examination showed a much more organized and homogeneous pattern of collagen fibers at all time points in lesions treated with the BMP-12 cDNA muscle graft. Both single fibrils and the collagen fibers had a greater diameter, with a higher degree of collagen crimp than the collagen of the control groups. This was confirmed by sirius red staining in conjunction with polarized light microscopy, which showed a higher shift of small yellow-green fibers to strong yellow-orange fibers after 2, 4 and 8 weeks in the presence of BMP-12 cDNA. There was also an earlier shift from fibroblasts to fibrocytes within the healing tendon, with less fat cells present in the tendons of the BMP-12 group compared with the controls. Treatment with BMP-12 cDNA-transduced muscle grafts thus produced a promising acceleration and improvement of tendon healing, particularly influencing early tissue regeneration, leading to quicker recovery

and improved biomechanical properties of the Achilles tendon. Further development of this approach could have clinical applications.

PMID: 18432278 [PubMed - indexed for MEDLINE]

41. Am J Dermatopathol. 2008 Apr;30(2):185-7.

Melanoma with second myxoid stromal changes after personally applied prolonged phototherapy.

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Most malignant melanomas are easily diagnosed; however, melanoma is also one of the lesions most frequently reported to mimic other tumors. One of the most difficult patterns to recognize is characterized by prominent myxoid matrix. A case is presented of primary cutaneous melanoma with abundant myxoid matrix in a patient who underwent prolonged phototherapy. Three years before, after getting sunburns, the patient noticed changes of a congenital nevus located in the area of sunburns. It became darker, started to blanch, and grew, with occasional bleeding. Without consulting a physician, the patient applied phototherapy onto the area for 30 months. He used a Bioptron lamp with polarized, polychromatic, incoherent light, at a wavelength from 480 to 3400 nm, without ultraviolet radiation. Clinically, the lesion was unevenly pigmented, ulcerated, covered with hemorrhagic crust, and measuring 3.5 cm in greatest dimension, with a satellite nodule. Multiple metastatic subcutaneous nodules were also found on the scalp and trunk. Histologically, the primary tumor and metastases were composed of nests and pseudotubular formations of polygonal, spindle, and stellate cells embedded in abundant myxoid stroma that comprised more than 80% of the tumor mass. Focally, in the epidermis and papillary dermis, nests of atypical melanocytes and numerous melanophages were observed. Chemotherapy and immunotherapy were administered as suggested by an oncologist. The patient died from distant metastases 6 months after the diagnosis. Although some authors believe that myxoid changes do not seem to alter the behavior of melanoma, it remains an important differential diagnosis issue.

PMID: 18360128 [PubMed - indexed for MEDLINE]

42. J Vasc Interv Radiol. 2008 Feb;19(2 Pt 1):189-94.

Cholesterol embolism evaluated by polarized light microscopy after primary renal artery stent placement with filter protection.

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PURPOSE: Cholesterol microembolization may explain some treatment failures after renal artery stent placement. The identification of cholesterol crystals may provide significant help in diagnosing the real frequency and severity of this complication. The aim of the present study was to examine the efficacy of polarized light imaging in the detection of cholesterol emboli trapped in a protection device. **MATERIALS AND METHODS:** During a period of 18 months, 15 significant atherosclerotic stenoses of the ostium of the main renal artery were treated with primary stent placement with embolic protection. The filter device

used was made of polyurethane, with a pore size of 115 μ m. The device was mounted over a 0.014-inch guide wire. For pathologic analysis, the recaptured filter basket was compressed between two slides and examined in a microscope under polarized light. RESULTS: All the stenoses were successfully treated without clinical complications. All the filters were deployed and recaptured without difficulty. Cholesterol crystals were detected in 12 filters and no cholesterol was found in three. In one case, trouble with filter manipulation precluded pathologic analysis. No worsening of renal function was detected in any patient during follow-up. CONCLUSIONS: Microscopic analysis with polarized light easily detects the cholesterol crystals trapped in the filter device. This provides evidence that renal cholesterol microembolism is highly prevalent during renal artery stent placement.

PMID: 18341947 [PubMed - indexed for MEDLINE]

43. Nefrologia. 2008;28(1):93-8.

[Systemic AA amyloidosis induced by benign neoplasms]

[Article in Spanish]

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Amyloidosis is a systemic disorder characterized by the extracellular tissue deposition of insoluble, toxic aggregates in bundles of beta-sheet fibrillar proteins. These deposits are typically identified on the bases of their apple-green birefringence under a polarized light microscope after staining with Congo red, and by the presence of rigid, nonbranching fibrils 8 to 10 nm in diameter on electron microscopy. The type of amyloid fibril unit can be further defined by immunohistology or by immunoelectron microscopy. It has been described at least 25 different human protein precursors of amyloid fibrils, which will describe its corresponding amyloid disease. The most common types of amyloidosis are AL (primary) and AA (secondary) types; the former, is the most frequent and is due to deposition of proteins derived from immunoglobulin light chain fragments, occurring alone or in association with multiple myeloma. The later (AA), is caused by deposition of fibrils composed of fragments of the acute phase reactant serum amyloid A (SAA) and complicates chronic diseases with ongoing or recurring inflammation, namely; rheumatoid arthritis (RA), juvenile chronic polyarthritis, ankylosing spondylitis, familial periodic fever syndromes (Familial Mediterranean Fever), chronic infections and furthermore, some neoplasms (mainly renal cell carcinoma and Hodgkin's disease). Despite its less frequent association, some benign neoplasms can subsequently complicate to AA amyloidosis, therefore, an early diagnose and successful treatment may lead indeed, to regression of the amyloid disease. Herein, we present two cases of AA amyloidosis, both of them caused by 2 different benign neoplasms: 1. A 34 year-old woman, after chronic oral contraceptive use, developed an hepatic adenoma (fig. 1) which finally lead to AA amyloidosis with primary kidney presentation (pure nephrotic syndrome) (table 1). Post-surgical complications yield to acute renal failure from which unfortunately could not be recovered. After being on hemodialysis therapy during 10 months she received a first renal allograft without any complication. 2. A 20 year old woman, was diagnosed of AA amyloidosis after a renal biopsy (fig. 2) because of nephrotic syndrome (table 1). Further investigation lead to the finding of a hialyne-vascular type Castleman's disease located in the retroperitoneum (fig. 2). Despite surgical resection and medical treatment (colchicine) she developed progressive renal failure requiring initialization of hemodialysis therapy. After 6 years being on hemodialysis, she received a first renal allograft which is currently functioning

after one year of follow-up. Although other chronic inflammatory diseases complicate more frequently to AA amyloidosis, benign tumors have to be taken into account as a potential ethiological cause for secondary amyloidosis.

PMID: 18336138 [PubMed - indexed for MEDLINE]

44. J Dent Res. 2008 Mar;87(3):228-32.

Active management of incipient caries and choice of materials.

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Evidence of the effects of various sealant and fluoride materials in stabilizing or reversing incipient caries lesions has been reported. However, a knowledge gap still exists as to what material yields the best results. Thus, the objective of this study was to find the most effective material by comparing the effects of a resin-based sealant (sealant), a fluoride-containing sealant (F-sealant), a fluoride varnish (F-varnish), and a glass-ionomer cement (GIC) on de-remineralization of incipient artificial caries and adjacent intact enamel on proximal surfaces of posterior teeth. The 4 materials were applied to lesions created on proximal surfaces. Areas of intact enamel 0.5 mm adjacent to the materials were also studied. The specimens were thermo- and pH-cycled. Cross-sections of the two areas were analyzed under polarized light microscope and quantified with Image-Pro plus. The most effective material in reducing the carious areas was GIC, followed by F-varnish, F-sealant, and sealants. GIC followed by F-varnish was most efficient in inhibiting new caries lesions 0.5 mm adjacent to the materials.

PMID: 18296605 [PubMed - indexed for MEDLINE]

45. J Contemp Dent Pract. 2008 Feb 1;9(2):113-21.

Effect of the CO2 laser combined with fluoridated products on the inhibition of enamel demineralization.

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AIM: This in vitro study evaluated the combined effects of a 10.6 microm CO2 laser, fluoridated dentifrice, and mouthrinse on the reduction of lesion progression in carious human enamel. METHODS AND MATERIALS: Slabs of previously demineralized dental enamel were assigned to nine groups, either treated with/without a CO2 laser, with/without fluoridated dentifrice, and with/without fluoridated mouthrinse. After a pH-cycling regime, fluoride concentrations were determined in the demin- and remineralizing solutions. A qualitative polarized light analysis was performed on enamel, and enamel mineral loss was determined by cross-sectional microhardness testing. RESULTS: All treatments were able to decrease mineral loss, and the inhibition of demineralization progression ranged from 48% to 60%. CONCLUSION: The 10.6 microm CO2 laser irradiation alone or combined with fluoridated products reduced demineralization progression in enamel. However, there was no significant additional demineralization inhibitory effect with the use of the combined laser-fluoride treatments. CLINICAL SIGNIFICANCE: CO2 lasers have proven to be efficient in reducing subsurface enamel demineralization. Its association with a high frequent fluoride therapy

may enhance this protective effect.

PMID: 18264533 [PubMed - indexed for MEDLINE]

46. Am J Gastroenterol. 2008 Mar;103(3):776-87. Epub 2007 Dec 12.

Gastrointestinal manifestations of amyloidosis.

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Comment in:

Am J Gastroenterol. 2009 Sep;104(9):2374-6.

Amyloidosis is characterized by extracellular deposition of abnormal protein. There are six types: primary, secondary, hemodialysis-related, hereditary, senile, and localized. Primary (AL) amyloidosis is associated with monoclonal light chains in serum and/or urine with 15% of patients having multiple myeloma. Secondary (AA) amyloidosis is associated with inflammatory, infectious, and neoplastic diseases. The presentation is protean, including macroglossia, a dilated and atonic esophagus, gastric polyps or enlarged folds, and luminal narrowing or ulceration of the colon. Amyloid deposition in the gastrointestinal (GI) tract is greatest in the small intestine. The symptoms include diarrhea, steatorrhea, or constipation. Pseudo-obstruction carries a particularly grave prognosis, often not responding to pro-motility agents. Hepatic involvement is common, but the clinical manifestations are usually mild with hepatomegaly and an elevated alkaline phosphatase level. Biopsies to diagnose amyloidosis can be taken from the fat, kidney, intestine, or bone marrow. The safety of liver biopsies is controversial. With Congo Red stain, amyloid appears red in normal light and apple-green in polarized light. Treatment for AL amyloidosis is chemotherapy and stem cell transplantation; treatment for AA amyloidosis is control of the underlying disease. Amyloidosis should be considered in patients with proteinuria, cardiomyopathy, hepatomegaly (with mildly abnormal liver tests), peripheral and autonomic neuropathy, weight loss, and GI symptoms.

PMID: 18076735 [PubMed - indexed for MEDLINE]

47. Methods Mol Med. 2007;136:283-302.

Analysis of arthritic lesions in the Dell mouse: a model for osteoarthritis.

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Osteoarthritis (OA) is characterised by progressive erosion of articular cartilage with a number of associated degenerative processes within the joint. Animal models of OA provide the only feasible way to systematically study the development and progression of OA, in order to understand the molecular events, and to develop tools for prevention and therapy of OA. Gene manipulation techniques have provided opportunities to generate transgenic mouse models for OA. In heterozygous Dell mice, incorporation of Col2a1 transgenes with a short deletion mutation results in production of shortened proalpha1 (II) collagen chains and a phenotype resembling human OA. This chapter describes techniques and practical aspects of preparation and processing of skeletal samples for radiological, histological, and molecular biologic analyses that have been used

to monitor the development of knee OA in Dell mice. A simple histological grading system to evaluate the progression of OA lesions, and examples of other degenerative alterations in the knee joint structures are presented.

Semiquantitative microscopic techniques are described for the analysis of proteoglycan distribution based on safranin O staining of glycosaminoglycans, and for the analysis of collagen matrix based on birefringence of polarized light.

Reference is also made to an experimental setup for correlating voluntary running activity of mice with OA score.

PMID: 17983156 [PubMed - indexed for MEDLINE]

48. *Int J Cancer*. 2008 Feb 15;122(4):751-60.

Relevance of a new rat model of osteoblastic metastases from prostate carcinoma for preclinical studies using zoledronic acid.

Lamoureux F, Ory B, Battaglia S, Pilet P, Heymann MF, Gouin F, Duteille F, Heymann D, Redini F.

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Animal models that mimic osteoblastic metastases associated with prostate carcinoma are required to improve the therapeutic options in humans. A new model was then developed and characterized in immunocompetent rats. The bisphosphonate zoledronic acid (ZOL) was tested to validate this model as a therapeutic application. Rat AT6-1 prostate tumor cells were characterized in vitro at the transcriptional (bone and epithelial markers) and functional (induction of mineralized nodules) levels. The bone lesions induced after their direct injection into the femur bone marrow were characterized by radiography, microscanner and histology analyses. ZOL effects were studied in vivo on bone lesion development and in vitro on AT6-1 cell proliferation, apoptosis and cell cycle analysis. Apart from epithelial markers, AT6-1 cells express an osteoblast phenotype as they express osteoblastic markers and are able to induce mineralized nodule formation in vitro. A disorganization of the trabecular bone at the growth zone level was observed in vivo after intraosseous AT6-1 cell injection as well as cortical erosion. The tumor itself is associated with bone formation as revealed by SEM analysis and polarized light microscopy. ZOL prevents the development of such osteoblastic lesions, related to a direct inhibitory effect on tumor cell proliferation independent of caspase 3 activation, but associated with cell cycle arrest. A new rat model of osteoblastic bone metastases was validated in immunocompetent rats and used to show the relevance of using ZOL in such lesions, as this compound shows bifunctional effects on both bone remodelling and tumor cell proliferation. (c) 2007 Wiley-Liss, Inc.

PMID: 17960623 [PubMed - indexed for MEDLINE]

49. *Z Rheumatol*. 2007 Nov;66(7):573-4, 576-8.

[Diagnosis and treatment of calcium pyrophosphate crystal-induced arthropathy]

[Article in German]

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Calcium pyrophosphate dihydrate deposition (CPPDD) disease is the term used to describe a group of common and potentially severe metabolic arthropathies. In

these, CPPD crystals form and are deposited in the cartilage matrix (chondrocalcinosis) and induce inflammatory and/or destructive mechanisms. Most cases are idiopathic, but hyperparathyroidism, hemochromatosis, hypomagnesemia and hypophosphatemia can promote or cause chondrocalcinosis. Early disease (with onset before the age of 60 years) thus requires that the patient be examined for these metabolic conditions, particularly hemochromatosis. The prevalence of CPPDD disease in the general population increases with age, being 10-15% in the age group 65-75 years and more than 40% in the over-80s. Although frequently asymptomatic, chondrocalcinosis can involve severe acute attacks of inflammatory arthritis (pseudogout) and also various types of chronic arthropathy including pseudorheumatoid arthritis, pseudo-osteoarthritis, and pseudoneuropathic joint disease. CPPD crystals can also be deposited in the bursae, ligaments, and tendons and generate inflammation and/or ruptures. The diagnosis is based on synovial fluid analysis (positively birefringent CPPD crystals visualized by compensated polarized light microscopy) and X-rays (punctate and linear radiodense areas in fibrocartilage and hyaline cartilage). Treatment is primarily symptomatic, since there is no known drug that can prevent progression of the joint destruction). Nonsteroid anti-inflammatory drugs (NSAIDs) and intra-articular or systemic glucocorticoids (amounts must be only small if use is prolonged) are the most useful treatments. Colchicine can be effective in recurring pseudogout, and magnesium can be used prophylactically. In a small uncontrolled series methotrexate was effective and aroused interest; it can be used when other treatments fail.

PMID: 17932681 [PubMed - indexed for MEDLINE]

50. Acta Biochim Pol. 2007;54(3):647-56. Epub 2007 Sep 18.

Orientation and spectral properties of two stilbazolium merocyanine dyes in stretched and unstretched polyvinyl alcohol films.

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Spectral properties (anisotropy coefficients calculated for absorption, emission and fluorescence decay time) of two stilbazolium merocyanine dyes have been determined to evaluate the applicability of these dyes as sensitizers in photodynamic therapy. The dyes were embedded in an anisotropic polymer matrix. Analysis of the emission decay components measured in polarized light provides information on the interactions of the dye molecules with the polymer matrix being a model of an anisotropic biological system. Different values of the emission anisotropies obtained from various polarized components of fluorescence decays have shown that the orientations of the dye molecules influence their interactions with the polymer. This means that differently oriented dye molecules located in biological systems should exhibit different interactions with membranes. The chain length and type of side groups attached as well as the salt form of the dye molecule were shown to influence the dye-polymer interactions and should be taken into account before the application of merocyanine dyes in medicine. These dyes seem to be promising optical sensors with spectral properties, including the calculated anisotropy coefficients, sensitive to the molecular environment, useful to study orientation and interaction with neighbouring molecules in biological membranes.

PMID: 17882325 [PubMed - indexed for MEDLINE]

51. J Dent. 2007 Oct;35(10):794-9. Epub 2007 Sep 14.

Enamel diffusion modulated by Er:YAG laser (Part 2). Organic matrix.

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Organic matrix (OM) has been hypothesized as a key player in the laser-induced retardation of enamel diffusion (LRED). OBJECTIVES: Therefore, this study was aimed to quantify the contribution of OM in LRED. METHODS: Four groups of enamel sections (n=10) were assigned to 'normal', 'laser treated', 'OM extracted' and 'laser+OM extraction' groups for measurement of diffusion coefficient (DC) using fluorescence recovery after photobleaching (FRAP) and fluorophores transport study (FTS). Er:YAG laser treatment and OM extraction were performed on respective groups. Sections were characterized with stereomicroscopy and polarized light microscopy. Treatment effects were statistically assessed with a factorial ANOVA. RESULTS: DC measured by FRAP and FTS coupled with confocal microscopy revealed the significant effect of OM ($p=0.001$) and laser treatment ($p<0.01$). After OM extraction, the laser effect on diffusion decreased about 34-75%, confirming the significant role of OM in LRED. CONCLUSION: Both FRAP and FTS may be promising tools to quantify enamel DC.

PMID: 17869404 [PubMed - indexed for MEDLINE]

52. J Dent. 2007 Oct;35(10):787-93. Epub 2007 Sep 14.

Enamel diffusion modulated by Er:YAG laser (Part 1)--FRAP.

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Several studies have demonstrated the caries protective effect of lasers by strengthening enamel crystalline structure. However, the effect of laser on enamel diffusion (ED) remains unclear. OBJECTIVES: This study aimed to quantify the laser-induced alteration of diffusion coefficients (DC) in enamel using fluorescence recovery after photobleaching (FRAP). METHODS: Eleven caries-free enamel sections were characterized morphologically using stereomicroscopy, polarized light microscopy and scanning electron microscopy, before and after laser treatment with Er:YAG laser 50 mJ x 5 s x 5 Hz. With 20 microM fluorescein, DCs were measured (n=11) by FRAP coupled with confocal microscopy. RESULTS: The DCs measured were $2.89\pm 0.61 \times 10^{-7} \text{ cm}^2/\text{s}$ and $4.076\pm 0.73 \times 10^{-7} \text{ cm}^2/\text{s}$, at the lased and unlased areas, respectively ($p=0.001$). CONCLUSIONS: This study has confirmed the reduction of ED as a potential mechanism involved in laser-induced caries prevention. FRAP was demonstrated to be a promising technique for evaluating diffusion-related phenomenon in enamel.

PMID: 17869402 [PubMed - indexed for MEDLINE]

53. Fiziol Zh. 2007;53(2):56-64.

[Pathogenetic basis for the correction of adaptation reactions in children using PILER-light]

[Article in Ukrainian]

Tsodikova OA, Zosimov AM.

According to the positions of systemic analysis of autoregulations and systemic reconstruction processes in children under the influence of PILER-light (Polarized polychromatic incoherent low-energy radiation) depending on the type of general non-specific adaptation reactions of the organism, the clinical blood test has been investigated using the correlation structures method. It has been established that phototherapy with polarized light causes stereotype effect of increased integration between the blood parameters, harmonizing of white and red blood parameters, elimination of the stress, decreased entropy elements. At the same time the specific adaptation reaction of the child's organism to the loadings of various origin, in particular, to the electromagnetic irradiation of optic diapason waves indicates the diverse character of the changed regulation system functions depending on the adaptation reaction type and grounds the differentiated approach to the polarized light therapy.

PMID: 17595913 [PubMed - indexed for MEDLINE]

54. *Aesthetic Plast Surg.* 2007 Sep-Oct;31(5):559-65.

Histologic analysis of zafirlukast's effect on capsule formation around silicone implants.

Bastos EM, Neto MS, Alves MT, Garcia EB, Santos RA, Heink T, Pereira JB, Ferreira LM.

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Comment in:

Aesthetic Plast Surg. 2008 Jan;32(1):179-80.

BACKGROUND: The most common complication experienced by patients who have undergone mammary implant surgery is capsular contracture. This matter concerns physicians and patients, but to date, there is no effective way to avoid this complication. Surgical intervention usually is required. In 2002, the use of zafirlukast, a leukotriene inhibitor (a drug used for asthma treatment), was reported for the treatment of capsular contracture, with good results. **METHODS:** For this study, 30 female Wistar rats were used. These animals received two silicone implants each: one with a smooth surface and one with a textured surface. All the animals received daily intraperitoneal injections for 90 days and were divided as follows: control group (C) receiving only saline solution, experimental group 1 (E-I) receiving 1.25 mg/kg/day of zafirlukast, and experimental group 2 (E-II) receiving 5 mg/kg/day of zafirlukast. Histologic analysis used hematoxylin and eosin to verify vessels, capsule thickness, and inflammatory cells. Immunohistochemical analysis with smooth muscle anti-actin antibody was used for myofibroblast verification. Picro-Sirius under polarized light was used for collagen analysis. **RESULTS:** Textured implant experimental groups presented smaller numbers of vessels, thinner capsules, lower collagen density, and smaller numbers of mastocytes and eosinophils than the control group. No significant differences were found in smooth surface implants, as compared with the control group. **CONCLUSION:** Zafirlukast reduced the occurrence of factors directly and indirectly connected with capsular contracture.

PMID: 17576504 [PubMed - indexed for MEDLINE]

55. *Lasers Surg Med.* 2007 Jun;39(5):381-5.

The prevalence and risk factors of post-inflammatory hyperpigmentation after fractional resurfacing in Asians.

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BACKGROUND: Ablative laser resurfacing is considered to be the main therapeutic option for the treatment of wrinkles and acne scarring. However, in Asians, post-inflammatory hyperpigmentation (PIH) is a common adverse effect of laser resurfacing. Fractional resurfacing is a new concept of skin rejuvenation whereby zones of micro thermal injury are generated in the skin with the use of a 1,540-nm laser. The risk and prevalence of hyperpigmentation in dark-skinned patients using this approach have not been studied. **OBJECTIVE:** To assess the prevalence and risk factors of PIH that is associated with the use of fractional resurfacing in Asians. **METHOD:** A retrospective study of 37 Chinese patients who were treated with fractional resurfacing for acne scarring, skin rejuvenation, and pigmentation was carried out. In all of the cases, pre- and post-treatment clinical photographs (from standardized and cross-polarized views) were taken using the Canfield CR system. Two independent observers assessed the photographs. A prospective study of treatments of nine different density and energy levels that were applied to the forearms of 18 volunteers was also performed. Clinical photographs were assessed pre- and post-treatment for evidence of PIH. **RESULT:** In the retrospective study, 119 treatment sessions were performed. Sixty-eight treatment sessions were high energy, low density; 51 sessions were low energy, high density. Patients who underwent a high energy but low-density treatment (range of energy 7-20 mJ; average energy 16.3 mJ, 1,000 MTZ) were associated with a lower prevalence of generalized PIH (7.1% vs. 12.4%) than those who underwent a low energy but high-density (range of energy 6-12 mJ; average energy 8.2 mJ, 2,000 MTZ) treatment. However, the difference was not statistically significant. Localized PIH occurred in the peri-oral area among patients who did not receive air cooling as an adjunctive therapy. **CONCLUSION:** Both the density and energy of the treatment determines the risk of PIH in dark-skinned patients. Density may be of more important but further studies are necessary to determine this. Cooling to prevent bulk tissue heating is also important, especially in small anatomical areas. By using adequate parameters, the risk of PIH in dark-skinned patients can be significantly reduced. (c) 2007 Wiley-Liss, Inc.

PMID: 17518354 [PubMed - indexed for MEDLINE]

56. Caries Res. 2007;41(3):190-7.

Effect of an alcohol-free, 1% chlorhexidine gel as an adjunct to a fluoridated dentifrice using an intraoral crown model.

Timmons SR, Harless JD, Hogan MM, Eckert GJ, Marek CL, Drake DR, Wefel JS.

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BACKGROUND/AIMS: The use of chlorhexidine as a topically applied oral antiseptic is well documented; however, clinical studies examining the effects of chlorhexidine gel on in situ dental caries are limited. This study utilized an in situ caries model and a modified crossover design to examine whether the addition of a biweekly topical, alcohol-free, 1% chlorhexidine digluconate gel to a daily fluoridated dentifrice inhibited artificial caries in dental tissues better than the fluoridated dentifrice alone when compared to a nonfluoridated placebo dentifrice. **METHODS:** Thirty patients were recruited based on their need for a mandibular, full crown. Artificial caries lesions were created in extracted human teeth and enamel and root tissue sections 100 µm in thickness were characterized using polarized light microscopy. The sections were fixed in the crown and placed on the prepared tooth. The participants were assigned a placebo toothpaste, a

toothpaste with 1,100 ppm F or a 1,100 ppm F toothpaste followed by 1 ml of 1% chlorhexidine gel at day 1 and day 14 (chlorhexidine+). Patients were instructed to brush twice daily for 4 weeks. Following each round, the sections in the crown were replaced with new sections. The sections were recharacterized and the mean changes were compared using ANOVA at alpha = 0.05. RESULTS: The chlorhexidine + F dentifrice and the F dentifrice alone significantly reduced lesion area in enamel tissue when compared to the placebo dentifrice. Both treatments also inhibited lesion progression and initiation in root tissue better than control in this model system. Although the chlorhexidine+ group enhanced remineralization and inhibited lesion progression better than the F(-) dentifrice alone for all outcomes measured, the differences were not significant. CONCLUSIONS: The chlorhexidine, in conjunction with a fluoride dentifrice, was no more effective than the fluoride dentifrice alone. Further study is needed before this 1% alcohol-free chlorhexidine gel should be recommended as an adjunct to a fluoride dentifrice in the treatment of dental caries. Copyright 2007 S. Karger AG, Basel.

PMID: 17426398 [PubMed - indexed for MEDLINE]

57. J Am Dent Assoc. 2007 Apr;138(4):502-6.

Potential inhibition of demineralization in vitro by fluoride-releasing sealants.

Salar DV, García-Godoy F, Flaitz CM, Hicks MJ.

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Comment in:

J Am Dent Assoc. 2007 Jul;138(7):938; author reply 938, 940.

BACKGROUND: The incorporation of fluoride into sealants has been viewed as a viable way to prevent pit-and-fissure caries by potential inhibition of demineralization through the release of fluoride to enamel. The authors conducted a study to examine the effect of a recently introduced fluoride-releasing sealant (ProSeal, Reliance Orthodontic Products, Itasca, Ill.) on enamel demineralization in an in vitro artificial caries system. METHODS: The authors randomly assigned 45 extracted human third molars to three treatment groups receiving either conventional sealant without fluoride (Group 1), fluoride-releasing sealant (Group 2) or glass ionomer sealant with high fluoride release (Group 3). They placed cavity preparations on the buccal surfaces of the molars and filled them with the assigned material. They placed acid-resistant varnish on the specimens' enamel surfaces to within 1 millimeter of the sealant, leaving a 1-mm rim of sound enamel available for in vitro enamel caries formation. They thermocycled the teeth (500 cycles) in artificial saliva. They subjected the teeth to an in vitro artificial caries challenge for six weeks to produce caries-like lesions in enamel adjacent to the sealant materials. The authors took longitudinal sections from each tooth, immersed them in water and examined them via polarized light microscopy to determine wall lesion frequencies. RESULTS: The mean (+/- standard deviation) lesion depths were 232 +/- 17 micrometers for Group 1, 144 +/- 21 mum for Group 2 and 128 +/- 15 mum for Group 3. The wall lesion frequency was 12 percent for Group 1 and 7 percent for both Groups 2 and 3. There was a significant difference ($P < .05$) among the fluoride-releasing materials versus the nonfluoride-releasing material. This study indicates that the new fluoride-releasing sealant substantially reduces the amount of enamel demineralization adjacent to the material. CONCLUSION: ProSeal provided increased demineralization inhibition compared with a conventional sealant containing no fluoride, but less than that shown by a glass ionomer sealant. CLINICAL IMPLICATIONS: ProSeal's physical properties and cariostatic effects may allow for applications beyond traditional sealant use.

PMID: 17403741 [PubMed - indexed for MEDLINE]

58. Hepatobiliary Pancreat Dis Int. 2007 Apr;6(2):176-81.

Inhibitory effects of prostaglandin E1 on activation of hepatic stellate cells in rabbits with schistosomiasis.

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BACKGROUND: Liver fibrosis is the result of an imbalance between synthesis and degradation of extracellular matrix proteins of the liver. At the cellular and molecular levels, this progressive process is mainly characterized by activation of hepatic stellate cells (HSCs). *Schistosoma japonica* is one of the most prevalent causes of liver fibrosis in China. It is characterized by hepatocyte damage, inflammation, and chronic parasite egg-induced granuloma formation leading to fibrosis. This study aimed to investigate the inhibitory effects of prostaglandin E1 (PGE1) on activation of HSCs and the alteration of type I and III collagen in rabbits with schistosomiasis. The study may promote the clinical application of praziquantel and PGE1 as a combined therapy to reverse hepatic fibrosis caused by schistosomiasis. **METHODS:** Rabbits were percutaneously infected with cercaria of *S. japonicum*. Seven rabbits were subjected to intravenous injections of PGE1 (2.5 mug/kg daily) from days 60 to 120 after infection. The ultrastructural changes in activated HSCs were observed under transmission electron microscopy. The expression of alpha-smooth muscle actin (alpha-SMA) was detected by immunohistochemistry. Fibril-forming collagens were detected by picosirius staining. **RESULTS:** Activation of HSCs was a characteristic alteration in schistosome-induced hepatic fibrosis. The expression of contraction-related alpha-SMA and the content of collagens were increased. Exogenous PGE1 markedly inhibited the activation of HSCs and reduced the expression of alpha-SMA around the hepatic sinusoids ($P < 0.01$). The contents of type I and III collagens were significantly attenuated. The ratio of staining area to the whole field (10X3.3) under a polarized light microscope in the untreated and treated groups was 37.25 ± 9.71 vs. 13.38 ± 4.24 ($P < 0.01$) and 9.66 ± 3.52 vs. 6.23 ± 1.81 ($P < 0.05$), respectively. **CONCLUSIONS:** Activation of HSCs may play a key role in the progress of schistosome-induced hepatic fibrosis. PGE1 effectively protects rabbit liver from fibrosis, at least in part by inhibiting the activation of HSCs.

PMID: 17374578 [PubMed - indexed for MEDLINE]

59. J Burn Care Res. 2007 Mar-Apr;28(2):291-8.

The efficacy of linear polarized polychromatic light on burn wound healing: an experimental study on rats.

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We aimed to investigate the questionable effect of linear polarized polychromatic light on burn wound healing in rats. Two deep second-degree burn wounds on the backside of each of 21 Sprague-Dawley rats were created with a standard burning procedure by applying a heated plaque. Burned regions located right dorsolaterally and classified as group I lesions were treated with linear polarized polychromatic light + open dressing + antibacterial pomade, whereas group II lesions were located left dorsolaterally and treated with only open

dressing + antibacterial pomade. Macroscopic evaluation was performed for determination of the completed wound closure rate, measurement of burn wound area, and investigation of macroscopic edema, hyperemia, and epithelialization. Histopathological evaluation included monitoring of epithelialization, vascularization, origination of granulation tissue, inflammatory cell response, and total histopathological score on days 7, 14, and 21 after burn creation. Macroscopic evaluation revealed more obvious epithelialization in group I lesions between days 6 and 15. The number of completely closed wounds was higher in group I than in group II on days 16 and 21. The average area of burn wounds was lower from day 5, hyperemia was less on days 2 to 17, and edema was less from day 4 to day 13 in group I lesions. Histopathological evaluation revealed a higher rate of epithelialization on day 7 and higher vascularization occurrence on day 21 in group I lesions. Linear polarized polychromatic light seems to be effective in the treatment of burn wounds and in the promotion of healing. This may be related to linear polarized polychromatic light stimulation of epithelialization and vascularization.

PMID: 17351447 [PubMed - indexed for MEDLINE]

60. J Pharm Pharmacol. 2007 Mar;59(3):419-27.

Physico-chemical alterations of urine in experimental hyperoxaluria: a biochemical approach with fucoidan.

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Urinary supersaturation-induced crystal formation has been attributed as one of the key factor for the pathogenesis/progression of lithogenesis. This study was aimed at investigating whether fucoidan, a naturally occurring sulfated glycosaminoglycan, could ameliorate the biochemical changes in urine induced by stone formation. Two groups of male albino Wistar rats (120+/-20 g) received 0.75% ethylene glycol (EG) for 28 days to induce hyperoxaluria, and one of them received sulfated polysaccharides (fucoidan from *Fucus vesiculosus*, 5 mg kg⁻¹, s.c.), commencing from the 8(th) day of the experimental period. One group was maintained as normal control group and another group served as drug control, which received sulfated polysaccharides. The urine collected from all the groups was analysed for changes in pH, volume, oxalate, calcium, phosphorus, uric acid, magnesium, citric acid and glycosaminoglycans. Urinary crystals were analysed with a light microscope. Renal tissues were studied under polarized light for deposition of crystals and also analysed for their oxalate and calcium content. The changes in extracellular matrix on crystal deposition were also evaluated. The urinary pH and volume were altered in rats treated with EG along with an increase in weight of the kidney. Further, administration of EG to rats increased the supersaturation of urine by escalating the levels of the stone-forming constituents, such as oxalate, calcium, phosphorus and uric acid, which was completely restored by fucoidan treatment. The decrease in the inhibitors, like citrate, magnesium and glycosaminoglycans, in urine was prevented by the co-treatment with fucoidan. In hyperoxaluric rats, there was an increased excretion of calcium oxalate monohydrate crystals in urine along with crystal deposition in renal tissues; this was prevented by fucoidan treatment. Fucoidan administration reversed even the tissue levels of calcium and oxalate. The increased accumulation of collagen and expression of transforming growth factor-beta(1) in hyperoxaluria was normalized on fucoidan administration. These results suggest that the physico-chemical alterations in urine produced during hyperoxaluria can be reversed by fucoidan administration.

PMID: 17331346 [PubMed - indexed for MEDLINE]

61. J Dent. 2007 May;35(5):383-7. Epub 2006 Dec 28.

Effect of compounds of *Galla chinensis* on remineralisation of initial enamel carious lesions in vitro.

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OBJECTIVE: To evaluate the effect of compounds of *Galla chinensis* on the remineralisation of initial enamel carious lesions in vitro. **METHODS:** Sixty bovine enamel blocks with early lesions were prepared and randomly divided into six treatment groups. The lesions were subjected to a pH-cycling regime for 12 days. Each daily cycle included 4x1min applications with one of six treatments; 1000ppm F aq. (as NaF, positive control); deionized water (negative control); or 4000ppm aqueous solutions of four *G. chinensis* extracts (GCEs); GCE, GCE-B, GCE-B1, or GCE-B2. Surface enamel microhardness was measured on the enamel blocks before and after demineralisation, and after pH-cycling, and percentage surface microhardness recovery (%SMHR) was calculated. The enamel specimens were then sectioned (thickness ca. 80microm) and examined by polarized light microscopy. **RESULTS:** All samples rehardened significantly compared to baseline. Fluoride had a significantly greater effect than all other treatments. In the GCEs groups, %SMHR was significantly greater than DDW for the GCE, GCE-B and GCE-B1 groups. There was no significant difference between the GCE-B2 group and DDW. Polarized light microscopy showed that the thickness of the surface layer increased obviously in all specimens including NaF group, GCE group, GCE-B group and GCE-B1 group. Negative birefringent band appeared in the lesions body and the depth of the lesions was obviously reduced. **CONCLUSION:** The present study has demonstrated the potential of three GCEs (GCE, GCE-B and GCE-B1) to effect net rehardening of artificial carious lesions under dynamic pH-cyclic conditions.

PMID: 17196320 [PubMed - indexed for MEDLINE]

62. J Rehabil Res Dev. 2006 Jul-Aug;43(4):565-72.

Antinociceptive effect of linear polarized 0.6 to 1.6 microm irradiation of lumbar sympathetic ganglia in chronic constriction injury rats.

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Linear polarized near-infrared light created with linear polarized near-infrared light therapy equipment (Super Lizer HA-550, Tokyo Iken Co, Ltd, Tokyo, Japan) has been used for the treatment of various painful disorders in Japan. Irradiation near the stellate ganglion with a Super Lizer (ISGL) is an especially notable therapeutic method used with stellate ganglion block (SGB) or substitutes for SGB. ISGL is a safe, simple, well-tolerated, and effective treatment. We examined the effects of irradiation with a Super Lizer applied to an area near the lumbar sympathetic ganglia on the ligated side in a chronic constriction injury (CCI) model, which is believed to be an animal model of complex regional pain syndrome (CRPS). Rats showing thermal hyperalgesia in a radiant heat test 1 wk postoperatively were used in Experiments 1 and 2: (1) Thermal hyperalgesia of irradiation group (n = 11) was less than that of the control or nonirradiation (n = 11) group at 1, 3, and 8 h after irradiation; however, the effect disappeared 12 h after irradiation. (2) Daily irradiation (n = 16) and 1 wk (n = 14) from 7 days after nerve ligation significantly shortened the interval from thermal

hyperalgesia until recovery. Rats showing mechanical hyperalgesia in the von Frey hair test 1 wk postoperatively were used in Experiment 3: 1 wk irradiation beginning 7 days after nerve ligation (n = 9) did not promote the recovery from mechanical hyperalgesia. We speculate that repeated ISGL may be more effective than a single ISGL in alleviating pain in CRPS patients. We cannot explain the discrepancy between the results obtained in Experiments 2 and 3. We believe the results of this study are relevant to the effect of ISGL for patients with upper-limb CRPS: irradiation near the lumbar sympathetic ganglia of the rat is effective for thermal but not mechanical pain in CCI.

PMID: 17123194 [PubMed - indexed for MEDLINE]

63. J Am Soc Nephrol. 2006 Dec;17(12):3458-71. Epub 2006 Nov 8.

Amyloidosis-associated kidney disease.

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The amyloidoses are a group of disorders in which soluble proteins aggregate and deposit extracellularly in tissues as insoluble fibrils, causing progressive organ dysfunction. The kidney is one of the most frequent sites of amyloid deposition in AL, AA, and several of the hereditary amyloidoses. Amyloid fibril formation begins with the misfolding of an amyloidogenic precursor protein. The misfolded variants self-aggregate in a highly ordered manner, generating protofilaments that interact to form fibrils. The fibrils have a characteristic appearance by electron microscopy and generate birefringence under polarized light when stained with Congo red dye. Advances in elucidating the mechanisms of amyloid fibril formation, tissue deposition, and tissue injury have led to new and more aggressive treatment approaches for these disorders. This article reviews the pathogenesis, diagnosis, clinical manifestations, and treatment of the amyloidoses, focusing heavily on the renal aspects of each of these areas.

PMID: 17093068 [PubMed - indexed for MEDLINE]

64. Curr Treat Options Cardiovasc Med. 2006 Dec;8(6):468-73.

Current treatment in cardiac amyloidosis.

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Involvement of the heart is a common finding in amyloidosis. The heart is usually infiltrated by amyloid fibrils in primary amyloidosis and age-related forms of amyloidosis, less commonly in transthyretin familial amyloidosis, and rarely in secondary amyloidosis. The most common clinical presentation is restrictive cardiomyopathy with right-sided heart failure. The second most frequent presentation is congestive heart failure due to systolic dysfunction, followed by arrhythmias and orthostatic hypotension. The diagnosis of amyloidosis requires tissue sample confirmation; at present, Congo red staining in polarized light is the diagnostic method of choice. The characterization of protein fibril type by immunohistochemistry or biochemistry is essential for patient prognosis and treatment. The therapeutic approach consists of specific treatment of amyloidosis and supportive treatment for cardiac-related symptoms. The treatment depends on the type of amyloidosis and the stage of disease. The mainstay of supportive

treatment of cardiac failure is diuretic therapy. Primary amyloidosis treatment protocol includes melphalan and prednisone chemotherapy. Heart transplantation is only a palliative treatment. Stem cell transplantation is an emerging treatment alternative. Combination therapy of melphalan and stem cell transplantation has been shown to be a promising treatment strategy. Secondary amyloidosis requires aggressive treatment of the associated inflammatory and neoplastic process. Age-related (senile) amyloidosis benefits from supportive cardiac treatment when applicable. Transthyretin amyloidosis, the most common cardiac hereditary amyloidosis, is treated by liver or combined liver-heart transplantation. New therapies based on chemical and immunologic reaction with amyloid or its precursor are under intensive development.

PMID: 17078911 [PubMed - in process]

65. J Dent Res. 2006 Oct;85(10):919-23.

Laser-fluoride effect on root demineralization.

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Although the individual cariostatic effects of laser and fluoride have been shown, the combined effect of CO(2) laser and fluoride on root demineralization remains uncertain and was the main aim of this study. By using a pH-cycling system and Polarized Light Microscopy, we demonstrated the synergistic effect of fluoride combined with CO(2) laser treatment on reducing root demineralization. The mean lesion depths (in microm) for each group were 160 +/- 14 (Control), 113 +/- 8 (Laser treatment alone), 111 +/- 6 (Fluoride treatment alone), and 25 +/- 7 (Fluoride followed by laser treatment). A significant laser-enhanced fluoride uptake, characterized by the ToF-SIMS analysis, was revealed by the 37% and 400% increments in loosely and firmly bound fluorides (both $p < 0.002$) in laser-irradiated areas, compared with the non-irradiated controls. In conclusion, there is a significant synergistic effect of combined CO(2) laser and fluoride treatment on the inhibition of root demineralization, possibly due to laser-enhanced fluoride uptake in the root.

PMID: 16998132 [PubMed - indexed for MEDLINE]

66. Masui. 2006 Sep;55(9):1104-11.

[Equipment for low reactive level laser therapy including that for light therapy]

[Article in Japanese]

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Equipments used for light therapy include machinery used for irradiation by low reactive level laser, xenon light and linear polarized infra-red ray. Low reactive level laser is divided into two types of laser according to the medium by which laser is obtained ; semiconductor laser and helium-neon laser. Low reactive level laser has only one wave length and produces analgesia by action of light itself. On the other hands, Xenon light and linear polarized infra-red ray produce analgesia by warming effect induced by light in addition to the action of light itself. There are four methods of irradiation by these light sources;

irradiation of acupuncture points, of trigger points, along nerves causing pain and of stellate ganglion area. Indication for light therapy includes various kinds of diseases such as herpes zoster, post herpetic neuralgia, cervical pain, lumbago due to muscle contracture, complex regional pain syndrome, arthralgia etc. However, we have to know that light therapy does not exert analgesic effects equally to all patients. But light therapy does not accompany pain and rarely shows any side effects. Therefore it is thought to be an alternative for patients who reject injection or patients who are not indicated for nerve block because of patients' conditions such as bleeding tendency.

PMID: 16984008 [PubMed - indexed for MEDLINE]

67. Zhongguo Zhen Jiu. 2006 Aug;26(8):566-8.

[Therapeutic effect of acupuncture on postoperative recovery of prolapse of lumbar intervertebral disc]

[Article in Chinese]

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OBJECTIVE: To evaluate therapeutic effect of comprehensive therapy of acupuncture as main in postoperative recovery of prolapse of lumbar intervertebral disc.

METHODS: Seventy-seven cases were randomly divided into an observation group (n = 40) and a control group (n = 37). The observation group were treated with acupuncture at Shenshu (BL 23), Dachangshu (BL 25), Baliao (BL 31, BL32, BL33, BL 34), Zhibian (BL 54) combined with polarized light, and the control group with western medicine dikeleke 75 mg, once daily. They were treated for 1 month.

RESULTS: The cure-markedly effective rate was 95.0% in the observation group and 75.7% in the control group with a significant difference between the two groups (P<0.05). The average VAS score was 2.28 +/- 0.96 in the observation group and 3.49 +/- 1.45 in the control group with a significant difference between the two groups (P <0.01). CONCLUSION: The comprehensive therapy of acupuncture as main can obviously increase the therapeutic effect in the postoperative recovery of prolapse of lumbar intervertebral disc.

PMID: 16941976 [PubMed - in process]

68. Wound Repair Regen. 2006 Jul-Aug;14(4):492-7.

Development of a porcine incisional wound model and novel scarring scales.

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A major goal of wound management is to reduce scarring. Prior to evaluating novel anti-scarring therapies, we developed a porcine incisional wound model and scarring outcome measures. Forty-eight full-thickness incisions (3 cm in length) and excisional wounds (3 x 0.5 cm) were created on two animals and closed with sutures (n=24) or tissue adhesive (n=24). Scars were evaluated using two validated clinical scar scales and a novel scale developed for animals. Full-thickness biopsies were obtained at 5 and 8 weeks for determination of scar morphology using H&E and Congo red staining with and without polarized light. Scar tissue was classified based on the collagen fiber morphology and "redness"

ratio, which is a measure of the relative distribution of collagen fiber in all three spatial dimensions. The clinical cosmetic scales were highly reliable, yet nondiscriminatory. The novel gross cosmetic and histomorphological scores were both highly reliable (0.75 and 0.70, respectively), yet poorly correlated with each other (0.17). The "redness" ratio and cross-sectional surface area measurements were also highly reliable ($r=0.96$ and 0.99 , respectively) but unrelated to cosmetic outcomes. However, the "redness ratio" did correlate with the histomorphologic appearance of the scars, with poorer appearing clinical scars receiving lower ratios (ANOVA $p=0.001$). Significant differences in cosmetic scores were noted between excisional and incisional favoring incisions ($p=0.0019$). We describe a novel porcine model for incisional and excisional wounds. The new clinical and histomorphologic outcomes were highly reliable yet poorly correlated. In general, incisional wounds healed with less apparent scarring than excisional wounds.

PMID: 16939579 [PubMed - indexed for MEDLINE]

69. Am J Dent. 2006 Aug;19(4):227-30.

Prevention of demineralization by CO₂ and Er,Cr:YSGG laser irradiation of overdenture abutments.

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PURPOSE: To assess the effects of Er,Cr:YSGG and CO₂ laser irradiation on the prevention of demineralization of overdenture abutments. **METHODS:** 32 human canines, premolars, and molars were acquired, cleaned, and scaled. They were randomly divided into two groups. Each tooth had two windows on the occlusal cut dentin. One window on each tooth was irradiated by either Er,Cr:YSGG or CO₂ laser, while the other window served as a control. After pH cycling at pH 5.5 for 18 days and pH 4.7 for 16 days, the teeth were sectioned and analyzed using polarized light microscopy with water as the imbibing medium. **RESULTS:** The Er,Cr:YSGG irradiated dentin had a mean lesion depth of 207 ± 27 microm while its control had a mean lesion depth of 209 ± 34 microm. The CO₂ laser irradiated dentin had a mean lesion depth of 185 ± 24 microm while its control had a mean lesion depth of 205 ± 22 microm. Based on paired t-tests Er,Cr:YSGG laser irradiation of dentin did not reduce demineralization when compared to the controls ($P= 0.81$), while CO₂ laser irradiation of dentin showed that it helped reduce demineralization when compared to the controls ($P= 0.025$).

PMID: 16939028 [PubMed - indexed for MEDLINE]

70. Nat Clin Pract Rheumatol. 2006 May;2(5):278-83.

Carbonated apatite-induced arthropathy: a consideration in cases of polyarthritis.

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BACKGROUND: A 79-year-old woman was referred for evaluation of her painful and swollen joints. She had a medical history of congestive heart failure, renal insufficiency and peptic ulcer disease. For the past 3 years she had experienced

recurrent bouts of debilitating arthritis, lasting approximately 3-4 weeks at a time. The symptoms were most severe in the hands and knees, where the joints were warm, swollen and tender. During each flare-up, the patient was housebound and required therapeutic dosing of nonsteroidal anti-inflammatory drugs and codeine to control joint pain. INVESTIGATIONS: Physical examination, fine-detailed radiographs of the hands, standing radiographs of the knees, arthrocentesis including cell count and gram stain, compensated polarized light microscopy, alizarin-red staining, X-ray diffraction, scanning and transmission electron microscopy with energy dispersive spectrometry, electron microprobe analysis with energy dispersive spectrometry, Fourier transform infrared spectroscopy, and atomic force microscopy. DIAGNOSIS: Carbonated-substituted apatite arthropathy. MANAGEMENT: Both knees were aspirated and large volumes of a straw-colored synovial fluid was removed. The knees were injected with corticosteroid, resulting in excellent symptomatic response.

PMID: 16932701 [PubMed - indexed for MEDLINE]

71. Nat Clin Pract Nephrol. 2006 May;2(5):263-70.

Drug Insight: emerging therapies for amyloidosis.

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Amyloidosis is a clinical disorder caused by extracellular deposition of proteins that are normally soluble as insoluble, abnormal fibrils that impair organ function. More than 20 unrelated proteins can form amyloid fibrils in vivo. All fibrils share cross-beta core structure and pathognomonic red-green birefringence when viewed under cross-polarized light after staining with Congo red. Amyloidosis can be acquired or hereditary, localized or systemic, and is classified according to the fibril precursor protein. Local amyloid deposition occurs in the brain in Alzheimer's disease and in the pancreas in maturity-onset diabetes, but a direct role in the pathogenesis of these diseases remains unproven. Systemic amyloidosis, with amyloid deposits in the viscera, blood vessel walls and connective tissues, is usually fatal and is the cause of about one death per thousand in developed countries. Recent elucidation of fundamental aspects of the pathogenesis of amyloidosis, and developments in diagnosis and monitoring of this disorder have greatly improved outcome for patients. Several exciting novel therapeutic strategies, reviewed in this article, are in development. These include interference with different stages of fibrillogenesis and enhancement of clearance of amyloid deposits.

PMID: 16932439 [PubMed - indexed for MEDLINE]

72. J Dent Res. 2006 Sep;85(9):804-8.

Remineralization of enamel caries can decrease optical reflectivity.

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The remineralization of enamel caries can lead to distinct optical changes within a lesion. We hypothesized that the restoration of mineral volume would result in a measurable decrease in the depth-resolved reflectivity of polarized light from

the lesion. To test this hypothesis, we measured optical changes in artificial caries undergoing remineralization as a function of depth, using Polarization-sensitive Optical Coherence Tomography (PS-OCT). Lesions were imaged non-destructively before and after exposure to a remineralization regimen. After imaging, microradiographs of histological thin sections indicated that the significant reflectivity reduction measured by PS-OCT accurately represented the increase in mineral content within a larger repaired surface zone. Mineral volume changes arising from remineralization can be measured on the basis of the optical reflectivity of the lesion.

PMCID: PMC2254215

PMID: 16931861 [PubMed - indexed for MEDLINE]

73. Am J Med Sci. 2006 Aug;332(2):93-6.

Resolution of intractable hiccups after near-infrared irradiation of relevant acupoints.

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BACKGROUND: Intractable hiccups are occasionally encountered in the presence of stroke but are usually difficult to manage. **METHODS:** We describe two stroke patients with intractable hiccups that were refractory to pharmacological treatment but were well resolved by application to relevant acupoints with the modality linear polarized near-infrared ray equipment on PC 6 (Nei Guan), ST 36 (Zu San Li), and DU 9 (Chih Yang), which are the empirical acupoints aimed at regulating gastrointestinal mobility and function of the thoracic organ. **RESULTS:** The first patient who received the treatment for only one time came out with a dramatic termination of intractable hiccups 3 hours later and with no recurrence thereafter. We applied the same treatment on the second patient once a day for 8 consecutive days, which led to progressive amelioration of intractable hiccups. **CONCLUSIONS:** This is the first report about the complete resolution of intractable hiccups due to stroke using near-infrared irradiation to acupoints, rather than using conventional pharmacologic therapy, traditional acupuncture, or moxibustion. Consequently, these findings suggest that linear polarized near-infrared ray irradiation, with its noninvasive properties, might be an alternative treatment for intractable hiccups after stroke.

PMID: 16909058 [PubMed - indexed for MEDLINE]

74. Clin J Sport Med. 2006 Jul;16(4):293-7.

Comparison in the effect of linear polarized near-infrared light irradiation and light exercise on shoulder joint flexibility.

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OBJECTIVE: This study aimed at comparing the effect of linear polarized near-infrared light irradiation (PL irradiation) and bicycle exercise with 50%HRreserve on the flexibility of the shoulder joint. **DESIGN:** Placebo-controlled trial. **SETTING:** Twenty-four healthy young adults (10 males: mean \pm -SD, age 20.9 \pm -3.1 y, height 171.0 \pm -3.9 cm, body mass 63.4 \pm -3.5 kg and 14 females: age 21.2 \pm -1.7 y, height 162.0 \pm -7.8 cm, body mass 56.2 \pm -7.2 kg). **INTERVENTIONS:**

PL-irradiation (100%, 1800 mW), placebo-irradiation (10%,180 mW), and light exercise (50%HRreserve) for 10 minutes. OUTCOME MEASUREMENTS AND RESULTS: The shoulder joint angles were measured twice-before and after each intervention. We measured the angles when the right shoulder joint extended forward and flexed backward maximally without support, and analyzed these shoulder joints and range of motion. Trial-to-trial reliability (intraclass correlations) of each joint angle was very high, over 0.98. All joint angles showed significant changes, and values in post-PL-irradiation and postlight exercise were significantly greater than that in postplacebo-irradiation. Shoulder forward flexion and backward extension angles had significantly greater change rates in PL-irradiation and light exercise than placebo-irradiation, and their range of motion angle was in the order of PL-irradiation, light exercise, and placebo-irradiation. CONCLUSIONS: It is suggested that PL-irradiation produces almost the same effect on shoulder joint range of motion as light exercise.

PMID: 16858211 [PubMed - indexed for MEDLINE]

75. Urol Res. 2006 Oct;34(5):305-14. Epub 2006 Jul 6.

The effect of L-arginine methyl ester on indices of free radical involvement in a rat model of experimental nephrocalcinosis.

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The aim of this study was to test the effect of L: -arginine methyl ester (L-Arg) on indices of free radical involvement in a rat model of experimental nephrocalcinosis. Twenty-eight Sprague-Dawley rats were randomized into four groups of seven. The first group (G1), the sham-control group received pure distilled drinking water. The second group (G2) received drinking water containing 0.7% ethylene glycol (EG) in distilled water for 3 weeks. The third group (G3) received drinking water containing 0.7% EG in distilled water for 3 weeks and L-Arg was administered for 3 weeks. The fourth group (G4) received drinking water containing 0.7% EG in distilled water for 3 weeks and L-NAME was administered for 3 weeks. Urine and aortic blood was collected to determine some parameters. The kidneys were also removed for histological examination. The increase in blood urea nitrogen, serum creatinine, K(+), Mg(2+) and uric acid were mild in group 3 compared with the groups 2 and 4. The urinary concentrations of Na(+), K(+), Mg(2+) and uric acid were noticed to be similar among the groups. However, Ca(2+) and oxalate excretion were significantly higher in groups 2, 3 and 4 than in group 1. The mean values of SOD, CAT and GSH-Px values were significantly increased in group 3 when compared to groups 2 and 4. Presence of aggregated urinary crystals was clearer in experimental groups compared to group 1. The tubular dilatation, epithelial degeneration and lymphocytic infiltration were significantly found in groups 2 and 4. Mild tissue damage was observed in L-Arg-pretreated rats. Under polarized light microscope intense crystals in the cortex and medulla were observed in the kidney of group 2 and 4 and moderate crystals were noticed in group 3. In conclusion, L-Arg supplementation may decrease free radicals and tubulary membrane injury in nephrocalcinosis due to infiltrating leukocytes and decreased antioxidant enzyme activities in rats fed with EG diet.

PMID: 16823549 [PubMed - indexed for MEDLINE]

76. Rinsho Byori. 2006 May;54(5):513-8.

[Histopathological diagnosis of amyloidosis]

[Article in Japanese]

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For the diagnosis of amyloidosis, histological evidence of amyloid deposition is essential. Histologically, an amyloid deposit is stained orange red with Congo red and shows green birefringence under polarized light. When amyloidosis is clinically suspected, endoscopic biopsy of the stomach, duodenum or colon, or aspiration biopsy of abdominal fat is usually performed. If clinicians suspect amyloidosis, they should advise pathologists. Identification of the chemical type of amyloid is necessary with respect to treatment and prognosis.

Immunohistochemical examination of amyloid in formalin-fixed, paraffin-embedded sections is simple to perform in most pathological laboratories. In Japan, almost all cases of systemic amyloidosis are classified as AL, AA, ATTR or Abeta2M amyloidosis, so the use of anti-immunoglobulin light chain, anti-amyloid A, anti-transthyretin and anti-beta2 microglobulin antibody is recommended for the classification of systemic amyloidosis. Formic acid pretreatment, which is often used for immunohistochemical detection of amyloidosis, is useful and easy for antigen retrieval. Amyloid deposits of AL amyloidosis are sometimes not immunostained well with commercial anti-immunoglobulin light chain antibody. Previously, we generated polyclonal antibodies against synthetic peptides corresponding to positions 118-134 of immunoglobulin lambda light chain and positions 116-133 of immunoglobulin kappa light chain. These antibodies are very useful for detecting AL amyloidosis because they react with amyloid deposits on formalin-fixed, paraffin-embedded specimens in almost all AL amyloidosis cases. Exact diagnosis and typing of amyloidosis are necessary for therapy.

PMID: 16789423 [PubMed - indexed for MEDLINE]

77. Brain Pathol. 2006 Apr;16(2):185-6, 187.

A 19-year-old male with generalized seizures, unconsciousness and a deviation of gaze.

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Light chain deposition disease (LCDD) is a form of monoclonal immunoglobulin deposition diseases (MIDD) which in contrast to light-chain derived (AL) amyloidosis is characterized by non-congophilic, non-fibrillary monoclonal protein deposits. Systemic organ deposits are common with the kidney being a major target organ. A clonal lymphoplasmocytic proliferation, e.g. plasmacytoma, is present in the majority of cases. Here we report on a 19-year-old male who presented with generalized seizures and an enhancing white matter lesion on MRI scans. A stereotactic brain biopsy revealed a low-grade B cell lymphoma with plasmacellular differentiation as well as lambda light chain deposits without birefringence under polarized microscopy. No systemic lymphoma manifestations or systemic light chain deposits were found, nor was a monoclonal gammopathy detectable in serum and urine. After systemic chemotherapy with three courses high-dose methotrexate the size of the lesion and the condition of the patient have remained stable for 24 months now. This is the first description of cerebral LCDD developing without systemic disease in conjunction with the diagnosis of a cerebral low-grade B cell lymphoma. We present the clinical, laboratory and radiological findings and discuss the pathogenesis of this unusual LCDD

manifestation.

PMID: 16768760 [PubMed - indexed for MEDLINE]

78. Vopr Kurortol Fizioter Lech Fiz Kult. 2006 Mar-Apr;(2):37.

[Application of polarized light in herpes]

[Article in Russian]

Dvurechenskiĭ VV, Kiseleva SS.

PMID: 16752826 [PubMed - indexed for MEDLINE]

79. Photomed Laser Surg. 2006 Apr;24(2):129-39.

Pro- and anti-inflammatory cytokine content in human peripheral blood after its transcutaneous (in vivo) and direct (in vitro) irradiation with polychromatic visible and infrared light.

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OBJECTIVE: The aim of this randomized, placebo-controlled, double-blind trial was to investigate changes in the content of 10 cytokines in the human peripheral blood after transcutaneous and in vitro irradiation with polychromatic visible and infrared (IR) polarized light at therapeutic dose. **BACKGROUND DATA:** The role of cytokines in development of anti-inflammatory, immunomodulatory, and wound-healing effects of visible and IR light remains poorly studied. **METHODS:** The sacral area of volunteers was exposed (480-3400 nm, 95% polarization, 12 J/cm²); in parallel, the blood samples of the same subjects were irradiated in vitro (2.4 J/cm²). Determination of cytokine content was performed using enzyme-linked immunosorbent assay (ELISA). **RESULTS:** A dramatic decrease in the level of pro-inflammatory cytokines TNF-alpha, IL-6, and IFN-gamma was revealed: at 0.5 h after exposure of volunteers (with the initial parameters exceeding the norm), the cytokine contents fell, on average, 34, 12, and 1.5 times. The reduced concentrations of TNF-alpha and IL-6 were preserved after four daily exposures, whereas levels of IFN-gamma and IL-12 decreased five and 15 times. At 0.5 h and at later times, the amount of anti-inflammatory cytokines was found to rise: that of IL-10 rose 2.7-3.5 times (in subjects with normal initial parameters) and of TGF-beta1 1.4-1.5 times (in the cases of its decreased level). A peculiarity of the light effect was a fast rise of IFN-gamma at 3.3-4.0 times in subjects with normal initial values. The content of IL-1beta, IL-2, IFN-alpha, and IL-4 did not change. Similar regularities of the light effects were recorded after in vitro irradiation of blood, as well as on mixing the irradiated and non-irradiated autologous blood at a volume ratio 1:10 (i.e., at modeling the events in a vascular bed of the exposed person when a small amount of the transcutaneously photomodified blood contacts its main circulating volume). **CONCLUSION:** Exposure of a small area of the human body to light leads to a fast decrease in the elevated pro-inflammatory cytokine plasma content and to an increase in the anti-inflammatory factor concentration, which may be an important mechanism of the anti-inflammatory effect of phototherapy. These changes result from transcutaneous photomodification of a small volume of blood and a fast transfer of the light-induced changes to the entire pool of circulating blood.

PMID: 16706691 [PubMed - indexed for MEDLINE]

80. J Biomed Opt. 2006 Mar-Apr;11(2):024002.

Collagen birefringence in skin repair in response to red polarized-laser therapy.

da Silva Dde F, Vidal Bde C, Zezell DM, Zorn TM, Núñez SC, Ribeiro MS.

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We use the optical path difference (OPD) technique to quantify the organization of collagen fibers during skin repair of full-thickness burns following low-intensity polarized laser therapy with two different polarization incidence vectors. Three burns are cryogenerated on the back of rats. Lesion L(parallel) is irradiated using the electric field vector of the polarized laser radiation aligned in parallel with the rat's occipital-caudal direction. Lesion L(perpendicular) is irradiated using the electric field vector of the polarized laser radiation aligned perpendicularly to the aforementioned orientation. Lesion C is untreated. A healthy area labeled H is also evaluated. The tissue samples are collected and processed for polarized light microscopy. The overall finding is that the OPD for collagen fibers depends on the electric field vector of the incident polarized laser radiation. No significant differences in OPDs are observed between L(parallel) and H in the center, sides, and edges of the lesion. Lesions irradiated using the electric field vector of the polarized laser radiation aligned in parallel with the rat's occipital-caudal direction show higher birefringence, indicating that collagen bundles in these lesions are more organized.

PMID: 16674192 [PubMed - indexed for MEDLINE]

81. Acta Neurochir Suppl. 2006;96:402-6.

Magnesium restores altered aquaporin-4 immunoreactivity following traumatic brain injury to a pre-injury state.

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Magnesium reduces edema following traumatic brain injury (TBI), although the associated mechanisms are unknown. Recent studies suggest that edema formation after TBI may be related to alterations in aquaporin-4 (AQP4) channels. In this study, we characterize the effects of magnesium administration on AQP4 immunoreactivity following TBI. Male Sprague-Dawley rats were injured by impact-acceleration diffuse TBI and a subgroup was administered 30 mg/kg magnesium sulphate 30 minutes after injury. Animals were fixed by perfusion 5 hours later, which corresponded to the time of maximum edema formation according to previous studies. One half of the brain was cut using a Vibratome and the other half blocked in paraffin wax. Wax and Vibratome sections were immunostained for detection of AQP4 by light and electron microscopy, respectively. In untreated animals, AQP4 immunoreactivity was increased in the subependymal inner glia limitans and the subpial outer glia limitans, and decreased in perivascular astrocytic processes in the cerebrum and brain stem. In contrast, animals treated with magnesium sulphate had AQP4 profiles similar to normal and sham control animals. We conclude that magnesium decreases brain edema formation after TBI, possibly by restoring the polarized state of astrocytes and by down-regulation of AQP4 channels in astrocytes.

PMID: 16671494 [PubMed - indexed for MEDLINE]

82. Osteoarthritis Cartilage. 2006 Aug;14(8):784-92. Epub 2006 Mar 23.

Maturation-dependent change and regional variations in acoustic stiffness of rabbit articular cartilage: an examination of the superficial collagen-rich zone of cartilage.

Kuroki H, Nakagawa Y, Mori K, Kobayashi M, Yasura K, Okamoto Y, Mizuno Y, Ando K, Ikeuchi K, Nakamura T.

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OBJECTIVE: The purpose of the study was to investigate maturation-dependent changes of acoustic (ultrasound) stiffness and other ultrasound features of articular cartilage in healthy rabbit knees. **METHODS:** Five groups of rabbits of various ages (3 weeks, 8 weeks, 6 months, 1 year, 2.5 years) consisting of five rabbits per group were examined. Signal intensity (index of stiffness), signal duration (index of surface irregularity) and interval between signals (index of thickness) of the ultrasound reflection from articular cartilage were examined at four sites: posterior lateral femoral condyle, posterior medial femoral condyle, lateral tibial plateau, and medial tibial plateau. The sites were observed macroscopically and microscopically with a light microscope and a polarized light microscope. **RESULTS:** At the lateral and medial condyles and the lateral tibial plateau, signal intensity was least in 3-week-old specimens. The intensity increased until 6 months or 1 year of age. At these sites, the signal durations and intervals between signals were least at the ages of 6 months or 1 year. At the medial tibial plateau, the intensity was the least at 2.5 years of age and the interval between signals was least at 3 weeks of age; there was no effect of age on signal duration. Cartilage surfaces of all specimens were smooth and no degenerative changes were macroscopically or microscopically evident. The surface brightness of cartilage under the polarized light microscope was consistent with signal intensity values. **CONCLUSIONS:** The response of articular cartilage to ultrasound was maturation-dependent. Acoustic properties differed from mechanical stiffness properties, which were determined using indentation. Ultrasound may detect properties of the surface collagen of the articular cartilage.

PMID: 16563812 [PubMed - indexed for MEDLINE]

83. Pain Res Manag. 2006 Spring;11(1):49-57.

Suppression of pain by exposure of acupuncture points to polarized light.

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BACKGROUND: According to clinical studies, the stimulation of acupuncture points (APs) by a variety of methods (eg, needles, pressure, etc) is an effective method for the treatment of many pain syndromes. However, no experimental proof exists showing that the exposure of APs to low-intensity incoherent polarized (P) light evokes an analgesic affect. **OBJECTIVES:** The authors' previous work, using mice, shows that the exposure of APs to low-intensity microwaves effectively decreases pain. The purpose of the present study was to determine whether exposure of APs to low-intensity incoherent P light evokes a statistically significant reduction in pain. **METHODS:** The effects of P light on behavioural responses to acute and tonic pain were tested in mice. The threshold of vocalization during electrical

stimulation of the foot (acute pain) was measured before and after exposure of AP E-36 to P light. The duration of licking the formalin-injected foot (tonic pain) was investigated in control mice and mice exposed to P light on APs E-36, V-56 and V-60 or on skin that did not contain analgesic APs. RESULTS: Exposure of APs to P light evoked a statistically significant increase in pain threshold by 34.2% to 59.1%, and shortened the licking time by 32.3% to 50% in mice. The most effective AP was E-36 in both the painful foot and the normal foot. After 2 min, 6 min and 10 min of P light exposure, analgesia was 7.6%, 30.9% and 50%, respectively. The exposure to P light on skin that did not contain analgesic APs did not evoke significant effect. CONCLUSIONS: The results show the efficacy of pain suppression by exposure of antinociceptive APs to P light.

PMCID: PMC2585036

PMID: 16511614 [PubMed - indexed for MEDLINE]

84. Photomed Laser Surg. 2006 Feb;24(1):17-21.

Effect of linear polarized light irradiation near the stellate ganglion in skin blood flow of fingers in patients with progressive systemic sclerosis.

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OBJECTIVE: The purpose of this study is to evaluate the effect of linear polarized light irradiation near the stellate ganglion area on cutaneous blood flow in fingers of patients with progressive systemic sclerosis. BACKGROUND DATA: Sympathetic overactivity is known to be present in patients with progressive systemic sclerosis. Recently introduced linear polarized light irradiation is designed to simulate noninvasive stellate ganglion block to decrease sympathetic output. METHODS: Five patients with progressive systemic sclerosis and three normal healthy controls were studied. Linear polarized light (Super Lizer) was irradiated near the stellate ganglion on the right side of the neck at 358 J/cm² for 10 min. Then, laser Doppler flowmetry, laser Doppler imager, and capillary microscopy were used to measure the cutaneous blood flow of the right fourth finger for 30 min. RESULTS: No significant alternations of the skin blood flow between normal controls and patients with progressive systemic sclerosis after linear polarized light irradiation were detected. The effect of linear polarized light on the microcirculation of patients with progressive systemic sclerosis was minimal and transient. CONCLUSION: The effect of linear polarized light in treating patients with progressive systemic sclerosis may not result from the improvement of skin blood flow. Therefore, the use of linear polarized light in those patients to increase cutaneous blood flow should not be overemphasized.

PMID: 16503783 [PubMed - indexed for MEDLINE]

85. Clin Rehabil. 2006 Jan;20(1):12-23.

Comparison of effects of Cyriax physiotherapy, a supervised exercise programme and polarized polychromatic non-coherent light (Biopton light) for the treatment of lateral epicondylitis.

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OBJECTIVE: To compare the effectiveness of Cyriax physiotherapy, a supervised exercise programme, and polarized polychromatic non-coherent light (Biopton

light) in the treatment of lateral epicondylitis. DESIGN: Controlled clinical trial. SETTING: Rheumatology and rehabilitation centre. SUBJECTS: This study was carried out with 75 patients who had lateral epicondylitis. They were allocated to three groups by sequential allocation. INTERVENTIONS: Group A (n = 25) was treated with Cyriax physiotherapy. A supervised exercise programme was given to group B (n = 25). Group C (n = 25) received polarized polychromatic non-coherent light (Biopton light). All patients received three treatments per week for four weeks. OUTCOMES: Pain was evaluated using a visual analogue scale and function using a visual analogue scale and pain-free grip strength at the end of the four-week course of treatment (week 4), one month (week 8), three months (week 16) and six months (week 28) after the end of treatment. RESULTS: The supervised exercise programme produced the largest effect in the reduction of pain and in the improvement of function at the end of the treatment ($P < 0.05$) and at any of the follow-up time points ($P < 0.05$). CONCLUSION: The supervised exercise programme should be the first treatment option for therapists when they manage lateral epicondylitis patients. If this is not possible, Cyriax physiotherapy and polarized polychromatic non-coherent light (Biopton light) may be suitable.

PMID: 16502745 [PubMed - indexed for MEDLINE]

86. ScientificWorldJournal. 2006 Jan 27;6:154-68.

Histochemical differential diagnosis and polarization optical analysis of amyloid and amyloidosis.

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Amyloidosis is characterized by extracellular deposition of protein fibrils of chemically heterogeneous composition. Early recognition and identification of amyloid deposits allows an early start of therapy, which may entail a better prognosis. Congo red staining according to Romhányi (1971) is a highly specific and sensitive method for early microscopic recognition of amyloidosis. The main and most important types of amyloidosis may be distinguished by classic histochemical methods of performate pretreatment according to Romhányi (1979), or by $KMnO_4$ oxidation according to Wright (1977) followed by Congo red staining and viewed under polarized light. Differences in the speed of breakdown (disintegration) of amyloid deposits according to Bély and Apáthy allow a more precise distinction of various types of amyloid.

PMID: 16493520 [PubMed - indexed for MEDLINE]

87. Actas Dermosifiliogr. 2005 Mar;96(2):69-82.

[Systemic amyloidoses]

[Article in Spanish]

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Amyloidoses are a heterogeneous group of diseases characterized by extracellular fibrillar protein deposits in the organs and tissues. These proteins are not biochemically related to each other, but share certain common characteristics, including apple green birefringence with polarized light after staining with

Congo red, and beta-pleated sheet configuration through x-ray diffraction. Amyloid deposits may occur in many organs (systemic amyloidoses) or may affect a single tissue (localized or organ-specific amyloidoses). There are different classifications, but in this review the amyloidoses are organized by clinical symptoms, which are determined by the amyloid protein involved. Special attention is given to cutaneous and mucous membrane manifestations, which are often the first sign of the disease and are useful for early diagnosis, thus avoiding more aggressive procedures. The involvement of other organs is analyzed, as are the diagnosis, prognosis and treatment of systemic amyloidoses.

PMID: 16476341 [PubMed - indexed for MEDLINE]

88. J Eur Acad Dermatol Venereol. 2006 Jan;20(1):75-8.

Foreign body post-varicella granulomas due to talc.

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Foreign body granulomas in the skin have been described frequently and may have various causes. Diagnosis is relatively easy in most cases, as most are related to foreign material penetrating into the skin due to different kinds of traumas. We present the case of a boy with multiple facial granulomas, persisting more than 6 months and related to the use of topical anti-pruriginous talc powder applied to papuloexudative lesions caused by varicella. Data gathered in the anamnesis, examination with polarized light and images seen through the electron microscope enabled us to identify the causal agent talc as the inducer of the granulomatous lesions that the patient presented, discarding other types of foreign body granulomas of exogenous origin.

PMID: 16405613 [PubMed - indexed for MEDLINE]

89. Semin Respir Crit Care Med. 2005 Oct;26(5):502-13.

Pulmonary amyloidosis in hematological disorders.

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Amyloidosis is defined by tissue deposits of amyloid, a proteic substance with a characteristic spatial structure of beta-sheet fibrils assembled into bundles. This structure results in specific staining with Congo red dye, with green birefringence under polarized light microscope. AL amyloid forms from amyloidogenic immunoglobulins produced by clonal plasma cells. Pulmonary amyloidosis may be either part of systemic amyloidosis (primary amyloidosis or associated with myeloma) or organ-limited. Pulmonary interstitial amyloidosis in systemic amyloidosis is rarely symptomatic unless amyloid deposits severely affect gas exchange alveolar structures, thus resulting in serious respiratory impairment. Localized parenchymal involvement may present as nodular amyloidosis or as amyloid deposits in the vicinity of pulmonary lymphomas. Tracheobronchial amyloidosis, which is not associated with evident clonal proliferation, results in airway stenoses necessitating iterative laser treatment. Treatment of systemic amyloidosis aims at reducing the clonal cell populations producing amyloidogenic immunoglobulins, using high-dose chemotherapy followed by autologous stem cell

transplantation in carefully selected patients. Its efficiency in treating diffuse pulmonary amyloidosis has not been established.

PMID: 16267701 [PubMed - indexed for MEDLINE]

90. Photomed Laser Surg. 2005 Oct;23(5):485-92.

Polarized light (400-2000 nm) and non-ablative laser (685 nm): a description of the wound healing process using immunohistochemical analysis.

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OBJECTIVE: This study aimed to describe, through morphologic and cytochemical analysis, the healing process of wounds submitted (or not) to laser therapy (λ 685 nm) or polarized light (λ 400-2000 nm). BACKGROUND DATA: There are many reports on different effects of several types of phototherapies on the treatment of distinct conditions, amongst them, on wound healing. Laser therapy and the use of polarized light are still controversial despite successive reports on their positive effects on several biological processes. METHODS: Thirty male Wistar rats, approximately 4 months old, were used, and standardized excisional wounds were created on their dorsum. The wounds were irradiated in four equidistant points with laser light or illuminated with polarized light, both with doses of 20 or 40 J/cm². Group 1 acted as untreated controls. Animals were irradiated every 48 h during 7 days, starting immediately after surgery, and were humanely killed on the 8th post-operative day. Specimens were taken and routinely processed and stained with H&E, and for descriptive analysis of myofibroblasts and collagen fibers, the specimens were immunomarked by smooth muscle alpha-actin and picrosirius stain. RESULTS: Control specimens showed the presence of ulceration, hyperemia, discrete edema, intense, and diffuse inflammation, collagen deposition was irregular, and myofibroblasts were seen parallel to the wound margins. Wounds treated by laser therapy with a dose of 20 J/cm² showed mild hyperemia, inflammation varied from moderate to intense, the number of fibroblasts was large, and the distribution of collagen fibers was more regular. Increasing the dose to 40 J/cm² evidenced exuberant neovascularization, severe hyperemia, moderate to severe inflammation, large collagen deposition, and fewer myofibroblasts. On subjects illuminated with polarized light with a dose of 20 J/cm², mild to moderate hyperemia was detectable, and collagen matrix was expressive and unevenly distributed; a larger number of myofibroblasts was present and no re-epithelialization was seen. Increasing the dose resulted in mild to moderate hyperemia, no re-epithelialization was seen, edema was discrete, and inflammation was moderate. CONCLUSION: The use of 685-nm laser light or polarized light with a dose of 20 J/cm² resulted in increased collagen deposition and better organization on healing wounds, and the number of myofibroblast was increased when polarized light is used.

PMID: 16262579 [PubMed - indexed for MEDLINE]

91. Am J Sports Med. 2006 Mar;34(3):362-9. Epub 2005 Oct 6.

Indomethacin and celecoxib impair rotator cuff tendon-to-bone healing.

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BACKGROUND: Nonsteroidal anti-inflammatory drugs are commonly prescribed after rotator cuff repair. These agents can impair bone formation, but no studies have evaluated their impact on tendon-to-bone healing. **HYPOTHESIS:** Traditional nonselective nonsteroidal anti-inflammatory drugs and cyclooxygenase-2-specific nonsteroidal anti-inflammatory drugs interfere with tendon-to-bone healing. **STUDY DESIGN:** Controlled laboratory study. **METHODS:** One hundred eighty Sprague-Dawley rats underwent acute rotator cuff repairs. Postoperatively, 60 rats received 14 days of celecoxib, a cyclooxygenase-2-specific nonsteroidal anti-inflammatory drug; 60 received indomethacin, a traditional nonselective nonsteroidal anti-inflammatory drug; and 60 received standard rat chow. Animals were sacrificed at 2, 4, and 8 weeks and evaluated by gross inspection, biomechanical testing, histologic analysis, and polarized light microscopy to quantify collagen formation and maturation. **RESULTS:** Five tendons completely failed to heal (4 celecoxib, 1 indomethacin). There were significantly lower failure loads in the celecoxib and indomethacin groups compared with the control groups at 2, 4, and 8 weeks ($P < .001$), with no significant difference between nonsteroidal anti-inflammatory drug groups. There were significant differences in collagen organization and maturation between the controls and both nonsteroidal anti-inflammatory drug groups at 4 and 8 weeks ($P < .001$). Controls demonstrated progressively increasing collagen organization during the course of the study ($P < .001$), whereas the nonsteroidal anti-inflammatory drug groups did not. **CONCLUSION:** Traditional and cyclooxygenase-2-specific nonsteroidal anti-inflammatory drugs significantly inhibited tendon-to-bone healing. This inhibition appears linked to cyclooxygenase-2. **CLINICAL RELEVANCE:** If the results of this study are verified in a larger animal model, the common practice of administering non-steroidal anti-inflammatory drugs after rotator cuff repair should be reconsidered.

PMID: 16210573 [PubMed - indexed for MEDLINE]

92. *Lasers Surg Med.* 2005 Sep;37(3):186-91.

Use of erythema index imaging for systematic analysis of port wine stain skin response to laser therapy.

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BACKGROUND AND OBJECTIVES: Quantitative methods to assess port wine stain (PWS) skin response to laser therapy are needed to improve therapeutic outcome. In this study, PWS skin erythema was analyzed using erythema index difference (DeltaEI: erythema index difference between PWS and normal skin) images before and after treatment to investigate systematically subject-dependent response to laser therapy. **STUDY DESIGN/MATERIALS AND METHODS:** Cross-polarized digital skin color images were acquired from 17 subjects with facial PWS and the associated DeltaEI images were computed. Qualitative and quantitative analyses of PWS skin erythema were performed with DeltaEI images, in which ranges of 40-6 and 5-0 represented PWS and normal skin, respectively. **RESULTS:** After laser therapy, we qualitatively observed a reduction in the DeltaEI values for all subjects. Regression fitting of DeltaEI values before and after PWS laser therapy was associated with strong positive linear correlation. **CONCLUSIONS:** The imaging modality and analysis method allowed systematic analysis of PWS skin erythema in response to laser therapy. PWS skin response was dependent on pretreatment DeltaEI values, suggesting that erythema can be utilized as an effective parameter to monitor PWS response to laser therapy. Copyright 2005 Wiley-Liss, Inc.

PMID: 16175634 [PubMed - indexed for MEDLINE]

93. Am J Dent. 2005 Jun;18(3):212-6.

In vitro model for evaluating the effect of child formula toothpastes on artificial caries in primary dentition enamel.

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PURPOSE: To determine if the in vitro 10-day pH-cycling model used for permanent teeth could be utilized to evaluate de/remineralization effects, on the enamel of primary teeth, of child formula toothpastes. **METHODS:** Sound extracted primary anterior teeth were coated with nail varnish, leaving a 1 mm-wide window prior to being placed in a demineralizing solution to produce artificial carious lesions in enamel. The teeth were subsequently cut longitudinally into 100 microm thick sections. The 72 specimens were randomly assigned to six groups. In Set 1 contained the specimens in Group a, which were treated with a pea-sized (0.32 g) quantity of non-fluoride toothpaste (First Teeth), and Groups b and c which were treated with half and pea-sized (0.16 g) quantities of fluoridated toothpaste (Colgate), and cycled for 10 days. The specimens in Set 2 (Groups A, B and C) were similarly treated but subjected to 7-day pH-cycling. **RESULTS:** After Day 8 the lesions in Set 1 extended into dentin and so could not be evaluated. Polarized light microscopy and microradiography were used to evaluate the lesions subjected to 7-day pH-cycling. Lesions in Groups A and B increased in depth and area by approximately 50%, while those in Group C increased in depth and area by 20%; however, no statistically significant differences occurred between the groups. If this model pH cycling is to be used for primary teeth, a reduction from 10 to 7 days in length should be considered.

PMID: 16158814 [PubMed - indexed for MEDLINE]

94. Zhongguo Wei Zhong Bing Ji Jiu Yi Xue. 2005 Sep;17(9):537-40.

[Experimental study of effect of carvedilol on myocardial collagen network remodeling after acute myocardial infarction in rats]

[Article in Chinese]

Liu HB, Bian SY, Yang TS, Wang L, Yi J, Yang X.

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OBJECTIVE: To investigate the effects of carvedilol, irbesartan and their combination on myocardial collagen network remodeling after acute myocardial infarction (AMI) in rats. **METHODS:** Twenty-four hours after ligating left anterior descending coronary artery, 35 surviving AMI male Sprague-Dawley rats were randomly assigned to control (n=8), carvedilol (n=9, 10 mg.kg(-1).d(-1)), irbesartan (n=9, 45 mg.kg(-1).d(-1)), and carvedilol (10 mg.kg(-1).d(-1)) plus irbesartan (45 mg.kg(-1).d(-1), n=9) groups. Sham operating group was comprised of 8 rats without coronary artery ligation as controls. After 8 weeks of administration of the drug by gastric gavage, hemodynamics and left ventricular function were measured, then the rat hearts were fixed, sectioned, and stained with Sirius red, and pathologically analyzed using polarized light. The total collagen volume density fraction (CVF) and type I and III CVF in the infarcted and noninfarcted zone (IZ/NIZ) were measured by computer-assisted image analysis system. **RESULTS:** There were no significant differences in myocardial infarction

size among the four AMI groups (40.02%-44.70%, $P > 0.05$). Compared with the sham operation group, left ventricular (LV) end diastolic pressure (LVEDP), left and right ventricular relative weight (LVRW/RVRW), the total CVF and the CVF of type I and III in the IZ and NIZ were all significantly higher ($P < 0.05$ or $P < 0.01$), and in contrast, blood pressure, left ventricular systolic pressure (LVSP), the left ventricular pressure maximal rate of rise and fall ($\pm dp/dt$ max) and their adjustment by LVSP ($\pm dp/dt$ max/LVSP) were significantly decreased ($P < 0.05$ or $P < 0.01$). Compared with the control group, LVEDP, LVRW, RVRW, the total CVF and the CVF of type I and III in the NIZ were all significantly decreased ($P < 0.05$ or $P < 0.01$), while $\pm dp/dt$ max and $\pm dp/dt$ max/LVSP were all significantly increased (all $P < 0.01$) in the carvedilol, irbesartan and their combination therapy groups. CONCLUSION: Carvedilol, irbesartan and their combination can all effectively decrease collagen deposition in the NIZ of left ventricle, prevent left ventricular remodeling after AMI in rats, improve hemodynamics and LV function.

PMID: 16146598 [PubMed - indexed for MEDLINE]

95. Lasers Surg Med. 2005 Aug;37(2):138-43.

Determination of an optimized conversion matrix for device independent skin color image analysis.

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BACKGROUND AND OBJECTIVE: A cross-polarized diffuse reflectance (CDR) color imaging system was developed for quantitative evaluation of port wine stain (PWS) response to laser therapy. To obtain calibrated Commission International de l'Eclairage (CIE) color space images from RGB (red, green, and blue) images, it was necessary to derive an optimized conversion matrix specific to our imaging system. STUDY DESIGN/MATERIALS AND METHODS: A chromameter (CR-200, Minolta) and CDR imaging system were used to acquire CIELAB (CIE L^* , a^* , and b^*) tristimulus values and RGB image values, respectively. A cost function was defined using these sample data sets and then a minimization algorithm was applied to obtain an optimized conversion matrix for our imaging system and illumination conditions. CIELAB color space values (L^* , a^* , and b^*) obtained with the chromameter and CDR color images were compared to assess the accuracy of the derived matrix. RESULTS: In measurements using in vitro standard color patch or in vivo human skin samples, use of the optimized conversion matrix resulted in a good correlation with standard chromameter values for PWS human skin sites. CONCLUSIONS: The cost function minimization algorithm resulted in an optimized conversion matrix for our CDR imaging system. Use of the optimized matrix improved the utility of CDR color image analysis as a simple non-contact measurement technique to monitor quantitatively PWS response to laser therapy. (c) 2005 Wiley-Liss, Inc.

PMID: 16134121 [PubMed - indexed for MEDLINE]

96. Blood Press. 2005;14(3):184-92.

Effects of olmesartan and enalapril at low or high doses on cardiac, renal and vascular interstitial matrix in spontaneously hypertensive rats.

Porteri E, Rodella L, Rizzoni D, Rezzani R, Paiardi S, Sleiman I, De Ciuceis C, Boari GE, Castellano M, Bianchi R, Agabiti-Rosei E.

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We have evaluated the effects of different doses of an angiotensin-converting enzyme (ACE) inhibitor, enalapril (ENA) and of an angiotensin II type 1 receptor blocker olmesartan (OLM), on extracellular matrix of the heart, kidney, aorta and mesenteric artery of spontaneously hypertensive rats (SHR). Forty SHR and eight Wistar-Kyoto controls (WKY) were included in the study. Eight SHR were treated with high-dose OLM 15 mg/kg per day, eight with high-dose ENA 25 mg/kg per day, eight with low-dose OLM 1 mg/kg per day and eight with low-dose ENA (2 mg/kg per day). Eight SHR and eight WKY were kept untreated as controls. Treatment was from age 4 to 12 weeks. Systolic blood pressure (SBP) was measured non-invasively every week. The left ventricular weight to body weight (RLVM) was measured, and the cardiac, aortic and glomerular interstitial collagen content was evaluated using Sirius red staining and image analysis. Mesenteric small arteries were dissected and mounted on a micromyograph, and the media:lumen ratio (M/L) was calculated. Collagen subtypes were evaluated by polarized light microscopy. The SHR treated with high-dose OLM or ENA showed a normalization of SBP. The RLVM was significantly increased in untreated SHR compared with untreated WKY, whereas significantly lower values were observed in the groups of SHR treated with high-dose OLM or ENA. A significant increase in cardiac and glomerular collagen content was observed in untreated SHR. Both high- or low-dose OLM and ENA normalized collagen content in the heart and the kidney. Both high-dose OLM and high-dose ENA normalized M/L ratio; however, OLM proved to be more effective than ENA in normalizing collagen pattern. In fact, aortic collagen content was normalized by both high-dose and low-dose OLM, but only by high-dose ENA. In conclusion, both OLM and ENA were significantly and equally effective in the prevention of cardiac and renal damage in SHR, whereas OLM was more effective than ENA in terms of effects on vascular extracellular matrix.

PMID: 16036499 [PubMed - indexed for MEDLINE]

97. Dermatology. 2005;211(1):63-71.

Hair shaft abnormalities--clues to diagnosis and treatment.

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Hair dysplasias are congenital or acquired alterations which often involve the hair shaft. Hair shaft abnormalities are characterized by changes in color, density, length and structure. Hair shaft alterations often result from structural changes within the hair fibers and cuticles which may lead to brittle and uncombable hair. The hair of patients with hair shaft diseases feels dry and looks lusterless. Hair shaft diseases may occur as localized or generalized disorders. Genetic predisposition or exogenous factors produce and maintain hair shaft abnormalities. Hair shaft diseases are separated into those with and those without increased hair fragility. In general, optic microscopy and polarized light microscopy of hair shafts provide important clues to the diagnosis of isolated hair shaft abnormalities or complex syndromes. To establish an exact diagnosis of dysplastic hair shafts, a structured history and physical examination of the whole patient are needed which emphasizes other skin appendages such as the nails, sweat and sebaceous glands. Profound knowledge on hair biology and embryology is necessary to understand the different symptom complexes. Therapy of hair shaft disorders should focus on the cause. In addition, minimizing traumatic influences to hair shafts, such as drying hair with an electric dryer or permanent waves and dyes, is important. A short hairstyle is more suitable for patients with hair shaft disorders. Copyright 2005 S. Karger AG, Basel.

PMID: 15983439 [PubMed - indexed for MEDLINE]

98. J Otolaryngol. 2005 Feb;34(1):60-3.

Laryngeal amyloidosis.

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Localized amyloidosis is characterized by the deposition of amyloid fibres in a particular site or organ system in the absence of systemic involvement. Patients with localized laryngeal amyloidosis usually present with long-standing hoarseness or dyspnea. The diagnosis is made by a high degree of suspicion on the basis of the history and a characteristic appearance on direct laryngoscopic examination. When such lesions are seen, an adequate deep punch biopsy should be obtained, and an experienced pathologist should be able to identify the lesion on routine staining. However, the slides should be stained with Congo red and examined with polarized light microscopy to establish the diagnosis. Following proper diagnosis and evaluation of the extent of disease, usually by computed tomographic scan, surgery is the treatment of choice. Preservation of the voice and airway should be the aim in all patients. Endoscopic carbon-dioxide laser excision of the mass should be the first line of therapy. Patients may require repeated removal of the amyloid deposits. The results of treatment are excellent.

PMID: 15966479 [PubMed - indexed for MEDLINE]

99. Fiziol Zh. 2005;51(2):57-64.

[Comparative testing of analgesia induced by polarized light and analgetics]

[Article in Ukrainian]

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In experiments on mice with the tonic pain locus the comparison of analgesia caused by the action of polarized light on an acupuncture point or by two classic analgetics (analginum, tramadol) was performed. The pain was evoked by hypodermic injection of formalin (30 ml of 5% solution) in the plantar region of hindlimb. Intensity of a pain was judged by duration of painful (licking of the pain locus) and non-painful (slipping, eating, running, washing) behavioral reactions for 60 minutes of observation. In animals which received immediately after creation of the tonic pain locus a single intraperitoneal injection of analginum in a doze of 4.2 mg/kg or 8.3 mg/kg the duration of pain response was reduced by 28.5% and 74.9%, respectively. Tramadol decreased the duration of pain behavioral response by 34.2% and 56.2% in a dose 0.8 mg/kg and 8.3 mg/kg, respectively. Statistically significant attenuation of pain (by 50%) was observed in the group of animals exposed to a 10 minute session of polarized light on the antinociceptive acupoint A-36. Compare to animals that received high dozes of analgetics, activity and behavior in mice subjected to an polarized light differed less from the norm. It is possible to suppose, that polarized light will allow a reduction of pharmacological analgetics use and consequently will reduce the risk of development of undesirable side effects in clinic.

PMID: 15943232 [PubMed - indexed for MEDLINE]

100. J Dent. 2006 Jan;34(1):62-6. Epub 2005 Jun 6.

Optimal Er:YAG laser energy for preventing enamel demineralization.

Liu JF, Liu Y, Stephen HC.

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OBJECTIVES: The purpose of this study was to identify the optimal laser energy range of Er:YAG laser irradiation for laser-induced caries prevention (LICP). **METHODS:** Twenty-one human non-carious molars were selected. The teeth were covered with nail varnish, except two 4 mm x 1 mm windows on both the buccal and lingual surfaces. The windows were randomly assigned to groups A, B, C and D, receiving no irradiation, 100, 200 and 300 mJ irradiation, respectively. The pulse width 10 pps (pulse per second) with a 1.0 mm spot size was used. After the laser treatment, each tooth was cut into two halves longitudinally. Then a two-day pH-cycling was performed, with an 18-hour demineralization followed by a 6-hour remineralization. Sections of 120 +/- 20 microm in thickness were obtained from each window. Lesion depth was measured using polarized light microscope coupled with an image analysis software. One-way ANOVA and post-hoc Tukey tests were used for evaluation of treatment effects. **RESULTS:** The laser treatments of 100 and 200 mJ have demonstrated significant protection of enamel demineralization (p = 0.01 and 0.001, respectively), but not the treatment with 300 mJ (p = 0.106). A smaller lesion depth was observed for the 200 mJ group (97.1 microm) than that of the 100 mJ group (105.6 microm). Compared with the control, a lesion reduction of 32.78 and 26.93% for the 200 mJ group and the 100 mJ group were obtained, respectively. **CONCLUSION:** Caries prevention may be achieved by using Er:YAG laser treatment if the optimal range of laser parameters for LICP can be employed.

PMID: 15939523 [PubMed - indexed for MEDLINE]

101. Cell Immunol. 2005 Jan;233(1):1-10.

Enhancement of T cell localization in mammary tumors through transient inhibition of T cell myosin function.

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Adoptive immunotherapy is hampered by poor lymphocyte localization in tumors. The polarized, adhesive phenotype of activated lymphocytes may contribute to this problem by making the cells prone to trapping and damage in pulmonary microvasculature. We found that transient inhibition of T cell polarization prior to i.v. infusion reduces trapping and improves tumor localization. Activated T cells were rendered nonpolar and nonadhesive by treatment with myosin light-chain kinase inhibitor ML-7. Polarity, adhesiveness, and motility recovered by 6 h after treatment, cytotoxicity, and proliferation by 24 h. ErbB2-specific T cells were infused i.v. into mice bearing ErbB2-expressing mammary tumors. ML-7 pre-treatment reduced T cell arrest in lungs by a factor of eight, improved tumor localization by 4-fold, and increased lymph node homing. Although this improvement alone proved insufficient to alter outcome in an immunotherapy experiment, this study indicates that cytoskeletal modification is a promising strategy for altering the trafficking of infused lymphocytes.

PMID: 15936742 [PubMed - indexed for MEDLINE]

102. Photomed Laser Surg. 2005 Apr;23(2):225-8.

Treatment of carpal tunnel syndrome with polarized polychromatic noncoherent light (Biopton light): a preliminary, prospective, open clinical trial.

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OBJECTIVE: Our aim was to assess the efficacy of polarized polychromatic noncoherent light (Biopton light) in the treatment of idiopathic carpal tunnel syndrome. **BACKGROUND:** Carpal tunnel syndrome is the most common compression neuropathy, but no satisfactory conservative treatment is available at present. **METHOD:** An uncontrolled experimental study was conducted in patients who visited our clinic from mid-2001 to mid-2002. A total of 25 patients (22 women and three men) with unilateral idiopathic carpal tunnel syndrome, mild to moderate nocturnal pain, and paraesthesia lasting >3 months participated in the study. The average age of the patients was 47.4 years and the average duration of patients' symptoms was 5.2 months. Polarized polychromatic noncoherent light (Biopton light) was administered perpendicular to the carpal tunnel area. The irradiation time for each session was 6 min at an operating distance of 5-10 cm from the carpal tunnel area, three times weekly for 4 weeks. Outcome measures used were the participants' global assessments of nocturnal pain and paraesthesia, respectively, at 4 weeks and 6 months. **RESULTS:** At 4 weeks, two patients (8%) had no change in nocturnal pain, six (24%) were in slightly less nocturnal pain, 12 (48%) were much better in regard to nocturnal pain and five (20%) were pain-free. At 6 months, three patients (12%) were slightly better in regard to nocturnal pain, 13 (52%) were much better regarding nocturnal pain, and nine patients (36%) were pain-free. At 4 weeks, four patients (16%) had no change in paraesthesia, five (20%) were slightly better, 13 patients (52%) were much better, and three patients (12%) were without paraesthesia. At 6 months, two patients (8%) had no change in paraesthesia, two (8%) were slightly better, 14 (56%) were much better, and seven (28%) were without paraesthesia. **CONCLUSIONS:** Nocturnal pain and paraesthesia associated with idiopathic carpal tunnel syndrome improved during polarized polychromatic noncoherent light (Biopton light) treatment. Controlled clinical trials are needed to establish the absolute and relative effectiveness of this intervention.

PMID: 15910192 [PubMed - indexed for MEDLINE]

103. Spec Care Dentist. 2005 Mar-Apr;25(2):118-23.

Effect of 2% plain and fluoridated milk on root surface caries in vitro.

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The caries-protective effect of milk and fluoridated milk on enamel has been reported; however, few data are available concerning the role of milk and/or fluoridated milk on root surfaces. The aim of this study was to compare the effect of plain and fluoridated milk on root surface caries. Artificial root surface lesions were created, sectioned and analyzed using polarized light microscopy (PLM) and microradiography (MRG). The sections were covered except for the original surface and assigned to a treatment group. The samples were immersed in 2% plain milk or fluoridated milk for 40 hours and re-evaluated. Changes were

measured and mean differences were compared with an unpaired t-test. Both techniques revealed a reduction in lesion depth for each milk group; however, a significantly greater reduction ($p < 0.05$) was observed with the fluoridated milk. These results suggest that fluoridated milk may have a beneficial effect on the remineralization of root surface caries.

PMID: 15856919 [PubMed - indexed for MEDLINE]

104. Photomed Laser Surg. 2005 Feb;23(1):66-9.

The use of polarized polychromatic non-coherent light as therapy for acute tennis elbow/lateral epicondylalgia: a pilot study.

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OBJECTIVE: The aim of this study was to assess the efficacy of polarized, polychromatic, non-coherent, low energy light (Biopton 2, Biopton AG, Switzerland) in the treatment of acute tennis elbow. **BACKGROUND:** Tennis elbow, or lateral epicondylitis, is one of the most common lesions affecting the arm. A plethora of treatment regimes have been described for this condition, but no specific therapy has emerged as a gold standard. **METHODS:** A pilot study was carried out with 25 patients who had acute tennis elbow. Biopton 2 device was applied over lateral epicondyle three times per week for 4 weeks. Pain on VAS, function on VAS, and painfree grip strength were measured at the beginning (week 0) and at the end of the study (week 4). **RESULTS:** The pain on VAS was reduced at the end of treatment ($t(24) = 3.84, p = 0.001$). Function on VAS was increased at the end of treatment ($t(24) = 4.23, p < 0.001$). Pain-free grip strength was increased at the end of treatment ($t(24) = 4.23, p < 0.004$). **CONCLUSION:** Although the results suggested that the Biopton 2 could reduce patients' symptoms with acute tennis elbow, future controlled studies are needed to establish the relative and absolute effectiveness of Biopton 2.

PMID: 15782036 [PubMed - indexed for MEDLINE]

105. Ultrasound Med Biol. 2005 Mar;31(3):345-50.

Comparative study of the efficacy of the topical application of hydrocortisone, therapeutic ultrasound and phonophoresis on the tissue repair process in rat tendons.

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The purpose of this study was to compare the treatment efficacy of topical application of hydrocortisone, therapeutic ultrasound (US) and phonophoresis on the rat's Achilles tendon (tendo calcaneus) repair process after tenotomy. The two treated groups with US were made in a pulsed mode. The irradiation of US was performed at a frequency of 1 MHz and an intensity of 0.5 W/cm² (SATA), for 5 min each session. The tendons were analyzed using the polarized light microscopy. The results showed that the treated group with the topical application of hydrocortisone has not been delivered transdermally and that the molecule of collagen responds to the ultrasonic stimulation. The treatment with phonophoresis was the more efficient method. These findings allow us to conclude that the US stimulates the acceleration of tissue repair processes and induces the

transdermal delivery of hydrocortisone in a therapeutic concentration on the tendon.

PMID: 15749557 [PubMed - indexed for MEDLINE]

106. Am J Dent. 2004 Dec;17(6):462-4.

Potential remineralization of demineralized enamel after application of fluoride varnish.

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PURPOSE: To evaluate remineralization effects of a topical fluoride varnish applied over a caries-like lesion compared to around a caries-like lesion. **METHODS:** Caries-like lesions were created on 30 molar surfaces. Sections were cut through each lesion, photographed under polarized light microscopy, and quantitated with a computerized imaging system. The sections were repositioned with only the lesion exposed. Half were painted with a 5% NaF varnish, including the surface of lesion. The remaining half were painted excluding the surface of the lesion. The sections were placed in artificial saliva for 30 days, re-photographed and re-quantitated. **RESULTS:** Using a student t-test for analysis, the results demonstrated the mean (+/- S.E.) percent remineralization of lesion size to be 10.8 (4.8) for lesions completely covered by the fluoridated varnish and 9.5 (2.9) for lesions that had the fluoridated varnish surrounding the lesion. Both application techniques indicated remineralization effects, yet there was no significant difference between the two application techniques evaluated in this study ($P < 0.05$). The data from this in vitro study indicated that there was no significant difference in methods of application for fluoridated varnish. Both application techniques demonstrated effective remineralization.

PMID: 15724762 [PubMed - indexed for MEDLINE]

107. Lasers Surg Med. 2005 Apr;36(4):270-80.

Intradermally focused infrared laser pulses: thermal effects at defined tissue depths.

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BACKGROUND AND OBJECTIVES: To produce controlled, spatially confined thermal effects in dermis. **STUDY DESIGNS/MATERIALS AND METHODS:** A 1 W, 1,500 nm fiber-coupled diode laser was focused with a high numerical aperture (NA) objective to achieve a tight optical focus within the upper dermis of skin held in contact with a glass window. The delivery optics was moved using a computer-controlled translator to generate an array of individual exposure spots. Fresh human facial skin samples were exposed to a range of pulse energies at specific focal depths, and to a range of focal depths at constant pulse energy. Cellular damage was evaluated in frozen sections using nitro-blue tetrazolium chloride (NBTC), a lactate dehydrogenase (LDH) activity stain. Loss of birefringence due to thermal denaturation of collagen was evaluated using cross-polarized light microscopy. The extent of focal thermal injury was compared with a model for photon migration (Monte Carlo Simulation), heat diffusion, and protein denaturation (Arrhenius model). **RESULTS:** Arrays of confined, microscopic intradermal foci of thermal injury were created. At high NA, epidermal damage was

avoided without active cooling. Foci of thermal injury were typically 50-150 microm in diameter, elliptical, and at controllable depths from 0 to 550 microm. Both LDH inactivation and extracellular matrix denaturation were achieved.

CONCLUSION: Spatially confined foci of thermal effects can be achieved by focusing a low-power infrared laser into skin. Size, depth, and density of microscopic, thermal damage foci may be arbitrarily controlled while sparing surrounding tissue. This may offer a new approach for nonablative laser therapy of dermal disorders. Copyright 2005 Wiley-Liss, Inc.

PMID: 15719420 [PubMed - indexed for MEDLINE]

108. Braz Dent J. 2004;15 Spec No:SI21-8.

Phototherapy improves healing of cutaneous wounds in nourished and undernourished Wistar rats.

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A wound represents the interruption of the continuity of tissue that is followed by damage or cellular death. Wound healing occurs due to a competitive mechanism between the synthesis and lysis of collagen. Any factor that increases collagen lysis or reduces its synthesis may result in changes in the healing process, i.e., nutritional deficiencies. Phototherapies have been suggested as an effective method to improve wound healing. This study evaluated, histologically, the differences in the healing of cutaneous wounds in nourished and undernourished rats following laser therapy or illumination by polarized light. Fifty nourished or undernourished Wistar rats had a standardized wound created on the dorsum and were divided into 6 subgroups: Group 1--Control (Standard diet; n=5); Group 2--Control (DBR; n=5); Group 3--Standard diet + laser therapy (λ 635nm; 20J/cm², n=5; or 40J/cm², n=5); Group 4--Standard diet + Bioptron (λ 400-2000nm; 20J/cm², n=5; or 40 J/cm², n=5); Group 5--DBR + laser therapy (λ 635nm; 20J/cm², n=5; or 40J/cm², n=5); Group 6--DBR + Bioptron (λ 400-2000nm; 20J/cm², n=5; or 40 J/cm², n=5). The first application of the treatment was carried out immediately after surgery and repeated every 24 h during 7 days. Specimens were routinely processed (wax, cut and stained with H&E and Picrosirius stain) and analyzed under light microscopy. Analysis included re-epithelization, inflammatory infiltrate, and fibroblastic proliferation. Picrosirius stained slides were used to perform descriptive analysis of the collagen fibers. The results showed the best results for nourished and undernourished groups treated with polarized light at a dose of 20J/cm² and the undernourished groups irradiated with the laser light. It is concluded that the nutritional status influenced the progression of the healing process as well as the quality of the healed tissue and that the use of both modalities of phototherapy resulted in a positive biomodulatory effect in both nourished and undernourished subjects. The effect of the polarized light was more evident in nourished subjects and laser therapy more effective in the treatment of undernourished subjects, in both cases with a dose of 20J/cm².

PMID: 15690767 [PubMed - indexed for MEDLINE]

109. Aesthetic Plast Surg. 2004 Sep-Oct;28(5):324-7. Epub 2004 Nov 5.

The use of polarized light in aesthetic surgery.

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This article presents a clinical investigation of polarized light therapy after aesthetic surgery procedures. The study included patients who the authors underwent face-lifts, blepharoplasties, and various facial ancillary procedures, at center during the past 2 1/2 years. One side of the surgically treated area was managed with polarized light, whereas the other side served as a control. The results were compared using clinical examination only including signs of recovery such as resolution of swelling and bruises. The results in most cases showed a significant difference between the treated and untreated sides.

PMID: 15666049 [PubMed - indexed for MEDLINE]

110. Biomed Eng Online. 2005 Jan 13;4(1):5.

Design and testing of low intensity laser biostimulator.

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BACKGROUND: The non-invasive nature of laser biostimulation has made lasers an attractive alternative in Medical Acupuncture at the last 25 years. However, there is still an uncertainty as to whether they work or their effect is just placebo. Although a plethora of scientific papers published about the topic showing positive clinical results, there is still a lack of objective scientific proofs about the biostimulation effect of lasers in Medical Acupuncture. The objective of this work was to design and build a low cost portable laser device for stimulation of acupuncture points, considered here as small localized biosources (SLB), without stimulating any sensory nerves via shock or heat and to find out a suitable method for objectively evaluating its stimulating effect. The design is aimed for studying SLB potentials provoked by laser stimulus, in search for objective proofs of the biostimulation effect of lasers used in Medical Acupuncture. **METHODS:** The proposed biostimulator features two operational modes: program mode and stimulation mode and two output polarization modes: linearly and circularly polarized laser emission. In program mode, different user-defined stimulation protocols can be created and memorized. The laser output can be either continuous or pulse modulated. Each stimulation session consists of a pre-defined number of successive continuous or square pulse modulated sequences of laser emission. The variable parameters of the laser output are: average output power, pulse width, pulse period, and continuous or pulsed sequence duration and repetition period. In stimulation mode the stimulus is automatically applied according to the pre-programmed protocol. The laser source is 30 mW AlGaInP laser diode with an emission wavelength of 685 nm, driven by a highly integrated driver. The optical system designed for beam collimation and polarization change uses single collimating lens with large numerical aperture, linear polarizer and a quarter-wave retardation plate. The proposed method for testing the device efficiency employs a biofeedback from the subject by recording the biopotentials evoked by the laser stimulus at related distant SLB sites. Therefore measuring of SLB biopotentials caused by the stimulus would indicate that a biopotential has been evoked at the irradiated site and has propagated to the measurement sites, rather than being caused by local changes of the electrical skin conductivity. **RESULTS:** A prototype device was built according to the proposed design using relatively inexpensive and commercially available components. The laser output can be pulse modulated from 0.1 to 1000 Hz with a duty factor from 10 to 90%. The average output power density can be adjusted in the range 24-480 mW/cm², where the total irradiation is limited to 2 Joule per

stimulation session. The device is controlled by an 8-bit RISC Flash microcontroller with internal RAM and EEPROM memory, which allows for a wide range of different stimulation protocols to be implemented and memorized. The integrated laser diode driver with its onboard light power control loop provides safe and consistent laser modulation. The prototype was tested on the right Tri-Heater (TH) acupuncture meridian according to the proposed method. Laser evoked potentials were recorded from most of the easily accessible SLB along the meridian under study. They appear like periodical spikes with a repetition rate from 0.05 to 10 Hz and amplitude range 0.1-1 mV. CONCLUSION: The prototype's specifications were found to be better or comparable to those of other existing devices. It features low component count, small size and low power consumption. Because of the low power levels used the possibility of sensory nerve stimulation via the phenomenon of shock or heat is excluded. Thus senseless optical stimulation is achieved. The optical system presented offers simple and cost effective way for beam collimation and polarization change. The novel method proposed for testing the device efficiency allows for objectively recording of SLB potentials evoked by laser stimulus. Based on the biopotential records obtained with this method, a scientifically based conclusion can be drawn about the effectiveness of the commercially available devices for low-level laser therapy used in Medical Acupuncture. The prototype tests showed that with the biostimulator presented, SLB could be effectively stimulated at low power levels. However more studies are needed to derive a general conclusion about the SLB biostimulation mechanism of lasers and their most effective power and optical settings.

PMCID: PMC549208

PMID: 15649327 [PubMed - indexed for MEDLINE]

111. Nefrologia. 2004;24(5):493-8.

[Primary amyloidosis associated to severe factor X deficiency]

[Article in Spanish]

Pérez Martínez J, Llamas F, López Montes A, Massó P, Poblet E, López Rubio E, Gallego E, Gómez Roldán C.

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Amyloidosis is a systemic disease characterized by generalized deposition of beta-organized proteic fibrillar material with green birefringence under polarized light, in different tissues and organs, the most frequent kidney, liver and heart, with important clinical repercussion. Primary or AL amyloidosis is the most common subtype of amyloidosis (1), confirmed by biopsy-proved amyloid deposition in abdominal fat pad, rectum, kidney or liver, if necessary, in which fragments of monoclonal light chains are deposited. Cases with factor X (Stuart factor) of coagulation deficiency associated are described, due to adsorption of this factor to amyloid fibrills. Normally, evolution is fatal, with only few months of survival. We report a case of primary amyloidosis with nephrotic syndrome, severe factor X deficiency (without bleeding complications), possible heart affection and short-term good response to chemotherapeutic treatment.

PMID: 15648909 [PubMed - indexed for MEDLINE]

112. Orthod Craniofac Res. 2004 Nov;7(4):205-10.

The efficacy of a fluoride varnish in reducing enamel demineralization adjacent to orthodontic brackets: an in vitro study.

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OBJECTIVES: To test the hypothesis that fluoride varnish is effective in reducing demineralization (white spot) lesions adjacent to bonded orthodontic brackets. **DESIGN:** Two similar samples of extracted bovine incisors, with bonded orthodontic brackets, were separated into an experimental group (fluoride varnish was applied) and control group (no fluoride varnish) to examine the preventive effects of fluoride varnish. **SETTING AND SAMPLE POPULATION:** The dental clinic of the State University of Maringá--UEM (Maringá, Paraná, Brazil). Thirty-eight extracted bovine incisors with bonded orthodontic brackets. **EXPERIMENTAL VARIABLE:** Fluoride varnish was applied topically to half of the sample of extracted bovine teeth. No varnish was applied to the other half. **OUTCOME MEASURE:** The depths of enamel demineralization (white spot) lesions were measured from polarized light microscopy images using image analysis software. **RESULTS:** The teeth in both the experimental and control groups had been exposed to a cariogenic environment twice a day for 35 days. Those teeth that had been treated with two applications of fluoride varnish (one at the outset and another 15 days later) demonstrated about 38% less mean lesion depth than teeth where no varnish had been applied. **CONCLUSION:** Orthodontists may wish to consider the application of fluoride varnish during fixed orthodontic therapy to help reduce the development of enamel white spot lesions.

PMID: 15562583 [PubMed - indexed for MEDLINE]

113. Nihon Kokyuki Gakkai Zasshi. 2004 Sep;42(9):825-30.

[Treatment of pulmonary amyloidosis with dimethyl sulfoxide--a case report]

[Article in Japanese]

Sutani A, Tabe K, Nagata M, Kuramitsu K, Shimizu Y, Sakamoto Y.

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Metastatic lung tumor was suspected in a 52-year-old woman who showed multiple nodules on her chest radiographs. Conventional examinations did not define the diagnosis, and so a biopsy was performed using video-assisted thoracoscopic surgery. Pathological examination demonstrated deposits of amorphous materials which were stained red by Congo red staining, even after potassium permanganate treatment. Green birefringence was also observed in the deposits under a polarized light microscope. A diagnosis of localized pulmonary amyloidosis with AL type amyloid protein was made, and therapy with dimethyl sulfoxide (10 ml/day) was started. During the two-year therapy, little exacerbation on pulmonary nodules was observed. It was suggested that dimethyl sulfoxide inhibited the progression of the disease.

PMID: 15500151 [PubMed - indexed for MEDLINE]

114. Am J Dent. 2004 Aug;17(4):245-8.

Remineralization effects of a sodium fluoride bioerodible gel.

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PURPOSE: To evaluate the effectiveness of a 5% sodium fluoride (NaF) bioerodible gel to remineralize demineralized enamel. **METHODS:** Artificial enamel lesions were created at the gingivofacial surface of 36 extracted teeth. Longitudinal sections were obtained through the lesions, photographed under polarized light microscopy, and the demineralized areas were quantitated. Sections were painted with an acid-protective varnish, leaving only the facial surface of the enamel lesion exposed, and positioned naturally into the tooth from which they were obtained. Teeth were randomly mounted in sets of four that simulated a natural anterior arch form. Equal numbers were subjected to a NaF gel, control gel or received no treatment, with the gel being placed and retained by the interproximal embrasures of the teeth. Following 30 days exposure to artificial saliva, the lesions were photographed and quantitated in the same manner as prior to treatment. **RESULTS:** The NaF gel showed significantly more remineralization than the control groups ($P < 0.05$), with a 68.9% (+/- 17.7) mean lesion remineralization.

PMID: 15478484 [PubMed - indexed for MEDLINE]

115. Am J Dent. 2004 Aug;17(4):241-4.

Argon laser irradiation and fluoride treatment effects on caries-like enamel lesion formation in primary teeth: an in vitro study.

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PURPOSE: To evaluate topical acidulated phosphate fluoride (APF) and low fluence argon laser (Ar) treatment effects on in vitro caries formation in primary tooth enamel. **METHODS:** 20 extracted or exfoliated primary teeth with sound buccal and lingual surfaces underwent soft tissue debridement and a fluoride-free prophylaxis. Treatment groups were: (1) Control [n=5]; (2) Ar [231mW, 10 seconds, 11.5J/cm²; n=5], (3) 1.23% APF for 4 minutes before Ar [n=5]; (4) Ar before APF [n=5]. Buccal and lingual enamel surfaces were treated, and then rinsed in deionized, distilled water (24 hours). An acid-resistant coating was applied leaving buccal and lingual sound enamel windows exposed. In vitro enamel caries was created (2.2 mM calcium, 2.2 mM phosphate, 5.0 mM fluoride, pH 3.90, 10 days). Following longitudinal sectioning, two lesions per primary tooth (10 lesions total) with each group were evaluated for lesion depth (polarized light, water imbibition) and compared (ANOVA, Duncan's Multiple Range). **RESULTS:** Argon laser irradiation alone provided a 41% reduction in lesion depth (176 +/- 21 microm, $P < 0.05$) when compared with that for the no treatment controls (297 +/- 31 microm). The combination of argon laser irradiation with APF treatment resulted in lesion depth decreases of slightly over 50% (140 +/- 23 microm for APF before ArTx; 124 +/- 17 microm for ArTx before APF, $P < 0.05$) compared with control lesion depths, and 20 to 30% over that for argon laser treatment alone ($P < 0.05$). There was no statistical difference in lesion depth regardless of whether fluoride treatment occurred before or after laser irradiation ($P > 0.05$).

PMID: 15478483 [PubMed - indexed for MEDLINE]

116. Melanoma Res. 2004 Oct;14(5):409-14.

Transscleral thermotherapy with laser-induced and conductive heating in hamster Greene melanoma.

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The purpose of this study was to investigate the cytotoxic effect of heat as induced by transscleral thermotherapy (TSTT), which may be of interest in the treatment of patients with choroidal melanoma. The aim of TSTT is to heat both the sclera and the tumor up to a cytotoxic temperature of about 60 degrees C. TSTT was performed in hamsters with subcutaneously implanted Greene melanoma covered by a specimen of human donor sclera of thickness 0.5, 0.7 or 0.9 mm. A newly developed applicator, which combines conductive episcleral heating at 60 degrees C with laser-induced heating, was used at laser powers ranging from 500 to 1500 mW delivered by an 810 nm diode laser, beam diameter 3 mm, and exposure time 1 min. Temperatures were measured at the scleral surface and at the sclera-tumor interface. The extent of tumor necrosis was examined by light microscopy and the sclera was examined by polarized light microscopy. Maximal depth of tumor necrosis without scleral damage was 4.4 (SD 1.5) mm. The temperature at the scleral surface after TSTT was 58.8 (SD 2.4) degrees C. The temperature at the sclera-tumor interface ranged from 56.4 (SD 3.7) degrees C at 500 mW to 65.3 (SD 4.4) degrees C at 1250 mW laser power. Structural changes to the scleral collagen started to develop at 1250 mW. TSTT with combined laser-induced and conductive heating caused cytotoxic temperatures in the tumor and the sclera, which were well tolerated by the scleral collagen.

PMID: 15457098 [PubMed - indexed for MEDLINE]

117. Lasers Surg Med. 2004;35(3):214-28.

Peripheral thermal and mechanical damage to dentin with microsecond and sub-microsecond 9.6 microm, 2.79 microm, and 0.355 microm laser pulses.

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BACKGROUND AND OBJECTIVES: It is desirable to minimize peripheral thermal damage during laser irradiation, since thermal damage to collagen and mineral compromises the bond strength to restorative materials in dentin and inhibits healing and osteointegration in bone. There were two primary objectives of this study. The first objective was to measure the degree of thermal damage peripheral to incisions in dentin produced with lasers resonant to the specific absorption bands of water, collagen, and hydroxyapatite with varying pulse duration using polarized-light microscopy (PLM). The second objective was to use synchrotron radiation infrared spectromicroscopy (SR-FTIR) to identify the specific chemical nature of the optical changes observed under PLM in the respective zones of thermal damage peripheral to the laser incisions. **STUDY DESIGN/MATERIALS AND METHODS:** Precise incisions were produced in 3 x 3 mm² blocks of human dentin using CO₂ (9.6 microm), Er:YSGG (2.79 microm), and Nd:YAG (355 nm) lasers with and without a computer controlled water-spray. Optical coherence tomography (OCT) was used to obtain optical cross-sections of each incision to determine the rate of ablation. The peripheral thermal damage zone around each incision was analyzed using PLM and SR-FTIR. **RESULTS:** Thermally induced chemical changes to both mineral and the collagen matrix were observed with SR-FTIR with a 10 microm spatial resolution and those changes were correlated with optical changes observed with PLM. Minimal (<10 microm) thermal damage was observed for pulse durations less than the thermal relaxation time (Tr) of the deposited laser energy, with and without applied water at 9.6 microm and with only applied water at 2.79 microm. For pulse durations greater than Tr, greater peripheral thermal damage was observed for both IR laser wavelengths with and without the

water-spray. There was minimal thermal damage for 355 nm laser pulses less than Tr with and without applied water; however, extensive mechanical damage (cracks) was observed. CONCLUSIONS: High resolution SR-FTIR is well suited for characterization of the chemical changes that occur due to thermal damage peripheral to laser incisions in proteinaceous hard tissues. Sub-microsecond pulsed IR lasers resonant with water and mineral absorption bands ablate dentin efficiently with minimal thermal damage. Similar laser parameters are expected to apply to the ablation of alveolar bone. Copyright 2004 Wiley-Liss, Inc.

PMID: 15389737 [PubMed - indexed for MEDLINE]

118. Actas Urol Esp. 2004 Jul-Aug;28(7):523-6.

[Indinavir and renal lithiasis]

[Article in Spanish]

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Indinavir is a new specific and potent drug that inhibits, like other antiretroviral agents, the protease of immune deficiency virus (HIV) or acquired immune deficiency syndrome (AIDS), an enzyme necessary to maturation and replication of the virus. Indinavir has the capacity to bind the active site causing a decrease in plasma of HIV1-RNA and an increase of T-CD4 helper lymphocytes. The aim of this work is to study in HIV and/or AIDS patients treated with indinavir the crystalluria and the formation of renal calculi due to the clearance of this drug. Two out of nine patients studied in this work presented abundant crystalluria and one of them presented spontaneously passed renal stone. Urinary crystals were studied under polarized-light microscopy and renal stone was analyzed by infrared spectroscopy.

PMID: 15384277 [PubMed - indexed for MEDLINE]

119. Arch Dermatol. 2004 Sep;140(9):1065-9.

Topical tacrolimus and the 308-nm excimer laser: a synergistic combination for the treatment of vitiligo.

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OBJECTIVE: To compare the efficacy of combined tacrolimus and 308-nm excimer laser therapy vs 308-nm excimer laser monotherapy in treating vitiligo. DESIGN: Comparative, prospective, randomized, intraindividual study. PATIENTS: Fourteen patients, aged 12 to 63 years, with Fitzpatrick skin types II to IV. INTERVENTION: For each patient, 4 to 10 target lesions were chosen. The treatment applied to each target lesion was randomized by drawing lots. Each lesion was treated twice a week by the 308-nm excimer laser, for a total of 24 sessions. Initial fluences were 12 mcal/cm² (50 mJ/cm²) less than the minimal erythema dose in vitiliginous skin. Then, fluences were increased by 12 mcal/cm² every second session. Moreover, topical 0.1% tacrolimus ointment was applied twice daily on target lesions receiving the combined tacrolimus and excimer laser treatment (group A). Group B target lesions received only excimer laser monotherapy. For each treated lesion, the untreated lesion on the opposite side

served as the control. Tolerance was evaluated by a visual analog scale, and secondary events were recorded at each session. MAIN OUTCOME MEASURE: Treatment efficacy, which was blindly evaluated by 2 independent physicians by direct and polarized light photographs taken before and after treatment. RESULTS: Forty-three lesions were treated (23 in group A and 20 in group B). All patients completed the study. Repigmentation was observed in all group A lesions (100%) and in 17 (85%) of the 20 group B lesions. Repigmentation was not observed in the untreated lesions (control group). A repigmentation rate of 75% or more was obtained in 16 (70%) of the 23 group A lesions and in 4 (20%) of the 20 group B lesions. In UV-sensitive areas (the face, neck, trunk, and limbs, with the exception of bony prominences and extremities), 10 (77%) of 13 group A lesions had a repigmentation rate of 75% or more vs 4 (57%) of 7 group B lesions. In classically UV-resistant areas, 6 (60%) of 10 group A lesions had a repigmentation rate of 75% or more vs 0 of the 13 group B lesions. The mean number of sessions necessary for an improvement of repigmentation was 10 in group A and 12 in group B. Adverse effects have been limited, and tolerance was excellent. CONCLUSIONS: The combination treatment of 0.1% tacrolimus ointment plus the 308-nm excimer laser is superior to 308-nm excimer laser monotherapy for the treatment of UV-resistant vitiliginous lesions ($P < .002$). The efficacy and the good tolerance of the 308-nm excimer laser in monotherapy for treating localized vitiligo were also confirmed, but this treatment regimen should be proposed only for UV-sensitive areas.

PMID: 15381545 [PubMed - indexed for MEDLINE]

120. Folia Med (Plovdiv). 2001;43(1-2):164-8.

A denture complication: sarcoid-like foreign body granulomas of the tongue.

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Sarcoidosis in the oral cavity occurs extremely rare (there have been described only 47 cases in the literature) and is almost always doubtful. We describe a protruding painful nodule (1 cm) on the apex of the tongue of a 65-year-old female, adjacent to the site of irritation of a new denture. Histologically it was confluent mass of non-caseous granulomas, rich in Langhans' cells. Silver impregnation showed them stamped out as in sarcoidosis. Corticosteroids proved to be ineffective and the therapy was discontinued because of the concomitant diabetes. Six months later, similar nodules reappeared on the same place. When examined in polarized light these giant cells were found to be of the foreign body type, each of them containing phagotized particles displaying bright yellow and dark green colour. We assume a sarcoid-like reaction of traumatic origin. There was no recurrence of the condition after removal of the denture.

PMID: 15354495 [PubMed - indexed for MEDLINE]

121. Tsitologiya. 2004;46(6):567-77.

[Modulation of proliferation of peripheral blood lymphocytes after irradiation of volunteers with polychromatic visible and infrared light]

[Article in Russian]

Zhevago NA, Samoïlova KA.

Effects on human immune system of visible and infrared (IR) radiation, the

dominating types of solar light on Earth, still remain poorly studied. In the present work, a small area of the volunteers' body surface was irradiated with polychromatic visible + IR polarized (VIP) light, whose spectral range is close to the natural one (400-3400 nm, 12 J/cm²), and spontaneous and phytohemagglutinin (PHA)-induced DNA syntheses were studied by radiometric method in lymphocytes (Lym) of peripheral blood. This Irradiation stimulated both spontaneous and PHA-induced DNA synthesis in Lym but only in volunteers with initially decreased parameters of synthesis (on average, by 2.5 and 2.7 times, respectively), which was recorded 24 h after irradiation of volunteers, and after a 72 h cultivation of separated mononuclears. In the parallel experiments, blood of each volunteer was irradiated in vitro. Besides, by modeling situation in vivo, when a small amount of transcutaneously photomodified blood contacts its much larger circulating volume, the irradiated and non-irradiated samples of autologous blood were mixed at a 1:10 volume ratio. In Lym with the initially decreased synthesis level, the spontaneous synthesis elevated by 2 and 3 times, respectively, whereas stimulation of PHA-synthesis was observed only after addition of the irradiated blood to the intact one (by 2.2 and 1.6 times, respectively). A high degree of positive correlation in changing the studied parameters is revealed in irradiation of blood in vivo and in vitro. This makes it possible to associate the light-stimulating effect on Lym of the entire circulating blood with transcutaneous photomodification of its small amounts, and with action of such blood on the rest of blood. A similarity in the direction and additivity of mitogenic effects of VIP light and PHA was revealed. The obtained data enable us to suggest that therapy employing polychromatic visible and IR light would promote presumably an increase in the number of Lym in peripheral blood and an enhancement of their response to antigenic stimulus.

PMID: 15341134 [PubMed - indexed for MEDLINE]

122. *Epilepsia*. 2004 Sep;45(9):1158-62.

A novel nonpharmacologic treatment for photosensitive epilepsy: a report of three patients tested with blue cross-polarized glasses.

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PURPOSE: Pharmacotherapy for photosensitive epilepsy is not always effective and is associated with well-recognized toxicities. Nonpharmacologic approaches to the management of photosensitive epilepsy have included the use of sunglasses of various types. Blue lenses have been shown to suppress the photoparoxysmal response more effectively than lenses of other colors with similar overall transmittances. Recently, cross-polarized glasses have shown promise. The axes of polarization of the two lenses of such glasses are perpendicular to one another. We tested the effect of combining the use of blue and cross-polarized lenses in three patients with photosensitive epilepsy. **METHODS:** We recorded the EEG response to photic stimulation, television screens, and computer monitors in three patients with photosensitive epilepsy. If photoparoxysmal responses were provoked in any of these scenarios, testing was repeated with the patient wearing nonpolarized, parallel-polarized, and blue cross-polarized sunglasses. **RESULTS:** One of our patients had clinical seizures that were inadequately suppressed with moderate doses of valproate (VPA) but completely suppressed with blue cross-polarized lenses. The second patient's photoparoxysmal response was suppressed by both parallel-polarized and blue cross-polarized glasses, whereas the third patient's photoparoxysmal response was not suppressed by either. **CONCLUSIONS:** These preliminary data suggest that blue cross-polarized lenses may be useful in the treatment of photosensitive epilepsies and that their efficacy can be predicted in the EEG laboratory. Copyright 2004 International League

Against Epilepsy

PMID: 15329083 [PubMed - indexed for MEDLINE]

123. Fiziol Zh. 2004;50(3):55-8.

[The effect of polarized light on fibrinolysis]

[Article in Ukrainian]

Mishchenko SV.

In experiments in vitro on a man, cat and rat thrombocyte-free plasma it was determined that the polarized light over 5 cm distance from the object (6 min exposure) causes the inhibition of fibrinolytic activity of euglobulin fraction. It was shown that the fibrinolytic inhibition under the influence of the polarized light is connected with its antiplasmin effect. The importance of the fibrinolytic reaction for the course of inflammation process and tissue regeneration after injury and the role of therapy with polarized light in these reactions is discussed.

PMID: 15320431 [PubMed - indexed for MEDLINE]

124. Tsitologiya. 2004;46(2):159-71.

[Enhancement of fibroblast growth promoting activity of human blood after its irradiation in vivo (transcutaneously) and in vitro with visible and infrared polarized light]

[Article in Russian]

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Visible and infrared (IR) irradiation of laser and non-laser sources has a pronounced wound-healing effect promoting tissue repair without hyperproduction of connective tissue elements. This effect develops as a consequence of local and systemic light effects, but many aspects of their mechanism have been yet unclear. In the present work, we have shown that in 0.5 h after irradiation of a small area of the volunteers' body surface with polychromatic visible + IR light (400-3400 nm, 95% polarization, 12 J/cm²) the amounts of PDGF and TGF-beta 1 in the blood serum increase, on average, by 20 and 43%, respectively. This effect is preserved for at least 24 h to be recorded only in volunteers with the initially normal and decreased levels of the growth factors; the initially elevated content of PDGF-AB decreases. Addition of such a plasma (2.5%) to the nutrient medium of primary cultures of human embryonal fibroblasts stimulates cell proliferation, on average, by 10 and 17%, but only in the case if the initial growth-promoting (GP) blood activity was low. Similar changes occur in parallel experiments following irradiation of blood samples of the same volunteers in vitro, as well as at mixing irradiated and non-irradiated autologous blood at the ratio 1:10 (v/v), i.e. at modeling a situation in the vascular bed, when the transcutaneously photomodified blood contacts with the rest of its volume. Similar changes in the blood GP activity under conditions in vitro were recorded as well after 4-9 daily phototherapy sessions. This allows us to suggest that changes in GP activity of circulating blood of the irradiated volunteers may be, to a large extent, the consequence of effect exerted on the blood by small amounts of transcutaneously photomodified blood. The obtained results are discussed in terms of light effect

on wound healing and scar tissue formation, with regard to the authors' previous data on much higher GP of the irradiated blood in respect to keratinocytes, the fast decrease in proinflammatory cytokine levels, and the increase in IFN-gamma content.

PMID: 15174355 [PubMed - indexed for MEDLINE]

125. Int J Paediatr Dent. 2004 May;14(3):199-203.

Effect of diode laser and fluoride varnish on initial surface demineralization of primary dentition enamel: an in vitro study.

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INTRODUCTION: Previous investigations have demonstrated improved enamel caries resistance after laser irradiation. The purpose of this in vitro study was to assess the caries-preventive potential of 809 nm diode laser treatment of the enamel of primary teeth compared to topical fluoride application. METHODS: Eighty samples of sound primary teeth were embedded in plastic and stored in saline solution. The enamel surface of 80 samples was polished in an area of 2 x 2 mm. These tooth specimens were randomly assigned to one control and three test groups: (1) no treatment/control; (2) application of 0.1 mg of fluoride varnish (Duraphat) for 6 h; (3) diode laser application (809 nm, 140 mJ, 50 Hz, Ø 600 micro m fibre, contact mode, absorber, 1 min; ORA-LASER01 I.S.T.); and (4) combined application - laser/fluoride varnish. Caries-like lesions were created by pH-cycling. After lesion formation, longitudinal sections were taken and examined by polarized light microscopy. RESULTS: In the control group, all samples showed lesions up to 30 micro m in depth. After laser application, lesions could be identified in 15 out of 20 samples. Topical fluoride treatment in groups 2 (varnish) and 4 (laser/varnish) completely inhibited the development of caries-like lesions in all samples. CONCLUSION: In this in vitro investigation, topical fluoride treatment enhances the resistance of sound enamel of primary teeth more effectively than diode laser application.

PMID: 15139955 [PubMed - indexed for MEDLINE]

126. J Clin Laser Med Surg. 2004 Feb;22(1):59-66.

Effects of low-intensity polarized visible laser radiation on skin burns: a light microscopy study.

Ribeiro MS, Da Silva Dde F, De Araújo CE, De Oliveira SF, Pelegrini CM, Zorn TM, Zezell DM.

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OBJECTIVE: This study was carried out to investigate the influence of low-intensity polarized visible laser radiation on the acceleration of skin wound healing. Background Data: Low-level laser therapy (LLLT) at adequate wavelength, intensity, and dose can accelerate tissue repair. However, there is still unclear information about light characteristics, such as coherence and polarization. Some studies indicate that linearly polarized light can survive through long propagation distance in biological tissue. MATERIALS AND METHODS: Three burns about 6 mm in diameter were created on the back of rats with liquid N(2). Lesion "L(//)" was irradiated by He-Ne laser ($\lambda = 632.8 \text{ nm}$), $D = 1.0 \text{ J/cm}^2$, with

linear polarization parallel to the spinal column of the rat. Lesion "L(inverted v)" was irradiated using the same laser and dose, but the light polarization was aligned perpendicularly to the relative orientation. Lesion "C" was not irradiated in order to be considered as control. The animals were sacrificed at day 3-17 after lesion creation. Samples were collected and prepared for histological analysis. RESULTS: Histological analysis showed that the healing of irradiated wounds was faster than that of non-irradiated wounds. Moreover, it was observed that skin wound repair is dependent on polarization orientation with respect to a referential axis as the animal's spinal column. Consequently, "L(//)" was completely healed after 17 days, whereas "L (perpendicular) " showed a moderate degree of healing after the same period. CONCLUSIONS: These results indicate that the relative direction of the laser polarization plays an important role in the wound healing process when highly coherent He-Ne laser is used.

PMID: 15117489 [PubMed - indexed for MEDLINE]

127. J Vasc Res. 2004 Mar-Apr;41(2):157-65. Epub 2004 Mar 3.

Inward remodeling of the rabbit aorta is blocked by the matrix metalloproteinase inhibitor doxycycline.

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Constrictive arterial remodeling accounts for a significant proportion of lumen loss in atherosclerotic progression and postangioplasty stenosis. Recent research suggests that constrictive remodeling is mediated by turnover of the extracellular matrix. We hypothesized that remodeling could be attenuated by treatment with the safe, effective matrix metalloproteinase (MMP) inhibitor doxycycline. Female rabbit abdominal aortas were denuded using a 4-Fr balloon embolectomy catheter, and reinjured 3 weeks later. Treatment with 30 mg/kg/day doxycycline was begun the day before the second injury. At 6 weeks after injury, lumen area measured 13.1 +/- 1.2 mm² in controls compared to 17.5 +/- 1.6 mm² in doxycycline-treated rabbits (p = 0.05). At 4 days after injury, MMP-2 activity was increased compared to uninjured controls, but doxycycline treatment reduced MMP-2 activity. Doxycycline treatment also inhibited fibrillar collagen deposition in the intima by 87% as detected by polarized light microscopy. Doxycycline was an effective inhibitor of constrictive arterial remodeling in the rabbit aorta. Treatment reduced MMP activity and attenuated the deposition of extracellular matrix particularly in the intima. Copyright 2004 S. Karger AG, Basel

PMID: 15004435 [PubMed - indexed for MEDLINE]

128. Quintessence Int. 2004 Jan;35(1):15-20.

In vivo caries formation in enamel following argon laser irradiation and combined fluoride and argon laser treatment: a clinical pilot study.

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OBJECTIVE: This in vivo pilot study investigated the role of argon laser irradiation and combined fluoride and argon laser treatment in accelerated natural caries development in sound enamel surfaces beneath plaque-retentive

orthodontic bands. METHOD AND MATERIALS: Five patients (3 female, 2 male, ages 19 to 28 years) requiring tooth extraction prior to orthodontic treatment, participated in the study. Buccal surfaces were treated with either: (1) argon laser (250 mW for 10 seconds, ARGO-MOD); (2) topical fluoride (0.5% fluoride ion, Thera-Flur-N) followed by argon lasing; or (3) no treatment (control). Orthodontic bands with plaque-retentive slots on buccal surfaces were placed on the teeth slated for extraction (n = 14). Following a minimum of 5 weeks of intraoral exposure, the teeth were extracted for laboratory analysis. The teeth underwent serial longitudinal sectioning (12 sections per tooth). The sections were imbibed in water, and lesion depths were determined with each section, using polarized light microscopy. Comparisons were made among treatment groups (analysis of variance, Duncan's multiple range test for paired samples). RESULTS: Mean lesion depths were: 261 +/- 24 microm for the no treatment control group (n = 84 sections); 147 +/- 18 microm for the argon laser group (n = 24 sections); and 99 +/- 12 microm for the fluoride and argon laser group (n = 60 sections). Both the argon laser (44%) and the fluoride and argon laser groups (62%) had significant lesion depth reductions compared to controls. The addition of fluoride treatment prior to argon lasing resulted in a 32% reduction in lesion depth compared to argon laser treatment alone. CONCLUSIONS: Within this clinical pilot study, in vivo natural caries formation was affected significantly by a single exposure to low fluence argon laser irradiation. Topical fluoride treatment in combination with argon lasing provided an even greater degree of resistance against in vivo enamel caries development. A simple technique for reducing the caries susceptibility of enamel may be a clinical reality.

PMID: 14765636 [PubMed - indexed for MEDLINE]

129. Fiziol Zh. 2003;49(5):43-51.

[Suppression of visceral pain by action of the low intensity polarized light on acupuncture antinociceptive points]

[Article in Ukrainian]

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In experiments on mice, statistically authentic weakening of visceral pain has been shown after an action of low intensity polarized light from a device Bioptron on antinociceptive acupuncture points (AP). Pain was caused by an intraperitoneal injection of 2% acetic acid (0.1 ml/10 g). The intensity of pain was judged on duration and frequency of painful behavioral reactions (writhing, licking of abdomen), as well as on duration of sleep, eating and motor activity. In animals which immediately after injections of acetic acid were exposed to polarized light of low intensity for 10 min, applied on any of antinociceptive APs (E-36, E-43, VC-8, RP-6), the duration of painful behavioral reaction was determined to be reduced, while that of non-painful one increased. The comparison of the total duration of the writhing at control and experimental mice showed that an activation of AP E-43 induced the greatest analgesic effect (76.5%), from AP VC-8 it was 76.3%, from RP-6--46.8%, and from E-36--41.4%. We have concluded that the effect of polarized light of low intensity on APs was a convenient non-pharmacological method of treating visceral pain.

PMID: 14663889 [PubMed - indexed for MEDLINE]

130. Dis Colon Rectum. 2003 Oct;46(10 Suppl):S50-3.

Results of linearly polarized near-infrared irradiation therapy in patients with intractable anorectal pain.

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PURPOSE: Electrogalvanic stimulation and biofeedback therapy for the treatment of intractable anorectal pain have been reported. However, these therapeutic modalities have some disadvantages and insufficient effectiveness. We noticed that digital examination revealed the strongly tender point in both lateral sides of the rectum and introduced linearly polarized near-infrared irradiation therapy to the strongly tender point. The purpose of this study was to review the outcomes and estimate its usefulness. **METHODS:** A total of 35 consecutive patients complained of vague and deep pain in the anorectum. Fourteen patients had a history of lower abdominal surgery. Eighteen patients had disordered defecation. The linearly polarized near-infrared light was irradiated to the strongly tender point on or a few centimeters apart from the skin for ten minutes. The effect of the therapy was assessed as excellent, good, no change, or worse by the patients themselves. **RESULTS:** Ten patients had the strongly tender point in the left side, 8 in the right posterior, and 17 in both. Five patients estimated as excellent, 28 as good, and 2 as no change. Mean total number of irradiation was 18.8 (range, 1-235), and mean number of irradiation for relief from pain was 2.5 (range, 1-9). Anorectal pain recurred in four patients, who received the same therapy and improved. Four patients felt hot during the irradiation, and a patient had frequent micturition after the irradiation. These mild complications easily disappeared. **CONCLUSION:** The linearly polarized near-infrared irradiation therapy is a simple, safe, and effective modality for relief from intractable anorectal pain and recommended for primary therapy.

PMID: 14530658 [PubMed - indexed for MEDLINE]

131. Tsitologiia. 2003;45(6):596-605.

[Enhancement of growth promoting activity of human blood on keratinocytes after its irradiation in vivo (transcutaneously) and in vitro with visible and infrared polarized light]

[Article in Russian]

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To stimulate wound healing, current medicine uses various methods of phototherapy. The induced activation of proliferative processes in the wound occurs due to development of not only local, but also systemic processes, whose nature remains largely uninvestigated. The present work provides evidences that as early as 30 min after irradiation of a small area of the volunteer's body surface with polychromatic visible light + infrared polarized light (400-3400 nm, 95% of polarization) at a therapeutic dose (12 J/cm²), soluble factors appear in the circulating blood, which are able to stimulate proliferation of human keratinocytes in primary culture. A similar effect was also revealed after a direct blood irradiation. A proof is provided in favor of a hypothesis that a rapid rise of growth promoting activity of the entire circulating blood may be a consequence of transcutaneous photomodification of the small amount of light-modified blood in superficial skin vessels, and of the effect of such blood on its entire circulating volume. A possibility of a release into plasma of

growth factors from blood cells and complexes with alpha 2-macroglobulin is discussed.

PMID: 14521091 [PubMed - indexed for MEDLINE]

132. Int J Dermatol. 2003 Sep;42(9):738-40.

Linear polarized infrared irradiation using Super Lizer is an effective treatment for multiple-type alopecia areata.

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BACKGROUND: Super Lizer trade mark is a linear polarized light instrument, which has been used with good effect in orthopedics and anesthesiology to treat arthralgia and neuralgia with a high output of infrared radiation. **AIM:** To test Super Lizer trade mark 's efficacy for the treatment of alopecia areata. **METHODS:** Fifteen patients over 18 years of age, diagnosed with alopecia areata and displaying symptoms of patchy hair loss, were topically irradiated with infrared radiation using the Super Lizer trade mark. The patients were irradiated intermittently for an interval of 3 min once every week or every 2 weeks. **RESULTS:** Seven of 15 (46.7%) of the irradiated areas showed hair regrowth 1.6 months earlier than the nonirradiated areas (chi2 official approval, P = 0.003). With regard to adverse effects caused by Super Lizer trade mark treatment, only one patient complained of a sensation of heat in the irradiated area. **CONCLUSIONS:** These findings suggest that Super Lizer trade mark, with its noninvasive properties, is a useful apparatus for the treatment of mild forms of alopecia areata.

PMID: 12956694 [PubMed - indexed for MEDLINE]

133. Fiziol Zh. 2003;49(2):35-44.

[Mechanisms of primary reception of electromagnetic waves of optical range]

[Article in Ukrainian]

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An existence of separate functional system of regulation of electromagnetic balance of organism has been substantiated and a working conception of light therapy has been formulated. As a basis, there is a possibility to use the acupuncture points for input of biologically necessary electromagnetic waves into the system of their conductors in a body that might be considered as a transport facility for energy of the polarized electromagnetic waves. Zones-recipients are organs having an electromagnetic disbalance due to excess of biologically inadequate radiation and being the targets for peroxide oxidation. Foremost, a body has the neurohormonal and immune regulatory systems. Electromagnetic stimulation or modification of functions of the zones-recipients determines the achievement of therapeutic and useful effects, and their combination with local reparative processes allows to attain a clinical goal. We represent own and literary experimental data about the development of physiological responses (analgesia) to BIOPTRON-light exposure on the acupuncture points or biologically active zones. We show the experimental facts in support of a hypothesis that a

living organism can perceive an action of the electromagnetic fields of optical range not only via the visual system, but also through the off-nerve receptors (specific energy-sensitive proteins detecting critical changes of energy in cells and functioning as the "sensory" cell systems), as well as via the acupuncture points. It confirms an important role of the electromagnetic waves of optical range in providing normal vital functions of living organisms. A current approach to BIOPTRON light therapy (by polarized polychromatic coherent low energy light) consists in combined (local and system) exposure of the electromagnetic waves within the biologically necessary range.

PMID: 12945112 [PubMed - indexed for MEDLINE]

134. Cell Mol Biol (Noisy-le-grand). 2003 Jun;49(4):579-85.

Experimental tendon repair: glycosaminoglycan arrangement in newly synthesized collagen fibers.

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Changes in the macromolecular orientation and metachromasy of glycosaminoglycans (GAG) in newly synthesized and assembled collagen fibers in rat Achilles tendon after tendon excision were investigated in toluidine blue (TB)-stained preparations, based in the selective absorption of polarized light (= linear dichroism, LD) and of absorption of unpolarized light in situ. Extrinsic LD was observed microspectrophotometrically from the early phases of tendon repair onwards, although the absorption peaks in both parallel and perpendicular directions with respect to the plane of polarized light and the long axis of the collagen fibers occurred at the same wavelength, and thus differed from the pattern situation in normal adult controls. Compared to normal adult tendons, the pattern of LD in newly synthesized and assembled fibers was still not fully attained 110 days after surgical tendon removal. This incomplete recovery possibly reflected the influence of aging during the repair process. There was no correlation between LD and metachromasy. The highest absorption values for metachromatic staining occurred on the 7th day after tendon removal, at a time when LD was not intense. Treatment with hyaluronidase showed that the LD in the early stages of tendon repair was mostly due to hyaluronate whereas the LD in the later stages was due to chondroitin sulfates. The changes in LD during Achilles tendon repair were attributed to gradual modifications in the composition and macromolecular orientation of GAGs relative to the long axis of the collagen fibers.

PMID: 12899449 [PubMed - indexed for MEDLINE]

135. Am Fam Physician. 2003 Jul 1;68(1):83-90.

Diagnosing acute monoarthritis in adults: a practical approach for the family physician.

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Acute monoarthritis can be the initial manifestation of many joint disorders. The first step in diagnosis is to verify that the source of pain is the joint, not the surrounding soft tissues. The most common causes of monoarthritis are

crystals (i.e., gout and pseudogout), trauma, and infection. A careful history and physical examination are important because diagnostic studies frequently are only supportive. Examination of joint fluid often is essential in making a definitive diagnosis. Leukocyte counts vary widely in septic and sterile synovial fluids and should be interpreted cautiously. If the history and diagnostic studies suggest an infection, aggressive treatment can prevent rapid joint destruction. When an infection is suspected, culture and Gram staining should be performed and antibiotics should be started. Light microscopy may be useful to identify gout crystals, but polarized microscopy is preferred. Blood tests alone never confirm a diagnosis, and radiographic studies are diagnostic only in selected conditions. Referral is indicated when patients have septic arthritis or when the initial evaluation does not determine the etiology.

PMID: 12887114 [PubMed - indexed for MEDLINE]

136. J Mol Med. 2003 Aug;81(8):471-80. Epub 2003 Jul 18.

A molecule solves psoriasis? Systemic therapies for psoriasis inducing interleukin 4 and Th2 responses.

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Psoriasis is an autoimmune disease affecting 2-4% of the Caucasian population. Inflammatory processes induce the migration of interferon (IFN) gamma producing Th1 lymphocytes into the skin. These play a key role in the pathogenesis of psoriasis. These Th1 lymphocytes are responsible for the pathological reactions in psoriatic skin leading to keratinocyte hyperproliferation, small vessel proliferation and neutrophilic infiltration. Antigen-presenting cells activate dermal CD4+ T lymphocytes, and various signals can support the polarization of Th1 responses. The main signal for Th1 development is interleukin (IL) 12. After binding to their receptors both IL-12 and IFN-gamma promote intracellular IFN-gamma production by activating signal transducer and activator of transcription (STAT) 4 or 1. STAT1 activation by IFN-gamma is followed by T-bet activation, a master transcription factor for Th1 lymphocytes. In experimental models of Th1-mediated autoimmune diseases immune deviation of polarized autoreactive Th1 into anti-inflammatory Th2 responses generally improves the disease. Therefore new therapeutic approaches based on immunomodulating molecules have been developed for psoriasis, a prototypical Th1-mediated autoimmune disorder. Recently IL-4, the most effective Th2-inducing cytokine, has been shown to be safe and efficient for treating psoriasis. Improvement was associated with the induction of a Th2 phenotype of skin infiltrating lymphocytes. This review summarizes the IL-4 inducing potential of various conventional and newer systemic therapies for psoriasis. Many of these were thought to be primarily immunosuppressive. A review of the literature reveals that most of them can induce IL-4 and Th2, and that Th2 induction may be an underestimated mode of action in the therapy of Th1-mediated autoimmune disease. Further studies are needed to determine the central role of IL-4 in the control of Th1-induced autoimmune disease, namely psoriasis.

PMID: 12879154 [PubMed - indexed for MEDLINE]

137. Lasers Surg Med. 2003;32(5):417-23.

Effects of linearly polarized 0.6-1.6 microM irradiation on stellate ganglion function in normal subjects and people with complex regional pain (CRPS I).

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BACKGROUND AND OBJECTIVES: Stellate ganglion blocks are an effective but invasive treatment of upper extremity pain. Linearly polarized red and near-infrared (IR) light is promoted as a safe alternative to this procedure, but its effects are poorly established. This study was designed to assess the physiological effects of this latter approach and to quantitate its benefits in people with upper extremity pain due to Complex Regional Pain Syndrome I (CRPS I, RSD). **STUDY DESIGN/MATERIALS AND METHODS:** This was a two-part study. In the first phase, six adults (ages 18-60) with normal neurological examinations underwent transcutaneous irradiation of their right stellate ganglion with linearly polarized 0.6-1.6 microm light (0.92 W, 88.3 J). Phase two consisted of a double-blinded evaluation of active and placebo radiation in 12 subjects (ages 18-72) of which 6 had upper extremity CRPS I and 6 served as "normal" controls. Skin temperature, heart rate (HR), sudomotor function, and vasomotor tone were monitored before, during, and for 30 minutes following irradiation. Analgesic and sensory effects were assessed over the same period as well as 1 and 2 weeks later. **RESULTS:** Three of six subjects with CRPS I and no control subjects experienced a sensation of warmth following active irradiation (P = 0.025). Two of the CRPS I subjects reported a >50% pain reduction. However, four noted minimal or no change and improvement did not reach statistical significance for the group as a whole. No statistically significant changes in autonomic function were noted. There were no adverse consequences. **CONCLUSIONS:** Irradiation is well tolerated. There is a suggestion in this small study that treatment is beneficial and that its benefits are not dependent on changes in sympathetic tone. Further evaluation is warranted. Copyright 2003 Wiley-Liss, Inc.

PMID: 12766967 [PubMed - indexed for MEDLINE]

138. Tsitologiia. 2003;45(2):179-95.

[Changes in the expression of membrane markers and in the number of human blood monocytes after single and repeated courses of visible and infrared light at therapeutic doses]

[Article in Russian]

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An attempt has been made to prove that the immunomodulating effect of therapeutic doses of polychromatic visible + infrared polarized (VIP) light at its application to a small body surface area is connected with a transcutaneous photomodification of a small amount of blood in superficial skin microvessels. For this purpose, in parallel experiments, using monoclonal antibodies, the membrane phenotype of circulating blood mononuclears was studied after irradiation of volunteers, of samples of their blood in vitro, and of a mixture of the irradiated and non-irradiated autologous blood in a 1:10 volume ratio, thereby modeling events in vivo, when a small amount of the transcutaneously photomodified blood in the vascular bed contacts its main circulating volume. In this variant of experiment, a great similarity has been established of changes in expression of mononuclear membrane markers (CD3, CD4, CD8, CD20, CD16, HLA-DR and to a lesser degree of CD25); the ability has been proven of the photomodified blood to "translate" the light-induced changes to a much higher volume of

non-irradiated blood, which might represent a mechanism of the systemic immunomodulating effect of phototherapy. Under conditions in vivo and in vitro, the most "reactive" were HLA-DR+, CD20+, CD16+, CD4+, and 0-cells. An increase of the total number of lymphocytes and monocytes has been shown by the end of the 10-day-long phototherapeutic course. The regulatory character of the single and course sessions of the VIP light on the blood immunocompetent cells is substantiated: depending on the initial state of the immune system, the VIP light can produce both stimulating and inhibitory effect on lymphoid cell subpopulations, which opens large possibilities of using this method for correction of immunological disturbances in diseases of different etiopathogenesis.

PMID: 12722482 [PubMed - indexed for MEDLINE]

139. Arch Ophthalmol. 2003 Apr;121(4):510-6.

Transscleral thermotherapy: short- and long-term effects of transscleral conductive heating in rabbit eyes.

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OBJECTIVE: To determine the highest safe treatment temperature, at 30- and 60-second exposure durations, for transscleral thermotherapy (TSTT) of choroidal melanoma. **METHODS AND DESIGN:** Transscleral conductive heating was performed in 15 rabbits at 50 degrees C to 70 degrees C for 30 or 60 seconds. The thermal lesions in the ocular fundus were monitored for 4 months with ophthalmoscopic, photographic, and fluorescein angiographic examination. Histologic examination included polarized light microscopy. **RESULTS:** The effect of TSTT was similar for both exposure durations. Vascular occlusion in the retina and choroid developed at temperatures of 55 degrees C and higher. After heating at 60 degrees C, scleral collagen fibers developed a minimal undulation; at 65 degrees C, they became clearly undulated. The undulation resolved in the 3 to 4 months after heating. Heating at 70 degrees C caused persistent severe damage to the sclera. Retinal tears developed after heating at 65 degrees C and 70 degrees C. **CONCLUSIONS:** A temperature of 65 degrees C was found to be the highest temperature that did not cause permanent damage to the sclera at both exposure durations. A temperature of 60 degrees C may be the optimal temperature for TSTT of choroidal melanoma because retinal tears may develop at 65 degrees C. **CLINICAL RELEVANCE:** In TSTT, the temperature levels reached are cytotoxic for choroidal melanoma as well as intrascleral tumor cells. Occlusion of choroidal vessels induced by TSTT may contribute to tumor necrosis because these vessels serve as feeder vessels for the tumor.

PMID: 12695248 [PubMed - indexed for MEDLINE]

140. J Clin Laser Med Surg. 2003 Feb;21(1):35-9.

Contribution of phototherapy to the treatment of episiotomies.

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OBJECTIVE: The purpose of this study was an objective consideration of possible benefits of phototherapy implemented with therapeutic laser or possibly polarized

light in treating episiotomy, which is the most frequent obstetric intervention. MATERIALS AND METHODS: In the present study, the authors treated a total of 2,436 women. The light sources were as follows: a laser of a wave length 670 nm, power 20 mW, with continuous alternations of frequencies 10 Hz, 25 Hz, and 50 Hz, a polarized light source of a 400-2,000 nm wavelength in an interval of power 20 mW and frequency 100 Hz and a monochromatic light source of a 660 nm wavelength and power 40 mW, with simultaneous application of a magnetic field at an induction 8 mT. RESULTS: The work demonstrated high healing effects with minimum secondary complications in the treatment of episiotomies using a therapeutic laser at an energy density of 2 J/cm². The application of polarized light at an energy density of 5 J/cm² also exerted favorable therapeutic effects.

PMID: 12614558 [PubMed - indexed for MEDLINE]

141. *Pediatr Dermatol.* 2003 Jan-Feb;20(1):40-3.

Cutaneous silica granuloma in a child.

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A 12-year-old girl had a 4-year history of two asymptomatic, sharply demarcated, granulomatous lesions on her face. The lesions did not respond to topical steroids and histopathologic examination of biopsy specimens showed granulomatous inflammation. Since cutaneous leishmaniasis is endemic where the patient lived, she was diagnosed as chronic cutaneous leishmaniasis but did not respond to meglumine antimoniate treatment. Reexamination of the biopsy specimens under polarized light revealed numerous birefringent crystalline particles, and cutaneous silica granuloma was the final diagnosis. The lesions were treated with intralesional triamcinolone acetonide and completely disappeared. We report this case of cutaneous silica granuloma, which is unusual in children, and emphasize the importance of polarized light microscopic examination of granulomatous skin diseases.

PMID: 12558845 [PubMed - indexed for MEDLINE]

142. *J Clin Laser Med Surg.* 2002 Oct;20(5):257-62.

Enamel caries initiation and progression after argon laser irradiation: in vitro argon laser systems comparison.

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OBJECTIVE: The purpose of this in vitro laboratory study was to determine the effect of low-fluence argon laser (AL) irradiation delivered from two different argon laser systems on enamel caries-like lesion initiation and progression. BACKGROUND DATA: Previous in vitro investigations and a recent in vivo pilot study have shown that AL irradiation of enamel provided a protective effect against in vitro and in vivo cariogenic challenges. MATERIALS AND METHODS: Twenty extracted human molars were selected, and 10 teeth were assigned to the HGM argon laser group and 10 were assigned to the LaserMed argon laser group. The exposed buccal windows of sound enamel were exposed to low-fluence irradiation, while the lingual windows of enamel were not exposed to laser irradiation and served as the no-treatment (control) group. Enamel caries-like lesions were created using an

acidified gel. Two longitudinal sections were taken per sample (n = 20 lesions per group) and evaluated by polarized light microscopy for body of the lesion depths after lesion initiation (8 weeks) and progression (12 weeks) periods. RESULTS: After lesion initiation and progression, the body of lesion depths were similar for both argon-irradiated groups (p > 0.05). With the no-treatment (control) group, there were significant increases in lesion depth with a 61-78% increase for the lesion initiation period and a 50-69% increase for the lesion progression period when compared with the argon laser-treated groups. CONCLUSION: Argon laser irradiation provides a certain degree of protection against in vitro enamel caries initiation and progression. Resistance to a continuous caries challenge was similar with either argon laser delivery systems (HGM and LaserMed). Argon laser irradiation may prove to be beneficial in reducing the caries susceptibility of sound enamel and white spot lesions in the clinical environment.

PMID: 12470455 [PubMed - indexed for MEDLINE]

143. Klin Khir. 2002 Sep;(9):34-6.

[Application of polarized light in purulent-septic surgery]

[Article in Ukrainian]

Desiateryk VI, Mikhno SP, Kryvyts'kyĭ IuM, Kostiuk SO.

Influence of polarized light on general state and healing of wounds and trophic ulcers in 57 patients with obliterating atherosclerosis of lower extremities, chronic venous insufficiency of extremities, purulent postoperative complications, purulent-septic complications in patients with diabetes mellitus was analyzed. Main mechanisms of the polarized light action in "Biopton" apparatus were enlightened, effective schemes of its usage were determined.

PMID: 12440209 [PubMed - indexed for MEDLINE]

144. J Orthop Res. 2002 Sep;20(5):910-9.

Insulin-like growth factor-I improves cellular and molecular aspects of healing in a collagenase-induced model of flexor tendinitis.

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Flexor tendinitis is a common and debilitating injury of elite and recreational athletes. Healing may be improved through intratendinous injection of insulin-like growth factor-I (IGF-I), which has been shown in vitro to stimulate mitogenesis and enhance tendon matrix production. This study investigated the effects of intratendinous injection of IGF-I on tendon healing in an equine model of flexor tendinitis. Collagenase-induced lesions were created in the tensile region of the flexor digitorum superficialis tendon of both forelimbs of eight horses. Treated tendons were injected with 2 microg rhIGF-I intralesionally every other day for 10 injections, while controls received 0.9% NaCl. Tendon fiber deposition and organization were evaluated serially using ultrasonography throughout the 8 week trial period. Following euthanasia, the tendons were harvested and DNA, hydroxyproline, and glycosaminoglycan content determined, mechanical strength and stiffness evaluated, gene expression and spatial arrangement of collagen types I and III assessed by northern blot and in situ hybridization, and tendon fiber architecture assessed by polarized light

microscopy. Local soft tissue swelling was reduced in the IGF-I treated limbs. Similarly, lesion size in IGF-I treated tendons was smaller 3 and 4 weeks after initiation of treatment. Cell proliferation and collagen content of the IGF-I treated tendons were increased compared to controls. Mechanically, IGF-I treated tendons showed a trend toward increased stiffness compared to saline treated controls. Considered together with the decreased soft tissue swelling and improved sonographic healing, these data support the potential use of intralesional IGF-I for treatment of debilitating tendon injuries.

PMID: 12382953 [PubMed - indexed for MEDLINE]

145. Int J Pharm. 2002 Oct 1;245(1-2):25-36.

Nail morphology studies as assessments for onychomycosis treatment modalities.

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The purpose of this investigation was to study the morphology of the human nail treated with chemical penetration enhancers (CPE), bioadhesives and surface modifiers for assessment of topical treatment modalities for onychomycosis. CPEs, including dimethyl sulfoxide (DMSO) and urea were applied to human nail samples. Additional samples were treated with surface modifiers, tartaric acid (TTA) and phosphoric acid gel (PA). Other nail specimens were subjected to the bioadhesive polymers Carbopol 971P and Klucel MF. Atomic force microscopy (AFM), scanning electron microscopy (SEM) and polarized light microscopy (PLM) were utilized to visualize nail morphology and topographical changes of the human nail samples subjected to the various chemical agents. AFM, SEM and PLM micrographs revealed changes in topography to the dorsal layer when CPEs and surface modifiers were applied. Roughness scores as determined by NANOSCOPE IIIA software indicated a 2-fold increase when the dorsal nail layer was subjected to PA versus the control (147.8 vs. 85.0 nm, respectively). In contrast, when carbomer 971P was applied to the dorsal surface, roughness scores decreased significantly (44.6 vs. 85.0 nm, respectively). AFM, SEM and PLM studies of the human nail subjected to various chemical agents may be useful in the design and formulation of novel drug delivery systems for the topical treatment of onychomycosis. The AFM studies offer both a qualitative and quantitative assessment for nail treatment opportunities.

PMID: 12270239 [PubMed - indexed for MEDLINE]

146. Am J Orthod Dentofacial Orthop. 2002 Sep;122(3):251-9.

The effects of argon laser irradiation on enamel decalcification: An in vivo study.

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Enamel decalcification is a significant problem in orthodontic patients. The argon laser has been shown to reduce decalcification during an acidic challenge in vitro. The purpose of this study was to investigate the in vivo effects of argon laser irradiation on enamel decalcification during orthodontic treatment. Nine volunteers whose treatment plans included 4 first premolar extractions were enrolled in the study. The 36 extracted premolars were assigned to 1 of the

following 4 groups: group 1, control group with no treatment; group 2 (pumice-laser), teeth were pumiced for 3 seconds and treated with a 325 mW, 5-mm diameter laser beam for 60 seconds; group 3 (pumice-etch-laser), teeth were pumiced for 3 seconds, acid-etched with 30% phosphoric acid for 30 seconds, and treated for 60 seconds with laser; and group 4 (laser only), teeth were treated for 60 seconds with laser. A specially designed (oversized) orthodontic band was fitted on each of the premolars to create a pocket for decalcification. The bands were cemented in place for 5 weeks. After extraction, the teeth were sectioned and examined under polarized light microscopy. Images of lesions were digitally analyzed and measured. Average lesion depths were calculated from 3 depth measurements recorded 10 microm apart. Average lesion area was calculated with the aid of imaging analysis software. Data were analyzed with analysis of variance ($P < .05$) and Student *t* tests. Significant differences were found in lesion depth ($P < .001$) and lesion area ($P < .01$) among the 4 test groups. The average lesion depths were 15.93 +/- 9.31 microm (control), 6.45 +/- 8.70 microm (pumice-laser), 1.71 +/- 4.82 microm (pumice-etch-laser), and 1.34 +/- 3.80 microm (laser only). The average lesion areas were 1028.67 +/- 725.68 microm (2) (control), 555.49 +/- 948.20 microm (2) (pumice-laser), 79.91 +/- 226.03 microm (2) (pumice-etch-laser), and 55.71 +/- 157.59 microm (2) (laser only). The average lesion depth in the laser-only group was reduced by 94.1% and the average lesion area was reduced by 94.4% when compared with the control group. In the pumice-etch-laser group, the average lesion depth was reduced by 89.1% and the average lesion area was reduced by 92.2% when compared with the control group. There were no significant differences in lesion depth and lesion area between maxillary and mandibular teeth ($P < .06$ and $P < .08$, respectively) and between the teeth on the right and left sides ($P < .68$ and $P < .55$, respectively). These results show that argon laser irradiation is effective in reducing enamel decalcification during orthodontic treatment. Pumicing and etching do not appear to reduce the effect of laser on enamel solubility.

PMID: 12226605 [PubMed - indexed for MEDLINE]

147. Fiziol Zh. 2002;48(3):87-94.

[Effect of polarized light on the immune status and cytokine levels of patients with bronchial asthma during immunotherapy with bronchomunal]

[Article in Ukrainian]

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The influence of polarized polychromatic light on immunocompetent cells in complex with immunomodulated bronchomunal is studied. Data of content of the main cytokines taking part in development of inflammation are presented. It is cleared up that polarized light increases the number of T-lymphocytes, normalizes ratio of subpopulation of T-lymphocytes and level of serum FNO-alpha and level of interleukin-4 reaches the level of healthy people. It is ascertained that complex use bronchomunal and polarized polychromatic increases level of serum interferon-gamma.

PMID: 12125291 [PubMed - indexed for MEDLINE]

148. J Heart Valve Dis. 2002 May;11(3):308-14; discussion 314.

Evolution of cell phenotype and extracellular matrix in tissue-engineered heart valves during in-vitro maturation and in-vivo remodeling.

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BACKGROUND AND AIM OF THE STUDY: Contemporary tissue valves are non-viable, and unable to grow, repair or remodel. It was postulated that tissue-engineered heart valves (TEHV) fabricated from autologous cells and a biodegradable scaffold could yield a dynamic progression of cell phenotype and extracellular matrix (ECM), in vitro and in vivo, and ultimately recapitulate native valve microscopic architecture. **METHODS:** Trileaflet valve constructs were fabricated from poly-4-hydroxybutyrate-coated polyglycolic acid seeded with ovine endothelial and carotid artery medial cells, cultured in vitro for 4-14 days in a pulse duplicator, implanted as pulmonary valves in five lambs, and explanted at 4-20 weeks. ECM composition and collagen architecture were examined by histology (including Movat pentachrome stain and picrosirius red under polarized light), and cell phenotype by immunohistochemistry. **RESULTS:** Cells from in-vitro constructs (14 days) were activated myofibroblasts, with strong expression of alpha-actin (microfilaments), vimentin (intermediate filaments) and SMemb (non-muscle myosin produced by activated mesenchymal cells). Cells from in-vivo explants at 16-20 weeks were fibroblast-like, with predominant vimentin expression and undetectable levels of alpha-actin (similar to native valve). Collagen elaboration and cellular expression of MMP-13 (collagenase 3) were evident in vitro at 14 days. In-vivo explants had increased collagen accumulation and strong MMP-13 expression at 4-8 weeks, but less activation (decreased expression of SMemb) and patchy endothelial cells at 16-20 weeks. Moreover, the ECM architecture of 16- to 20-week explanted TEHV resembled that of native valves. **CONCLUSION:** Cell phenotype and ECM in TEHV prepared in vitro and implanted in vivo are dynamic, and reflect the ability of a vital tissue to remodel and, potentially, to grow.

PMID: 12056720 [PubMed - indexed for MEDLINE]

149. Caries Res. 2002 Mar-Apr;36(2):122-8.

In situ evaluation of sodium hexametaphosphate-containing dentifrices.

Wefel JS, Stanford CM, Ament DK, Hogan MM, Harless JD, Pfarrer AM, Ramsey LL, Leusch MS, Biesbrock AR.

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The purpose of this investigator-blinded, five-treatment, crossover human intraoral study was to evaluate the effects of two experimental dentifrice formulations containing either stannous fluoride (SnF(2)) or sodium fluoride (NaF) packaged with sodium hexametaphosphate in a dual-phase delivery system on demineralization-remineralization using an in situ model system. The experimental dentifrice formulations' ability to alter demineralization-remineralization was compared to a series of three controls: SnF(2)-positive control, NaF-positive control and no-fluoride placebo-negative control. The single-section crown model, developed at the University of Iowa, was used to assess the fluoride efficacy of two experimental products versus the placebo containing no fluoride and positive controls. The results of the current in situ study suggest a clinical level of anticaries activity for the experimental SnF(2) and NaF dentifrice formulations that was as good as either of the positive controls, when evaluated using polarized light microscopy. This supports the conclusion that the use of the sodium hexametaphosphate ingredient does not interfere with the normal fluoride activity of these toothpastes. In addition, the experimental SnF(2) product was numerically better than both the NaF and placebo controls at preventing

demineralization of sound root surfaces. Copyright 2002 S. Karger AG, Basel

PMID: 12037369 [PubMed - indexed for MEDLINE]

150. Cardiovasc Pathol. 2002 Mar-Apr;11(2):88-93.

Ventricular remodeling after myocardial infarction and effects of ACE inhibition on hemodynamics and scar formation in SHR.

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The effect of ACE inhibition after myocardial infarction (MI) on MI healing and remodeling in the presence of hypertension is not exactly known. Therefore, the effect of quinapril on scar formation, remodeling and hemodynamics was studied in spontaneously hypertensive rats (SHR). Nine weeks after moderate and large MI, left ventricular end-diastolic pressure (LVEDP) and passive pressure-volume relations were similar in 28-week-old hypertensive and normotensive rats. Chronic therapy with quinapril (6 mg/kg/day, started 30 min post-MI) reduced LVEDP and LV to body weight ratio, yet did not affect pressure-volume relations. Quinapril increased MI size and reduced the content and brightness of collagen fibers in the scar examined by polarized light microscopy. In conclusion, ventricular dilatation after MI was not accelerated in SHR, probably due to LV hypertrophy. Quinapril produced beneficial hemodynamic effects similar to that observed in the normotensive rat model. The significance and timing of ACE inhibitor-induced impairment of scar formation need further evaluation.

PMID: 11934599 [PubMed - indexed for MEDLINE]

151. J Clin Laser Med Surg. 2002 Feb;20(1):37-40.

Effects of 1047-nm neodymium laser radiation on skin wound healing.

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Previous research in our laboratory has shown that the polarization component of the electrical field plays an important role on the healing process of inflammatory lesions created in the end of the spinal column of Lewis rats, using a He-Ne laser at $\lambda = 632.8$ nm. It is well known that polarization is lost in a turbid medium, such as living tissue. However, the Nd:YLF wavelength ($\lambda = 1,047$ nm) allows more polarization preservation than $\lambda = 632.8$ nm, and the Nd:YLF laser beam has been used in clinical trials as a biostimulating agent. In this work, we investigated the influence of a low-intensity, linearly polarized Nd:YLF laser beam on skin wound healing, considering two orthogonal directions of polarization. We have considered a preferential axis as the animals' spinal column, and we aligned the linear laser polarization first parallel, then perpendicular to this direction. Burns of about 6 mm in diameter were created with liquid N₂ on the back of the animals, and the lesions were irradiated on days 3, 7, 10, and 14 postwounding, $D = 1.0$ J/cm². Lesions 1 and 2 were illuminated using Nd:YLF pulsed laser radiation. Lesion 1 was irradiated with linear polarization parallel with the rat spinal column. Lesion 2 was irradiated using the same protocol, but the light polarization was aligned with the perpendicular relative orientation. Control lesions were not irradiated. We have taken photographs from the wound areas on the 3rd, 7th, 10th, 14th, and 17th

postoperative day for a biometrical analysis. The results have shown that lesion 1 healed faster than the control lesions ($p < 0,05$), which presented a smaller degree of healing after 14 days postwounding.

PMID: 11902353 [PubMed - indexed for MEDLINE]

152. *Cutis*. 2001 Oct;68(4 Suppl):25-33.

Polarized light photography and videomicroscopy greatly enhance the capability of estimating the therapeutic response to a topical retinoid (adapalene) in acne vulgaris.

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Assessment of improvement in acne lesions following treatment is often based on clinical evaluation and photographs. However, limitations are associated with this subjective evaluation, making it difficult to accurately review individual acne lesions and to observe early response to therapy. Conventional photographs do not allow us to visualize small lesions, and it can be difficult to differentiate inflammatory lesions as papules or small nodules. Our objective was to evaluate a new standardized method for tracking individual acne lesions based on photographs. The effect of adapalene gel 0.1% on both inflammatory and noninflammatory acne lesions was evaluated using this technique. Polarized light photography and videomicroscopy were used to record the evolution of acne lesions over a 16-week period in 5 volunteers with moderate acne vulgaris. During the first 4 weeks before treatment, acne lesions were evaluated on a 3-times weekly basis to establish a pattern of progression and determine the length of time to resolution. Sebum secretion rates were monitored using Sebutape adhesive patches applied to the forehead and both cheeks for 1 hour. After 4 weeks, adapalene gel 0.1% was used once daily at bedtime for 8 weeks; polarized light photography, videomicroscopy, and assessment of sebum production followed treatment response. This treatment period was followed by a further 4-week phase, after which acne lesions and sebum secretion rates were evaluated. Our results showed that the new methodology was appropriate to track acne lesions and allowed an accurate and more objective evaluation of individual lesions. Using this methodology demonstrated that adapalene gel 0.1% causes rapid resolution of inflammatory and noninflammatory lesions. The probability of clearing inflammatory and noninflammatory lesions during the treatment period increased, and the probability of new lesions appearing decreased. Sebum secretion rates declined in patients while on study drug, returning to near pretreatment levels following therapy cessation. Using sophisticated photography and videomicroscopy every other day proved to be a valuable, noninvasive, and reliable method of following response to adapalene treatment in patients with moderate acne vulgaris.

PMID: 11845945 [PubMed - indexed for MEDLINE]

153. *J Eur Acad Dermatol Venereol*. 2001;15 Suppl 3:13-8.

New photographic techniques for clinical evaluation of acne.

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Clinical evaluation of acne is usually based on direct visual assessment and ordinary flash photography, both of which are compromised by viewer subjectivity. It is difficult to accurately assess individual acne lesions and to observe early

response to therapy. Standard flash photography has inherent limitations owing to the physics of light; it does not permit consistent visualization of subtle cutaneous characteristics like erythema or microcomedones, and it tends to blur distinctions between active inflammatory lesions and older hyperpigmented macules. Over the last decade there has been increasing interest in newer techniques aimed at increasing the accuracy and objectivity of acne evaluation. These include parallel-polarized light photography, cross (or perpendicular)-polarized light photography, videomicroscopy, and fluorescence photography. This article will review the advances of the past decade and summarize new techniques to evaluate acne lesions. Moreover, findings of a study that evaluated the course of individual acne lesions and the effects of adapalene gel 0.1% on inflammatory and non-inflammatory acne lesions will be viewed. In this study, the use of parallel-polarized and cross-polarized photography, in combination with videomicroscopy and sebum production measurement, provided objective, detailed information on the evolution of different variable acne lesions and their response to adapalene gel 0.1%. Adapalene treatment produced rapid resolution of inflammatory and non-inflammatory lesions, and inhibited formation of new lesions. Sebum secretion rates also declined during treatment. Use of the new assessment techniques proved to be a valuable, non-invasive and reliable method of assessing acne vulgaris and its response to treatment.

PMID: 11843228 [PubMed - indexed for MEDLINE]

154. Ultrasound Med Biol. 2001 Dec;27(12):1691-6.

The effect of therapeutic ultrasound on repair of the achilles tendon (tendo calcaneus) of the rat.

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The purpose of this study was to evaluate the effects of therapeutic ultrasound (US) on the healing process in the Achilles tendon (Tendo calcaneus) of Wistar rats after tenotomy. Sonication was performed at a frequency of 1 MHz, an intensity of 0.5 W/cm² (SATA), for 5 min, over a period of 14 consecutive days in two modalities (n = 15); in both continuous and pulsed modes. The control group was divided into tenotomized, mock-sonicated and nontenotomized tendons (n = 15). On the 15th postoperative day, the tendons were removed and analyzed by using the polarized light microscopy, with the purpose of detecting and measuring the organization of collagen fibers through birefringence. The results showed a high birefringence for the tendons treated using the pulsed mode (p < 0.001), revealing the best organization and aggregation of collagen bundles. Sonication in the continuous mode induced a decrease (p = 0.047) in the ability to quicken the healing process. These findings suggest that US therapy is beneficial in the early healing process of tendons when the pulsed mode is used.

PMID: 11839414 [PubMed - indexed for MEDLINE]

155. Int J Nurs Pract. 2002 Feb;8(1):49-55.

Effect of polarized light in the healing process of pressure ulcers.

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Erratum in:

Int J Nurs Pract 2002 Apr;8(2):116.

A trial was conducted to examine the effect of polarized light on pressure ulcers of 1st, 2nd and 3rd grades. Patients with two pressure ulcers, one of which received the polarized light therapy (experimental ulcer) and the other acting as control, were included in the study. The experimental ulcers received treatments for 2 weeks consisting a 5 min therapy session each day, excluding weekends, for 10 days. Experimental and control ulcers were assessed as they appeared on admission and reassessed at the end of each week. Fifty-five patients aged 37-85 years (67.1 +/- 11.9 years) were studied. Pressure ulcers of 1st, 2nd and 3rd grades receiving extra treatment with polarized light had increased values of epithelial tissue between the first and second assessments of 0-30.9% and between the second and third assessments of 30.9-21.7%. Values of the control pressure ulcers were, respectively, from 0 to 5.5% and from 5.5% to 3.1%. The mean pink/white colour values of the experimental ulcers, between the first and second measurements increased significantly compared with the control ulcers (P = 0.021) and also increased significantly between the second and third measurements (P = 0.003). The mean values of 'no and minimal exudate' of the experimental ulcers increased significantly between first and second measurements compared with the control ulcers (P = 0.001), and similarly, significantly between the second and third measurements (P = 0.002). Mean surface areas of the experimental ulcers decreased significantly between the first and second measurements from 2.84 to 2.54 cm² (P < or = 0.001) and between the first and third measurements from 2.84 to 2.26 cm² (P < or = 0.001). Mean surface areas of the control ulcers decreased between the first and second measurements from 2.10 to 2.08 cm² (P < or = 0.42) and between the first and third measurements from 2.10 to 2.04 cm² (P < or = 0.007). Pressure ulcers subjected to extra treatment with polarized light in the early stages (first to third measurements) showed improvement in the healing process than the control ulcers.

PMID: 11831427 [PubMed - indexed for MEDLINE]

156. Am J Dent. 2001 Feb;14(1):46-9.

ER-YAG laser pretreatment effect on in vitro secondary caries formation around composite restorations.

Ceballos L, Toledano M, Osorio R, García-Godoy F, Flaitz C, Hicks J.

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PURPOSE: This in vitro study determined if Er-YAG laser used in instead of acid-etching influenced artificial secondary caries formation in enamel and root surfaces. **MATERIALS AND METHODS:** Class V cavities were prepared in buccal and lingual surfaces of 10 extracted caries-free molars, with cervical margins in the root surface and occlusal margins in enamel. The specimens were randomly assigned to 2 groups: Group 1: Enamel and dentin etched with 35% phosphoric acid gel (Scotchbond 15s, rinse 10s; n=5 teeth with 2 cavities per specimen, 10 occlusal and 10 root surface margins at caries risk). Group 2: Enamel and dentin surfaces conditioned using a pulsed Er-YAG laser (KAVO) with 2.94 microm wavelength, 250 micros pulse duration, 300 mJ for enamel and 250 mJ for root surface pulse energy, 2 Hz repetition rate, and water cooling (n=5 teeth with 2 cavities per specimen, 10 occlusal and 10 root surface margins at caries risk). The cavity preparations were restored with a wet-bonding technique (Scotchbond 1 adhesive system) and a hybrid resin, light-cured composite (Z100, A3 shade), according to the manufacturer's instructions. Acid-resistant varnish was applied leaving the restoration and a 1 mm rim of adjacent surface enamel and root surface exposed. The specimens were thermocycled (5-50 degrees C, 500 cycles, dwell time 30s).

Following artificial caries formation (2.2 mM calcium, 2.2 mM phosphate, 50 mM acetic acid, 5.0 mg/L fluoride, pH 4.25, 10 days), longitudinal sections (3/tooth, 30 occlusal and cervical caries risk sites per group) were taken for polarized light microscopic examination (water imbibition). Primary surface lesion depth and wall lesion frequency was determined and compared between groups (Student's t-test). RESULTS: Er-YAG laser irradiation resulted in a 56% reduction in primary enamel surface lesion depth (116 microm mean depth) when compared with the acid-etched group (263 microm mean depth), and a 39% decrease in root surface lesion depth (194 microm mean depth) compared with that (316 microm mean depth) for acid-etching pretreatment ($P < 0.05$). Wall lesion frequency was similar ($P > 0.05$) between treatment groups.

PMID: 11806480 [PubMed - indexed for MEDLINE]

157. J Clin Laser Med Surg. 1999 Dec;17(6):241-3.

In vivo caries-like lesion prevention with argon laser: pilot study.

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OBJECTIVE: This clinical pilot study was conducted to investigate the effectiveness of argon laser irradiation to reduce demineralization or loss of tooth structure in vivo. SUMMARY BACKGROUND DATA: In vitro research previously demonstrated the ability of argon laser irradiation to reduce demineralization or loss of tooth structure. METHODS: Using the Ogaard model of producing demineralization, the experimental teeth were irradiated with argon laser of 250 mW (producing approximately 12 J/cm²) prior to banding. Polarized light evaluation of the sectioned, extracted teeth was used to determine the amount of demineralization. RESULTS: Results showed a 29.1% reduction in demineralization in the experimental teeth as compared to the bilateral control teeth. CONCLUSION: Low-power argon laser irradiation significantly reduced demineralization clinically.

PMID: 11800094 [PubMed - indexed for MEDLINE]

158. J Pediatr Ophthalmol Strabismus. 2001 Nov-Dec;38(6):331-4.

Cross polarized spectacles in photosensitive epilepsy.

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PURPOSE: To investigate the role of cross polarized spectacles in the treatment of photosensitivity demonstrable by EEG. METHOD: Patients receiving an EEG who tested positive for photosensitivity were invited to participate in the study. The most sensitive light flicker frequency causing a photic response was determined for each patient. Stimulation was repeated with 2 different pairs of spectacles--1 conventionally polarized and the other cross polarized. An EEG was obtained in each case and reported by a neurophysiologist who was unaware of the identity of the 2 types of spectacles. RESULTS: We tested 19 patients, 8 to 18 years of age. Two patients did not benefit from either pair of glasses. In 17 patients, the photic response was greatly diminished or eliminated by polarizing spectacles. In 1 patient, conventional polarized glasses helped, but the cross polarized spectacles did not. In 6 patients, both types of spectacles were equally effective; in 10 patients, cross polarized spectacles were more effective

than conventionally polarized spectacles. CONCLUSION: The role of cross polarized spectacles in the management of photosensitivity in a clinical situation merits further investigation.

PMID: 11759770 [PubMed - indexed for MEDLINE]

159. J Dent. 2001 Nov;29(8):521-9.

Effect of CO2 laser on pulpal temperature and surface morphology: an in vitro study.

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OBJECTIVES: The objective of this study was to evaluate the potential effects on underlying dental hard tissues of a high pulse rate carbon dioxide (CO2) laser that was designed for soft tissue surgery. METHODS: Eighteen extracted human teeth were sectioned longitudinally, cleaned, and varnished, leaving nine exposed windows on each: six on the coronal surface (enamel) and three on the root surface (cementum, dentin). The CO2 irradiation conditions used were: wave length 10.6 microm; 1.2-2.6J/cm(2) fluence per pulse; repetition rate 120-1000Hz; 100-200ms pulse duration; and cumulative fluences ranging from 14 to 2200J/cm(2). Each window was irradiated with a 0.3mm beam diameter at one of nine power settings for 0.1, 0.5, or 1.0s. The pulp chamber temperature was measured with a microthermocouple. The irradiated teeth were evaluated by Polarized Light Microscopy (PLM) and Scanning Electron Microscopy (SEM). RESULTS: The pulp chamber temperature rise ranged from 0.5 to 19 degrees C depending on the location of the window and distance to pulp chamber. SEM revealed crystal fusion in both enamel and dentin at all cumulative fluences. At cumulative fluences of 40J/cm(2), 200 pulses/second and higher, measurable tissue loss was observed with PLM both in dentin and enamel. CONCLUSIONS: These results indicate there are threshold conditions above which pulsed CO2 laser light used for soft tissue surgery may cause detrimental changes to underlying oral hard tissue and to the pulp.

PMID: 11700201 [PubMed - indexed for MEDLINE]

160. Skeletal Radiol. 2001 Oct;30(10):565-9.

Gout: radiographic findings mimicking infection.

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OBJECTIVE: To describe radiographic features of gout that may mimic infection. DESIGN AND PATIENTS: We report five patients with acute bacterial gout who presented with clinical as well as radiological findings mimicking acute bacterial septic arthritis or osteomyelitis. Three patients had delay in the appropriate treatment with the final diagnosis being established after needle aspiration and identification of urate crystals under polarized light microscopy. Two patients underwent digit amputation for not responding to antibiotic treatment and had histological findings confirming the diagnosis of gout. CONCLUSION: It is important for the radiologist to be aware of the radiological manifestations of acute gout that can resemble infection in order to avoid

inappropriate diagnosis and delay in adequate treatment. The definitive diagnosis should rely on needle aspiration and a specific search for urate crystals.

PMID: 11685479 [PubMed - indexed for MEDLINE]

161. Ann N Y Acad Sci. 2001 Sep;941:185-93.

Photoactivational cytokine-modulatory action of 8-methoxypsoralen plus ultraviolet A in lymphocytes, monocytes, and cutaneous T cell lymphoma cells.

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Treatment with 8-methoxypsoralen (8-MOP) and ultraviolet A light (UVA) has been reported to modulate cytokine production in various cells. Our study was conducted to see the effects of 8-MOP/UVA on the expression/production of cytokines in peripheral blood lymphocytes and monocytes in relation to the therapeutic mechanisms of extracorporeal photochemotherapy. 8-MOP/UVA augmented the expression of mRNAs for interferon-gamma (IFN-gamma) and interleukin (IL)-2 and reduced those for IL-4 and IL-10 in peripheral blood mononuclear cells (PBMCs) from normal subjects and Sézary syndrome patients. This enhancement of Th1 cytokines was caused by increment of cytokine production by Th1 cells but not by conversion of Th2 cells to produce Th1 cytokines. The number of IFN-gamma-secreting lymphocytes was markedly increased in 8-MOP/UVA-treated PBMCs 20 h after treatment, and its amount was elevated in culture supernatants. However, this enhanced production of IFN-gamma was found only until three days after 8-MOP phototreatment, and its level was rapidly declined by five days after treatment. In addition to this Th1-polarized action, 8-MOP/UVA-treated PBMCs produced enhanced amounts of IL-8 upon stimulation with anti-CD3/CD28 antibodies. Phototreated CD4+ but not CD8+ cells provided excellent T cell help for monocytes to produce IL-8 via a direct cell-to-cell contact mechanism. These findings suggest that 8-MOP/UVA has a transient but biologically active Th1-skewing action in T cells, and the phototreated T cells simultaneously stimulate monocytes to produce IL-8. It is suggested that 8-MOP/UVA exerts a beneficial therapeutic effect on malignant Th2 neoplasms as a Th1-skewing cytokine modifier and that 8-MOP-phototreated CD4+ T cells allow monocytes to become effective tumor antigen-presenting cells for tumor-specific cytotoxic T cells.

PMID: 11594572 [PubMed - indexed for MEDLINE]

162. J Clin Laser Med Surg. 2000 Aug;18(4):203-7.

Differences in histochemical characteristics of gingival collagen after ER:YAG laser periodontal plastic surgery.

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OBJECTIVE: The aim of this study is to evaluate gingival collagen for the effect of treatment with the Erbium:YAG Kesler handpiece. The handpiece is designed for gingival resurfacing in cases of hypertrophic gingiva and gingival pigmentation. **BACKGROUND DATA:** Lasers represent recent technological advances that afford new options for the treatment of periodontal diseases. However, lasers used for esthetic gingival soft tissue resurfacing require careful histopathological evaluation of the effects on tissue. In particular, it is important to determine the effect of laser irradiation on connective tissue, especially the collagen

fibers. To date, no stage-wise clinical or histological studies have been performed addressing this issue. METHODS: Ten patients underwent irradiation with the following parameters: energy per pulse, 500 mJ; repetition rate, 10 pps; spot size, 3 mm. Gingival biopsy specimens were derived from 6 patients with hypertrophic gingiva and 4 with gingival pigmentation. The patients were examined before laser treatment and at 7 and 14 days after laser treatment. The tissues were fixed in tymp node revealing solution (LNRS), embedded in paraffin, sectioned at 5 microm, and stained with hematoxylin & eosin. The status of collagen in the treatment site was examined under polarized light after picosirius red (PSR) staining. PSR is a collagen stain that differentiates collagen fiber density or size by means of a spectrum of color changes under polarized light. The major colors are red, orange, yellow, and green. RESULTS: We found a significant difference in the properties of collagen fibers at the first week and at 14 days post-treatment. In the normal gingiva, the predominant polarization colors were in the red-orange range, signifying tightly packed, mature collagen. During the first postoperative week, collagen fibers exhibited polarization colors in the green to green-yellow range, implying loosely packed collagen fibers. After 2 weeks, collagen fibers reacquired their preoperative PSR characteristics. CONCLUSIONS: We conclude that sequential series of changes accompany photothermal treatment of the gingiva. The occurrence of this sequence in all successful outcome cases may suggest the importance of these temporally sequenced changes in collagen during gum healing. In any event, the status of PSR staining of gum collagen provides a useful adjunct in the assessment of gingival health.

PMID: 11573512 [PubMed - indexed for MEDLINE]

163. Fiziol Zh. 2000;46(6):105-11.

[The examination of the analgetic action of polarized light]

[Article in Ukrainian]

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The influence of lowintensive polarized light on pain and nonpain behavioural responses (BR) was studied in experiments on mice with the locus of tonic pain (phormalin test). It was shown, that the action of polarized light on the acupuncture points (AP) statistically reliable decrease of pain BR (licking of the locus of a pain), but increase the duration of nonpain BR (sleeping, eating). The analgetic effect depends from a choice of AP and ehposition. The maximal analgesia (50%) was observed after 10-minute action of polarized light on AP E-36.

PMID: 11424553 [PubMed - indexed for MEDLINE]

164. J Formos Med Assoc. 2001 Mar;100(3):181-5.

Synergistic effect of Nd:YAG laser combined with fluoride varnish on inhibition of caries formation in dental pits and fissures in vitro.

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BACKGROUND AND PURPOSE: Although the effectiveness of neodymium yttrium aluminum

garnet (Nd:YAG) laser and fluoride anticaries treatment has been established, most previous studies focused on smooth tooth surfaces. We evaluated the anticaries effects of Nd:YAG laser combined with fluoride varnish (Duraphat) on caries-susceptible pit and fissure areas. METHODS: A total of 36 noncarious molars were treated with either a Nd:YAG laser (2.5 W, 6 sec) followed by fluoride varnish, Nd:YAG laser only, fluoride varnish only, or no treatment (control). Artificial carious lesions were created to assess the acid resistance of enamel after treatment. Undecalcified successive tooth slices were made. Percentage lesion formation, lesion length, and lesion depth were evaluated using polarized light microscopy. RESULTS: The Nd:YAG laser enhanced the resistance of dental enamel to acid challenge. However, Nd:YAG laser alone was not as effective as the Nd:YAG laser combined with fluoride varnish, especially for the treatment of pits and fissures. Nd:YAG laser treatment combined with fluoride varnish inhibited 43% of lesions at pits and fissures and 80% of lesions on smooth surfaces compared to no treatment. Carious lesions had shallower depth and shorter length. No carious lesion extended beyond the dentinoenamel junction in either laser-treatment group. CONCLUSIONS: A synergistic effect on dental caries prevention in pit and fissure areas and on the smooth surfaces of the tooth can be achieved by applying Nd:YAG laser followed by fluoride varnish.

PMID: 11393113 [PubMed - indexed for MEDLINE]

165. J Rheumatol. 2001 Mar;28(3):577-80.

Treatment of chronic gout. Can we determine when urate stores are depleted enough to prevent attacks of gout?

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OBJECTIVE: To determine if lowering of serum uric acid (SUA) concentrations below 6 mg/dl or longer duration of lowered SUA will result in depletion of urate crystals from the knee joints and prevent further attacks of gout. METHODS: A prospective study was initiated 10 years ago at Philadelphia VA Medical Center to attempt to maintain SUA levels of patients with crystal proven gout at < 6.0 mg/dl. We recalled all 57 patients who were available during 1999. Patients were divided into 2 groups: Group A, with SUA still > 6 mg/dl, and Group B, with SUA < or = 6 mg/dl. A knee joint aspirate was requested from all asymptomatic Group B patients and many in Group A. Aspirates were examined by polarized light microscopy for identification of crystals. RESULTS: There were no differences between the groups in age, sex, duration of gout, or serum creatinine. Group A (n = 38) had a mean of 6 attacks of gout for the recent year, those with tophi having the most frequent attacks. Among the 16 patients in this group who agreed to knee aspiration, monosodium urate (MSU) crystals were found in 14, although they were asymptomatic at the time. Nineteen patients (Group B) were able to maintain serum urate levels < or = 6 mg/dl for > 12 months. Nearly half of them had no attack of gout for 2 or more years, with a mean of 1 attack in the last year for the whole group. Three patients in whom tophi were found did not have major flares of gout within the past year. Knee joint aspiration was done on 16 asymptomatic patients. Seven (44%) still had MSU crystals present in their knees. Patients in this group who were taking prophylactic colchicine did not differ with respect to the character of synovial fluid from those who had discontinued it for up to several years, although the frequency of attacks was less in those who continued colchicine. CONCLUSION: A majority of patients were able to deplete urate crystal stores in their knee joint fluids when their SUA levels were kept to < or = 6 mg/dl for several years. The mechanisms for persistence in some patients, and whether such crystals have clinical implications, are not known. Patients with chronic gout need serum urate concentrations to be kept low to

prevent further attacks.

PMID: 11296962 [PubMed - indexed for MEDLINE]

166. J Periodontol. 2001 Feb;72(2):174-82.

Laser irradiation of bone: III. Long-term healing following treatment by CO2 and Nd:YAG lasers.

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BACKGROUND: Relative few reports exist concerning healing of laser created osteotomies over an extended period of time. The purpose of this study was to evaluate long-term healing, from 21 to 63 days, of osteotomy defects in the rat tibia created with the Nd:YAG and CO2 in the presence of a surface cooling spray of air/water. **METHODS:** The experimental model consisted of 15 large Sprague-Dawley rats. Six treatment modalities were randomly distributed among 6 tibial recipient sites: 1) a negative control (no treatment); 2) a positive control (bur osteotomy); 3) CO2 laser at 5 W (860 J/cm²); 4) CO2 laser at 6 W (1,032 J/cm²); 5) Nd:YAG laser at 5 W (714 J/cm²); and 6) Nd:YAG laser at 7 W (1,000 J/cm²). All laser irradiation was delivered in the presence of a surface coolant consisting of air (15 psi) and sterile water. Five animals were sacrificed at each of 3 time intervals: 21, 35, and 63 days post-treatment. Multiple histologic sections from each treatment site were examined by light microscopy using hematoxylin and eosin Goldner's trichrome stains, and polarized light and evaluated for presence of a char layer, heat induced cracking, heat related alterations in cells or tissue matrix, and osseous regeneration. **RESULTS:** Healing was severely delayed in all laser treated sites compared to positive control sites. Of the laser treated sites, those irradiated by CO2 laser at 5 W (780 J/cm²) exhibited the greater amount of bone regeneration. At best, however, only a small percentage of sections from any of the laser treated specimens showed evidence of bone regeneration within the ablation defect regardless of the post-treatment time interval. **CONCLUSIONS:** Under the conditions of this study, the osseous healing response was severely delayed by CO2 and Nd:YAG laser irradiation of bone, even in the presence of a surface cooling spray of air/water.

PMID: 11288790 [PubMed - indexed for MEDLINE]

167. Biochem J. 2001 Apr 15;355(Pt 2):271-8.

Transgenic mice with inactive alleles for procollagen N-proteinase (ADAMTS-2) develop fragile skin and male sterility.

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Transgenic mice were prepared with inactive alleles for procollagen N-proteinase (ADAMTS-2; where ADAMTS stands for a disintegrin and metalloproteinase with thrombospondin repeats). Homozygous mice were grossly normal at birth, but after 1-2 months they developed thin skin that tore after gentle handling. Although the gene was inactivated, a large fraction of the N-propeptides of type I procollagen in skin and the N-propeptides of type II procollagen in cartilage were cleaved. Therefore the results suggested the tissues contained one or more additional

enzymes that slowly process the proteins. Electron microscopy did not reveal any defects in the morphology of collagen fibrils in newborn mice. However, in two-month-old mice, the collagen fibrils in skin were seen as bizarre curls in cross-section and the mean diameters of the fibrils were approx. half of the controls. Although a portion of the N-propeptides of type II procollagen in cartilage were not cleaved, no defects in the morphology of the fibrils were seen by electron microscopy or by polarized-light microscopy. Female homozygous mice were fertile, but male mice were sterile with a marked decrease in testicular sperm. Therefore the results indicated that ADAMTS-2 plays an essential role in the maturation of spermatogonia.

PMCID: PMC1221736

PMID: 11284712 [PubMed - indexed for MEDLINE]

168. Hum Gene Ther. 2001 Mar 20;12(5):455-67.

EGTA enhancement of adenovirus-mediated gene transfer to mouse tracheal epithelium in vivo.

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Administration of recombinant adenoviral (AdV) vectors to animals can lead to inflammatory and immune responses. For therapeutic indications in which repeated treatment is necessary, such as cystic fibrosis (CF), these responses can limit the therapeutic usefulness of the vector. In principle, the utility of the vector can be improved by increasing its therapeutic index, that is, by either increasing its efficacy or decreasing its toxicity. A strategy that would enhance the efficacy of an adenoviral approach would allow the use of fewer virus particles to achieve a given level of transgene expression, and thereby also reduce unwanted effects such as immune responses. Following up on our observation that treating polarized normal human bronchial epithelial cells with calcium (Ca²⁺)-free medium or the calcium chelator ethylene glycol-bis(beta-aminoethyl ether)-N,N,N',N'-tetraacetic acid (EGTA) significantly enhanced the subsequent transfection of these cells with cationic lipid:pDNA complexes, we have now asked whether such a treatment protocol might also improve the ability of AdV to infect these cells. Treating polarized airway epithelial cells with EGTA led to a dramatic increase in AdV-mediated transduction, as demonstrated by an approximately 50-fold increase in transgene expression. This strategy was also tested in vivo and resulted in substantial increases (up to 50-fold) in the ability of AdV vectors to infect mouse tracheal epithelium. Transfection of mouse trachea with an AdV aerosol was also significantly increased by pretreatment with EGTA. The enhancing effects of EGTA could not be duplicated with hypo- or hyperosmotic treatments. Light microscopy of mouse trachea that had been EGTA treated and then infected with AdV demonstrated an EGTA-mediated AdV infection of airway epithelial cells. The apparent enhanced potency of AdV for airway cells resulting from this strategy provides a significant increase in the therapeutic index of this gene delivery vector, and may increase the likelihood that it can be used for clinical indications requiring chronic administration of the vector.

PMID: 11268280 [PubMed - indexed for MEDLINE]

169. J Clin Laser Med Surg. 2000 Feb;18(1):33-6.

Caries resistance in enamel by laser irradiation and topical fluoride treatment.

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PURPOSE: The purpose of this in vitro study was to compare caries resistance of sound human enamel following argon laser (AL) irradiation, as well as, combinations of topical fluoride foams and AL irradiation. **METHODS:** AND **MATERIALS:** Thirty extracted human teeth were sectioned into four buccal windows and assigned to one of the following treatment groups: (1) no treatment/control; (2) low fluence (11.5 J/cm²) AL irradiation for 10 seconds; (3) 1.23% APF foam for 4 minutes followed by low fluence AL irradiation; (4) 2.0% NaF foam for 4 minutes followed by low fluence AL irradiation. Caries-like lesions were created by submerging the teeth in ten Cate solution (pH 4.5). Following a 96-hour exposure period, 100 microns longitudinal sections were prepared for polarized light evaluation. Visilog 5.1.1. image analysis software was used to obtain quantitative lesion depths. The Scheffe F-test was used to compare the lesion depths for each of the four treatment groups. **RESULTS:** Lesion depths were: 16.1 +/- 6 microns for control; 13.7 +/- 4 microns for AL irradiation alone; 12.1 +/- 4.3 microns for 1.23% APF foam before AL irradiation; and 11.4 +/- 5.9 microns for 2.0% NaF foam before AL irradiation. Significant difference (p < 0.05) was found between the control group and the 2.0% NaF foam before AL irradiation group. AL irradiation alone reduced lesion depth by 15% compared with the control lesion. When AL irradiation was combined with 1.23% APF foam treatment, lesion depth decreased by 25% compared with control lesions, and by 29% when combined with 2.0% NaF foam. **CONCLUSION:** Combining AL irradiation and 2.0% NaF foam treatment significantly enhances the resistance of sound enamel to an in vitro cariogenic challenge.

PMID: 11189111 [PubMed - indexed for MEDLINE]

170. J Clin Laser Med Surg. 2000 Feb;18(1):3-8.

Fluorescence spectroscopic imaging to detect changes in collagen and elastin following laser tissue welding.

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OBJECTIVE: A study was performed to evaluate the use of native fluorescence imaging to detect in situ molecular changes. **SUMMARY BACKGROUND DATA:** There is no ideal noninvasive method to monitor molecular changes in a local region at a laser weld joint without removing a section of tissue for histological examination. **METHODS:** Two sections of animal skin were welded together border to border using a Ti:sapphire laser beam (800 nm). Fluorescence imaging was performed on the cross section of the welded site at specific emission wavelengths (λ_c) for collagen at 380 nm and for elastin at 450 nm using excitation wavelengths (λ_e) of 340 nm, and 380 nm, respectively. **RESULTS:** A reduction of the collagen and elastin emission was observed in the fluorescence images of the welded region. These results were confirmed with histology using picosirius red F3BA under polarized light and orcein stains. **CONCLUSION:** Optical spectroscopic imaging offers a new noninvasive detecting method for microscopic evaluation of laser tissue welding.

PMID: 11189110 [PubMed - indexed for MEDLINE]

171. Acad Emerg Med. 2001 Feb;8(2):107-11.

The effects of octylcyanoacrylate on scarring after burns.

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OBJECTIVE: To compare the effects of octylcyanoacrylate (OCA), silver sulfadiazine (SSD), polyurethane film (PU), and dry gauze (G) on scarring three months after partial-thickness burns. **METHODS:** This was a prospective, blinded, controlled experimental trial using isoflurane-anesthetized swine. Standardized partial-thickness burns were inflicted by applying an aluminum bar preheated to 80 degrees C to the backs and flanks of a young pig for 20 seconds. Four equal sets of ten burns each were randomly treated with OCA spray, SSD, PU, or G. Dressing changes were performed on days 1, 2, 3, and 4 after injury. Digital images of the burns were obtained immediately and three months later for masked computerized determination of scar surface area. Full-thickness biopsies were taken at three months for masked histopathological evaluation. The primary outcome was the percent reduction in residual wound area (RWA) calculated by subtracting the area of each individual burn from the area of the largest burn and dividing this value by the area of the largest burn (intraobserver correlation, $r = 0.99$). Secondary outcomes were the proportion of burns with the presence of scar tissue (abnormal collagen under polarized light; intraobserver agreement, $\kappa = 0.93$) and the cosmetic appearance on a 100-mm visual analog scale marked "best scar" at the high end (inter-observer correlation, $r = 0.82$). Analysis of variance (ANOVA) and chi(2) tests were used for group comparisons as appropriate. This study had 80% power to detect a 33-percentage-point difference in RWA among groups ($\alpha = 0.05$). **RESULTS:** A total of 40 burns were inflicted on the pig. There was no difference in percent RWA across the groups (OCA = 25%, SSD = 40%, PU = 25%, G = 32%; $p = 0.13$). There was no difference in the proportion of wounds with scarring among the groups (OCA = 10%, SSD = 22%, PU = 2%, G = 30%; $p = 0.89$). There was also no difference in the cosmetic scores among the groups (OCA = 78 mm, SSD = 75 mm, PU = 74 mm, G = 74 mm; $p = 0.96$). **CONCLUSIONS:** The effects of OCA spray, SSD, PU, and dry gauze on scarring three months after burns in pigs are similar.

PMID: 11157284 [PubMed - indexed for MEDLINE]

172. *Lasers Surg Med.* 2000;27(4):305-18.

Histologic signatures of thermal injury: applications in transmyocardial laser revascularization and radiofrequency ablation.

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BACKGROUND AND OBJECTIVE: Cardiac treatments such as transmyocardial laser revascularization and radiofrequency ablation cause thermal injury. We sought to provide quantitative histologic methods of assessing such injury by using the inherent birefringence of cardiac muscle and collagen; specifically, to exploit the connection between thermal injury and the loss of birefringence. **STUDY DESIGN/MATERIALS AND METHODS:** We quantified tissue birefringence changes in vitro for temperatures up to 130 degrees C. This information was used to assess thermal injury associated with myocardial channels made in vitro. We then measured in vivo cardiac injury 30 minutes and 3 days after radiofrequency exposure. **RESULTS:** Birefringence decreased above 60 degrees C for muscle and above 70 degrees C for collagen. Temperatures above 80 degrees C were associated with collagen fiber straightening and above 95 degrees C with little muscle birefringence. Injury adjacent to laser channels was greatest parallel to cell orientation. In vivo, muscle with reduced birefringence was surrounded by cells exhibiting focal

birefringence increases (contraction bands). Early injury assessment marked by birefringence changes corresponded to lesion size at 3 days. CONCLUSION: Polarized light revealed histologic temperature signatures corresponding to irreversible muscle injury and collagen denaturation. Copyright 2000 Wiley-Liss, Inc.

PMID: 11074507 [PubMed - indexed for MEDLINE]

173. Amyloid. 2000 Sep;7(3):212-7.

Histochemical and immunohistochemical differential diagnosis of amyloidosis--a brief illustrated essay and personal experience with Romhányi's method.

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The histochemical and immunohistochemical differential diagnosis of amyloidosis in surgical pathology in a referral center is presented. Different forms of amyloidosis are considered e.g. systemic generalized amyloidosis: secondary (AA), primary (AL), senile, hemodialysis-associated, hereditary and organ (tissue)-limited (localized) amyloidosis: cerebral, dystrophic (age-related, so-called "senile"), endocrine-related, localized to tumours, focal (concentrated secretion), and isolated plasma cell (solitary plasmacytoma, B-cell) dyscrasia related amyloidosis. The amyloid deposits were identified and characterized histochemically by Congo red staining after performate pre-treatment at 20 degrees C for 1, 3, 5, 10, 15, 20 or 25 sec, and with oxidation induced proteolysis by trypsin digestion at 20 degrees C for 5, 10, or 30 sec, 1, 2, 3, 4, 5, 6 or 10 min and covered with gum-arabic according to Romhányi, and confirmed by streptavidin-biotin-complex/horseradish peroxidase immunohistochemical reactions. The "sensitivity" or "resistance" to pre-treatment of amyloid deposits depends on the type of amyloid, and the length of pre-treatment. Secondary (AA) amyloid is sensitive to KMnO4 oxidation, followed by trypsin digestion (for 1 min), and its green birefringence under polarized light disappears, while primary (AL) (for 1-5 min), senile (for 1-10 min), and most forms of organ (tissue)-limited (localized) amyloid (for 1-10 min) are resistant. Performate pre-treatment is followed by pronounced congophilia. Secondary (AA) is sensitive to performate pre-treatment (for 1 sec), while primary (AL) amyloid (for 1-20 sec), senile (for 1-25 sec), and most forms of organ (tissue)-limited (localized, isolated) amyloid deposits (for 1-25 sec) are resistant, and are constantly positively birefringent. Early identification and differentiation of amyloid deposits is important for the prognosis and for the choice of therapy. The authors conclude that the presented classical histochemical methods are useful as first line screens for the histological identification of amyloidosis.

PMID: 11019862 [PubMed - indexed for MEDLINE]

174. Int J Dermatol. 2000 Aug;39(8):616-8.

Perianal Crohn's disease.

Morales MS, Marini M, Caminero M, Caglio P.

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A 13-year-old girl with a history of 4 months of perianal skin lesions is

described. Physical examination revealed three 0.5 I 1-cm red, swollen, fleshy, skin tags extending from the perianal area to the perineum (Fig. 1). The patient reported intermittent fever, diarrhea, and abdominal pain, and her body weight was below the third percentile for her age. Laboratory studies showed an erythrocyte sedimentation rate of 101 mm/h; hematocrit of 26%; white blood cell count of 9800/mm³; serum iron of 15 mg/L (normal value (NV), 60-160 mg/L); ferritin of 43.4 microg/L (NV, 12-150 microg/L); transferrin of 203 mg/100 mL (NV, 200-400 mg/100 mL); transferrin saturation of 6% (NV, 20-50%); hypoalbuminemia; negative purified protein derivative (PPD), cytomegalovirus (CMV), human immunodeficiency virus (HIV), venereal disease research laboratory (VDRL), and antinuclear antibody tests; and Toxoplasma titers of 1/16, Van de Kamer 1.67 g/day. A barium examination revealed marked irregularity of the descending colon, and a colonoscopy showed uneven areas of mucosal edema and pseudopolyps in the transverse and descending colon, associated with irregular thickening and stenosis. Histopathologically, large intestine and skin lesions consisted of noncaseating epithelioid and giant cell granulomas (Fig. 2). Cultures for acid-fast bacilli and fungi were negative, and under polarized light no foreign bodies were seen. Treatment with metronidazole (250 mg three times a day), prednisone (0.5 mg/kg/day), and acetylsalicylic acid (75 mg/kg/day) was moderately effective. Vitamin, folic acid, and iron supplements were also added.

PMID: 10971732 [PubMed - indexed for MEDLINE]

175. Acad Emerg Med. 2000 Feb;7(2):114-9.

The effects of epidermal debridement of partial-thickness burns on infection and reepithelialization in swine.

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OBJECTIVE: Early postburn debridement of burn blisters is controversial. This study was conducted to compare rates of infection and reepithelialization in debrided vs nondebrided second-degree burns in swine. **METHODS:** This was a prospective, blinded, controlled, experimental trial using isoflurane-anesthetized swine. Standardized partial-thickness burns were inflicted by applying an aluminum bar preheated to 80 degrees C to the backs and flanks of two young pigs for 20 seconds. In half of the burns the necrotic epidermis was manually debrided. All burns were randomly treated with octylcyanoacrylate spray (OCA) or dry gauze (C). Full-thickness biopsies were taken at 7, 10, and 14 days for blinded histopathologic evaluation. The primary outcomes were the proportions of infected burns at days 7 and 10 and the proportion of completely reepithelialized burns at day 14. Burns were considered infected in the presence of intradermal neutrophils containing bacteria (intraobserver agreement, K = 1.00). A secondary outcome was the proportion of burns with the presence of scar tissue (abnormal collagen under polarized light; intraobserver correlation, K = 0.93). Chi-square tests were used for group comparisons. This study had 90% power to detect a 40-percentage-point difference in infection rates (alpha = 0.05). **RESULTS:** A total of 126 biopsies from 42 burns were available for review. Infection rates were higher in the debrided burns both at day 7 (55% vs 4.5%, p < 0.001) and at day 10 (65% vs 9%, p < 0.001) after injury. The proportion of nondebrided burns that were completely reepithelialized was higher at days 10 (68% vs 0%, p < 0.001) and 14 (100% vs 65%, p = 0.003). The presence of scar tissue was more common in debrided burns (75% vs 4.5%, p < 0.001). Burns treated with OCA had fewer infections than controls (4% vs 55%, p < 0.001). Fewer OCA-treated debrided burns were reepithelialized at 14 days than those that were not debrided (30% vs 100%, p = 0.001). **CONCLUSIONS:** Under the current study conditions, early postburn epidermal debridement of second-degree

burns resulted in more infections and slower reepithelialization rates in swine. The effects of early postburn epidermal debridement in humans should be explored.

PMID: 10691068 [PubMed - indexed for MEDLINE]

176. Am J Dent. 1999 Oct;12(5):213-6.

Artificial caries removal and inhibition of artificial secondary caries by pulsed CO2 laser irradiation.

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PURPOSE: To investigate the inhibition of artificial secondary caries around restorations placed after removal of artificial caries by pulsed CO2 laser irradiation and by mechanical means. **MATERIALS & METHODS:** Beveled cavities were prepared mechanically on the facial surfaces of extracted human molars. Each cavity was subsequently exposed to an artificial caries (demineralizing) solution (pH 5.0) for 7 d to generate a demineralized zone approximately 100-200 microns thick on the cavity surface. The artificial carious/demineralized zones of the cavities were removed by a pulsed CO2 laser operating at a wavelength of 9.3 microns with pulse duration of 100 microseconds and an irradiation intensity of 5 J/cm². Artificial control caries were removed mechanically with a carbide bur in a slow speed handpiece. The cavities were slightly undercut and restored with a resin-based composite without etching and bonding and the restored teeth were subjected to pH cycling solutions for 10 d as follows: Demineralization solution, pH 4.5 for 6 hrs, followed by remineralization solution, pH 7.0 for 18 hrs. Cycled teeth were sectioned through the restorations and the resulting lesions were analyzed in thin section using polarized light and Knoop microhardness. **RESULTS:** Mean microhardness delta Z values, indicating mineral loss were: 549 (SD 191) for control, and 140 (SD 127) N = 11. This difference is significant with t = 5.543 and P = 0.000 (Paired t-test). Caries penetration: Control side--231 microns (SD 71), Laser treated side: 123 microns (SD 79) N = 6. This difference is significant with t = 5.198 and P = 0.003 (Paired t-test). The results show that the laser treatment not only removed artificial caries, but also inhibited decalcification of the cavity wall in a subsequent artificial caries challenge by as much as 81% compared to control samples. No etching and bonding was used in this pilot study, which might have influenced the results. Future studies should address the inhibition effect of the laser treatment as compared to adhesive techniques, fluoride treatments and fluoride release restorative materials. **CONCLUSION:** Caries removal by a pulsed lambda = 9.3 microns CO2 laser produces a cavity surface morphology with marked resistance to artificial secondary caries as compared to mechanical removal.

PMID: 10649910 [PubMed - indexed for MEDLINE]

177. Curr Opin Rheumatol. 1999 Sep;11(5):436-40.

What is the relation between crystals and osteoarthritis?

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The nature of the relation between osteoarthritis and the various forms of calcium crystals that are found within osteoarthritic joints continues to challenge and confound researchers. The most basic question is whether such crystals are directly relevant to the development of osteoarthritis, or are

merely a byproduct or marker of the disease itself. The past year has produced several studies that elucidate important aspects of the molecular and cellular mechanisms of calcium pyrophosphate dihydrate and apatite crystal formation. Such studies may yield novel targets for therapeutic intervention in crystal-associated osteoarthritis. Other recent studies have provided further understanding of the mechanisms by which crystals induce inflammation. Arthroscopic assessment of patients with knee osteoarthritis refractory to traditional therapy suggests that the combined absence of chondrocalcinosis on plain films and identifiable crystals on compensated polarized light microscopy of synovial fluid from arthrocentesis may not be adequate to exclude clinically relevant crystalline deposition and inflammation. Clinical criteria are needed to identify patients with occult crystalline disease who, by virtue of crystal-induced inflammation, require more aggressive anti-inflammatory therapy than those with noninflammatory osteoarthritis.

PMID: 10503667 [PubMed - indexed for MEDLINE]

178. Med Phys. 1999 Aug;26(8):1552-8.

Design and construction of a light-delivery system for photodynamic therapy.

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We have developed a device to divide the output from a dye laser into as many as eight beams of equal power with negligible total power loss. In this system, 630-nm s-plane polarized laser light was split by a series of highly polarization-sensitive plate beamsplitters. Each of the beams was coupled to a 200, 400, or 600 microm diameter optical fiber. Brewster-window-type attenuators allowed the power of each beam to be individually set. It was possible to reconfigure the device to produce four, two, or one output(s). We discuss the design requirements of the beamsplitter device and describe its construction from mostly commercially available components. An apparatus for positioning and stabilizing each optical fiber relative to the skin surface of a patient is also described. The illumination from the fiberoptic supported by such an apparatus strikes a defined surface area and is independent of patient movement. Both the beamsplitter device and the optical fiber positioner are used routinely in photodynamic therapy (PDT) of malignant tumors in the clinic and in the laboratory.

PMID: 10501055 [PubMed - indexed for MEDLINE]

179. Am J Dent. 1998 Dec;11(6):254-8.

Secondary caries adjacent to amalgam restorations lined with a fluoridated dentin desensitizer.

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PURPOSE: To determine the in vitro effect of a fluoridated dentin desensitizer solution (DentinBloc) on (1) secondary caries formation, and (2) the interfacial adaptation when used as a cavity liner before amalgam (Dis-persalloy) placement. **MATERIALS AND METHODS:** 24 macroscopically caries-free molars were selected. Class V cavity preparations on mesial and distal surfaces were placed along the

cemento-enamel junction, providing an enamel margin and a root surface margin. DentinBloc was applied prior to alloy restoration in the experimental group for 60 s (the excess was removed with cotton pellets), while a copal cavity varnish (Copalite) was used before alloy restoration in the control group. Polarized light evaluation was performed on longitudinal sections (24 caries risk sites for enamel and dentin margins in each group). Alloy-tooth interfaces were evaluated by SEM. RESULTS: Wall lesions were present in 100% of caries-risk sites for the control group, while 58% of enamel risk sites and 50% of root risk sites had wall lesions in the DentinBloc group. Surface lesion depth was reduced 13% at enamel margins and by 18% at root margins in the experimental group when compared to the control group. Relatively small interface gaps between the alloy and tooth surfaces were seen in both groups, but these were less for the root surface margins (2-5 microns) than for the enamel margins (5-15 microns).

PMID: 10477975 [PubMed - indexed for MEDLINE]

180. Acta Derm Venereol. 1999 Jul;79(4):305-10.

Hypopigmented macules of photodamaged skin and their treatment with topical tretinoin.

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Hypopigmented macules are frequently observed in the photodamaged skin of elderly people. We undertook to study and treat 2 types of hypomelanosis of photoaged skin. These lesions were: 1) idiopathic guttate hypomelanosis; and 2) macular hypomelanosis. Comparative studies included: 1) high-resolution photography using parallel polarized light, ultra-violet (UVA) and epiluminescence; 2) Silflo replicas for microtopography; and 3) suction device (Cutometer) for elasticity. Macular hypomelanosis was distinguishable from idiopathic guttate hypomelanosis because the macules were less white and less well demarcated. Glyphic markings were essentially absent in macular hypomelanosis, but variably effaced in idiopathic guttate hypomelanosis. Distensibility of the macules was characteristically low in proportion to the loss of glyphic markings. The chief histologic finding was the absence of melanin in basal keratinocytes. Macular hypomelanosis and idiopathic guttate hypomelanosis are probably related disorders along a spectrum of depigmentation. Treatment with tretinoin for 4 months restored the elasticity, the glyphic markings, with a partial restoration of pigmentation.

PMID: 10429990 [PubMed - indexed for MEDLINE]

181. J Am Dent Assoc. 1999 Jun;130(6):817-25.

Evaluating the effects of fluoride-releasing dental materials on adjacent interproximal caries.

Donly KJ, Segura A, Wefel JS, Hogan MM.

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BACKGROUND: The authors examined several restorative materials to evaluate their ability to inhibit demineralization and enhance remineralization of incipient carious lesions on the interproximal enamel of teeth adjacent to those restored with the materials. METHODS: Twenty-one subjects in need of a crown on a mandibular molar and a Class II inlay on an adjacent tooth took part in this

six-phase study. Artificial enamel lesions were created and positioned within the interproximal portion of a crown. Lesions were photographed with polarized light microscopy and characterized before and after 30-day intraoral exposures. Each phase included the placement of a new section in the crown model and a new Class II inlay restorative material in the adjacent tooth. RESULTS: Results demonstrated that nonfluoridated resin composite, fluoridated resin composite and resin-modified glass ionomer restorative materials, when placed in subjects who brushed with a fluoridated dentifrice, demonstrated significantly ($P < .05$) less enamel demineralization than the nonfluoridated resin composite control placed in subjects who brushed with a nonfluoridated dentifrice. The resin-modified glass ionomer cement, however, even when brushed with a nonfluoridated dentifrice, exhibited significantly ($P < .05$) less demineralization than the nonfluoridated resin composite control brushed with a nonfluoridated dentifrice. CONCLUSIONS: Resin-modified glass ionomer cement appears to significantly inhibit demineralization of interproximal enamel of teeth adjacent to those restored with the material. CLINICAL IMPLICATIONS: Resin-modified glass ionomer cement restorations can enhance prevention of enamel demineralization on adjacent teeth.

PMID: 10377639 [PubMed - indexed for MEDLINE]

182. Lasers Surg Med. 1999;24(4):253-60.

Success of transmyocardial laser revascularization is determined by the amount and organization of scar tissue produced in response to initial injury: results of ultraviolet laser treatment.

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BACKGROUND AND OBJECTIVE: Previous studies of transmyocardial laser revascularization have reported open channels after ultraviolet laser treatment and closed channels with infrared lasers. We speculated that differences in long-term channel patency were determined by the healing response to injury. METHODS: Channels were made in rat hearts with a frequency-tripled neodymium:YAG laser, at 5 and 10 mJ per pulse, by advancing an optic fiber through the myocardium, from the epicardium to the ventricular cavity. Several months later, we challenged the ability of the channel to supply blood by arterial occlusion and examined the channel structure with polarized light microscopy. RESULTS: Low-pulse energy was associated with lower patency, more fibrosis, and larger infarcts than was the higher energy. Open channels were surrounded by collagen fibers aligned parallel to the channel; in closed channels, fibers were aligned perpendicular to the original channel direction. CONCLUSION: The amount of initial injury and its repair determine channel patency and function.

PMID: 10327042 [PubMed - indexed for MEDLINE]

183. Am Fam Physician. 1999 Feb 15;59(4):925-34.

Gout and hyperuricemia.

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Comment in:

Am Fam Physician. 2000 Apr 15;61(8):2343-4.

Gout is a condition characterized by the deposition of monosodium urate crystals in the joints or soft tissue. The four phases of gout include asymptomatic hyperuricemia, acute gouty arthritis, intercritical gout and chronic tophaceous gout. The peak incidence occurs in patients 30 to 50 years old, and the condition is much more common in men than in women. Patients with asymptomatic hyperuricemia do not require treatment, but efforts should be made to lower their urate levels by encouraging them to make changes in diet or lifestyle. Acute gout most commonly affects the first metatarsal joint of the foot, but other joints are also commonly involved. Definitive diagnosis requires joint aspiration with demonstration of birefringent crystals in the synovial fluid under a polarized light microscope. Treatment includes nonsteroidal anti-inflammatory drugs (NSAIDs), colchicine, corticosteroids and analgesics. In patients without complications, NSAID therapy is preferred.

PMID: 10068714 [PubMed - indexed for MEDLINE]

184. Zhonghua Yi Xue Za Zhi (Taipei). 1999 Jan;62(1):55-60.

Intracerebral hemorrhage caused by cerebral amyloid angiopathy: a case report.

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Cerebral amyloid angiopathy (CAA) accounts for approximately 10% of spontaneous intracerebral hemorrhages (ICH), and typically occurs in the cortex and subcortical white matter. It is characterized by the deposition of amyloid fibrils in the leptomeningeal, cortical and subcortical arteries. Pathologically, amyloid is stained pink with Congo red and shows yellow-green birefringence when viewed under polarized light. Although there have been many reports of CAA in the literature, it has rarely been described in Taiwan. This is the report of a case of a 75-year-old man with ICH caused by CAA. The postoperative course was uneventful. The incidence of this disease increases with age. The authors, therefore, suggest conducting a brain biopsy and special stain for CAA in each operative case of spontaneous ICH, especially in the elderly.

PMID: 10063714 [PubMed - indexed for MEDLINE]

185. Caries Res. 1998;32(4):247-54.

Detection, diagnosing, monitoring and logical treatment of occlusal caries in relation to lesion activity and severity: an in vivo examination with histological validation.

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The aims of the present study were to investigate the ability of 3 experienced clinicians to detect occlusal carious lesions, assess their depth, diagnose their activity and define a logical management for each lesion. The material consisted of 35 third molars scheduled for extraction or surgical removal making it possible to validate the accuracy of the clinical recordings histologically. Examinations were carried out at baseline and after 4 months in order to monitor lesion progression. At the first visit a radiograph was taken; the number of filled surfaces was counted and the oral hygiene assessed generally and by disclosing occlusal plaque of the tooth under examination. After cleaning the occlusal surface caries was recorded in a selected investigation site using a

visual ranked caries scoring system, as well as an electrical conductance recording (ECM). Apart from counting fillings and taking new radiographs the same procedure was performed at the second visit, which then was followed by extraction of the tooth. After sectioning the tooth lesion depth was recorded, and lesion activity, based on acid production, was assessed using methyl red dye. Lesion activity was also judged by means of polarized light microscopic examinations of the sections. Results showed strong relationships between the visual, ECM and radiographic assessments and both lesion depth and lesion activity. In contrast, all other parameters were poorly related to lesion activity. Changes in visual assessments and in conductance readings from first to second examination were poorly associated with lesion activity. In conclusion, clinicians are able to detect lesions, predict activity and severity and define a logical management of occlusal caries on the basis of a single examination.

PMID: 9643366 [PubMed - indexed for MEDLINE]

186. J Clin Laser Med Surg. 1997 Dec;15(6):261-7.

Detection and assessment of laser-mediated injury in transmyocardial revascularization.

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When channels are made through the myocardium with a laser, tissue surrounding the channels is injured. Thus, methods of examining and quantifying the histologic changes caused by laser-mediated injury are required both for comparison of different channel making protocols and also to help understand the mechanisms of transmyocardial revascularization. The two principal components of the myocardium, collagen and muscle, are both normally birefringent. This optical property can be exploited with the use of polarized light microscopy to assess tissue structure at the cellular and subcellular levels allowing several different types of injury to be detected. Increases in tissue temperature above 60 degrees C for muscle and 70 degrees C for collagen decrease their birefringence and, hence, result in decreased brightness when viewed with polarized light. Lower temperatures may cause cell membrane injury, calcium overload, and the formation of contraction bands, which appear as areas of increased birefringence. In this way, the extent of thermal injury can be assessed. The same optical properties can be used to measure cell and fiber orientation and, hence, enable assessment of mechanical disruption of the tissue after ablation. Long-term remodeling of the myocardium in the form of scar formation, increased interstitial fibrosis, and muscle disarray can also be quantified. The ability to measure the acute injury and the long-term structural consequences of that injury with the use of polarized light microscopy should prove vital in determining the optimal laser "dose" required and may also reveal information on the mechanism(s) of benefit found with transmyocardial revascularization.

PMID: 9641081 [PubMed - indexed for MEDLINE]

187. J Rheumatol. 1998 Jun;25(6):1164-70.

Amyloid and non-amyloid carpal tunnel syndrome in patients receiving chronic renal dialysis.

Chary-Valckenaere I, Kessler M, Mainard D, Schertz L, Chanliau J, Champigneulle J, Pourel J, Gaucher A, Netter P.

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OBJECTIVE: To determine the prevalence of amyloid deposits among patients with carpal tunnel syndrome (CTS) receiving dialysis, and to investigate the factors associated with amyloid and non-amyloid CTS. **METHODS:** Subjects for this prospective study were dialysis patients who underwent surgery for CTS in the same surgical unit between 1989 and 1997. CTS was diagnosed from clinical and electromyographic (EMG) findings. Systematic standard radiographs and laboratory data were also obtained. Surgical investigations included systematic macroscopic examination and biopsy of the epineurium, flexor retinaculum, synovium, and flexor tendon sheaths. Samples were stained for amyloid and examined by plain and polarized light microscopy, immunohistochemistry, and electron microscopy. **RESULTS:** Forty-one samples from 30 patients (11 bilateral cases) were examined. Amyloid deposits were found in 26 samples from 18 patients (7 M, 11 F). Fifteen samples from 12 patients (3 M, 9 F) showed no amyloid deposits. Amyloid CTS was statistically significantly associated with arthralgia and longterm dialysis [mean 13.3 (range 5.5-23) vs 7.5 yrs (range 3 mo-14 yrs)] in non-amyloid CTS. Flexor tenosynovitis and carpal bone erosion occurred more frequently in amyloid CTS. There were no statistically significant differences between the 2 groups in clinical, laboratory or EMG findings, type of dialysis membrane, or frequency of ipsilateral fistula. Only amyloid CTS was recurrent. **CONCLUSION:** Amyloid deposits were confirmed microscopically in 63.4% of patients. The relatively large number of cases of non-amyloid CTS without signs of dialysis associated arthropathy suggests that CTS is not a satisfactory criterion for diagnosis of dialysis arthropathy or beta2-microglobulin amyloidosis unless the presence of amyloid has been confirmed or duration of dialysis treatment has been at least 15 years.

PMID: 9632081 [PubMed - indexed for MEDLINE]

188. Bull Rheum Dis. 1998 Jun;47(4):2-5.

Diagnosis and management of complicated gout.

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Although a diagnosis of gout can be confirmed by the presence of monosodium urate crystals in synovial fluid, arriving at the suspected diagnosis and managing the disease can be a challenge for primary care physicians and specialists alike. Symptoms of gout can mimic other forms of inflammatory arthritis such as rheumatoid arthritis, pseudogout, or septic arthritis. Treatment can be complicated by the patient's need for drugs that contribute to hyperuricemia. Once other diagnoses are ruled out and urate crystals are detected under polarized light microscopy, treatment to end the acute attack and follow-up treatment designed to lower serum urate levels can be undertaken.

PMID: 9624822 [PubMed - indexed for MEDLINE]

189. Vestn Oftalmol. 1998 Jan-Feb;114(1):34-6.

[New method of visual fields color division in diploptic treatment of strabismus]

[Article in Russian]

Avetisov ES, Vakurina AE, Kashchenko TP, Vakurin EA.

A new method of color division of the visual fields based on polarized light interference is described. A new method for diploptic therapy of strabismus is developed, based on the above principle and possessing numerous advantages. The method was used in 38 patients with binocular disorders of various severity; binocular function improved in 18. The method is particularly effective in the patients with correct position of the eyes with bifoveal fusion on the synaptophore and parallel color test vision and in the patients with binocular vision and amblybinopia.

PMID: 9584638 [PubMed - indexed for MEDLINE]

190. Clin Immunol Immunopathol. 1998 Mar;86(3):280-9.

Taxol involution of collagen-induced arthritis: ultrastructural correlation with the inhibition of synovitis and neovascularization.

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Collagen-induced arthritis (CIA) is an animal model of rheumatoid arthritis (RA) that can be regressed with Taxol (paclitaxel), a chemotherapeutic agent. To identify structural changes that occur with involution, the synovium from naive, untreated CIA, and Taxol-treated CIA rats were evaluated by light microscopy plus transmission and scanning electron microscopy. Analysis included detailed images of vascular networks using polymeric corrosion casts. The CIA synovium was morphologically similar to human RA synovium. In CIA, the integrity of the intimal lining is lost by Type-B synoviocytes becoming highly elongated and polarized toward the joint space, resulting in non-overlapping cellular processes and the elimination of the basal lamina. In addition, the lining expanded from a width of 6-10 microns in naives to 200-250 microns in CIA due primarily to increased numbers of both Type-A and -B synoviocytes and more interstitial matrix. Vascular corrosion casts of CIA synovium illustrated a marked increase in blood vessel volume and an extensive interconnecting vascular architecture; neovascular arrays were observed to project toward the synovial surface. In Taxol-treated CIA, the synoviocyte and neovascular components reverted to the naive synovium morphology, suggesting that this agent might be useful in the therapy of RA.

PMID: 9557161 [PubMed - indexed for MEDLINE]

191. J Dent. 1998 Mar;26(2):125-31.

Qualitative assessment of stress distribution during insertion of endodontic posts in photoelastic material.

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OBJECTIVES: The purpose of this study was to investigate the stress patterns associated with prefabricated endodontic posts during the various stages of insertion according to a number of design characteristics. **METHODS:** In a photoelastic material with elastic properties comparable to dentin, analyses were performed of the overall stress patterns with polarized light revealing substantial differences in stresses generated by the various posts. The effects

of variations in design for certain configurations of the posts were also assessed. RESULTS: One geometric feature was the retentive thread of the post. The stress patterns within the photoelastic material revealed a homogeneous distribution of stress along the entire length of the thread, and more threads induced additional stress. The stress recorded with a vent when the pitch of the thread was 0.8-1.0 mm was classified as minimal-to-mild stress. Another geometric feature considered was the head (coronal extension) of the post. Minimal stress was recorded in the material in contact with the head and the apical end of the post when the contact surface of head was more than 3 mm². CONCLUSIONS: This study suggests that during insertion of threaded posts the least stress occurs when the head contact surface is sufficient ($> \text{ or } = 3 \text{ mm}^2$). A thread with a pitch of 0.8-1.0 mm is most desirable in stress reduction. The number of windings should also be limited (less than six windings) as samples with a substantial number of windings (N = 13 or 30) produce severe stress.

PMID: 9540309 [PubMed - indexed for MEDLINE]

192. Am J Dent. 1997 Oct;10(5):247-50.

Enamel remineralization on teeth adjacent to Class II glass ionomer restorations.

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PURPOSE: To examine the in vitro remineralization of incipient carious lesions on teeth adjacent interproximally to teeth with Class II glass ionomer cement restorations. MATERIALS AND METHODS: Artificial carious lesions were created at the contact area of 30 teeth. Ten teeth had Class II glass ionomer cement/resin composite restorations placed, 10 teeth had Class II glass ionomer silver cermet restorations placed and 10 teeth had Class II amalgam restorations placed. Sections 100 microns thick were obtained longitudinally through the caries sites and polarized photomicrographs were taken in imbibition media of water and Thoulet's (R.I. 1.41 and 1.47) solutions, representing 5%, 10% and 25% pore volume respectively. Varnish was placed on the section, leaving only the external section site exposed, then sections were situated back into the original tooth. The restored teeth were abutted to the carious tooth so that the restorations came into contact with the adjacent restoration. The specimens were placed into closed environments of artificial saliva for 14 days, then were photographed again under polarized light and areas of the carious lesions were quantitated. RESULTS: An ANOVA indicated significant variance in adjacent tooth remineralization, when comparing the experimental groups, in imbibition media of water ($P < 0.05$), Thoulet's 1.41 solution ($P < 0.008$) and Thoulet's 1.47 solution ($P < 0.006$). Duncan's multiple range test demonstrated the glass ionomer cement/resin composite group to have significantly greater decrease in pore volume ($P < 0.05$) than the amalgam control group in water imbibition media and Thoulet's 1.47 media. There was no statistically significant difference between the glass ionomer cement/resin composite and glass ionomer silver cermet groups in these two imbibition media. The glass ionomer cement/resin composite group demonstrated significantly more ($P < 0.05$) decrease in pore volume than both the glass ionomer silver cermet group and amalgam control group in Thoulet's 1.47 imbibition media.

PMID: 9522700 [PubMed - indexed for MEDLINE]

193. J Am Acad Dermatol. 1997 Dec;37(6):948-52.

Polarized light photography enhances visualization of inflammatory lesions of

acne vulgaris.

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BACKGROUND: Polarized light photography has been used to selectively differentiate surface from subsurface features of photoaged skin. OBJECTIVE: Our purpose was to compare acne assessments obtained from clinical evaluations with assessments from photographs obtained with flash photography and with perpendicular polarized light photography. METHODS: Assessments of acne with the Cunliffe scale were made of 32 subjects. Retrospective evaluations of standard and perpendicular polarized light photographs were made in a blinded fashion by a panel of evaluators. RESULTS: Visualization of inflammatory acne lesions was enhanced with perpendicular polarized light photography, with clear delineation of erythematous borders. Acne assessments with the use of a Cunliffe scale were significantly higher ($p = 0.001$) from perpendicular polarized light photographs than for clinical evaluations. CONCLUSION: Polarized light photography enhances visualization of inflammatory acne lesions in a manner not possible with conventional flash photographs, permitting accurate evaluation of the extent of disease and the effectiveness of therapy.

PMID: 9418762 [PubMed - indexed for MEDLINE]

194. Am J Sports Med. 1997 Sep-Oct;25(5):670-4.

The thermal properties of bovine joint capsule. The basic science of laser- and radiofrequency-induced capsular shrinkage.

Naseef GS 3rd, Foster TE, Trauner K, Solhpour S, Anderson RR, Zarins B.

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Orthopaedic surgeons have recently adapted the holmium: yttrium-aluminum-garnet (YAG) laser for the shrinkage of capsular tissues for treatment of glenohumeral instability. The molecular mechanism of capsular shrinkage has not been documented to date. This study examined the effects of heating on bovine calf knee capsule and subsequent shrinkage of the capsule. Capsule specimens were placed in a saline bath at temperatures ranging from 55 degrees to 75 degrees C for 1, 3, 5, and 10 minutes. Shrinkage was quantified by digital imaging, and the tissue was examined by light and polarized light microscopy. Tissue contraction was not measurable at or below 57.5 degrees C. At 60 degrees C, tissue shrinkage occurred with corresponding basophilic staining and loss of birefringence in collagen fibers. For specimens heated at 60 degrees C and 62 degrees C, shrinkage directly correlated with duration of thermal exposure. Maximal shrinkage of approximately 50% in length occurred at and above 65 degrees C with thermal exposures of 1 minute or greater. This study demonstrates that thermal shrinkage of bovine knee capsule correlates with denaturation of collagen fibers and depends on both time and temperature. Capsular shrinkage treatments may be performed with any energy source that is capable of well-controlled heating of capsular tissue and does not depend on the special properties of laser light.

PMID: 9302474 [PubMed - indexed for MEDLINE]

195. J Rheumatol. 1997 Sep;24(9):1780-6.

Dialysis arthropathy: identification and evaluation of a subset of patients with

unexplained inflammatory effusions.

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OBJECTIVE: Rheumatic disorders have been reported in patients with chronic renal failure treated with hemodialysis. We identified and evaluated 9 patients undergoing hemodialysis with inflammatory joint effusions not explained by known causes such as gout and bacterial infection. METHODS: Forty-nine consecutive synovial fluid (SF) analyses on 41 dialysis patients were reviewed. Nine with unexplained inflammatory arthritis were studied in detail. SF analysis included polarized light examination, alizarin red S stain, Congo red stain, cultures, transmission electron microscopy, and electron probe elemental analysis. RESULTS: SF leukocyte counts ranged from 4550 to 36,000/mm³ with 44-98% neutrophils. No infections were identifiable in these patients. Findings evaluated as possible factors in the joint inflammation included apatite crystals, iron, lipids, amyloid, and difficult to diagnose nonbacterial infections such as hepatitis C. CONCLUSION: Some highly inflammatory joint effusions in patients undergoing chronic hemodialysis are not due to pyogenic infections and may be attributable to other factors.

PMID: 9292804 [PubMed - indexed for MEDLINE]

196. Cutis. 1997 May;59(5):256-8.

A case of chrysiasis.

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Chrysiasis and chrysoderma are terms used to describe permanent pigmentation of the skin due to the parenteral administration of gold salts. A case of chrysiasis, including a photomicrograph of the characteristic orange-red birefringence of gold in tissue when viewed under cross-polarized light, is presented. A review of the literature on the pathogenesis of the pigmentation seen in this disorder is also presented.

PMID: 9169265 [PubMed - indexed for MEDLINE]

197. C R Acad Sci III. 1997 Mar;320(3):253-8.

Reconstruction of human maxillary defects with nacre powder: histological evidence for bone regeneration.

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The defective areas in the premolar-molar region of maxillary alveolar bone of eight patients were reconstructed using powdered nacre from the giant oyster *Pinctada maxima*. Histological, microradiographic and polarized light studies of drill biopsies taken 6 months postoperatively showed that nacre was tightly bound to newly-formed bone. The nacre was gradually and centripetally bio-dissolved and replaced with immature and then mature lamellar bone. These results are in agreement with our previous experimental in vitro data indicating that nacre has

good osteogenic properties.

PMID: 9183443 [PubMed - indexed for MEDLINE]

198. Caries Res. 1997;31(6):423-8.

Remineralization of root surfaces demineralized in solutions of differing fluoride levels.

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The beneficial effects of fluoride on enamel have been well documented. However, limited data are available concerning the amount of fluoride required for beneficial effects on tooth root. Although studies have shown that fluoride inhibits root demineralization, the aim of this study was to investigate the location, extent and amount of remineralization on root dentin substrates after demineralization has occurred. The root surfaces of extracted human teeth were demineralized in a pure chemical buffer containing varying concentrations of sodium fluoride. After this lesion initiation, the same root sections were then placed into a remineralizing solution. The root sections were characterized after demineralization, and again after remineralization, by polarized light microscopy (PLM) and microradiography (MRG). Lesion depths after the demineralization phase were found to be inversely proportional to the fluoride concentration. When fluoride was present, bands or lines within the body of the lesion were observed with PLM and MRG. Using quantitative MRG, variations in mineral content and distribution were recorded. Examination of the root sections after the remineralization phase showed remineralization to have occurred on the remaining mineral and not on organic matrix devoid of mineral. The amount and location of mineral deposition may be of great significance in the arrestment and treatment of in vivo root surface caries.

PMID: 9353581 [PubMed - indexed for MEDLINE]

199. Caries Res. 1997;31(6):418-22.

An in vitro comparison of three fluoride regimens on enamel remineralization.

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The purpose of this study was to compare the enamel remineralization effectiveness of a fluoride rinse, fluoridated dentifrice, and fluoride-releasing restorative material. Forty extracted molars had 1 x 5 mm artificial carious lesions formed at the interproximal contact point. One-hundred-micrometer sections were obtained at the caries sites, and polarized light photomicrographs were obtained. The sections had varnish placed, leaving only the external section site exposed, and were situated back into the original tooth. Forty other molars were obtained; 10 had Class-II glass ionomer cement restorations placed. These 40 teeth were mounted to have interproximal contact with the adjacent teeth containing artificial carious lesions. Specimens were placed in closed environments of artificial saliva for 1 month, with saliva being changed every 48 h. Ten specimen pairs were brushed with a fluoridated dentifrice for 2 min, twice per day, 10 specimen pairs were rinsed with a 0.05% sodium fluoride rinse for 1 min twice per day, 10 specimen pairs had Class-II glass ionomer cement

restorations positioned adjacent to 10 teeth with artificial carious lesions, and 10 specimen pairs acted as controls. After 30 days, the same sections were photographed again under polarized light, and areas of the lesions were digitized quantitatively. Results demonstrated the mean (+/- SD) remineralization (μm^2) in Thoulet's 1.41 imbibition media to be: lesions adjacent to glass ionomer cement restorations, 2.45 +/- 170; lesions exposed to a fluoridated dentifrice, 223 +/- 102; lesions exposed to 0.05% sodium fluoride rinse, 374 +/- 120, and control lesions only exposed to artificial saliva, 101 +/- 69. Duncan's analysis indicated the fluoridated rinse to have significantly greater remineralization effects on adjacent caries than the other groups ($p < \text{or} = 0.05$). The glass ionomer restorative material and fluoridated dentifrice also had significantly greater remineralization effects on adjacent caries than the control, yet significantly less than the fluoridated rinse ($p < \text{or} = 0.05$).

PMID: 9353580 [PubMed - indexed for MEDLINE]

200. Swed Dent J. 1997;21(1-2):11-7.

Remineralization of natural carious lesions with a glass ionomer cement.

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Remineralization of carious lesions at the histological level is of great benefit since this will arrest lesion progression. The ability of glass ionomer cement (GIC) to (1) release fluoride it originally contains and (2) release "loosely bound" fluoride acquired from its surroundings have been previously demonstrated. This in vitro study examined the potential for caries remineralization if the lesion was placed near a GIC. Sixteen mesiodistal sections were cut through extracted deciduous molars exhibiting approximal white spot lesions. Sections were "linked" to a plastic tooth restored with a GIC to simulate the abutting surfaces of adjacent teeth. Lesions were photographed in water under polarized light initially and after one- and two-week exposures to artificial saliva. The photographs were digitized, lesion body outlined, and the area corresponding to the body of the lesion was determined to provide a comparison over time. Sixty-two percent of the sections showed a quantitative reduction in lesion body size by an average of 43% after the first week and an additional 14% reduction after the second week. All but two sections demonstrated a qualitative change thereby illustrating that a reduction in pore volume size of the lesion body had also occurred. Therefore, fluoride released from a GIC has the potential to enhance remineralization of the early carious lesion in vitro. The greatest remineralization occurred during the first week of artificial saliva exposure.

PMID: 9178445 [PubMed - indexed for MEDLINE]

201. Vestn Oftalmol. 1997 Jan-Feb; 113(1):31-3.

[Method of treatment of amblyopia with dynamic color stimuli emerging in polarized light interference]

[Article in Russian]

Kashchenko TP, Vakurin EA, Vakurina AE.

A method for treating amblyopia by using dynamic color objects (stimuli) influencing simultaneously different channels of the optic system is proposed. Original equipment based on polarized light interference was used, as well as a nomogram permitting rapid assessment of the optimal size of the offered test objects. The method was used in 90 children (99 amblyopic eyes). It reliably improved the efficacy of comprehensive treatment of amblyopia of different degree and origin and may be effectively used as the only method, particularly advisable for cases poorly treated by the traditional methods. The method is simple and interesting for young children.

PMID: 9133042 [PubMed - indexed for MEDLINE]

202. J Endod. 1996 Dec;22(12):662-7.

Treatment of root fracture by CO₂ and Nd:YAG lasers: an in vitro study.

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The purpose of this in vitro study was to use scanning electron microscopy and polarized light microscopy to evaluate the feasibility of using either the CO₂ laser or an Nd:YAG laser in combination with air/water surface cooling to effect fusion of fractured tooth roots. The experimental unit consisted of 81 single-rooted teeth, each with an induced root fracture. Fifty-six teeth that had been reapproximated in dental stone and 25 teeth that had been reapproximated with C-clamps were assigned to untreated control groups or groups for treatment using CO₂ and Nd:YAG lasers. Laser treatment consisted of multiple passes along the line of fracture, which was inspected using a dissecting microscope after each pass until a visual indication of fusion or irreparable damage resulted. Scanning electron microscopy evaluation of the treated lines revealed heat-induced fissures and cracks, areas of cementum meltdown and resolidification, crater formation, and separation of cementum from underlying dentin. In no instance-regardless of reapproximation technique, laser type, energy, and other parameters-did the treatment effect fusion of the fractured root halves.

PMID: 9220751 [PubMed - indexed for MEDLINE]

203. Can J Vet Res. 1996 Oct;60(4):305-11.

Utilization of the serosal scarification model of postoperative intestinal adhesion formation to investigate potential adhesion-preventing substances in the rabbit.

Singer ER, Livesey MA, Barker IK, Hurtig MB, Conlon PD.

Department of Clinical Studies, Ontario Veterinary College, University of Guelph, Ontario.

A rabbit serosal scarification model was utilized to compare the ability of four drugs, previously administered peri-operatively to horses undergoing exploratory celiotomy, to prevent the development of postoperative intestinal adhesions. The substances compared were 32% Dextran 70 (7 mL/kg), 1% sodium carboxymethylcellulose (7 mL/kg), trimethoprim-sulfadiazine (30 mg/kg), and flunixin meglumine (1 mg/kg). The first two were administered intra-abdominally following surgery, while the latter two were administered systemically in the peri-operative period. Fibrous adhesions were evident in all animals in the untreated serosal scarification group. No significant difference in the number of animals with adhesions was found between the untreated control group and any treatment group, nor among the treatment groups. Microscopic examination of adhesions collected at postmortem examination revealed fibers consistent with cotton, surrounded by a giant-cell reaction and ongoing acute inflammation. The source of the fibers was likely the cotton laparotomy sponges used to scarify the intestinal surface, since the pattern in the granuloma and sponge fibers appeared similar under polarized light. Though consistent intestinal adhesion formation was produced in the rabbit, the presence of foreign body granulomas may prevent consideration of this model for future research. The drugs tested were ineffective in preventing the formation of postoperative small intestinal adhesions in this model.

PMCID: PMC1263853

PMID: 8904667 [PubMed - indexed for MEDLINE]

204. Calcif Tissue Int. 1996 Oct;59(4):240-4.

Fibrogenesis imperfecta ossium: ineffectiveness of melphalan.

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Fibrogenesis imperfecta ossium (FIO) is an extremely rare, acquired, metabolic bone disease related to a collagen defect in bone matrix inducing spontaneous fractures. Among the 17 cases of FIO reported to date, four patients exhibited a monoclonal gammopathy (MCG) and one, treated with melphalan, was the first patient to present clinical and histological remission of the bone and plasma cell manifestations. We report the case of a 56-year-old woman who suffered spontaneous fractures of both patellae and olecranon. Skeletal X-rays showed generalized coarse, ill-defined trabeculae. The following biological parameters were abnormal: ESR: 50 mm/hour, alkaline phosphatase (AP) 256 IU/liter [normal (N): 40-110], serum IgG kappa light chain 11 g/liter, bone marrow aspirate 9% atypical plasma cells. Iliac crest biopsy showed the features of FIO including evidence of osteomalacia and nonbirefringent osteoid seams under polarized light. Eroded surfaces were increased, and trabecular bone volume was decreased. Melphalan (4 mg/day) was given in 1988 and was interrupted 1 year later because of leucopenia. Clinical status worsened. A second bone biopsy in 1989 showed identical features of FIO. In November 1990, an X-ray film showed several fractures, and coarser trabeculae. The patient died in December 1991. Regarding the prevalence of MCG and FIO, their association is unlikely accidental. The collagen defect might be related to a plasma cell-induced osteoblast impairment.

PMID: 8781045 [PubMed - indexed for MEDLINE]

205. Am J Vet Res. 1996 Sep;57(9):1274-87.

Ultrastructure of selected struvite-containing urinary calculi from dogs.

Domingo-Neumann RA, Ruby AL, Ling GV, Schiffman PS, Johnson DL.

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University of California, Davis 95616, USA.

OBJECTIVE: To elucidate the ultrastructural details of struvite-containing urinary calculi from dogs. SAMPLE POPULATION: 38 specimens were selected from a collection of approximately 13,000 canine urinary calculi: 18 of these were composed entirely of struvite, and 20 consisted of struvite and calcium phosphate (apatite). PROCEDURE: Qualitative and quantitative analyses of specimens included use of plain and polarized light microscopy, x-ray diffractometry, scanning electron microscopy with backscattered electron imagery, x-ray fluorescence scans, and electron microprobe analysis. RESULTS: 4 textural types were recognized among struvite calculi, and 4 textural types of struvite-apatite calculi were described. Evidences of calculus dissolution were described from 4 calculi studied. CONCLUSIONS: The presence of small, well interconnected primary pores in struvite-containing urinary calculi from dogs appears to be a significant factor in determining the possible interaction of calculi with changes in the urine composition. The progress of dissolution from the calculus surface to the calculus interior appears to be largely affected by the primary porosity originally present between crystals forming the calculus framework. Apatite was observed to be more resistant to dissolution than struvite. CLINICAL RELEVANCE: The prevalence of fine concentric laminations having low porosity, and the common occurrence of apatite among struvite-containing urinary calculi from dogs may be 2 reasons why the efficacy of dietary and medicinal manipulations in dissolving urinary calculi is greater among cats than it is among dogs.

PMID: 8874719 [PubMed - indexed for MEDLINE]

206. *Pediatr Dent*. 1996 May-Jun;18(3):205-9.

Remineralization of caries-like lesions of enamel with acidulated calcifying fluids: a polarized light microscopic study.

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The purpose of this in vitro study was to evaluate the effects of acidulated calcifying fluids (CF) on remineralization of caries-like lesions of enamel. Lesions were created in sound enamel using an acidified gel. Central longitudinal sections were taken from each tooth (N = 20) following lesion formation to serve as control lesions (CL). Each tooth was sectioned into quarters and each quarter was assigned to one of four groups: 1) 1 mM calcium CF at pH 7.0 (CF1); 2) 1 mM calcium CF at pH 5.0 (ACF1); 3) 3 mM calcium CF at pH 7.0 (CF3); 4) 3 mM calcium CF at pH 5.0 (ACF3). Tooth quarters were treated with assigned CFs (HAP [Ca/P = 1.63], pH 7.0 or 5.0, 0.05 mM F1) for ten 60-sec periods. Longitudinal sections were prepared and imbibed in water for polarized light study. Mean lesion depths were determined and compared (ANOVA and DMR). With 1 mM calcium CFs, mean lesion depths were 187 microns for CL, 154 microns for CF1 and 133 microns for ACF1. With 3 mM calcium CFs, mean lesion depths were 192 microns for CL, 172 for CF3 and 149 for ACF3. Acidulated (22%, 29%) and nonacidulated (10%, 18%) CFs resulted in significant reductions ($P < 0.05$) in lesion depths when compared with control lesions. Acidulated CFs (13%, 14%) resulted in significant lesion depth reductions ($P < 0.05$) when compared with nonacidulated CFs. The acidulated 1 mM calcium CF produced the greatest degree of remineralization. Acidulation of CFs enhanced the degree of remineralization over that attained by nonacidulated CFs. This improvement in remineralizing ability of acidulated calcifying fluids may be

due to creation of a more reactive enamel surface.

PMID: 8784910 [PubMed - indexed for MEDLINE]

207. Z Arztl Fortbild (Jena). 1996 May;90(3):227-31.

[Polyarticular gout--change in the clinical picture?]

[Article in German]

Becker-Capeller D, Helker K, Weber MH.

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40% of the male patients suffering from gouty arthritis treated in our rheumatological unit during a three years period showed a chronic polyarticular course. In polyarticular gout, acute gouty attacks affect above all the joints of the upper limbs. Gouty arthritis in these patients shows an ascending pattern. Therefore, in case of unawareness of the clinical symptoms, differential diagnosis can be difficult especially when laboratory findings including uric acid levels are in normal ranges and classical radiological findings are missing. It is important to notice that the atypical joint attack in gouty arthritis is typical for polyarticular gout. In case of unclear arthritis the polarized light microscopy of the synovial fluid should always be demanded.

PMID: 8779236 [PubMed - indexed for MEDLINE]

208. Soc Sci Med. 1996 May;42(9):1227-33.

The diet-heart disease hypothesis: a response to Atrens.

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Department of Psychology, The University of Sydney, Australia.

Comment on:

Soc Sci Med. 1994 Aug;39(3):433-47.

In a recent examination of the main tenets of the widely accepted diet-heart disease hypothesis, Atrens concluded that the evidence to date is not sufficient to support the hypothesis. Reviewing Atrens' critique highlights both strengths and limitations in his case against the role of dietary lipids and cholesterol in coronary heart disease mortality. Research on the following hypothesized relationships is discussed in light of the objections raised by Atrens: the relationships between fat intake and heart disease mortality; dietary fat and serum cholesterol; serum cholesterol and atherosclerosis; atherosclerosis and heart disease death; and serum cholesterol and heart disease death. The inconsistency of the findings suggests that definitive answers regarding the diet-heart disease hypothesis are premature and that the polarized positions of acceptance vs rejection of the hypothesis fail to account for the full range of results.

PMID: 8733193 [PubMed - indexed for MEDLINE]

209. Am J Clin Pathol. 1996 May;105(5):576-82.

Fourier transform infrared microscopy identification of crystal deposits in tissues: clinical importance in various pathologies.

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The presence of crystal deposits in tissues is associated with various pathologies. Sometimes their identification is useful for understanding the etiology or the mechanism of the disorder. The authors applied Fourier transform infrared microscopy (FTIRM) to the molecular characterization of crystal deposits in tissue and compared the results with those provided by histologic studies using polarized light microscope and histochemical reactions. Twenty-five biopsies were investigated. In 10 cases, the results were in good agreement. In 15 cases only FTIRM could precisely identify the crystals. In three cases, this technique allowed to characterize dihydroxyadenine crystals revealing an adenine phosphoribosyltransferase deficiency previously undiagnosed in patients presenting severe chronic renal failure. In three cases, crystal deposition was related to drug therapy. In other cases, crystal identification was useful to understand the mechanism of the pathology responsible for tissue damage and crystal deposition.

PMID: 8623766 [PubMed - indexed for MEDLINE]

210. Vestn Oftalmol. 1996 Apr-Jun;112(2):29-31.

[The possibility for using the phenomenon of polarized light interference in treating amblyopia]

[Article in Russian]

Abramov VG, Vakurina AE, Kashchenko TP, Pargina NM.

A new method for treating amblyopia is proposed, making use of the phenomenon of polarized light interference. It helps act simultaneously on the brightness, contrast frequency, and color sensitivity in response to patterns. The method was used in the treatment of 36 children. In group 1 (n = 20) it was combined with the traditional methods. Such treatment was more effective than in controls treated routinely. Group 2 consisted of 16 children in whom previous therapy was of no avail. Visual function was improved in 7 of them.

PMID: 9045484 [PubMed - indexed for MEDLINE]

211. Masui. 1996 Apr;45(4):433-8.

[Linear polarized light irradiation around the stellate ganglion area increases skin temperature and blood flow]

[Article in Japanese]

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We evaluated the effect of linear polarized light irradiation with a SUPER LIZER around the stellate ganglion area on skin temperature and blood flow in healthy adult volunteers. We carried out two experiments (study I and study II). In study I, we investigated one-sided irradiation around the stellate ganglion area or posterior neck on the skin temperature of the bilateral nasus externi and earlobes. In study II, we investigated one-sided irradiation around the stellate ganglion area or posterior neck on the skin temperatures of both hands and skin

blood flow on the irradiated side. In study I, irradiation around the stellate ganglion area increased skin temperature on the irradiated sides of the nasus externi (wings of the nose), and in study II, skin temperature and blood flow were increased on the irradiated side of the hands. These results suggest that linear polarized light irradiation with a SUPER LIZER around the stellate ganglion area would be useful and beneficial in clinical therapy.

PMID: 8725597 [PubMed - indexed for MEDLINE]

212. Ger J Ophthalmol. 1996 Mar;5(2):84-91.

Morphological and biomorphometrical observations on laser thermal keratoplasty. Histological and biomorphometrical examination of the relationship between refractive change and the volume following Cr:Tm:Ho:YAG laser treatment.

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Laser thermal keratoplasty (LTK) is currently under clinical trial for the correction of hyperopia and hyperopic astigmatism by means of collagen coagulation in the peripheral cornea. The purpose of our study was to optimize the ratio between the volume of damaged corneal stroma and the refractive effect so as to minimize potential side effects such as endothelial damage or induction of glare phenomena. We therefore performed histological and morphometrical examinations of enucleated pig eyes to determine the relationship between the coagulated stromal volume and the refractive change after LTK using a pulsed Cr:Tm:Ho:YAG laser (wavelength 2.12 microns) on enucleated pig eyes. The refractive change was documented with a Littman ophthalmometer. Morphometrical analysis was performed using polarized light microscopy of sirius red-stained specimens. This special stain separated the thermally changed stroma into a dark nonbirefringent center and a birefringent peripheral zone. The volume of both zones was positively correlated with the refractive change induced. The volume was in turn influenced by the choice of laser parameters. From the ratio of the volume to the refractive change it was found that pulse energies above 30 mJ led to an enlargement of the coagulation volume without increasing the refractive change effectively. The use of high pulse energies did not improve the effect of LTK but only increased the risk of unwanted side effects. However, an increase in the laser repetition rate at a constant pulse number per spot led to refractive changes with minimal coagulation volume. The highest relative refractive change was achieved with a dark central zone and a birefringent zone, each having a volume of about $50-80 \times 10^{-3} \text{ mm}^3$.

PMID: 8741152 [PubMed - indexed for MEDLINE]

213. Am J Dent. 1995 Aug;8(4):217-20.

De/remineralization from sodium fluoride dentifrices.

Wefel JS, Jensen ME, Triolo PT, Faller RV, Hogan MM, Bowman WD.

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PURPOSE: To test the demineralization/remineralization effects of sodium fluoride dentifrices using an in situ single-section crown model system. MATERIALS AND METHODS: A fluoride dose response was evaluated using 0, 1100 and 2800 ppm F⁻, along with the effects of an enhanced fluoride delivery system (polyampholyte-NaF). The single-section crown model was employed with supervised

toothbrushing twice a day. At the end of each 1-month study leg, sections were removed and replaced with new sections for the next leg. Both before and after the double-blind, crossover portion of the study, sections were evaluated by polarized light microscopy and microradiography. The change in mineral content of the enamel and root lesions was analyzed by ANOVA with a Waller-Duncan K-Ratio Test post hoc. RESULTS: The placebo dentifrice group showed a loss of mineral and was statistically different from all groups. The fluoride dentifrices showed increasing amounts of enamel mineral gain, with increasing fluoride concentration. The polyampholyte-NaF delivery system with 1100 ppm F⁻ was equivalent to the 2800 ppm F⁻ dentifrice. Root lesions gave similar rank-order results although all treatments showed demineralization or mineral loss.

PMID: 7576392 [PubMed - indexed for MEDLINE]

214. Clin Infect Dis. 1995 Jul;21(1):217-9.

Granulomatous tophaceous gout mimicking tuberculous tenosynovitis: report of two cases.

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Granulomatous inflammation in a tissue specimen raises concern about infection with Mycobacterium tuberculosis, atypical mycobacteria, certain fungi, Brucella species, and other infectious agents. Inflammatory disorders, such as sarcoidosis, crystal-associated arthritis, or foreign body reactions also are considered when granulomatous changes are seen on histological examination of a tissue specimen. We describe two cases of granulomatous tenosynovitis due to tophaceous deposits in patients with gout. In one case, tuberculous synovitis was considered the primary diagnosis until the diagnosis of gout was confirmed by examination of a tissue specimen with polarized light. In the second case, gout and tuberculosis were found in the patient's wrist joint. After antituberculous therapy was discontinued, he continued to have wrist synovitis and chronic drainage due to granulomatous tophaceous gout. The findings in this report suggest that gouty tenosynovitis can mimic tuberculous tenosynovitis and that gout should be considered in the differential diagnosis of granulomatous tenosynovitis, especially when acid-fast stains and cultures are negative for mycobacteria.

PMID: 7578737 [PubMed - indexed for MEDLINE]

215. Circulation. 1995 Apr 1;91(7):2049-57.

Histomorphometric and biochemical correlates of arterial procollagen gene expression during vascular repair after experimental angioplasty.

Karim MA, Miller DD, Farrar MA, Eleftheriades E, Reddy BH, Breland CM, Samarel AM.

Department of Medicine, St Louis University School of Medicine, Mo.

Comment in:

Circulation. 1996 Jan 1;93(1):202.

Circulation. 1995 Nov 1;92(9):2760-1.

BACKGROUND: To determine the transcriptional, biochemical, and histomorphometric correlates of neointimal procollagen accumulation during arterial repair after

balloon angioplasty of atherogenic vessels, rabbit iliac artery collagen content and the induction of alpha 1(I) and alpha 1(III) procollagen mRNA were assessed in normal vessels and at 2, 7, and 30 days after angioplasty. METHODS AND RESULTS: Quantitative iliac artery histomorphometric neointimal collagen analysis was performed using a specific picrosirius red stain under polarized light. Arterial cross-sectional area reduction, total cellularity, and vascular smooth muscle cell density (per 10(4) mu2 of neointima) were quantified in routine and immunohistochemically stained sections (alpha-actin and RAM-11), from which biochemical concentrations of tissue protein, RNA, and DNA were also measured. Collagen comprised 0.23 +/- 0.1 mg/mg of total protein in the normal vessel wall and did not increase in vessels studied 2 and 7 days after angioplasty (0.26 +/- 0.06, 0.28 +/- 0.05 mg/mg of protein, P = NS). By 30 days after angioplasty, > 50% of the protein concentration was collagen (0.55 +/- 0.11 mg/mg of protein, P = .02). Collagen-positive histological staining also increased significantly from 17 +/- 2% of the neointima at day 2 to 32 +/- 5% by day 30 (P = .01). The transcript regulatory signal for alpha 1(I) procollagen mRNA was induced 2 days after angioplasty, peaking at 7 days for both alpha 1(I) and alpha 1(III), and returning to control levels 30 days after angioplasty. A significant luminal cross-sectional area reduction of the arterial wall was confirmed both by angiography and histomorphometry (P = .01). This was not associated with a significant change in alpha-actin (+) vascular smooth muscle cell density (38 +/- 7 nuclei per 10(4) mu2 at day 2 and at day 30) or tissue DNA concentration (P = NS). CONCLUSIONS: We conclude that procollagen genes are transcriptionally activated early (2 to 7 days) after angioplasty vessel injury and that collagen subsequently constitutes a major biochemical and histological component of the proliferative neointima by 30 days after angioplasty. Alterations in pathways regulating procollagen metabolism may also contribute to the accumulation of extracellular matrix and growth of the neointima in the late repair phase after vessel wall injury.

PMID: 7895364 [PubMed - indexed for MEDLINE]

216. Geriatrics. 1995 Apr;50(4):33-9.

Gout or 'pseudogout': how to differentiate crystal-induced arthropathies.

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Gout is an inflammatory joint disease that primarily affects middle-aged men and postmenopausal women. It is characterized by severe pain and erythema in the big toe and other affected joints. Acute gout may be triggered by diuretics, aspirin, minor trauma, or acute illness. The presence of monosodium urate crystals within phagocytes from synovial fluid aspirates is almost always diagnostic. Calcium pyrophosphate deposition disease ("pseudogout") usually affects larger joints and often follows trauma, surgery, or ischemic heart disease. Microscopic examination of crystals under compensated polarized light is used to differentiate gout and pseudogout. Disorders involving basic calcium phosphate are often more difficult to diagnose and treat but are also less likely to be disabling.

PMID: 7721112 [PubMed - indexed for MEDLINE]

217. Am J Dent. 1995 Feb;8(1):10-4.

Effects of argon laser irradiation and acidulated phosphate fluoride on root caries.

Hicks MJ, Westerman GH, Flaitz CM, Blankenau RJ, Powell GL, Berg JH.

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PURPOSE: To determine the effects of argon laser irradiation (ArI) and topical acidulated phosphate fluoride (APF) treatment on artificial caries formation in root surfaces. **MATERIALS AND METHODS:** After soft tissue debridement and fluoride-free prophylaxis, the teeth were divided into quarters and acid-resistant varnish was applied, leaving windows of sound root surface exposed. Each tooth received four separate treatments: (1) Control-mesiobuccal quarter; (2) ArI only--mesiolingual quarter; (3) ArI followed by APF- distobuccal quarter; (4) APF followed by ArI-distolingual quarter. ArI was for 10 seconds at 2W (100J/cm²) and APF treatment was for 4 minutes. After artificial lesion formation, sections were prepared and evaluated with polarized light. Mean lesion depths were determined and compared (ANOVA & DMR for a paired design). **RESULTS:** Mean lesion depths were: 347 +/- 41 microns--controls; 263 +/- 32 microns--ArI only; 158 +/- 21 microns--ArI followed by APF; and 149 +/- 17 microns -APF followed by ArI. Lesion depths were significantly different (P < 0.05) between the control group and each treatment group, and between ArI only group and either combined APF and ArI groups. No lesion depth difference (P > 0.05) was present between the combined APF and ArI groups. Argon laser irradiation significantly enhanced the resistance of root surfaces to demineralization. Combination of APF treatment with argon laser irradiation provided added protection against a constant artificial caries attack.

PMID: 7546465 [PubMed - indexed for MEDLINE]

218. J Clin Pediatr Dent. 1995 Fall;20(1):9-13.

Enamel caries initiation and progression following low fluence (energy) argon laser and fluoride treatment.

Hicks MJ, Flaitz CM, Westerman GH, Blankenau RJ, Powell GL, Berg JH.

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The aim of this study was to evaluate the effect of low fluence argon laser (AL) and acidulated phosphate fluoride (APF) treatment on caries initiation (CI) and progression (CP) in human enamel. Twenty caries-free molars were divided into tooth quarters. Tooth quarters from each specimen were assigned to one of four groups: 1) Control; 2) AL Only; 3) AL before APF; 4) APF before AL. AL was at 0.25 watts for 10 seconds (12.0 +/- 0.5 J/cm²). APF treatment was with a 1.23% gel for 4 minutes. Lesions were created in two treated, sound enamel windows per tooth quarter with an acidified gel. After CI and CP, sections were obtained and imbibed with water for polarized light study. Mean body of the lesion (BL) depths were determined and compared among groups (ANOVA & DMR). After CI, BL depths were: 189 +/- 29 micrometers for Control, 133 +/- 23 micrometers for AL only; 91 +/- 17 micrometers for AL before APF; and 83 +/- 14 micrometers for APF before AL. After CP, BL depths were: 321 +/- 43 micrometers for Control, 206 +/- 35 micrometers for AL only; 118 +/- 21 micrometers for AL before APF; and 114 +/- 19 micrometers for APF before AL. After CI and CP, argon laser irradiation alone resulted in significant reductions in lesion depth when compared with controls (p<0.05). APF treatment before or after argon laser exposure resulted in a significant reduction in lesion depth when compared with AL alone or control groups (p<0.05). Caries initiation and progression in vitro are affected to a significant extent when low fluence (energy) argon laser irradiation of sound enamel alone or in conjunction with APF treatment is done. This caries-protective effect occurs at an argon laser fluence (energy) that is capable of polymerizing visible light-cured resins.

PMID: 8634203 [PubMed - indexed for MEDLINE]

219. *Pediatr Dent*. 1995 Jan-Feb;17(1):31-5.

Argon laser irradiation and acidulated phosphate fluoride treatment in caries-like lesion formation in enamel: an in vitro study.

Flaitz CM, Hicks MJ, Westerman GH, Berg JH, Blankenau RJ, Powell GL.

Dentistry Division University of Texas Health Science Center at Houston Dental Branch, USA.

The purpose of this in vitro study was to determine the combined effects of argon laser irradiation (ArI) and acidulated phosphate fluoride treatment (APF) on caries-like lesion formation in human enamel. Each specimen was divided into tooth quarters with each quarter assigned to one of four groups: 1) control; 2) ArI Only; 3) ArI before APF treatment; 4) APF treatment before ArI. After a fluoride-free prophylaxis, acid-resistant varnish was applied to the tooth quarters, leaving sound enamel windows exposed on buccal and lingual surfaces. Argon laser irradiation was at 2 watts for 10s (100J/cm²). APF treatment was with a 1.23% APF gel for 4 min. Lesions were created in sound enamel windows with an acidified gel. After lesion formation, sections were obtained and imbibed with water for polarized light study. Body of the lesion depths were determined and compared among the four groups. Lesion depths were: 195 +/- 23 microns for control; 129 +/- 17 microns for ArI only; 96 +/- 14 microns for ArI before APF; and 88 +/- 11 microns for APF before ArI. Significant differences (P < 0.05) were found between the control group and all treatment groups, and between the ArI only group and both combined APF and ArI groups. Significant difference (P > 0.05) was not found between the ArI before APF and the APF before ArI groups. Laser irradiation alone reduced lesion depth by 34% compared with control lesions. When ArI was combined with APF treatment, lesion depth decreased by more than 50% compared with control lesions, and by 26 to 32% when compared with lased-only lesions. (ABSTRACT TRUNCATED AT 250 WORDS)

PMID: 7899099 [PubMed - indexed for MEDLINE]

220. *ORL J Otorhinolaryngol Relat Spec*. 1994 Nov-Dec;56(6):352-6.

A delayed teflonoma of the neck simulating a thyroid neoplasm.

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Pseudotumoral granulomatous foreign body reaction to Teflon particles is a rare complication of intracordal Teflon paste injection for unilateral vocal cord paralysis. We report a case of pseudotumor of the thyroid area, which appeared 3 years after intracordal Teflon paste injection and presented as a cold thyroid nodule. At frozen section examination the presence of a giant-cell foreign body granuloma containing numerous refringent particles suggested a 'teflonoma'. The diagnosis was confirmed on permanent sections, after comparison of the intratissular particles with fresh Teflon paste, under conventional and polarized light. The histological and ultrastructural features of the lesion are presented and attention is drawn to the long delay between initial Teflon injection and the clinical manifestation of the lesion.

PMID: 7838488 [PubMed - indexed for MEDLINE]

221. *Arterioscler Thromb.* 1994 Sep;14(9):1452-8.

Plasminogen activator inhibitor-1 released from activated platelets plays a key role in thrombolysis resistance. Studies with thrombi generated in the Chandler loop.

Stringer HA, van Swieten P, Heijnen HF, Sixma JJ, Pannekoek H.

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To investigate the potential role of plasminogen activator inhibitor-1 (PAI-1), which is released from the alpha-granules of activated platelets, in thrombolysis resistance, we employed a model (the "Chandler loop") that mimics the formation of arterial thrombi in vivo and that can be manipulated in terms of rheological parameters and composition of blood cells. Light and electron microscopy revealed that the distribution of blood cells in Chandler thrombi is polarized, as it is in arterial thrombi, resulting in platelet-rich "white heads" and red blood cell-rich "red tails.". Resistance toward tissue-type plasminogen activator (TPA)-mediated thrombolysis parallels the presence of platelets that are fully activated in this system. We demonstrate that the PAI-1 released by the alpha-granules is preferentially retained within the thrombus and that the concentration of PAI-1 antigen is higher in the head than in the tail of the thrombus. The relative thrombolysis resistance of the heads of Chandler thrombi can be largely abolished by inclusion of an anti-PAI-1 monoclonal antibody that blocks that inhibitory activity of PAI-1 toward TPA. We propose that PAI-1, released from activated platelets, plays a key role in thrombolysis resistance and/or reocclusion after thrombolytic therapy. This is due to binding of PAI-1 to polymerized fibrin within the thrombus, followed by inhibition of TPA-mediated fibrinolysis.

PMID: 8068607 [PubMed - indexed for MEDLINE]

222. *Quintessence Int.* 1994 May;25(5):355-8.

In vitro demineralization-rem mineralization of enamel caries at restoration margins utilizing fluoride-releasing composite resin.

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The release of fluoride from a composite resin has been shown to inhibit enamel demineralization. The purpose of this study was to examine the remineralization effects of a fluoride-releasing resin. Twenty extracted molars were painted with an acid-protective varnish, excluding a 2 x 6-mm window. Artificial carieslike lesions were created in the exposed enamel with an acidified gel. A Class II preparation was restored with a fluoride-releasing or a non-fluoride-releasing composite resin. The teeth were sectioned longitudinally and photographed with polarized light microscopy in water and Thoulet's imbibition media. The sections were then painted with an acid-protective varnish, so that only the natural external surface of the lesion was exposed, and placed in separate closed environments of a nonfluoridated artificial saliva. Sections were removed after 2 weeks and 3 months and photographed under polarized light as before. A sonic digitizer was used to measure the area of the body of the lesion. Results demonstrated a statistically significant area reduction in the body of the lesions exposed to the fluoridated composite resin at 2-week and 3-month intervals.

PMID: 7938422 [PubMed - indexed for MEDLINE]

223. Postgrad Med. 1994 Feb 1;95(2):103-6, 109, 113-6 passim.

Gout and 'pseudogout'. When are arthritic symptoms caused by crystal deposition?

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The proper diagnosis of gout and pseudogout (ie, calcium pyrophosphate dihydrate crystal deposition disease) leads to correct treatment. The two disorders can be easily confused and misdiagnosed in certain situations. Thus, in every case, synovial fluid aspiration and microscopic synovial fluid analysis under compensated polarized light should be done to confirm the suspicion of crystal-induced arthropathy. Underlying diseases should always be sought, because many are treatable.

PMID: 8309855 [PubMed - indexed for MEDLINE]

224. Histopathology. 1994 Feb;24(2):176-8.

Orange-red birefringence of gold particles in paraffin wax embedded sections: an aid to the diagnosis of chrysiasis.

al-Talib RK, Wright DH, Theaker JM.

Department of Pathology, Southampton University Hospitals, UK.

Comment in:

Histopathology. 1994 Sep;25(3):298-9.

Chrysiasis, the systemic deposition of gold pigment in patients on long term chrysotherapy, is identified histologically as small black granules within macrophages. Histological sections from 12 confirmed cases of chrysiasis were examined under crossed polarized light. This revealed a striking orange-red birefringence of the pigment not detected in other histologically similar deposits. This technique provides a valuable adjunct to the histological identification of gold without the need to resort to ultrastructural and analytical procedures.

PMID: 7910148 [PubMed - indexed for MEDLINE]

225. Bone. 1993;14(1):19-27.

The effects of growth hormone on fracture healing in rats: a histological description.

Mosekilde L, Bak B.

Department of Connective Tissue Biology, University of Aarhus, Denmark.

Previous biomechanical studies have indicated that growth hormone has a stimulatory effect on fracture healing. This study was designed to give a histological description of the long-term effects of growth hormone on fracture healing in rats. Sixty-four female rats were divided into two groups and were given either biosynthetic human growth hormone (2.7 mg/kg body weight/day) or

saline s.c. in two daily injections. This treatment was given for 20 days after a closed tibial fracture with medullary nailing had been performed. Five or six rats were killed from each group after 10, 20, 30, 40, 50, and 80 days of healing. The fracture site was embedded undecalcified in methylnmethacrylate, cut into 8 microns thick, mid-frontal sections, and investigated in a normal light microscope after staining with Masson Trichrome and in polarized light after staining with Sirius red. The results revealed that growth hormone had an initially stimulatory effect on external callus formation. However, the callus formed was loosely structured and was not removed by the normal modeling and remodeling process. The callus therefore persisted even after 80 days of healing. In contrast, after only 40 days the saline treated rats showed healing, with a resumption of the normal size and shape of the fractured tibial bone, leaving only a small amount of dense callus tissue. The study also revealed that the hemopoietic system was stimulated by growth hormone, with massive invasion of marrow cells into the external fracture callus. Bone marrow cells dominated the intratrabecular space in growth-hormone treated animals, even after 80 days of healing. (ABSTRACT TRUNCATED AT 250 WORDS)

PMID: 8442998 [PubMed - indexed for MEDLINE]

226. Masui. 1992 Nov;41(11):1814-7.

[Polarized light irradiation near the stellate ganglion in a patient with Raynaud's sign]

[Article in Japanese]

Otsuka H, Okubo K, Imai M, Kaseno S, Kemmotsu O.

Department of Anesthesiology, Hokkaido University School of Medicine, Sapporo.

Polarized light irradiation near the stellate ganglion was performed in a 55-year-old female with Raynaud's sign. She was suffering from cold and numb pain in bilateral fingers for 1 year. Stellate ganglion block and low reactive-level laser therapy near the stellate ganglion were not sufficient to relieve this symptom. Polarized light irradiation near the stellate ganglion induced a sting stimulation and warm sensation in her hands. Thermograms revealed a remarkable increase in temperature of her hands. The results imply that polarized light irradiation near the stellate ganglion increases blood flow of forearms and relieves Raynaud's sign.

PMID: 1460761 [PubMed - indexed for MEDLINE]

227. J Clin Periodontol. 1992 Oct;19(9 Pt 2):687-92.

Formulation of a drug delivery system based on a mixture of monoglycerides and triglycerides for use in the treatment of periodontal disease.

Norling T, Lading P, Engström S, Larsson K, Krog N, Nissen SS.

A/S Dumex, Copenhagen, Denmark.

This paper describes the development of a stable, controlled-release formulation of metronidazole for use in the treatment of periodontal disease. It is formulated as a suspension, which undergoes transformation to a release-controlling, semi-solid on contact with gingival fluid. The system is based on the ability of mixtures of monoglycerides and triglycerides to form liquid crystals, i.e., reversed hexagonals, in contact with water. The reversed hexagonal form was found to have the most favourable sustained release

properties, compared with those from the cubic form. The source of metronidazole is the prodrug, metronidazole benzoate, which further helps to slow down the release rate. Product characteristics are assessed by differential scanning calorimetry and viscometry. The release data derive from the results of in vitro dissolution tests. X-ray diffraction, phase diagrams, and polarized light microscopy were used to elucidate the structure of the liquid crystalline phases.

PMID: 1447387 [PubMed - indexed for MEDLINE]

228. *Anticancer Res.* 1992 Sep-Oct;12(5):1373-6.

Correlation of drug response in human tumors histocultured in vitro with an image-analysis MTT end point and in vivo xenografted in nude mice.

Colangelo D, Guo HY, Connors KM, Kubota T, Silvestro L, Hoffman RM.

AntiCancer Inc., San Diego, California 92110.

We have in this study used the 3-(4,5-dimethyl-2-thiazoyl)-2,5-diphenyl 2-H-tetrazolium bromide (MTT) end point in our histoculture drug-response assay. We have previously demonstrated that the formazan crystals formed by MTT reduction by mitochondrial succinate dehydrogenase reflect polarized light and can be measured by pixel analysis in intact tissue. The results described here indicate a total specificity of 93.8% and a total accuracy of 74.6% of the MTT end point for drug response in histoculture correlating with nine different human xenograft tumors grown in nude mice with respect to the in vivo drug response data. This in vitro system allows prediction of positive and negative responses to drugs, with a rate of 70% and 71.8%, respectively. The system described here has potential for clinical use because of the possibility of simultaneous description of the MTT values and heterogeneous response to drugs within individual tumors.

PMID: 1444193 [PubMed - indexed for MEDLINE]

229. *Arthroscopy.* 1992;8(3):305-10.

Effusions after anterior cruciate ligament reconstruction using the ligament augmentation device.

Yamamoto H, Ishibashi T, Muneta T, Furuya K, Mizuta T.

Department of Orthopaedics, Tokyo Medical and Dental University, Japan.

Persistent effusions occurred in 4.3% (seven patients) of 164 patients who underwent anterior cruciate ligament (ACL) reconstruction using an autograft augmented with the ligament augmentation device (LAD) between 1986 and 1989. No bacteria were cultured from the joint fluid. The radiograph in each case showed a tibial drill hole located anteriorly or anterolaterally. Arthroscopy confirmed an abraded LAD in six cases and breakage of the LAD in one case and impingement of the graft on the femoral condyle during extension. Under polarized light microscopy, the histology of the synovia showed foreign body giant cells in one case and particles among the proliferative cells in four cases. The effusions subsided in two cases after notchplasty and in five cases after removal of the LAD. Impingement of the graft on the femoral condyle due to incorrect positioning of the tibial drill hole presumably produced particles that induced synovitis and effusions.

PMID: 1418201 [PubMed - indexed for MEDLINE]

230. Scand J Infect Dis. 1991;23(3):377-82.

Cure of zygomycosis caused by a lipase-producing *Rhizopus rhizopodiformis* strain in a renal transplant patient.

Nordén G, Björck S, Persson H, Svalander C, Li XG, Edebo L.

Department of Nephrology, Sahlgrenska Sjukhuset, University of Göteborg, Sweden.

A 40-year-old man with renal failure due to membranous glomerulonephritis received a cadaveric renal transplant and immunosuppressive therapy with cyclosporine, azathioprine and steroids. Initially the transplantation was successful. 12 days after the transplantation, however, serous secretion appeared in the wound. Later, black necrosis was seen. Fungal culture showed growth of a zygomycete species. *Rhizopus rhizopodiformis*, with high in-vitro resistance to amphotericin B, flucytosine, fluconazole, ketoconazole and itraconazole. The MIC value for the allylamine derivative SF86-327 (Exoderil) was 1.6 micrograms/ml. Microscopic examination of sections from a surgical revision showed necrosis of the fat tissue and massive hyphal invasion of the perirenal fat, which contained semi-crystalline material anisotropic as seen in polarized light and characteristically staining with rubanic acid. These histological data indicate a lipase-induced in-vivo splitting of lipids into fatty acids. In-vitro *R. rhizopodiformis* showed very high extracellular lipase production. 11 days after initiation of amphotericin B therapy cultures and sections remained positive for rhizopus. Amphotericin B was therefore supplemented with Exoderil orally, cyclosporine and steroids were maintained, and azathioprine was discontinued. The wound granulated, shrank, and healed completely in 10 weeks.

PMID: 1882202 [PubMed - indexed for MEDLINE]

231. J Oral Rehabil. 1990 Nov;17(6):573-8.

The production of secondary caries-like lesions on cavity walls and the assessment of microleakage using an in vitro microbial caries system.

Gilmour SM, Edmunds DH, Dummer PM.

Department of Conservative Dentistry, Dental School, University of Wales College of Medicine, Cardiff, U.K.

The aim of this study was to assess microleakage along restored cavity walls using a new in vitro microbial technique. Extracted human teeth containing cavities restored with a microfine posterior composite were incubated in broth inoculated with a single strain of *Streptococcus mutans* for 10 days, using a sequential batch culture technique. Each margin of the cavities was finished in one of three ways: butt joint and etching; butt joint and no etching, or; bevel joint and etching. The assessment of microleakage was achieved by examining sections of the teeth histologically using polarized light for the presence or absence of caries-like cavity wall lesions. Outer (surface) lesions were also examined and displayed the characteristic zones of early natural caries lesions. The cavity wall lesions were observed as a translucent zone in 31% of butt and unetched margins, 16% of butt and etched margins, and 5% of bevelled and etched margins.

PMID: 2283552 [PubMed - indexed for MEDLINE]

232. Acta Odontol Scand. 1990 Jun;48(3):161-7.

Proximo-occlusal composite restorations in primary molars: marginal adaptation, bacterial penetration, and pulpal reactions.

Varpio M, Warfvinge J, Norén JG.

Pedodontic Clinic, Public Dental Service, Gothenburg, Sweden.

Marginal adaptation and bacterial penetration were studied in 32 primary molars filled with composite resin in shallow class II cavities. The restorations had served in the mouth for 3 years (mean, 3 years and 4 months; range, 8 months to 6 years and 4 months). Ground sections of the retrieved teeth were evaluated with polarized light microscopy and demineralized sections with light microscopy. Clinically excellent restorations, free from bacteria, were found in 25%. Gaps were recorded in 42%, under- or over-contouring and porosities in 95%, caries in the cervical area in 58%. Bacteria were observed subjacent to the fillings in 75% and in the dentin tubules in 61%. Pulpal necrosis was found in 7 of 16 teeth. Marginal discoloration, visible crevice, or color mismatch was associated with marginal defects, bacterial leakage, and pulpal reactions.

PMID: 2195839 [PubMed - indexed for MEDLINE]

233. Angle Orthod. 1990 Summer;60(2):135-52.

Rigid endosseous implant utilized as anchorage to protract molars and close an atrophic extraction site.

Roberts WE, Marshall KJ, Mozsary PG.

Department of Orthodontics, Indiana University School of Dentistry, Indianapolis 46202.

A two-stage endosseous implant, placed in the retromolar area of the mandible was utilized as rigid anchorage to translate two molars 10-12 millimeters mesially into an atrophic edentulous ridge. Despite substantial anchorage demand over a three year period, the endosseous implant remained rigid ("osseointegrated"). At the end of treatment the implant and adjacent, intravitaly labeled bone were recovered. Microradiographic and polarized light analyses revealed that about 80 percent of the endosseous portion of the implant was in direct contact with mature lamellar bone. Bone labels demonstrated a remarkably high remodeling rate (about 30 percent/year) for cortical bone within 0.5 millimeter of the interface. Continuous remodeling may be the long-term mechanism whereby loaded implants resist bone fatigue and maintain "osseointegration." Clinical use of orthodontic implants, placed outside the dental arches, requires careful attention to soft tissue management.

PMID: 2344070 [PubMed - indexed for MEDLINE]

234. Rheumatol Int. 1990;10(1):1-8.

beta 2-Microglobulin amyloidosis. A systemic amyloid disease affecting primarily synovium and bone in long-term dialysis patients.

Maury CP.

Fourth Department of Medicine, University of Helsinki, Finland.

A number of rheumatic disorders occur in patients on long-term hemodialysis treatment. In recent years a clinical syndrome comprising carpal tunnel syndrome, destructive arthropathy, and cystic bone lesions has been recognized in these

patients. Congo-red staining and microscopy in polarized light reveal a high frequency of amyloid in the affected tissues. Amino acid sequence data of the isolated major amyloid fibril protein show its identity with beta 2-microglobulin. beta 2-microglobulin amyloid has a predilection for synovial tissues and bone, but visceral deposits may also occur indicating the systemic nature of the disease. The clinicopathological features, pathogenesis, and diagnosis of beta 2-microglobulin amyloidosis are reviewed, and the therapeutic and prophylactic measures discussed. The identification of beta 2-microglobulin as an amyloidogenic protein has in an important way contributed to the understanding of the mechanisms of amyloidogenesis in general and emphasized the complexity of amyloid disease and the diversity of proteins capable of forming congophilic fibrillar deposits in human tissues.

PMID: 2191408 [PubMed - indexed for MEDLINE]

235. J Urol. 1989 Sep;142(3):821-2.

Pulmonary migration following periurethral polytetrafluoroethylene injection for urinary incontinence.

Claes H, Stroobants D, Van Meerbeek J, Verbeken E, Knockaert D, Baert L.

Department of Urology, University Clinic of St.-Pieter, Leuven, Belgium.

Comment in:

J Urol. 1991 Apr;145(4):839-40.

We report a case of clinically significant migration of polytetrafluoroethylene (Teflon) paste particles to the lungs after periurethral injection. These particles were identified by standard and polarized light microscopy. Since the long-term effects in humans are not sufficiently known, we strongly warn against the use of polytetrafluoroethylene paste in children or young adults with a normal life expectancy.

PMID: 2671416 [PubMed - indexed for MEDLINE]

236. J Prosthet Dent. 1989 May;61(5):535-43.

Photoelastic analysis of stress transfer by endodontically treated teeth to the supporting structure using different restorative techniques.

Assif D, Oren E, Marshak BL, Aviv I.

Department of Prosthodontics, Tel Aviv University, Maurice and Gabriela Goldschleger School of Dental Medicine, Israel.

A photoelastic model was used to examine the influence of different types of restorations placed following endodontic therapy, emphasizing the way in which forces applied to the occlusal surface were dispersed to the supporting structures of the teeth. Stresses were photographed in the polarized light field. Findings indicate that distribution and patterns of stresses vary depending on the direction of the loads and the nature of the involved restorative procedures.

PMID: 2664139 [PubMed - indexed for MEDLINE]

237. J Osaka Dent Univ. 1989 Apr;23(1):57-62.

Increased remineralization of subsurface enamel lesions with molybdenum

treatment.

Kambara M, Uemura M, Noshi H, Miyake T, Konishi K.

The present study was conducted to determine the effect of high molybdenum (Mo) concentration on fluoride (F) uptake and remineralization of subsurface lesions utilizing acid cyclic methods in vitro. Bovine enamel with artificial subsurface lesions were treated with test solutions containing 1,000 ppm F (NaF) with and without 1,000 ppm Mo at pH 7.0. F uptake was analyzed using a microdrilling technique and remineralization was evaluated by polarized light microscopy. The results indicate that addition of 1,000 ppm Mo in a 1,000 ppm F solution modestly increases F uptake and promotes remineralization of subsurface lesions compared with 1,000 ppm F alone. These findings suggest that a high level of Mo may enhance the remineralizing activity of F in subsurface bovine enamel lesions in vitro.

PMID: 2640940 [PubMed - indexed for MEDLINE]

238. Lasers Surg Med. 1989;9(6):589-94.

Lactate dehydrogenase in laser incisions: a comparative analysis of skin wounds made with steel scalpel, electrocautery, superpulse--continuous wave mode carbon-dioxide lasers, and contact Nd:YAG laser.

Hukki J, Lipasti J, Castren M, Puolakkainen P, Schröder T.

Second Department of Surgery, Helsinki University Central Hospital, Turku, Finland.

A histochemical method for demonstrating lactate dehydrogenase activity was used in addition to standard Van Gieson stain to study early alterations near wounds made in pig skin by steel scalpel, electrocautery, two modes of CO₂ laser (the rapid super-pulse mode and the continuous wave mode), and contact Nd:YAG laser. The enzyme-free zone near the wounds made using the thermal knives appeared to be twice as wide as the necrotic zone observed with Van Gieson stain. In polarized light, the enzyme-free area showed two zones of equal width with respect to birefringence of collagen fibers. The zone lacking birefringence correlated well with that observed with Van Gieson stain. The birefringent zone represented functionally damaged tissue with more or less normal structures by light microscopy. The damage to adjacent tissue caused with the thermal knives seems to be considerably larger than has usually been reported.

PMID: 2601553 [PubMed - indexed for MEDLINE]

239. Caries Res. 1988;22(4):250-6.

The effect of regular professional plaque removal on dental caries in vivo. A polarized light and scanning electron microscope study.

Holmen L, Mejare I, Malmgren B, Thylstrup A.

Department of Structural Properties of Materials, Technical University of Denmark, Copenhagen.

This study aims to describe the histological and ultrastructural enamel reactions to regular disturbance/removal of dental plaque, using an in vivo caries model. Fourteen young volunteers undergoing orthodontic treatment participated in the study. To create local protected areas, orthodontic bands with a buccal space were placed in homologous pairs of premolars. One tooth in each pair served as

control and had the band cemented for the entire test period of 5 weeks. The other band was removed weekly and the buccal surface cleaned, either by careful pumicing with a nonfluoride toothpaste, or by simple cleaning with a cotton pellet. Results indicated that 5 weeks with completely undisturbed plaque accumulation resulted in visible enamel demineralization in all 14 individuals, whilst a weekly performed professional plaque removal was able to prevent lesion progress independent of the cleaning procedure. It is therefore concluded that regular mechanical disturbance of dental plaque is able to suppress bacterial activity and hence caries development.

PMID: 3165719 [PubMed - indexed for MEDLINE]

240. J Dent Res. 1987 Nov;66(11):1640-3.

The use of saturated DCPD in remineralization of artificial caries lesions in vitro.

Wefel JS, Harless JD.

Dows Institute for Dental Research, College of Dentistry, University of Iowa, Iowa City 52242, USA.

Dicalcium phosphate dihydrate (DCPD) may play a significant role in the caries lesion since it is a stable calcium phosphate phase under acidic conditions. The reaction of DCPD and fluoride, forming fluorapatite (FAP), may provide a potentially promising treatment regimen for remineralization of caries lesions in vivo. The purpose of this study was to determine whether a two-step DCPD and inorganic wash with fluoride can remineralize artificial caries-like lesions in vitro. We used the single-section technique to facilitate quantitation of the same tissue before and after the experimental regimen. The two-step remineralizing treatment was repeated three times and consisted of a two-minute saturated DCPD treatment (pH 2.1) followed by a 24-hour inorganic wash. Lesion parameters were recorded before and after treatment by the taking of polarized light photomicrographs of each section after imbibition in several media. The changes in the tissue following treatment were expressed as a percent change in the area of the initial pre-treatment lesion. Significant reductions ($p < 0.02$) in lesion pore volume were observed in all aqueous media examined. In the lesions after imbibition in quinoline, remineralization was also apparent from the significant increase in the area of the dark zone following treatment. This two-step DCPD treatment appears to remineralize artificial caries-like lesions effectively, but additional work is needed to determine whether it affords any protection against subsequent cariogenic challenges.

PMID: 10872398 [PubMed - indexed for MEDLINE]

241. Am J Surg Pathol. 1987 Nov;11(11):890-4.

Unusual intestinal talcosis.

Anani PA, Ribaux C, Gardiol D.

Institut de Pathologie, Centre Hospitalier Universitaire Vaudois, Lausanne, Switzerland.

A case of intestinal talcosis in a 46-year-old man is reported. At the age of 27, the patient was treated for pulmonary tuberculosis with tablets containing talc (183 g talc per 2,670 g total drug intake) over a period of 28 months. Eighteen years later, the patient was hospitalized for abdominal pain that remained refractory to antacids; he subsequently underwent a right hemicolectomy.

Light-microscopic examination revealed a prominent fibrosis of the intestinal wall in which birefringent particles were demonstrated by polarized light. Using energy-dispersive spectroscopy, an analysis of these particles showed that they were predominantly composed of silicon and magnesium as well as small amounts of phosphorus, sulphur, calcium, and iron--the spectrum typically associated with talc. We believe that the source of this talc is the tablets ingested by the patient during prior antituberculosis therapy.

PMID: 3674285 [PubMed - indexed for MEDLINE]

242. Hinyokika Kiyō. 1987 Jan;33(1):101-5.

[A case of localized amyloidosis of the urethra]

[Article in Japanese]

Ogawa T, Uekado Y, Fujinaga T, Kusuyama Y.

A case of localized amyloidosis of the urethra is reported. A 42-year-old man visited with the complaint of urethral discharge and urethral tumor on May 24, 1985. A small fingertip sized, elastic hard mass was present on the left side of the external urethral meatus. Cold cup biopsy of the urethral tumor was done. Histological examination of the tumor showed amorphous eosinophilic tissue staining. Green birefringence indicating amyloidosis by Congo red staining was observed under polarized light microscope. Since the patient's symptoms were minimal, no specific therapy was instituted.

PMID: 2437777 [PubMed - indexed for MEDLINE]

243. Taehan Chikkwa Uisa Hyophoe Chi. 1986 Feb;24(2):171-81.

[Polarized light microscopy findings of the dental hard tissues irradiated with a CO₂ laser]

[Article in Korean]

Lee HR.

PMID: 3086469 [PubMed - indexed for MEDLINE]

244. J Am Intraocul Implant Soc. 1985 Nov;11(6):564-7.

Intraocular lens damage associated with posterior capsulotomy: a comparison of intraocular lens designs and four different Nd:YAG laser instruments.

Fallor MK, Hoft RH.

A comparison of intraocular lens damage associated with four different Nd:YAG laser instruments was performed using polarized light, scanning electron microscopy, and a qualitative measurement of optical resolution. Five intraocular lens designs, each of which provided a different separation between the intraocular lens and a model of the posterior capsule, were tested with each laser instrument. There was no statistically significant difference in the frequency of lens pitting caused by each laser. Intraocular lenses designed with a theoretical separation of 0.25 mm or more between the lens and the posterior capsule sustained no damage with any of the laser instruments used in this study.

PMID: 3841118 [PubMed - indexed for MEDLINE]

245. Am J Pathol. 1984 Mar;114(3):431-42.

Amyloid deposits in bioprosthetic cardiac valves after long-term implantation in man. A new localization of amyloidosis.

Goffin YA, Gruys E, Sorenson GD, Wellens F.

Congo red staining with microscopic examination under polarized light was performed in 30 porcine bioprosthetic cardiac valves and one autologous fascia lata valve explanted from 31 patients in order to detect the presence of amyloid. Microdeposits of amyloid were present in the sewing ring of the fascia lata valve and in 10 porcine bioprostheses, and this finding was confirmed by transmission electron microscopy in 3 porcine bioprostheses. All amyloid-laden porcine valves had been implanted for at least 33 months before removal, and all except two showed dysfunction and/or severe degeneration of cuspal tissue. Statistical analyses failed to establish any correlation between the presence of amyloid and patient-related factors. In a majority of porcine bioprostheses amyloid was permanganate-sensitive and tryptophan-positive. The pathogenesis of this new form of heart valve amyloidosis might consist in penetration of human macrophages in deteriorated bioprosthetic cusps and their interaction with blood-borne amyloid precursors.

PMCID: PMC1900422

PMID: 6421168 [PubMed - indexed for MEDLINE]

246. Zentralbl Allg Pathol. 1984;129(5):413-22.

[Metabolic triglyceride storage disorders. A report of 2 cases of systemic carnitine deficiency]

[Article in German]

Künnert B, Ziegen J, Kühn HJ, Wässer S, Meier T, Förster G, Mahneke PF.

Two cases of triglyceride storage in liver, kidney, heart, and skeletal muscle are described in infants who died at the age of 1 1/2 years and 4 d, respectively. In the first patient, a previously normal girl, the clinical symptoms began two months before death with encephalopathy (vomiting, unconsciousness), liver enlargement, hypoglycemia, increase in serum transaminases. These signs disappeared within the following days. Some weeks later she died during the second attack. The 4-d-old boy, the second child of healthy consanguineous parents, showed at the third day of life an impaired sucking, muscular hypotonia, respiratory arrest and bradycardia. An intensive therapy was inefficient. At autopsy gross examination showed only a moderately enlarged yellow liver and an edematous brain in the first case and pale organs in the second one but no cause of death. The microscopical examination of all tissues of both cases showed fat storage within the four organs mentioned above. The common histochemical methods for neutral lipids were positive, the Schultz-reaction for cholesterol and cholesterol esters was negative. The lipid laden cells did not show birefringence in polarized light. A predominance and strong fat storage of the type I fibres was found in the skeletal muscle. The storage of triglyceride could be confirmed by histochemistry, a thin-layer chromatography of tissue sections. The triglyceride accumulation in liver, heart, kidney, and skeletal muscle is a characteristic feature of systemic carnitine deficiency. The clinical symptoms of the first patient are in agreement with reports of this disease also. A carnitine deficiency in a newborn was not yet described. Family studies revealed a low carnitine concentration in the mother's serum in both cases, while the serum of father and brother resp. sister showed

normal carnitine levels.

PMID: 6528756 [PubMed - indexed for MEDLINE]

247. Scan Electron Microsc. 1984;(Pt 3):1313-20.

Fibroblast-collagen sponge interactions and the spatial deposition of newly synthesized collagen fibers in vitro and in vivo.

Doillon CJ, Whyne CF, Berg RA, Olson RM, Silver FH.

Fibroblast-collagen sponge interactions were studied in cell culture and dermal wound systems. In both models fibroblasts appear to adhere, attach and orient in the presence of type I collagen fibrils. In the presence of fibronectin, purified from bovine blood, adhesion and alignment of fibroblasts appeared to be enhanced as well as the deposition of thick collagen fibers. When collagen sponges were grafted onto full thickness dermal wounds the granulation tissue that was laid down within the collagen sponge appeared to differ from granulation tissue laid down below the collagen sponge or on similar wounds in the absence of a sponge. In the absence of a collagen sponge the granulation tissue is characterized by wavy collagen fibers that exhibit an extinction pattern characteristic of crimped fibers found in tendon when examined under polarized light. In contrast, collagen fibers laid down within the sponge appear to be highly oriented and lack evidence of crimp. These results suggest that the presence of a collagen matrix acts as a template that allows for the organized spatial deposition of newly synthesized collagen fibers. The enhanced biosynthesis of thick collagen fibers in the presence of a collagen sponge containing fibronectin may decrease the remodeling phase that is associated with dermal scarring.

PMID: 6505616 [PubMed - indexed for MEDLINE]

248. Diabetes. 1983 Dec;32(12):1092-101.

Unanticipated amyloidosis in dogs infused with insulin.

Albisser AM, McAdam KP, Perlman K, Carson S, Bahoric A, Williamson JR.

Highly purified regular porcine insulin was given by portable insulin pumps through indwelling vena caval catheters to 17 (13 normal, and 4 pancreatectomized) dogs initially weighing 15 +/- 2 kg at rates ranging from 2 to 10 mU/min (total 17-250 mg) over time periods ranging from 37 to 252 days. During the course of the study, many of the animals lost weight and became anemic. Since these conditions persisted and weight loss progressed even after cessation of insulin infusion, as many of the dogs as possible (15 of 17) were autopsied for microscopic studies. Large amounts of amyloid were demonstrated in the liver, kidney, spleen, and/or pancreas in 55% (6/11) of normal, and in 75% (3/4) of pancreatectomized dogs. The amyloid deposits were Congo red positive, exhibited classical apple green fluorescence under polarized light, and possessed the characteristic ultrastructural features of amyloid. Massive deposits of amyloid were observed in animals receiving as little as 17 mg of insulin over a time span of 52 days. In those animals with hepatic amyloid, marked hepatomegaly was present (i.e., 1200 +/- 250, X +/- SD, versus 300 +/- 25 g for normal animals) and preterminal serum alkaline phosphatase levels were markedly elevated (434 +/- 285 versus 30 +/- 14 IU/L for animals without hepatic amyloid). The magnitude of the hepatic amyloid deposits precludes the possibility that they represent insulin aggregates or insulin-derived products per se. No evidence of amyloid was present in any of the tissue biopsy specimens obtained prior to insulin infusion. Moreover, the possibility that this represents an immune response to the injected porcine insulin has to be viewed in light of the fact that the amino acid

sequences of dog and porcine insulins are identical. It is of particular interest that the affinity of the amyloid deposits for Congo red stain was totally abolished by prior permanganate treatment, suggesting that the amyloid was derived from serum amyloid A protein rather than from immunoglobulin light chains or insulin aggregates per se. Further evidence that the protein was of the AA-type came from the initial biochemical characterization. Gel filtration on Sephadex G100 in 6 M guanidine hydrochloride identified two small molecular weight peaks of about 13,000 and 25,000 daltons, both of which inhibited the radioimmunoassay for human AA protein. (ABSTRACT TRUNCATED AT 400 WORDS)

PMID: 6360758 [PubMed - indexed for MEDLINE]

249. J Rheumatol. 1983 Jun;10(3):503-6.

Staphylococcal septic arthritis presenting as acute flare of pseudogout: clinical, pathological and arthroscopic findings with a review of the literature.

Lurie DP, Musil G.

A patient with primary hyperparathyroidism and known pseudogout presented with an acute flare of the right knee. Gram stain was negative, and many intracellular calcium pyrophosphate dihydrate (CPPD) crystals were seen by both compensated polarized light and transmission electron microscopy. Cultures grew Staphylococcus aureus; the joint was probably seeded by an antecedent skin infection, with enzymatic "strip mining" precipitating acute pseudogout. The patient was refractory to therapy with oxacillin, naproxen, intravenous colchicine, and closed drainage. Arthroscopic debridement with insertion of drainage tubes led to rapid improvement, and offers an alternative to arthrotomy in septic knee arthritis unresponsive to closed drainage.

PMID: 6887177 [PubMed - indexed for MEDLINE]

250. J Am Optom Assoc. 1983 May;54(5):447-50.

Control of vertically polarized glare.

Peli E.

Reflected glare often interferes with vision. Since such glare is usually polarized it can be controlled with polarizers. The use of polarized filters to eliminate vertically polarized glare from blackboards and glossy printed material is presented. Practical means for the construction of such filters are discussed.

PMID: 6863803 [PubMed - indexed for MEDLINE]

251. Biull Eksp Biol Med. 1983 Jan;95(1):104-7.

[Effect of monochromatic red helium-neon laser on the morphology of zymosan arthritis in rats]

[Article in Russian]

Mul'diiarov PIa, Tsurko VV.

Histological and electron microscopy findings suggesting the effect of monochromatic coherent polarized red light on zymosan arthritis in rats are presented. The data obtained have confirmed that treatment of inflamed joints with laser rays exerts an evident therapeutic effect which is determined by

activated function of macrophages and fibroblasts of the synovial membrane, resulting in a more rapid change of inflammation phases. Analysis of the cases where the rats were treated with ordinary red light has revealed no essential differences in the joints of the control and irradiated groups.

PMID: 6830947 [PubMed - indexed for MEDLINE]

252. Chirurg. 1982 Nov;53(11):719-31.

[Results of animal experiments following the use of a new material--biocement--for osteoplasty and fixation of alloimplants]

[Article in German]

Raveh J, Stich H, Kehrer B.

We report on results obtained with biocement (BC), a new material recently developed in our laboratory, in animal experiments dealing with osseous repair in the facial area. The organic matrix of BC corresponds to the Bowen formula. Anorganic filler substances comprise $\text{Ca}_5(\text{PO}_4)_3\text{OH}$, Bioceramic A2 (Battelle) and Bioglass Hench. We applied the new material to the following surgical interventions in monkeys or dogs: reconstruction of the anterior wall of the frontal sinus; covering of skull cap defect with or without a lesion of the dura mater; fixation of autologous bone transplants; bridging of defect in the mandible and the fixation of alloimplants under stress. The histological preparations of undecalcified bone were examined by light microscopy, in polarized light, with the help of scanning electron-microscope and the interface evaluation between implant and bone with energy dispersive X-ray analysis. Direct contact between BC and bone, and interdigitations between the two, as well as new bone formation were the rule. In addition, very few reactive changes were observed in cerebro-meningeal tissues neighboring BC. The latter did also not disturb the regeneration of ciliated epithelium in its vicinity.

PMID: 6761094 [PubMed - indexed for MEDLINE]

253. Circulation. 1982 Nov;66(5):917-22.

Transluminal angioplasty in experimental atherosclerosis. Analysis for embolization using an in vivo perfusion system.

Sanborn TA, Faxon DP, Waugh D, Small DM, Haudenschild C, Gottsman SB, Ryan TJ.

We used polarized light microscopy and thin-layer chromatography to determine whether embolization of atherosclerotic material occurs after transluminal angioplasty. The experimental model consisted of an in vivo perfusion system of the atherosclerotic rabbit left iliac artery. Of eight rabbits that underwent successful angioplasty, four had angiographic evidence of dissection and three showed aneurysm formation. Histologic studies demonstrated fracture of the intimal plaque, dissection, and stretching of the noninvolved portion of the vessel. Perfusate analysis revealed no detectable cholesterol by thin-layer chromatography in six of eight rabbits. In two rabbits, a very small amount of cholesterol was measured, which was totally accounted for by hemorrhage into the perfusate rather than from cholesterol in the plaque. No evidence of arterial wall embolic debris could be detected by polarized light microscopy in seven rabbits, but lipid debris from the plaque was found in the perfusate of one rabbit that had excessive arterial trauma. We conclude that the major mechanism of successful transluminal angioplasty in this experimental model is intimal fracture combined with stretching of a noninvolved portion of the vessel. Furthermore, embolization of atheromatous lipid debris was an uncommon event

related to arterial trauma during catheter placement rather than transluminal angioplasty itself.

PMID: 6215186 [PubMed - indexed for MEDLINE]

254. Swed Dent J Suppl. 1982;15:123-9.

Root resorption following slow maxillary expansion.

Lilja E, Odenrick L.

In the present investigation the occurrence and nature of root resorption in patients treated with slow maxillary expansion appliances was studied with the aid of radiographs and histological sections from premolars. The radiographs failed to reveal any root resorption, but on the histological sections resorption lacunae were identified. Three types of resorption were distinguished: active, arrested and repaired. The majority of the resorption cavities were located on the bucco-marginal side of the premolars and were of the arrested or repaired type. Examination in polarized light revealed that the reparative cementum was different from normal cementum and that no new attachment had been established between the principal fibres in the periodontal ligament and the reparative cementum.

PMID: 6763782 [PubMed - indexed for MEDLINE]

255. Ann Pathol. 1982;2(2):155-7.

[D-Penicillamine effect on collagen synthesis and structural maintenance Red Sirius staining with polarized-light examination. The value of this staining in cases of collagen diseases (author's transl)]

[Article in French]

Pieraggi MT, Bonafe JL.

A severe systemic scleroderma has been treated by D-Penicillamine. A pathological study before and after treatment showed important changes of the collagen structure. The soluble or foetal collagen fraction is enhanced. By the Red-Sirius staining with polarized light examination of the bundles of foetal collagen are green and bright. Then, this staining appears as a marker of collagen structures.

PMID: 6179525 [PubMed - indexed for MEDLINE]

256. Arch Pathol Lab Med. 1981 Feb;105(2):86-8.

Tuberculoid cornstarch granulomas with caseous necrosis. A diagnostic challenge.

Nissim F, Ashkenazy M, Borenstein R, Czernobilsky B.

We studied a patient in whom peritoneal granulomas developed with caseous-type necrosis after exposure to cornstarch from surgical gloves. This necrotizing type of lesion, which is the least common among cornstarch granulomas, can simulate tuberculous infection and lead to initiation of antituberculous therapy. A review of the literature suggests that there are two basic types of cornstarch granulomas: the phagocytic, foreign body type, and the tuberculoid granuloma with and without central necrosis. The morphologic features and possible mechanism of formation of these types of granulomas are being discussed. Although the

cornstarch particles can be identified with a variety of stains, the most reliable method is that of examination with polarized light, which is recommended in all cases of granulomas, especially abdominal ones.

PMID: 6893923 [PubMed - indexed for MEDLINE]

257. Acta Derm Venereol. 1981;61(5):444-7.

Hair changes due to zinc deficiency in a case of sucrose malabsorption.

Weismann K, Hagdrup HK.

A 7-year-old girl suffering from chronic diarrhoea due to sucrase deficiency was referred because of poor hair growth. Her scalp hair had a poor, colourless appearance and was much thinned in the occipital region. Her skin was dry, but otherwise normal. P-zinc was low (7.9 $\mu\text{mol/l}$), whereas P-albumin was normal. Oral zinc therapy, 40 mg daily, had a marked beneficial effect on her scalp hair, eyebrows and eyelashes, which became thicker and pigmented. Beau lines appeared on thumb-nails and 4th left finger-nail. A rise in P-zinc and S-alkaline phosphatase levels was observed during the zinc supplementation. Microscopic examination of her poor scalp hair, using polarized light, revealed well-defined abnormalities of the hair shafts, as reported by others in a case of acrodermatitis enteropathica: 1) a marked individual variation in diameter, 2) narrowing often associated with waving or sharp bending and broken ends, 3) striation with a tendency to trichonodosis. Such changes were absent in the pigmented hair appearing after the start of zinc therapy.

PMID: 6172938 [PubMed - indexed for MEDLINE]

258. Resuscitation. 1980 Jun;8(2):101-14.

Intrahematic crystallization of hemoglobin related to blood preservation with acid citrate dextrose and shock.

Poraicu D, Mogoşeanu A, Menessy I, Poraicu M, Bageacu V.

In 480 investigations and 40 samples of blood stored liquid with acid citrate dextrose, under adequate conditions for morphological study, many crenated cells of echinocyte types II-III were observed. In 17 samples of blood within 17-21 days of preservation 80-100% crenated red cells were observed including spherocytes. The filterability test performed with significant differences of $P < 0.001$. In 45 critically ill patients filterability was increased by more than 50%, $P < 0.001$. Some samples of stored blood appear anisotropic in polarized light microscopy, proving internal crystallization of hemoglobin, the only compound in the blood from some patients in shock and following massive transfusion of 3.5-4 liters. The phenomenon, undoubtedly could give evidence for the participation of internal crystallization of hemoglobin in the late stages of transformation of red cells into crenated shape with two possible factors being incriminated: the participation of membrane or crystallization of Hb. Anisotropic, birefringent, red cells indicate great modification in the specific viscosity of erythrocytes in above conditions. The data are in keeping with the findings of Taube, Massuda and Shoemaker (1973) who suggested that changes in the viscosity of the blood in traumatized patients may be related to alterations in the internal viscosity of the red cell.

PMID: 7455377 [PubMed - indexed for MEDLINE]

259. Hautarzt. 1980 Mar;31(3):161-3.

[Alopecia and hair changes following colchicine therapy]

[Article in German]

Harms M.

After a two month treatment with colchicine in small doses, a 43 year old patient suffered from a diffuse alopecia. The hairs were damaged and mostly broken 1-2 cm above the scalp. Microscopic examination with polarized light proves to be a very efficient and simple method of investigation of the hair.

PMID: 7399906 [PubMed - indexed for MEDLINE]

260. Ophthalmologica. 1980;181(2):100-7.

[Sensory binocular relationships in divergent strabismus and convergent strabismus]

[Article in French]

Pigassou-Albouy R.

The adaptive processes mentioned here (which include inhibitory phenomena and modifications in spatial localization) were observed, using a stereoprojector which polarized light. Comparing the adaptive processes in convergent and divergent strabismus has led to the following observations: (1) there are differences between the two types of strabismus; these differences appear not only at the level of the binocular sensory parameter but also at the level of motor and accommodative parameters; adaptive processes are less deep and less serious in divergent and strabismus; these differences are also manifest in therapy: divergent strabismus is curable whatever the age, treatment is much shorter. These observations were the starting point for using prismatic overcorrection to induce a state of 'sensory divergence' as treatment in cases of convergent strabismus with anomalous retinal correspondence. The excellent results obtained using this method of treatment are not only due to the action on sensory binocular relations, but also to the fact that prismatic overcorrection also modifies abnormal motor patterns. Treating strabismus must involve the entire disturbed optico-sensorimotor complex.

PMID: 7219962 [PubMed - indexed for MEDLINE]

261. Kidney Int. 1979 Dec;16(6):722-8.

Urinary matrix calculi consisting of microfibrillar protein in patients on maintenance hemodialysis.

Bommer J, Ritz E, Tschöpe W, Waldherr R, Gebhardt M.

In seven patients on maintenance hemodialysis, de novo recurrent renal stone formation was observed. In all patients, the underlying disease was glomerulonephritis, with or without the nephrotic syndrome. All patients had considerable persistent proteinuria. The stones consisted predominantly of protein, as revealed by amino acid analysis, and had a negligible carbohydrate and lipid content. Only in some specimens, X-ray diffraction and scanning electron microscopy revealed the presence of small amounts of whewellit (calcium oxalate monohydrate) and/or uric acid. In semithin sections, the stones had a laminated texture and exhibited structural anisotropy under polarized light. With transmission electron microscopy, they were found to consist of peculiar

microfibrils. The proteinaceous material differed from fibrin or Tamm-Horsfall-protein, as indicated by ultrastructure, carbohydrate analysis, and amino acid analysis. Symptomatic de novo matrix stone formation constitutes another complication of dialyzed patients which has not been reported so far.

PMID: 548610 [PubMed - indexed for MEDLINE]

262. Arthritis Rheum. 1977 Jun;20(5):1125-8.

Plant thorn synovitis.

Sugarman M, Stobie DG, Quismorio FP, Terry R, Hanson V.

Five children with an inflammatory monarthritis due to penetration of the joint by plant thorns are presented. The clinical presentation was that of a transient acute synovitis followed by a relatively asymptomatic period, and later by chronic arthritis often after the thorn injury was forgotten. Histopathology demonstrated a granulomatous synovitis. Polarized light microscopy facilitated identification of the plant tissue within the synovium. Conservative medical therapy was ineffective, but surgical excision of the affected synovium resulted in normal joint function. The differential diagnosis of monarthritis in children is extensive, and awareness of this condition is necessary to elicit a comprehensive history and to avoid delay in treatment.

PMID: 869959 [PubMed - indexed for MEDLINE]

263. Eur Urol. 1977;3(3):171-5.

Scanning electron microscopic study of calcium oxalate concretions grown in gel system and calcium oxalate stones.

Phaneuf-Mimeault F, Tawashi R.

Calcium oxalate concretions grown in gelatin gel medium, and calcium oxalate renal stones were studied by polarized light and scanning electron microscopy. In both cases, the results obtained confirm that the surface crystals have random axial orientation and that the gross configuration seems to be determined by the fibrous organic matrix. In vitro concretions grown in the gelatin gel medium are more resistant to EDTA demineralization and to ultrasonic irradiation than calcium oxalate stones.

PMID: 407084 [PubMed - indexed for MEDLINE]

264. Q J Med. 1976 Apr;45(178):233-53.

Fibrogenesis imperfecta ossium.

Swan CH, Shah K, Brewer DB, Cooke WT.

The case history, clinical course and laboratory findings in a 66-year-old woman with fibrogenesis imperfecta ossium are reported, the sixth case in the literature. The condition is characterized clinically by intractable skeletal pain and progressive immobility. Though serum alkaline phosphatase has been raised in all patients, there are no specific haematological or biochemical findings. The radiological features of coarse and dense trabecular pattern with symmetrical and diffuse involvement of all bones without expansion or change of shape, together with periosteal reactions and soft tissue calcification are characteristic. The macroscopic appearance of bone shows large areas of opaque

white and brittle trabeculae. The histological findings mimic those of osteomalacia unless examined under polarized light which shows the loss of normal birefringence. On electron microscopy the normal lamellar pattern made up of orientated collagen fibrils all about 80 nm diameter is replaced by a random tangled pattern of much thinner irregularly curved fibrils, some as thin as 5nm. The condition appears to be acquired, leading to erosion of the normal skeleton and replacement with an abnormal fibre deficient matrix. There is no definitive therapy at present.

PMID: 1085005 [PubMed - indexed for MEDLINE]

265. Pol Med Sci Hist Bull. 1976 Apr-Jun;15(2):241-6.

Effect of dehydration of the cornea with experimentally induced ulcer on collagenase activity.

Szwarc B, Wawrzyniak M.

In the course of healing of experimental ulcer one could observe a distinct difference between a cornea, subjected to the action of glycerol and a control one. The damage to the chemical structure of collagenous fibers was much smaller than in the control. On the basis of the investigations performed one may conclude that glycerol, through dehydration of the corneal tissue and stimulation of mucopolysaccharide synthesis, suppresses the activity of collagenase. In polarized light this process was manifested by the double refraction phenomenon and in clinical observation--by an accelerated healing of ulcer.

PMID: 183191 [PubMed - indexed for MEDLINE]

266. Postgrad Med. 1976 Jan;59(1):231-236.

Surgery. Cornstarch peritonitis following the trail of the surgeon's gloves.

Berkow AE.

Granulomatous inflammation of the peritoneal surfaces resulting from exposure to cornstarch granules from surgical gloves produces a syndrome of abdominal pain, adynamic ileus, fever, peritonitis, variable white blood cell count, and inflammatory ascites. Symptoms develop three to four weeks after a routine abdominal surgical procedure. Recognition of this entity by nonsurgical means is necessary to avoid reoperation. Paracentesis with examination of fluid by polarized light offers the best method of non-surgical diagnosis. Treatment is with steroids or indomethacin or conservative measures. To prevent the disease, gloves must be washed effectively before operation.

PMID: 1246540 [PubMed - indexed for MEDLINE]

267. Wien Klin Wochenschr. 1975 Sep 5;87(16):521-4.

[Generalized secondary amyloidosis in patients with chronic rheumatoid arthritis (author's transl)]

[Article in German]

Tausch G, Siegmeth W, Eberl R.

During a period of 6 years (1968 to 1973) 177 patients with rheumatoid arthritis were submitted on one or more occasions to biopsy of the rectal mucosa for the

diagnosis of amyloidosis. The indications for biopsy were as follows: 1. proteinuria, even in an intermittent form, 2. progressive type of rheumatoid arthritis with high inflammatory activity, 3. rheumatoid arthritis of longer than 2 years duration with a marked tendency to joint destruction. The histological specimens were stained with Congo red and investigated in polarized light. The biopsy for amyloidosis was positive in 80 patients (45.2%) of whom 14 showed no proteinuria, even of an intermittent nature. Patients with rheumatoid arthritis survived maximally 5 years after amyloidosis had been diagnosed. No successful therapy of amyloidosis has been devised.

PMID: 1226759 [PubMed - indexed for MEDLINE]

268. Clin Orthop Relat Res. 1975;(107):232-8.

The effect of growth hormone on established cartilage lesions. A presidential address to the Association of Bone and Joint Surgeons, 1974.

Chrisman OD.

The major problem in osteoarthritis research today is our inability to promote effective cartilage regeneration in the presence of adult chondromalacia. Yet such regeneration is consistently present in acromegalics. The present study of experimentally damaged rabbit knee cartilage measures numbers of cells, mitoses, tritiated thymidine incorporation, DNA content, collagen presence under polarized light and sulfated protein polysaccharides histologically. Under growth hormone stimulation cell counts nearly double as compared to controls, TTI increases, DNA content triples or more. Matrix healing is evident histologically. The addition of salicylate has a mild additive effect on cell counts and on retention of matrix. The above data appear to be the first reported demonstration of these effects of growth hormone on experimentally damaged cartilage and may gain importance for clinical use when human growth hormone or substitutes for it become available.

PMID: 1132180 [PubMed - indexed for MEDLINE]

269. J Bone Joint Surg Am. 1948 Oct;30A(4):895-902.

Arthritis deformans of the hip joint and its pathological histology; research in polarized light.

LUGIATO PE.

PMID: 18887294 [PubMed - OLDMEDLINE]