ABSTRACTS BOOK OF THE OIWC & WFLD CONGRESSES

OIWC CONGRESS

WEDNESDAY, JULY 4th 2014

- Short communications -

SESSION : Implantology 1
7/2/2014 at 08:30 - 08:45

Abstract n° : 60484
Ref # STI-01

Author(s) : N. Frydman(1)

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Managing the implant in the esthetic zone : Socket preservation , immediate implant placement , GBR.

• Introduction

Scientific littérature and evidence based dentistry agreed on the fact that a bone resorption always occurs after a tooth extraction. When the implant has been chosen as a solution to replace the missing teeth , we have to preserve as much as we can the hard tissue volume to put the implant in the proper position and enhance the esthetic and functional outcome ; however when placement is possible at time of extraction we will have to deal with the situation .

• Aim

The aim of this presentation is to describe thru some clinical cases , a methodology to decide when to choose to preserve , to grow bone or to immediately put the implant

• Results / Evolution description

The result will be shown 6 to 10 month following implant and crown placement .

• Conclusion

We will conclude on he fact that our decision will depend on the amount of bone in the buccal wall. And that one of the main key to success is to maintain or grow bone on the buccal wall to have perdictable result .

SESSION : Implantology 1
7/2/2014 at 08:45 - 09:00

Abstract n° : 64009
Ref # STI-02

Author(s) : M. Harmand*(1), C.Sedarat(2), J.Cougoulic(3)

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PEEK / β – TCP / TiO2 composite: a smart biocompatible composite

• Introduction

PEEK is a thermoplastic used in orthopaedics. It exhibits poor osteoconductive properties that limits potential applications. To overcome this, surface treatments or coatings have been developed. A PEEK-based composite (BIOPIK®) was produced as a mixture of β-TCP (14%) and TiO2 (18%) within a PEEK matrix. This composite displays mechanical properties comparable to those of human cortical bone. Composite biocompatibility has been demonstrated according to ISO 10993-1.

• Aim

The behaviour of human osteoblasts (HOB) was studied in vitro in direct contact with PEEK-OPTIMA, cpTi and BIOPIK® samples.

• Materials and Methods

Cell adhesion (SEM), cell growth and alkaline phosphatase activity (PAL) were assessed over 27 days.

• Results / Evolution description

SEM showed that HOB adhere and proliferate on the composite. Cell density is similar on both BIOPIK® and negative control whereas it is 65% and 42% of negative control on Ti and PEEK respectively. ALP activity is enhanced on BIOPIK®: +21%, $P<0.01$ on day 27.

• Conclusion

This in vitro study suggests BIOPIK® osteoconductive potential, which is confirmed in vivo in the Rabbit showing improved bone neo-formation in contact with BIOPIK® implants compared to cpTi. Good clinical results have been obtained with a dental implant made of this new composite.

SESSION : Implantology 1
7/2/2014 at 09:00 - 09:15

Abstract n° : 64429
Ref # STI-03

Author(s) : C. Albisetti*(1), M.Baranes(2), A.Becmeur(2), L.Maman(2)

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CASE REPORT: Surgical reintervention three months after sinus membrane perforation

• Introduction

The most common complication of sinus augmentation using a lateral approach is membrane perforation. Generally the lesion is covered with a resorbable membrane which acts as a barrier before the bone graft. However the perforation's large size or location sometimes prohibits such a repair technique and the surgical procedure must be rescheduled after a three month healing period. To date no reintervention guidelines exist be it with regards to sinus membrane healing time, optimal surgical repair procedures or prognosis.

• Aim

A non-smoker 69 year old female patient reported to the Dental Department of Charles Foix Hospital (Ivry, France) for functional rehabilitation of her posterior right maxilla. Medical questioning only disclosed hypercholesterolemia treated with Atorvastatin.

• Results / Evolution description

Sinus augmentation surgery was carried out under local anaesthesia. Despite the accuracy of the procedure a perforation of the Schneiderian membrane under the superior-mesial window angle occurred. We opted for the latter due to the membrane's fragility and perforation size. The intervention was rescheduled three months later by which time 3D scans showed steady healing. The procedure was recommenced following the same steps and no perforation occurred.

• Conclusion

Maxillary sinus membrane perforation is one of the most frequent peroperative complications for the sinus augmentation procedure. Its incidence reportedly varies between 10% to 44%. Large perforations are covered with a bioabsorbable membrane or a large lamellar bone sheet. But in some cases, the procedure is stopped. To date how to reintervene remains unclear. This case study aims to describe the biological healing of Schneiderian membrane and suggests modality for clinical re-intervention.

SESSION : Implantology 1
7/2/2014 at 09:15 - 09:45

Abstract n° : 59787
Ref # STI-04

Author(s) : D. Georgy(1)

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Technique to Obtain a Predictable Aesthetic Result through Appropriate Placement of the Prosthesis/ Soft Tissue Junction in the Edentulous Patient with a Gingival Smile

• Introduction

Background: Treating the edentulous patient with a gingival smile requires securing the prosthesis/soft tissue junction (PSTJ) under the upper lip. To present a simple method that helps achieve a predictable aesthetic result when alveoplasty of the anterior maxilla is needed to place implants apical to the presurgical position of the alveolar ridge.

• Aim

The maximum smile line of the patient is recorded and carved on a thin silicone bite impression as a soft tissue landmark. During the three-dimensional radiographic examination, the patient wears the silicone guide loaded with radiopaque markers. The NobelClinician® software is then used to bring the hard and soft tissue landmarks together in a single reading. Using the software, a line is drawn 5 mm apical to the smile line; it dictates the position of the crestal ridge to be reached following the alveoplasty

• Results / Evolution description

Results: An alveoplasty of the anterior maxilla was performed as simulated on the software, and implants were placed accordingly. The PSTJ was always under the upper lip, even during maximum smile events. The aesthetic result was, therefore, fully satisfactory.

• Conclusion

Conclusion: This simple method permits the placement of the PSTJ under the upper lip with a predictable outcome; it ensures a reliable aesthetic result for the edentulous patient with a gingival smile. Clin Implant Dent Relat Res. 2013 Dec 27 Demurashvili G, Davarpanah K, Szmukler-Moncler S, Davarpanah M, Raux D, Capelle-Ouadah N, Rajzbaum P.

SESSION : Implantology 2
7/2/2014 at 10:30 - 10:45

Abstract n° : 67191
Ref # STI-05

Author(s) : L. Detzen*(1), S.Amr(1), A.Brami(1)

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Is dental auto-transplantation still relevant? A 5 year clinical follow-up case report.

• Introduction

Auto-transplantation is a surgical procedure during which a tooth is extracted from the same patient selecting one location (“the donor site”) and replanted in a distant location (“the recipient site”). This procedure is indicated when a tooth has a poor prognosis and a potential graft may be used without prejudice. It is intended primarily for children, adolescents and young adults.

• Aim

The aim of this case report is to show the prevailing (or remaining) interest in tooth auto-transplantation, and based upon monitoring over 5 years, the success of implant rehabilitation associated with an auto-transplantation.

• Materials and Methods

Mrs. C, a 27 year old young woman in good health and a non-smoker, was referred to our dental office in 2009 to replace tooth 45 with an implant treatment. Two years post-surgery, a chronic recurrent apical periodontitis appeared on tooth 46. This tooth was extracted both due to recurrent pain and because of its risk factor of infection for the implant. The patient wished to avoid a second implant mostly for financial reasons and, in view of her young age, the professional recommendation to auto-transplant tooth 48 to replace tooth 46 was accepted by the patient.

• Results / Evolution description

The success criteria for the implant were validated 5 years after implantation surgery as well as the anatomical and functional integration of auto-transplantation after 3 years.

• Conclusion

Auto-transplantation of teeth offers a new treatment option for some specific clinical situations. This procedure provides additional potential benefits for the patient since an alternative conventional treatment, such as implant or prosthodontics, will still be possible. Achieving implant rehabilitation in conjunction with auto-transplantations is totally conceivable and offers treatment benefits while minimizing risks if properly performed.

SESSION : Implantology 2
7/2/2014 at 10:45 - 11:00

Abstract n° : 68716
Ref # STI-06

Author(s) : H. Meurisse*(1)

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Split-crest technique

• Abstract
A narrow mandibular ridge is a great challenge for the clinician when implants are required. A bone graft can be proposed but a bone expansion could be an alternative, depending on the shape of the mandible. The technique of split-crest bone expansion is very delicate but gives the opportunity to place implants on the same time as bone augmentation. The treatment time is shortened. We will present two cases of split crest techniques with implants placement and the prosthetic rehabilitation.

SESSION : Implantology 2
7/2/2014 at 11:00 - 11:15

Abstract n° : 62996
Ref # STI-07

Author(s) : C. Bollen*(1)

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Peri-implantitis: a new disease

• Introduction
28 to 56% of our implant patients will get peri-implantitis. Moreover, 80% of all the implant patients will get peri-implant mucositis. Since implants are used since nearly 50 years, this disease can be called "new".

• Aim
Topics to be discussed: - pathogenisis - histopathology - diagnosis - prevalence

• Results / Evolution description
Furthermore: - risk indicators - treatments - maintenance

• Conclusion
Finally some cases are shown.

SESSION : Implantology 2
7/2/2014 at 11:15 - 11:30

Abstract n° : 64820
Ref # STI-08

Author(s) : A. Guyon*(1), M.Samama*(1), F.Gaultier(1)

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SINUS FLOOR ELEVATION BY TWO TECHNIQUES : PIEZOSURGERY AND ROTARY INSTRUMENT

• Introduction

The sinus lift is a surgical technique indicated during atrophy of the maxillary ridge. It aims to increase bone height and allows the implants in the posterior region. Filling material must be inserted between the sinus membrane and shallows sinus.

• Aim

The main risk is perforation. Two techniques were performed and compared : piezosurgery and rotative instrument.

• Results / Evolution description

A 35-year man consults for maxillary implant rehabilitation; tooth loss is due to aggressive periodontitis. Periodontal treatment is performed. Radiological guide is made with which the patient performs a CBCT. A double sinus lift is indicated and implant placement is performed in a second step after controlling for bone graft. On the right side, the bone window is made by using the piezosurgery; on the left side, rotary instrument is used. In both cases no perforation of the membrane happened. Duration of the osteotomy is 15 minutes longer than the left side.

• Conclusion

The major risk is perforation : 10-55%. Complications can be reduced by using piezosurgery (Delilbasi, 2013). No significant difference was demonstrated on the membrane perforation despite better control with piezosurgery. In our patient, no perforation has occurred whether by ultra sonic instrument or rotary instrument. Oedema and greater post-operative pain were reported on the side where the rotary tools were used. The piezosurgery is used in oral surgery and especially in the preimplant surgery, it allows less postoperative complications.

SESSION : Implantology 2
7/2/2014 at 11:30 - 11:45

Abstract n° : 60550
Ref # STI-09

Author(s) : B. Hmiedan(1)

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Assessment of Primary Stability for Two Implant Designs

• Introduction
Dental implants manufacturers are racing to introduce different implants designs. But how does this design affects the implant's performance?

• Aim
To compare the effect of two dental implant designs (tapered and straight) on primary stability.

• Materials and Methods
In a clinical study, 7 patients received 24 Anthogyr dental implants (11.5 * 4 mm), 12 straight, and 12 hybrid (tapered), bilateral or proximal in the same jaw. Primary stability was assessed by measuring the insertion torque and by the Periotest device. An in vitro study was also made similarly, using dummy implants (12 straight, 12 tapered), inserted in the lower jaw of a calf. In this part, the removal force (pull-out) was also measured (using an Instron 1195). Values were compared using the t-test and ANOVA.

• Results / Evolution description
No statistical differences were found with respect to Periotest and removal force values between the two types of implant design. The tapered implant showed higher insertion torque with statistical significance.

• Conclusion
The tapered implant design showed higher primary stability which could be measured by the insertion torque test but by neither the Periotest nor by removal force.

SESSION : Implantology 2
7/2/2014 at 11:45 - 12:00

Abstract n° : 64939
Ref # STI-10

Author(s) : N. Cohen*(1)

(1)Université Paris 7, Paris, France

Computerized occlusal analysis in periodontitis and periimplantitis

• Introduction
Links between occlusion, periodontal disease progression and periimplantitis have been a controversial topic for years. Animal studies, human studies (mainly autopsy material and case reports) have brought some conclusions but no clinical study with significant level of evidence has been carried out.

• Aim
New technologies allowing real time mapping of occlusal contacts in maximal intercuspation as well as during functional movements are available today. They have been validated to be reliable, repeatable and free from subjective interpretation. Our aim is to describe their use in periodontal and implant issues.

• Materials and Methods
Tscan III (Tekscan, Boston, USA) was used in a series of implant treated patients and periodontal compromised patients (showing moderate to severe periodontitis), at baseline, after periodontal initial therapy and during maintenance.

• Results / Evolution description
Relative force mapping, precise timing of occlusion and pointing out of interferences could be done in almost no chair time and brought information that was not available with clinical paper mark inspection. There was no direct correlation between importance of total force and severity of periodontal lesions. Underload appeared on the contrary linked to chronic lesions.

• Conclusion
Relationship between periodontal disease and occlusal issues should be reconsidered with new technologies.

SESSION : Implantology 2
7/2/2014 at 12:00 - 12:15

Abstract n° : 64471
Ref # STI-11

Author(s) : F. Liebaug*(1), D.Wu(1)

(1)Ellen Institute, Steinbach-hallenberg, Germany

LASER SUPPORTED TREATMENT STRATEGIES IN PATIENTS WITH PERI-IMPLANT INFECTIONS

• Introduction

While implants have become widely accepted and internationally used as a popular form of therapy for partial and/or complete edentulous patients, peri-implantitis, i.e. the infection of the peri-implant tissue will be likewise encountered with increasing frequency. It is evident that peri-implant diseases would increasingly occupy the practicing dentist or oral surgeon in the future. The knowledge of the etiology and pathogenesis of peri-implant diseases is of great relevance to addressing proper protocols for the therapy of these diseases.

• Aim

The removal of biological contamination with pathogen germs from common implant surfaces is a need. After cleaning the surface of implants a combination with GBR can support the healing progress

• Results / Evolution description

A thorough removal of any bacterial deposits without causing major damage to the adjacent tissues may be required, according to the cause-related concept of periodontal and peri-implant treatments, in order to support effective healing at diseased sites.

• Conclusion

The Er:YAG-Laser is especially qualified for usage in periimplantitis therapies. This lecture presents the concept of a systematic laser-supported treatment of periimplant infections with numerous illustrations of clinical examples and pictures. Laser Irradiation combined with guided bone regeneration techniques (GBR) can provide one option for beneficial lang-term outcomes in peri-implantitis therapy.

SESSION : Implantology 3
7/2/2014 at 14:00 - 14:30

Abstract n° : 51602
Ref # STI-12

Author(s) : C. Peron*(1)

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Trabecular metal implant placed into fresh extraction socket with immediate loading for a single tooth.

• Introduction

Osteointegration(or bone ongrowth) was described by Branemark et al, as the process of living bone forming structural and functional connection with a load carryng titanium implant. Osseoincorporation is the combination of bone ingrowth and bone ongrowth which was demonstrated by a dental implant with Trabecular Metal Material a cancelluous-like osteoconductive structure with interconnected porosity.

• Aim

The Objective is describe step by step a new clinical approch using a TRABECULAR METAL IMPLANT in fresh extraction socket with an immediate provisional restoration and a final restoration in lithium disilicate at two Weeks.

• Materials and Methods

25 patients has placed 25 TM IMPLANT. Step of this clinical procedure: -atraumatic extraction without incisions and flap elevation -correct position of implant -check torque insertion and implant stability(osstell) -using bone graft material(Puros cancellous Zimmer) -immediate provisional restoration -impression copy with polyeter material(Permadyne) and light curing resin(Easyform LC) -definitive restoration in lithium disilicate(E-Max Ivoclar)

• Results / Evolution description

Describes about 25 TRABECULAR METAL IMPLANTS are positioned in order to have primary stability for immediate loading in fresh extraction socket and final restoration is delivered at Two Weeks with a follow up of 1 year.

• Conclusion

TRABECULAR METAL MATERIAL are designed to enhance secondary stability through bone ingrowth, confirmed by high ISQ Value. This Material is able to reduce the Time of the definitive restoration.

SESSION : Implantology 3
7/2/2014 at 14:30 - 14:45

Abstract n° : 64510
Ref # STI-13

Author(s) : R. Al-falaki(1), M.Cronshaw*(2)

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Treatment outcome following use of the Er,Cr:YSGG laser in the non surgical management of peri-implantitis: a retrospective pilot study

• Introduction

Laser applications to debride contaminated implant surfaces in erbium wavelengths of 2940nm and 2780nm have been subject to in vitro, animal and a limited number of clinical outcome studies. To date, there is no consensus on the appropriate usage of lasers in the management of peri-implantitis, and few clinical studies reporting on the efficacy of the 2780nm ErCrYSGG laser.

• Aim

To conduct a pilot study as a retrospective clinical analysis of an extended treated case series. Implants diagnosed with peri-implantitis and having at least one 5mm pocket around them were included into the study. In total 28 implants were treated consisting of 68 sites >4mm. These were treated with an Er,Cr:YSGG laser, using a 14mm, 500um diameter, 60º (85%) radial firing tips (1.5W, 30pps, short (140us) pulse, 50% water, 40% air).Probing depths were recorded at baseline, after 2 months and 6 months, along with the presence of bleeding on probing.

• Results / Evolution description

No adjunctive antimicrobials were given and the prostheses were not removed. The age range of patients was 27-69 years (mean 55.9); the mean pocket depth at baseline was 6.5mm (sd +/-1.48,range 5-12mm), reducing by a mean of 3.5mm to 3.04mm (sd +/-1.26) at 2 month follow up ($p<0.001$) and remaining at 3.02 (sd +/-1.55) mm after 6months ($p<0.001$). Treatment resulted in the complete resolution (<4mm) of 91% of sites, leaving just 6 remaining pockets, and 10% of total sites still bleeding on probing.

• Conclusion

The results of this study compares favourably to other case series reported in the literature using a similar wavelength of erbium laser (2940nm ErYAG). This may perhaps be due to the difference in energy distribution to the treated pockets as a consequence of using the 60ºradial firing tip. The use of the radial firing tip with the ErCr:YSGG is a novel concept in the management of peri-implantitits and in view of the positive findings in this pilot study, further studies including RCTs are required to further evaluate the potential benefits of this new treatment approach.

SESSION : Implantology 3
7/2/2014 at 14:45 - 15:00

Abstract n° : 64504
Ref # STI-14

Author(s) : I. Ingenegeren(1)

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THE VALUE OF THE NEW SCANNER HAND PIECE OF FOTONA LIGHTWALKER ER:YAG LASER IN IMPLANT SURGERY

• Introduction

Evaluation of the possibilities of the Er:YAG scanner hand piece in bone preparation for achieving more defined cavities for implant insertion.

• Aim

The Fotona LightWalker AT System with Er:YAG and Nd:YAG (2940 nm and 1064 nm) laser with the new scanner hand piece (after University of Aachen first installation ever in dental clinic in Germany), was used on eggs, bone, meat and during implant bed preparation on several patients to investigate the advantage of the scanner. Different settings were chosen, pulse lengths from max mode to SSP and power from zero to 1500 mJ. In vivo also the Er:YAG tip less hand piece and the hand piece with tips were used to compare.

• Results / Evolution description

On the egg shell the scanner produced correct square or round spots. On dense (cortical) bone probes (D1, D2) we could achieve round craters with preset diameter of about 1-2 mm of depth an in spongies bone (D3, D4) the cavities were les defined, caused by the open trabecular structure. Only with the max mode, deep conical craters of about 10mm with some carbonisation could be achieved, suitable for compression implants. On meat the scanner produced superficial carbonisation.

• Conclusion

No transgingival prep can be done: the scanner ablates only superficial, what seems to be an appropriate application for deepithelisation or carbonisation. In an open flap it needs skill to handle the relative big scanner hand piece in a way that the same exact shapes are produced as on the probes under ideal conditions (no blood, no movements), the depth is limited and the interference of blood makes the procedure inconvenient. Although valuable for other applications, the scanner hand piece does not yet seem to add value in implant bed preparation.

SESSION : Implantology 3
7/2/2014 at 15:00 - 15:15

Abstract n° : 67199
Ref # STI-15

Author(s) : Y. Israel*(1), L.Benmoussa(2)

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Extraction-Immediate implant placement in esthetic region: a case report

• Introduction

The esthetic region represent a hard area to treat in implantology. The aesthetic integration is hard to obtain and is a real challenge for the surgeon. Since the 2000s, the extraction-immediate implantation technical is part of the surgeon's routine procedure, because of its great advantages as : number of surgeries reduced, like the treatment length, bone preservation and soft tissue management.

• Aim

We report the case of a 24 years old male patient consulting for mobilities of his central incisor. Clinical and radiographic examination reveal an upper root fracture of his incisor, occurred during a work accident.

• Results / Evolution description

Clinical examination shows a good oral health, thick periodontal and scalloped gum. 3D exam reveals a sufficient bone width and height, and an intact buccal plate. We can say that our patient is considered as a good candidate for immediate implant placement. We describe step by step the surgical procedure of the case.

• Conclusion

Nowadays, extraction-immediate implant placement has to be part of the therapeutic proposals, because of its great advantages. The efficacy of immediate implant placement has been established and shown to be predictable if reasonable guidelines are followed.

SESSION : Implantology 3
7/2/2014 at 15:15 - 15:30

Abstract n° : 60898
Ref # STI-16

Author(s) : X. Riaud*(1)

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History of Implantology

• Introduction

From Antiquity till nowadays, from Fauchard till Branemark, Implantology made a long trip of 7 000 years. Here is its history.

• Aim

Describe history of Implantology and actors.

• Materials and Methods

Archivs, Testimonies, antiques medical books

• Results / Evolution description

From a single bone till titanium, here is the story of XX century science.

• Conclusion

What can we expect for the future?

WFLD CONGRESS

THURSDAY, JULY 3rd 2014

- Short communications -

SESSION : Endodontics 1
7/3/2014 at 08:45 - 09:00

Abstract n° : 64779
Ref # STL-01

Author(s) : M. Meire*(1)

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In vitro investigation on the influence of various lasing parameters on the cleaning efficacy of Laser-Activated Irrigation

• Introduction

Laser-activated irrigation (LAI) using erbium lasers is a relative new irrigant agitation technique with great potential for efficient cleaning of the root canal system. The optimal lasing parameters for LAI however remain unclear.

• Aim

To investigate the influence of pulse energy, pulse frequency, pulse length, irradiation time, fiber tip shape, -position and -diameter on the cleaning efficacy of LAI. Resin blocks containing standardized root canals (apical diameter of 0.4 mm, 6% taper, 15mm long, with a coronal reservoir) were the test model. A standardized groove in the apical part of each canal wall was packed with stained dentin debris.

• Materials and Methods

The canals were filled with irrigant, which was activated by an Er:YAG laser (2940 nm, AT Fidelis, Fotona). In each experiment, one laser parameter was varied, while the others remained constant. In this way, the influence of pulse energy (10-40mJ), pulse length (50-1000µs), frequency (5-30Hz), irradiation time (5-40s), fiber tip shape (flat or conical), its vertical position and diameter (300-600µm) was determined by treating 20 canals per parameter. The amount of debris remaining in the groove after each LAI procedure was scored and compared among the different treatments.

• Results / Evolution description

The parameters significantly ($P < 0.05$, Chi square) effecting debris removal from the groove were fiber position, pulse length, pulse energy, irradiation time and frequency. Fiber tip shape and diameter had no significant influence on the cleaning efficacy.

• Conclusion

Within this in vitro setup, shorter pulses, higher pulse energy, higher frequency and position of the fiber tip close to the groove were correlated with better debris removal.

SESSION : Endodontics 1
7/3/2014 at 09:00 - 09:15

Abstract n° : 64911
Ref # STL-02

Author(s) : S. Moreira*(1), R.Andrade de carvalho(2), F.Campos almeida souza(1), I.Márcia diniz(1), I.Itagiba neves(3), G.Gavini(1), M. m. Marques*(1)

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Dental pulp regeneration promoted by stem cell homing an laser phototherapy

• Introduction

The ultimate desire of Dentistry is the regeneration of the dental pulp tissue. The recruitment of stem cells from the periapical region resident populations seemed to be the most promising method to obtain the dental pulp regeneration. Laser Phototherapy (LPT) is able to improve cell migration and then could be useful for promoting homing of periapical stem cells into dental root canals for promoting regeneration of dental pulp

• Aim

The aim of this paper was to analyze the influence of Laser on the regeneration of root dental pulp in rat molars

• Materials and Methods

For testing this hypothesis the dental pulp tissues of twenty molar roots of rats were removed. The root canals were endodontic instrumented and filled by blood clot from hemorrhage provoked at the periapical tissue. These roots were randomly divided into two groups: Lased and non-Lased. The LPT was done using a continuous diode laser (660nm; 20mW, 0.028cm, 5J/cm², 7s, 14J per point) in punctual mode. The crowns of the molars were restored with glass ionomer and 30 days later the teeth were histologically and immunochemistry analyzed

• Results / Evolution description

The root canals in both groups were partially or totally filled. In some cases the root canal content were interpreted as newly formed connective tissue that underwent to necrosis (53%), whereas in others the content were only remnants of infected and disorganized blood clots (35%). In two cases (12%) of the lased group newly formed connective tissue was observed. In one these cases the viable tissue was present at the end of the root canal. In the other a fully restored dental pulp tissue was formed including an odontoblast-like layer.

• Conclusion

These preliminary results point out to an improvement of the dental pulp regeneration stimulated by LPT, probably by promoting periapical stem cell homing.

SESSION : Endodontics 1
7/3/2014 at 09:15 - 09:30

Abstract n° : 59804
Ref # STL-03

Author(s) : R. Porth*(1)

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An 18 Year Successful Laser Endodontic Study With a Comparison to Traditional Endodontic Studies

• Introduction

This 18 year study involves 2,600 teeth treated with an Nd:YAG laser. All pulpal canals received 40 to 80 seconds of continuous laser application at 15 Hz., 0.75 W. with water lubrication. No chemical disinfection occurred at any stage. At the 15 year stage, 1,380 teeth were studied in two groups, one with abscesses and one without, to determine treatment success compared to traditional non-laser techniques.

• Aim

To prove that an Nd:YAG laser could be utilized as an effective disinfecting agent in endodontic treatment and to quantify the long term results and compare them to clinical studies reported in the literature.

• Results / Evolution description

The overall ongoing healing response of the 2,600 cases over the 18 years has been in the range of 96 percent. In the 15 year study, the results were equivalent or better than non-laser results, such as those reported by Friedman S. and Mor C. in their article "The Success of Endodontic Therapy: Healing and Functionality" Journal of California Dental Association, June 2004. In the 1,200 cases of the Group 1 study, the success rate was 92-98 percent; importantly, in the Group 2 study of 180 cases with abscesses, the success rate was 96-98 percent.

• Conclusion

The overall study has demonstrated the effectiveness of utilizing the Nd:YAG laser in endodontic treatment.

SESSION : Endodontics 1
7/3/2014 at 09:30 - 10:00

Abstract n° : 64273
Ref # STL-04

Author(s) : G. Olivi*(1)

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Laser endodontics, PDT, LAI, PIPS: where are the limits?

• Introduction
Lasers where introduced in endodontics with the purpose to improve the cleaning and decontaminating ability of conventional endodontic techniques. Although there is a heterogeneity in data making it difficult for interpretation, the amount of information available helps to better understand the mechanism of action of different lasers, their efficiency, the different protocols being used and possible related problems.

• Aim
To clarify advantages and disadvantages of different tecqhniques used in endodontics.

• Materials and Methods
A review of the literature on laser applications for debriding and disinfecting the root canal will be showed. Studies from the author will be also showed.

• Results / Evolution description
Thermal damage, not complete deriding and inefficient decontamination resulted from many studies in literature on laser endodontics and PDT. LAI and PIPS resulted always superior to conventional techniques in both cleaning and disinfecting the root canals.

• Conclusion
The complex macro-anatomy and the micro-anatomy of the teeth on one side, the limit of different tips or fibers to completely negotiate the root canals on the other side, suggest the use of a less invasive technique that does not involve the position of tips or fibers within the canal. All the studies from the literature showed PIPS as an efficient method for debriding and disinfecting the root canals.

SESSION : Periodontology 1
7/3/2014 at 08:30 - 08:45

Abstract n° : 59503
Ref # STL-05

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The effectiveness of using Er,Cr:YSGG lasers as an adjunct to root surface instrumentation in the management of Chronic Periodontitis: A retrospective study

• Introduction

The use of Er,Cr:YSGG lasers in the management of Chronic Periodontitis has been reported on, and found to be both beneficial with superior clinical results in some cases, while in others, no added benefit has been found. While using this type of laser in periodontal pockets, marked pocket depth reduction and resolution was noted along with radiographic changes suggestive of marked increases in bone volume

• Aim

To carry out an extensive retrospective analysis of an extended case series. 27 patients with Generalised Chronic Periodontitis, and at least one radiographically visible infrabony defect, were treated using ultrasonic scalers, followed by the application of Er,Cr:YSGG, with 14mm radial firing tips (1.5W, 30-50pps, short pulse, 50% water, 40% air). Probing depths were measured after a minimum of 2 months, and radiographs of the infrabony defects repeated after at least 6 months. All pockets >4mm were analysed for mean pocket depth change, and number of residual deep sites.

• Materials and Methods

• Results / Evolution description

Randomised radiographs were assessed for relative linear bone height by an independent blinded examiner. 27 patients (20 female, 7 male) were included in the analysis, and 78 radiographs were analysed. The mean pocket depth reduction overall was 3.79 +/- 0.82mm. 15 out of the 531 sites treated still had residual pockets of 5mm or greater. In contrast with the observed gains in bone volume, the relative linear bone height was mostly consistent in pre- and post op radiographs. The overall change in apical and coronal bone height was 0.03+/-0.12 and 0.02+/-0.1 respectively

• Conclusion

Treatment resulted in conversion of more than 95% of deep sites to < 5mm, which is considered a critical outcome for long term stability. However, there is no clear evidence of gain in linear bone height, which would be associated with periodontal regeneration. The use of Er,Cr:YSGG laser as a non-surgical adjunct in periodontal pockets seems to be effective with potentially greater pocket depth reductions than those recorded for conventional treatment. Further studies, including well designed RCTs are required

SESSION : Periodontology 1
7/3/2014 at 09:00 - 09:15

Abstract n° : 64381
Ref # STL-06

Author(s) : K. Luk(1)

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Effect of varying pulse duration of Er:YAG laser on microstructure of titanium implant surface. An in vitro study by Scanning Electron Microscopy observation

• Introduction

The effect of surface texture of implants irradiated with Er:YAG laser by varying pulse energy and irradiation time have been investigated under SEM. It has been reported that implant surface irradiated by Er:YAG laser with an energy density of 10.6J/cm² at 200 µsec to be safe. So far, there is no study found in incorporating pulse durations as a significant parameter on implant surface irradiation.

• Aim

The object of this study is to investigate the effect on implant surface by varying pulse durations of Er:YAG laser.

• Materials and Methods

Er:YAG lasers with articulated arm transmission are chosen. 40µsec, 100µsec and 300µsec pulse durations were selected. For each implant sample, three threads were selected for laser irradiation with the same parameters. The implant is fixed to an implant handpiece to be driven by the implant motor. The sapphire tip is placed perpendicular to the implant thread at a distance of 1mm. The implant was first wetted at rotation speed of 8mm per second to simulate hand movement before laser emission commencement. The threads of the samples were observed under SEM .

• Results / Evolution description

In all samples, there were melting, resolidification and micro crack formations under SEM observations.

• Conclusion

Er:YAG laser with articulated arm transmission at pulse durations of 40 µsec and 100 µsec and 300 µsec at a distance of 1mm are not suitable on preservation of implant surface with RBT microstructure.

SESSION : Periodontology 1
7/3/2014 at 09:15 - 09:30

Abstract n° : 64384
Ref # STL-07

Author(s) : A. Minovska(1)

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IMMUNOHISTOCHEMICAL AND HISTOMORPHOMETRIC ANALYSIS OF THE EARLY PHASE OF WOUND HEALING FOLLOWING LOW INTENSITY LEVEL ER: YAG LASER ASSISTED POCKED DEBRIDEMENT

• Introduction

The concept of laser assisted no-surgical periodontal treatment, using low-level Er:YAG irradiation, is expected to facilitate or promote the normality of tissue repair, and thereby enhance the sequence of events that take the tissues from their injured to their 'normal' state.

• Aim

Since, the excellent ablation of tissue within laser assisted pocket treatment with low intensity Er:YAG irradiation is awaited to promote healing, the present study was conducted to provide analysis of inflammatory cells within initial phase of wound healing following laser debridement versus conventional hand instrumentation.

• Materials and Methods

• Results / Evolution description

After 72 hour biopsy was taken from the soft tissue wall of the periodontal pocket andtissue were formalin-fixed and paraffin embedded. A routine hematoxylin-eosin stain were perform using following antibodies: myeloperoxidase, CD68, vimentin and CD34.The findings demonstrate pronounce cellular inflammatory response ($p<0,001$) following conventionally treatedversus laser treated group after 72h, but higher CD34 expression in the laser treated group.

• Conclusion

Our results showed that relatively low postoperative cellular inflammatory response seen in laser treated group can be attributed to the very narrow zone of thermal disruption withminimal invasive instrumentationof pocket;higher CD34 expressioncan be address to lasers transfer of energy to surrounding tissues in the form of heat able toinduce a heat shock response.

SESSION : Periodontology 1
7/3/2014 at 09:30 - 09:45

Abstract n° : 64897
Ref # STL-08

Author(s) : P. Polenik(1)

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Bactericidal effect of fluorescent nanoparticles against planktonic Porphyromonas gingivalis in vitro

• Introduction

Periodontal microflora localized as a biofilm and planktonic phase inside the periodontal pocket is a target of prevention and therapy of periodontitis. Classical mechanical debridement cannot completely remove all periodontal pathogens and some other antibacterial mechanisms are grateful.

• Aim

The purpose of this study was to create an adherent layer as a source of specific fluorescence with antibacterial effect on the root surface and to test its in vitro activity against dominant periodontal pathogen – Porphyromonas gingivalis (P.g.).

• Materials and Methods

The surface of dental roots specimens was prepared by Er,Cr:YSGG laser before adhesion of fluorescent nanoparticles. P.g. was cultivated and bacterial concentration was standardized. 100 µl of suspension was placed in plates and after excitation of treated root surface by 378 nm, emission spectrum of 413 nm was activated. Treated specimens were placed in bacterial culture and after 12, 24 and 48 hours, 100 µl of diluted cultivation media were spread over the surfaces of the agar plates. Survival of bacteria was determined by counting the colony-forming units after incubation.

• Results / Evolution description

The best results were recorded after 3,5W application and these settings were used in next steps of the study. More then 70% of planktonic Porphyromonas gingivalis were killed after 12 hours and almost 100% after 24 hours.

• Conclusion

The results of this study showed that blue light emitted by fluorescent nanoparticles is available to reduce Porphyromonas gingivalis in the planktonic state.

SESSION : Periodontology 1
7/3/2014 at 09:45 - 10:00

Abstract n° : 65007
Ref # STL-09

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Comparing Fibroblast Attachment in Root Surface Scaling With Er,Cr:YSGG Laser Versus Ultrasonic Scaler: A SEM Study

• Introduction
The regeneration of periodontal support is a main concern in periodontal therapy

• Aim
The aim of this in vitro study was to investigate the fibroblasts attachment on root surfaces after scaling with Er,Cr:YSGG laser and ultrasonic instruments, using scanning electron microscopy (SEM).

• Results / Evolution description
The data derived from MTT and cell-attachment analysis indicated that laser-ultrasonic scaling tended to increase cell-viability by lapse of time (within 3 to 5 days), with significantly better cell-attachment compared to other groups on days 3 and 5 ($p<0.05$). the comparison of the difference in fibroblast cell attachment rate on both days of 3 and 5 with independent T-Test indicated a significant rise on the fifth day compared to the third day of study ($p<0.05$).

• Conclusion
Indeed, both Er,Cr:YSGG laser and ultrasonic scaling may promote fibroblast attachment on dentinal root surfaces more than laser or ultrasonic scaling alo

SESSION : Laser and bone surgery
7/3/2014 at 10:45 - 11:15

Abstract n° : 65013
Ref # STL-10

Author(s) : E. Merigo*(1), M.Meleti(1), M.Meleti(1), I.Giovannacci(1), C.Fornaini(1), G.Raise(2), M.Manfredi(1), P.Vescovi(1)

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Laser-assisted management of Bisphosphonates-Related Osteonecrosis of the Jaw (BRONJ)s in 247 patients: ten years experience of the University of Parma.

• Introduction
Bisphosphonates-Related Osteonecrosis of the Jaw (BRONJ)s has been reported with increasing frequency in literature over past ten years. Therapy for this condition is still a dilemma.

• Aim
The aim of this retrospective study is to compare medical, surgical and laser-assisted approaches for the treatment of BRONJ.

• Materials and Methods
Two hundred and forty-seven patients (70 males, 177 females; 187 oncological and 60 non oncological patients) affected by BRONJ were evaluated at the University of Parma, Italy, between 2004 and 2014. Sites were subclassified in five groups on the basis of performed treatment (medical, surgical, laser-assisted or not. Outcome of treatment was assessed using the staging system proposed by Ruggiero: transition from a higher Stage to a lower one for at least 6 months was considered as clinical improvement and suggestive of a successful treatment.

• Results / Evolution description
Clinical improvement was achieved in 8 out of 33 (24.2%) BRONJ sites in G1. Sites of G2 with an improvement were 36 out of 51 (70.6%). Eleven out 17 BRONJ sites (64.7%) in G3 had a transition to a lower stage after treatment. A clinical improvement was recorded in 39 out of 43 cases (90.7%) in G4 and in 61 out of 62 cases (97.1%) in G5. Complete healing was obtained in 65 out of 69 cases (94.2%) in G5.

• Conclusion
In our experience, percentage of success obtained with a combined approach based on medical, surgical (including laser-assisted) and LLLT (G4-G5) is significantly higher than percentage of improvement obtained in G1, G2 aThe management of BRONJ is still controversial: the introduction in the treatment protocols of laser-assisted approach could improve the therapeutical results.

SESSION : Laser and bone surgery
7/3/2014 at 11:30 - 11:45

Abstract n° : 62324
Ref # STL-12

Author(s) : H. Geha*(1)

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Diode Laser Uses in Clinical Cases

• Introduction

CO2 LASER has been utilised in oral surgery, the sole applications were limited to carbonisation or incision effect, the limitations for portability being weight and largeness. Diode LASER is portable, light weight and uses the same effects as CO2 LASER but also has many other applications in oral surgery.

• Aim

MATERIAL : A portable light weight diode LASER machine (980 nm, 7 W LASERICAL-D, LASERICAL Inc., Paris, France) is utilised in oral surgery either under local or general anaesthesia. Carbonisation, Coagulation, Decontamination with use of photochemical effect, Bone Biostimulation after tooth extraction (LPL) and Incision of oral lesions. METHODS: A retrospective review of the first 715 cases between April 2012 and February 2014. Inclusion criterion was presentation at systematic postoperative review between days 10 and 14 Results were analysed using SPSS 22.0 (IBM Inc).

• Results / Evolution description

345 cases were included in the study. Carbonisation mode was utilised in 171 patients (84.5+/-112.), dependant of and correlated to result (165 pos., 6 neg.), Coagulation mode in 24 patients (12 +/- 9.9), not correlated to result (19 pos, 5 neg.) ; Decontamination mode in 19 patients (10 +/-11.3), not correlated to result (18 pos. 2 neg.), Bone biostimulation LPL mode in 117 patients (58.5 +/- 72.8) , not correlated to result (110 pos., 7 neg.) ; and Incision mode in 17 patients(8.5 +/-10.6), not correlated to result (16 pos., 1 neg.).

• Conclusion

Effectiveness of different modes of Diode Laser therapy are already largely desribed. This study is the first described large case series with statiscal analysis described in world literature.

SESSION : Laser and bone surgery
7/3/2014 at 11:45 - 12:00

Abstract n° : 63792
Ref # STL-13

Author(s) : S. Sameh*(1), B.Raouaa(2), A.Chokri(3), S.Jamil(2)

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Effects of Low-level-laser Therapy and Corticotherapy after Third Molar surgery: A clinical trial

• Introduction

In oral surgery, postoperative pain, trismus and edema are frequent . Several methods have been used to inhibit these sequelae, including the use of corticosteroids, and Low-level laser therapy (LLLT)

• Aim

To compare the effects of LLLT and corticosteroids on postoperative pain, trismus and oedema following surgical removal of mandibular third molars.

• Materials and Methods

Sixty patients who were to undergo surgical removal of their lower third molars.They were randomly assigned to two groups. A diode laser device (Whitening laze II) with a continuous wave length of 808 nm and a maximal output power of 100 mW was used. Patients in the LLLT group received 3.3 J (fluence of 120 J/cm2) intraorally at the operation site and the same dose extraorally. Patients in the corticosteroids group received postoperative parenteral injection of Dexamethasone. Pain, interincisal opening and facial swelling were evaluated on the third and seventh postoperative days

• Results / Evolution description

The levels of pain, trismus and facial swelling at the third and seventh postoperative days were lower in the corticosteroids side than in the LLLT side, though without statistically significant differences.

• Conclusion

This study demonstrates that there is no significant difference between administration of corticosteroids and LLLT for the reduction of postoperative pain and trismus but dexamethasone was more effective to reduce swelling on seventh postoperative day.

SESSION : Laser and bone surgery
7/3/2014 at 12:00 - 12:15

Abstract n° : 63361
Ref # STL-14

Author(s) : M. Capocci*(1), G.Tenore(1), R.Kornblit(1), L.Ottolenghi(1), U.Romeo(1), A.Polimeni(1)

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The use of Er:YAG and Low Level Diode Lasers in the prevention and treatment of Bisphosphonate Related Osteonecrosis of the Jaws

• Introduction

The "BRONJ" (Bisphosphonate Related Osteonecrosis of the Jaws) is a rare bone disease linked to the administration of bisphosphonates. It's of paramount importance to follow best practice protocols both in prevention and treatment of BRONJ. Er:YAG laser and Low Level Diode Laser are two supports for a more complete treatment and prevention protocol: Er:YAG laser for the surgical removal (bone debridment) of BRONJ and Low Level Diode Laser treatment, for the preparation of the surgical site (biostimulation program) and in the healing phase (analgesic / anti-inflammatory program).

• Aim

To describe the possibilities and limitations of the use of Er:YAG laser and LLLT in the management of patients affected by BRONJ, on the basis of the literature and our clinical experience.

• Results / Evolution description

Clinical improvement was achieved in every surgical case comparing with non-laser assisted surgery procedures: less invasiveness of the surgical procedures, better and faster closure of surgical wounds, less post-operative pain.

• Conclusion

Our results are in agreement with the literature: the use of Er:YAG laser, combined with Low Level Laser Therapy has given several positive outcomes in the prevention, treatment and in the after surgery healing process of the BRONJ.

SESSION : Low Power laser 1
7/3/2014 at 10:45 - 11:00

Abstract n° : 64413
Ref # STL-15

Author(s) : V. Preve*(1)

(1)Seccional Laser Asociacion Odontologica Uruguaya, Montevideo, Uruguay

Pain management in endodontic with Low Power Laser

• Introduction

Pain is an often source of discomfort . It is caused by multiplex physical, chemical, microbiologic and osmotic factors , that go to produce an answer exasperated in the tooth. We describe the efficacy of a Low Laser Diode gallium aluminum arsenide (GaAlAs) on decreasing extreme periapical post endodontic treatment pain and efficacy in Dentinal Hypersensitivity (DH).

• Aim

To describe the use of low-level laser therapy (LLLT) on reducing pain in cases with extreme dentinal hypersensitivity (DH) and post endodontic treatment emergencies.

• Materials and Methods

• Results / Evolution description

The clinical efficacy in reducing pain after endodontic treatment emergencies was very satisfactory after 10 minutes of Low Power Laser irradiation. Dentinal Hypersensitivity was evaluated by air-blast test and cold-water test using visual analog scale (VAS) immediately, and after a week, (2 sessions treatment). One month and 12 months follow up showed an effective reduction of cervical DH with an almost completlely abscense of sinthoms, starting five minutes after the first LLLT application.

• Conclusion

GaAlAs Diode lasers were effective in the treatment of Post Endodontics Pain Emergencies and also with Dentinal Hypersensitivity following a single application and even much more effective after a second application. Hence, further studies are needed to reconfirm LLLT as a "gold standard" treatment in pain management.

SESSION : Low Power laser 1
7/3/2014 at 11:00 - 11:15

Abstract n° : 64559
Ref # STL-16

Author(s) : A. Fauchon(1)

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Low-Lewel Laser Therapy of TMJ pain.A randomized clinical study

• Introduction

A.Fauchon-Giumelli, D.Heysselear,G.Ciais,S.Namour Dept of Dental Sciences, EMDOLA,University of Liege, Belgium

• Aim

The purpose of this study is to evaluate the efficiency of LLLT applied in first intention to acupuncture points of patients diagnosed with TMJ disorders. One hundred patients have participated to this clinical study. Specific acupoints and auricular points were used as electromagnetic switches to be localised and excited in each treatment by LLLT:

• Materials and Methods

• Results / Evolution description

Diode laser 810 nm + Diode laser 635 nm were used together at:250mW(R) + 300 to 350mW(I-R) in pulsed mode of 5 to 65Hz. Three evaluations of pain, quantified using a pain scale (0 to 10) are done: Ev1: before LLLT applications Ev2 : immediately after LLLT applications Ev3 : a week after LLLT applications

• Conclusion

Results : The use of LLLT for the treatment of TMJ pain is statically relevant. Conclusion : LLLT is helpful for primary treatment of TMJ pain relief.

SESSION : Low Power laser 1
7/3/2014 at 11:30 - 11:45

Abstract n° : 67252
Ref # STL-17

Author(s) : . Todea*(1), B.Hoinoiu(1), C.Sinescu(1), M.Negrutiu(1), A.Manescu(2)

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The evaluation of bone augmentation following 808nm laser irradiation

• Introduction

The evaluation of bone augmentation following 808nm laser irradiation

• Aim

The aim of the study is to investigate, using Synchrotron Micro Computer Tomography (MicroCT), the bone augmentation after applying 808nm diode laser radiation.

• Materials and Methods

An experimental study was conducted on 20 Wistar male rats (250-300 grams). On each animal, a bone defect in the middle third of the femur was made which was augmented later with Bio–Oss Geislich. Each animal in the right femur defect was exposed to 808nm laser radiation (1.5 J / cm2) for six weeks long, while on contralateral limb (the control group) the laser was not used. At six weeks the animals were euthanatized, harvested and prepared the bone samples. Examination of the samples was made using Synchrotron micro Computer Tomography, Trieste.

• Results / Evolution description

For each considered sample were obtained 900 slices, grouped in stacks at a resolution of 9 micrometers. The power of the system was 29KeV. Each of the stacks has been implemented in the 3D reconstruction program, which generates interactive 3D bone reconstruction. On the same reconstructions has been observed bone neoformation in parallel with partial-activated matrix in the considered femur site.

• Conclusion

MicroCT can be used as a method of choice in emphasizing the qualitative and quantitative evaluation of the augmentation of bone following laser radiation application.

SESSION : Low Power laser 1
7/3/2014 at 11:45 - 12:00

Abstract n° : 68676
Ref # STL-18

Author(s) : L. Longo*(1)

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LASER THERAPY AT HOME POST ORAL SURGERY

• Introduction

today surgical interventions of implantology are performed frequently and the frequency of teeth extractions continue to be important. Both grpup of surgical intervention give postsurgical pain and inflammation, treated by the dentist with laser Nd-YAG and diodes immediately after the surgery, and antinflammatory and analgesic drugs for some days or weeks.

• Aim

Aim of our study is to reduce the discomfort of the patient after the surgical intervention and to decrease the recovery time, without the use of antinflammatory and analgesic drugs.

• Materials and Methods

a diode laser 808 nm (B-Cure), fluence 5 J /cm2 is used twice a day for three days directly by the patient at home. We enrolled 10 patients after implantology surgical intervention, and the treatment start directly immediatly after that. Further 10 patients were the control, treated with common drugs .

• Results / Evolution description

Evaluation of the results were based on the parameters pain, inflammation features and healing time of post-surgical wound. Data show a dramatic positive effect of diode laser used at home. Pain disappeared rapidly, at first temporary, for some hour, after three days permanently. Inflammation followed same course. The healing of post surgical wound was obtained 50% more quickly than the control . On the other hand, laser used is extremely safe (class 1), don't requires the use of lens and the procedure of treatment is very simple.

• Conclusion

If these data should confirmed on larger number of patients, thie procedure could be used always, saving the use of drugs riches of side effects.

SESSION : Low Power laser 1
7/3/2014 at 12:00 - 12:15

Abstract n° : 67350
Ref # STL-19

Author(s) : B. Vitez*(1), C.Todea(2), A.Sarpe(3), L.Ruxandra(3), A.Velescu(3), D.Gheorghe(4)

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LASER DOPPLER PULP VITALITY EVALUATION AFTER DIFFERENT TOOTH BLEACHING PROCEDURES

• Introduction

The determinant factors of a successfull bleaching therapy are represented by the pulp capacity to return to the initial status as well as obtaining the desired result while maintaining it in time. A rigorous assessment of dental pulp status prior to dental bleaching treatment is essential. Conventional tests do not quantify the degree of pulp inflamation, thus providing subjective information depending on the patients perception and the doctor's ability to interpret the obtained result.

• Aim

For this purpose, Laser Doppler Flowmetry (LDF) is recomended as a current adjuvant technology for efficiently evaluating the blood supply of vital teeth with discoloration. The present study aims to assess the pulp vitality before and after different tooth bleaching procedures, in order to determine the changes in pulpal microcirculation and whether they are reversible or not.12 volunteers were included in this study.

• Materials and Methods

For each volunteer, the pulpal blood flow of upper front teeth (six teeth) was assessed prior to the bleaching procedure using Laser Doppler Flowmetry (LDF). The "in office" bleaching technique was performed with two different gels. In group I (control group) a conventional chemically activated gel was used while in laser group (Group II), the activation was made using Nd:YAG laser (300 μm laser, λ= 1064 nm, P=8W, 60 Hz, t= 10sec/ tooth). After completing the bleaching procedure, the pulpal blood flow was assessed again by LDF immediately after treatment and one week later.

• Results / Evolution description

All data were collected and statistically analyzed. Immediately after the treatment a decrease of pulpal blood flow was detected in all the teeth included in the study s, but higher in Group I as compared to Group II. The subsequent assessments showed a return of the pulpal blood flow values to the initial level in Group II. In group I, a slower recovery of the blood flow values was observed, however/but with statistically significant differences between the study groups ($p<0.005$)

• Conclusion

The results suggest that the bleaching procedure represents a safe treatment method, which does not lead to irreversible damage to the dental pulp, when it used correctly.

SESSION : Oral surgery 1
7/3/2014 at 14:00 - 14:15

Abstract n° : 64421
Ref # STL-20

Author(s) : E. Omar*(1)

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The Light and Tissues Interaction: The outline of Optical Biopsy and Non-invasive methods in diagnosis of Oral Seqaumous Cell Carcinoma – Literature Review

• Introduction

The malignant tissues showed changes in the physical and chemical characteristics due to the sub-cellular Structural changes. These mean that the malignant tissues have different light- tissues interactions (fluorescence characteristics) than the normal tissues. This can be used for diagnosis of malignancy by technologies using the interaction of light with tissues (Optical Biopsy). The technology of spectroscopy in diagnosis of OSCC provides an absolute objective technology that may help in early diagnosis of oral cancer at primary care setting.

• Aim

Objective: Oral Squamous Cell Carcinoma (OSCC) has a remarkable incidence over the world and a fairly strenuous prognosis, encouraging further research on advanced technologies for non-invasive methods that may make the early diagnosis possibly at primary care setting.

• Materials and Methods

Data sources: A web-based search for all types of articles published was initiated using Medline/Pub Med, with the key words such as diagnostic methods of oral cancer, non-invasive methods. The search was restricted to articles published in English, with no publication date restriction (last update November, 2013). Review Methods: In this review article, I approach the advanced technologies of non-invasive methods in OSCC diagnosis. I also reviewed available studies of the oral brush biopsy, Optical Biopsy, Saliva-Based Oral Cancer Diagnosis and others.

• Results / Evolution description

The spectroscopy can detect changes at sub-cellular level so it conveys information that may not be available from conventional histology with a reliable sensitivity and specificity. One of promising non-invasive technique in OSCC diagnosis is Saliva-Based Oral Cancer Diagnosis which can be an alternative to serum testing.

• Conclusion

Conclusion: It is clearly evident that screening and early detection of the cancer and pre-cancerous lesions have the potential to reduce the morbidity and mortality of this disease. Saliva-Based Oral Cancer Diagnosis and optical biopsy are promising Non-invasive methods for diagnosis of OSCC which are easily to perform clinically. They show promising pathways for the future development of more effective prognosis, when are used widely as reliable routine modalities for oral cancer diagnosis at primary care setting.

SESSION : Oral surgery 1
7/3/2014 at 14:15 - 14:30

Abstract n° : 48580
Ref # STL-21

Author(s) : R. Hanna*(1), P.Parker(2)

(1)King's College Hospital, London, United Kingdom, (2)Genoa University, Leeds, United Kingdom

The advantages of carbon dioxide laser applications in paediatric oral surgery.

• Introduction

Carbon dioxide (CO2) laser assisted therapy is a modern and effective method with wide applications in the management of paediatric oral surgery procedures. Studies have shown that the use of soft tissue laser has many advantages over conventional intra-oral soft tissue surgical management.

• Aim

The aim of this study is to demonstrate the advantages of CO2 laser in paediatric oral surgery patients in terms of minimal post-operative pain, absence of bleeding and infection, healing without scaring, functional benefits, positive patient perception and acceptance of the treatment.

• Materials and Methods

The outcome of 100 fit and healthy children (aged 4-15) who had undergone laser surgery for different soft tissue conditions was examined. The Wong-Baker faces Pain Rating Scale was used to assess the pain pre-op. and immediately after surgery in the clinic and 1 day post-op. at home. Post-op. swelling, infection, and bleeding were assessed during a telephone call the day after surgery. Then the patients were reviewed 2 weeks post op.

• Results / Evolution description

All the patients scored ‘0’ to pain pre-operative, peri-operative and immediately after surgery. The pain score one day after surgery was rated between 0-2. The healing time was two weeks. Minimum analgesia was required. No one reported bleeding, infection, or swelling after surgery. Patients’ perception and acceptance were rated very good.

• Conclusion

CO2 laser offers an effective, acceptable, technique in the surgical management of soft tissues in paediatric dentistry with minimum to none post-operative complications. Patients’ perception and satisfaction are rated very good.So, establishing CO2 laser, as a part of armamentarium of specialist oral surgeon would allow the delivery of " State of art" clinical care, reduce the incidence of complications and improve clinical outcome.

SESSION : Oral surgery 1
7/3/2014 at 14:30 - 14:45

Abstract n° : 64486
Ref # STL-22

Author(s) : G. Lajos*(1)

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Soft tissue Laser application in oral surgery - aesthetical aspects

• Introduction
Different type of lasers have been used more and more extensively in our Clinic, and the experience has been accumulated especially in the following fields: • soft tissue surgery: benign tumours and tumorlike lesions, surgery of vascular lesions of the mouth, the face, and other different oral lesions • aesthetical medicine: dermatology, cosmetology, plastic surgery and other related fields

• Aim
The purpose of this presentation is to analyze the aesthetical aspects in soft tissue surgery and aesthetical medicine.Our experience obtained in the last 20 years on more than 17 000 patients is described. We have introduced the CO2, Nd YAG, Argon, Combi, ErYAG, Diode, KTP lasers. In our study the aesthetical results were measured with our own evaluation score systems covering different clinical aspects.

• Materials and Methods

• Results / Evolution description
Our objective with this study was to summarize our experience gained with different type of laser systems, different methods and analyzing the aesthetical aspects. The evaluation of advantages and disadvantages of laser wavelengths, laser methods, shows the way to develop optimal protocols.

• Conclusion
The role of aesthetical aspects is increasingly important. The lasers and the application of protocols can contribute to the optimal outcomes in the wide range of oral and dental lesions in the every day practice.

SESSION : Oral surgery 1
7/3/2014 at 14:45 - 15:00

Abstract n° : 64485
Ref # STL-23

Author(s) : T. Nagase*(1), A.Tsukui(2), K.Moriya(3), T.Shinoki(4), J.Kato(3)

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Clinical case of using Er:YAG laser to incision ankyloglossia

• Introduction

Almost all cases of ankyloglossia are treated in infancy, because it effects the development of language. In this case report, we clinically evaluated the effect of using Er:YAG laser irradiation to incise the frenum on patients with ankyloglossia.

• Aim

We evaluated Er:YAG laser irradiation incision in comparison with conventional surgical treatment to demonstrate Er:YAG laser incision efficacy.

• Materials and Methods

Ten ankyloglossia patients, aged 5 to 12 years, were included in this case. The Er:YAG laser (Erwin-Advel, J. Morita Mfg. Corp., Japan), was irradiated to incise the frenum of ankyloglossia. The irradiation condition was 80mJ-10pps using a contact tip with no water spray, and bleeding was stopped by defocused irradiation, irradiation condition of 30mj-20pps. The patients were evaluated the state of the incision, pain and mobility of the tongue after treatment.

• Results / Evolution description

During laser operation, there is little bleeding. We were able to stop bleeding quickly by applying pressure. This treatment doesn’t require sutures, avoiding the pain of suture removal. This method is simple above all.

• Conclusion

We think that excision using Er:YAG laser is effective for surgical treatment infancy, avoiding pain as much as possible.

SESSION : Oral surgery 1
7/3/2014 at 15:00 - 15:15

Abstract n° : 64880
Ref # STL-24

Author(s) : J. Rocca*(1), E.Medioni(1), C.Fornaini(2)

(1)University of Nice, Nice, France, (2)University of Parma, Parma, Italy

Multi-wavelength diode laser (1): an “ex-vivo” study.

• Introduction
The multi-wavelength diode laser (Delta cube, Erma Electronique, France) combines four different wavelengths (1064, 915, 635 and 405nm). The output power ranges from 0.1 to 15W and the frequency from 20Hz to 20KHz. The LLLT is performed by a 635nm wavelength while the 405nm is used as aiming beam.

• Aim
To define the safe parameters avoiding possible thermal damages in “ex-vivo” clinical situations.

• Materials and Methods
Ten samples were tested to observe the cutting ability of the combined 1064- 915nm handpieces on sheep soft tissue (gingiva) and compared to conventional lancet (blade n°15) via macroscopic and SEM observations. Thermal registration with three different output powers (3.5, 5 and 7W) was conducted with thermocouples placed just in front of the incision lines. On artificial periodontal pockets and root canals, pulp or cement temperature rise was measured.

• Results / Evolution description
Cutting ability on sheep soft tissue was observed with an output power of 5 and 7W (pulse duration 300msec, 200µm fiber): rare traces of carbonization were observed. In terms of cutting velocity in 30 sec. it was possible to cut 1cm of this thick (1.2 to 1.5mm) soft tissue. Temperature elevation ranged from 2.27C° to 3.68C°. When used in periodontal artificial pockets or root canals, temperature rise was always lower than 7C°.

• Conclusion
915-1064nm combined wavelengths laser do not damage surrounding tissues in those “ex vivo” preliminary observations

SESSION : Oral surgery 1
7/3/2014 at 15:15 - 15:30

Abstract n° : 64873
Ref # STL-25

Author(s) : C. Fornaini*(1), E.Medoni(2), J.Rocca(2)

(1)University of Parma, Fiorenzuola d'arda, Italy, (2)University of Nice, Nice, France

Multi-wavelength diode laser (2): clinical observations.

• Introduction

The originality of the Delta Cube laser (Erma Electronique, France) consists in emitting four different wavelengths, also in the same time. On the basis of “ex-vivo” safe parameters, clinical observations were conducted to treat different oral problems.

• Aim

To observe the behaviour of a multi-wavelength diode laser in periodontics, endodontics, hypersentivity treatment, soft tissue surgery and tooth bleaching.

• Materials and Methods

Clinical observations were conducted using combined 1064-915nm and 635-915nm wavelengths in: -endodontic decontamination (output power 1 to 3W, fiber 400µm, 20 KHz) -hypersensitivity treatment: output power 0.5 or 0.75W, fiber 400µm, 10Hz) -periodontal decontamination (output power 2 to 5W, fiber 400µm,10Hz) - soft tissue surgery: contact mode or non-contact mode with specific handpieces (frenectomies, gingivectomies, epulides, vestibular deepening, etc.) - hemostasis and forced dehydratation of vascular benign lesions (haemangioma, lymphangioma)

• Results / Evolution description

Expressed in terms of clinical efficiency and post-operative management, surgical procedures are safe in a bloodless environment. Systematic use of LLLT (635nm) after surgical procedures helps for good healing process.

• Conclusion

The Multi-wavelength diode laser may be used in dentistry with several advantages and the possibility to emit different laser wavelengths in the same time represents a new way to utilize laser technology.

SESSION : Restaurative dentistry 1
7/3/2014 at 14:00 - 14:30

Abstract n° : 59255
Ref # STL-26

Author(s) : I. Alves diniz*(1), C.Uehara(2), A.Carreira(2), C.Sipert(2), P.Kossugue(2), D.Araújo(3), M.Sogayar(2), M.Marques(2)

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Low-level laser therapy improves proliferation and odonto/osteodifferentiation of dental pulp stem cells vehicled in BMP-4 loaded hydrogels

• Introduction
Cell-based therapies have emerged as new potential therapeutic approaches in structures with low regenerative potential, such as bone and dental tissues. As such, there is recent evidence showing that low-level laser therapy (LLLT) may positively modulate stem cell properties for tissue engineering purposes.

• Aim
Here we evaluated whether low-level laser phototherapy has influence on dental pulp stem cells (DPSCs) proliferation and differentiation when seeded onto an injectable and thermorresponsible vehicle (Pluronic F127) loaded with BMP4.

• Materials and Methods
Cells were irradiated with two different energy doses using a continuous-wave diode laser (GaAlAs, 660 nm, 0.028 cm2, 20 mW, 0.71 W/cm2, 3 (4s) or 5 J/cm2 (7s)). PKH26 staining and MTT were performed to verify cell proliferation. Alizarin red staining and qPCR analysed cell differentiation. Data was statistically compared and significant level was set at 5%.

• Results / Evolution description
Under oxidative stress, cells seeded onto hydrogels without BMP4 and irradiated with 5 J/cm2 exhibited increased cell proliferation rate. In the presence of BMP4, irradiated groups with both 3 and 5 J/cm2 have shown early mineral deposition. After 14 days of odonto/osteogenesis induction, cells onto BMP-4 loaded hydrogels and irradiated with 5 J/cm2 produced massive nodule formation compared to the control groups. DPSCs were able to differentiate into odonto/osteoblasts as determined by the expression of collagen type I, osteocalcin and HSP27 markers.

• Conclusion
Altogether, these data demonstrates that BMP4-loaded hydrogels allows stem cell proliferation and odonto/osteodifferentiation and LLLT notably improves this response.

SESSION : Restaurative dentistry 1
7/3/2014 at 14:30 - 14:45

Abstract n° : 64892
Ref # STL-27

Author(s) : C. Zamataro*(1), P.Ana(2), C.Benetti(1), D.Zezell(1)

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In Situ Study of Dental Enamel Submmited to Er,Cr:YSGG Laser Irradiation Associated to Fluoridated Products Application

• Introduction
Er,Cr:YSGG irradiation on enamel enhances the surface area for retention and prolonged effect of fluoride (F-) within fluoridated products. The formed product originated from a single use of acidulated phosphate fluoride or from use of toothpaste could extend cariostatic effect by increasing its formation and retention on irradiated enamel.

• Aim
To verify in vitro human enamel sterilization with Gamma radiation and in situ CaF2-like products formation on enamel surface irradiated with Er,Cr:YSGG.

• Materials and Methods
274 human enamel samples were treated with Er,Cr:YSGG laser irradiation 8.5 J/cm2 alone or in combination with topical applications of: 1) dentifrice 1100 mg F-/g or 2) APF 12300 mg F-/g. Sterilization was performed by Gamma radiation (25 kGy) in 101 samples. Then, 15 volunteers wore in situ palatal appliances containing 8 pretreated samples for native plaque formation. F-dentifrice was used regularly. Analyses were performed after two weeks of in situ use. Results were expressed with $p \leq 0.05$.

• Results / Evolution description
CaF2-like formation was verified by SEM. Biochemical analysis of alkali soluble F- showed statistical difference in groups where Er,Cr:YSGG laser was used prior to topical application of dentifrice or APF. Microhardness showed difference when laser was used after topical application of toothpaste or AFP in situ, suggesting a prolonged synergy FTIR analysis showed that Gamma radiation prior to the in situ study does not alter its microstructure. Although the biological tests showed the sterilization was safe, macroscopic morphological as surface microhardness were unaltered.

• Conclusion
Formation and retention of CaF2 after use of fluoridated products with different concentrations prior to Er,Cr:YSGG irradiation seems to be a parameter to the clinical use in high risk of caries patients.

SESSION : Restaurative dentistry 1
7/3/2014 at 14:45 - 15:00

Abstract n° : 52319
Ref # STL-28

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Current state of the art about low and high power lasers in the treatment of dentin hypersensitivity

• Introduction

In the last decades a reduction in the loss of teeth caused by caries has been observed. However, the longer life of the teeth has led to an increase in the occurrence of non carious lesions and, as a consequence, the increasing number of cases of dentinal hypersensitivity. A large amount of products are available but many therapies show equivocal results due to the difficulties in methodologies and comparisons of the different therapeutic modalities.

• Aim

The introduction of laser technology can provide a reproducible and reliable treatment, offering a contemporary alternative for the treatment of cervical dentinal hypersensitivity. So, this work aims to situate the current state of knowledge about the treatment of dentin hypersensitivity with low and high power lasers suggesting irradiation protocols and, through them, endorse their use.

• Materials and Methods

Ten papers of the literature will be presented in which low and high power lasers were used, in vitro and in vivo. All papers are related to the treatment of dentin hypersensitivity with different study methodologies.

• Results / Evolution description

The conclusions of the 10 presented papers showed that no desensitizing agent proved to be completely effective; low and high power lasers are considered as contemporary alternatives in the treatment of dentin hypersensitivity, with promising results. Also, the combination of protocols can be an effective method of treatment.

• Conclusion

More clinical studies are needed to confirm its positive effects.

SESSION : Restaurative dentistry 1
7/3/2014 at 15:00 - 15:15

Abstract n° : 64566
Ref # STL-29

Author(s) : H. Nokhbatolfoghahaei*(1), S.Nemati anaraki(2), S.Shahabi(3), N.Chiniforush(3), B.Yousefi(3)

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microroughness evaluation of enamel surface after laser- activated bleaching

• Introduction
Esthetic dentistry has gained special attention. Among different techniques, bleaching seems to be a simple and safe procedure compared to other techniques.

• Aim
The aim of this study was to evaluate the enamel microroughness after laser activated bleaching compared to conventional methods.

• Materials and Methods
15 caries-free human molars were sectioned mesiodistally to produce 30 enamel blocks.After mounting samples in transparent acrylic resin block, they were assigned to laser bleaching and office bleaching groups. before treatment, the evaluation of microroughness was done for all samples, then, the samples in office bleaching group,were bleached twice with opalescent Xtra Boost and in laser group, laser-activated gel was used. then, microroughness of all samples evaluated. the data were analyzed by repeated measure ANOVA.

• Results / Evolution description
in both groups, enamel surface roughness was increased. There was significant difference between two groups ($P<0.05$) and office bleaching group showed higher microroughness compared to laser bleaching group.

• Conclusion
laser-activated bleaching is considered a safer technique compared to other bleaching procedures.

SESSION : Restaurative dentistry 1
7/3/2014 at 15:15 - 15:30

Abstract n° : 64998
Ref # STL-11

Author(s) : A. Oppici*(1), F. Clini(1), M. Fontana(1), L. Cella(1), E. Merigo(1)C. Fornaini(1)

Laser utilization, in combination of other different high technology devices (QMR and piezosurgery) in special needs dentistry.

• Introduction

Modern oral dentistry found new perspectives in the utilization of high technology instruments during the different steps of interventions. The advantages consist in better compliance of the patients due to the reduction of pain, bleeding control and faster healing processes, and also in the decrement of the operative time.

• Aim

To demonstrate the important role which laser technology may play in the treatment of the “special needs” dental patients

• Materials and Methods

Several cases in “special needs” patients were treated at the Odontostomatology and Maxillo-Facial Surgery Unit of the Hospital of Piacenza by utilizing laser technology even in synergy with other different high technology devices (Quantic Molecular Resonance Scalpel-QMR and Piezosurgery)

• Results / Evolution description

All treated patients reported a good postoperative comfort without use of painkillers, absence of bleeding and fast healing processes. Histological exams were of good quality without artefacts.

• Conclusion

Sequential utilization of different high technologies devices during all the steps of the “special needs” patients oral treatments allows to perform a faster and less invasive dentistry with a more comfortable postoperative healing process and it represents a new and innovative approach in the oral surgery.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 16:15 - 16:30

Abstract n° : 64834
Ref # STL-30

Author(s) : M. Serajzadeh*(1), R.Fekrazad(2), H.Dehghan(3)

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The effect of CO2 laser with TiF4 and NaF varnish on enamel hardness (in vitro study)

• Introduction

Preventing dental caries is one of the most important goals in dentistry. The preventive value of topically applied fluorides has been well accepted. However, unlike the commonly used fluorides (e.g. NaF), titanium tetrafluoride TiF4 has shown to offer greater protection against caries and tooth erosion. According to some papers, in order to increase the effect of different kinds of fluorides on enamel demineralization, laser irradiation is a good choice.

• Aim

The aim of this invitro study was to assess the effect of experimental TiF4 varnish and NaF with Co2 laser on enamel hardness.

• Materials and Methods

90 human enamel samples were randomly assigned to one of the following groups: 1) Control (no treatment), 2) NaF varnish (2.26%), 3) TiF4 varnish (2.45%), 4) Co2 laser (10.6 µm, 2 Watt, for 10 seconds, at a distance of 1-2 mm, spot size of 0.2mm), 5) NaF varnish (2.26%) with Co2 laser, and 6) TiF4 varnish (2.45%) with Co2 laser. Enamel changes were determined by Surface Vickers Microhardness(SMVH) Test with a load of 1000 grams and a dwell time of 12 seconds. Each sample was stroked three times. Data were analyzed using One-way variance and Tukey's test.

• Results / Evolution description

The mean SMVH for the control group was 255.5, for NaF was 280.3, TiF4 338.7, Co2 laser 277.0, NaF with Co2 laser 345.3, and for TiF4 with Co2 laser was 368.0. The statistical analysis showed that groups 3, 5, and 6 had significantly higher surface hardness than the control group. ($p<0.05$)

• Conclusion

The enamel microhardness when treated with just TiF4 varnish or together with laser irradiation is a lot more than the control group. It seems that TiF4 varnish is a better choice for increasing enamel surface hardness and it would be even more when accompanied with Co2 laser. So using TiF4 varnish with Co2 Laser could be advised in order to increase enamel surface microhardness.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 16:30 - 16:45

Abstract n° : 64864
Ref # STL-31

Author(s) : C. Russo*(1), G.Palaia(1), A.Del vecchio(1), U.Romeo(1), A.Polimeni(1)

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HISTOLOGICAL EVALUATION OF PERIINCISIONAL MARGINS OF LASER BIOPSIES. IN VIVO STUDY

• Introduction
Biopsy is a diagnostic procedure aiming to establish a clear diagnosis. Recently laser replaced traditional tools in surgery but in the case doubts still persist about the possibility to obtain safe and clear cuts by lasers without damaging tissue readability.

• Aim
In vivo histological evaluation of cut edges of biopsies performed by 2 diode and a KTP laser

• Materials and Methods
Seventeen oral benign lesion were excised by: diode 808nm Laser Innovation, Italy; diode 980nm DOC Medica, Italy both at 2W, CW, 320µ fiber, 2400J/cm²; SmartLite KTP 532nm, DEKA, Italy, at 1.5W, PW, 300µ fiber, 212J/cm². Samples were fixed in 4% formalin then paraffin embedded, cut and stained with HE.. Tissues were observed at OM LEICA DM 2000; marginal thermal signs were measured through the Leica Application Suite 3.4 software.

• Results / Evolution description
Morphology and structure of lesions influenced tissue reactions to irradiation. The extent of thermal signs was quantified both in epithelium and chorion for each lesion resulting: 0,245mm avg ± 0.162mm SD in mucocele; 0,382mm avg ± 0.149mm SD in fibromas; 0.336mm ± 0.106mm SD in hyperkeratosis; 0.473mm avg ± 0.105 mm SD in squamous hyperplasia; 0.182mm in giant cell granuloma and 0.149mm in melanotic macula.

• Conclusion
In no case lasers created such edge damages up to compromise diagnosis mainly the KTP. The largest thermal extents were observed in hypercellular and inflammatory lesions.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 16:45 - 17:00

Abstract n° : 64716
Ref # STL-32

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CLINICAL STUDY OF PERIODONTAL TISSUES REGENERATION: COMPLEMENTARITY OF LASER AND NUTRITIONAL TREATMENTS

• Introduction

The use of laser treatment to cure periodontal pathologies lies in its removal capacity, hemostasis, bacterial destruction and cellular stimulation.

• Aim

With this clinical study, I aim at highlighting the importance of the beneficial effects of nutritional quality of terminal tissues such as periodontal tissues as well as the positive aspect of Laser impact stimulation concomitant of these tissues. I have thus conducted a clinical study in my dental surgery to assure the regeneration of periodontal tissues by the combination of these two treatments.

• Materials and Methods

Moreover, if the number of dietary supplements seems unlimited, the supplement chosen for this study has a specific action on the stimulation of stress proteins (Porphyral HSP®), the Er: YAG laser stimulating these same proteins. The different clinical cases chosen show that the combination of specific individual complementation and laser Er: YAG local stimulation at low energy (60 mJ, 10 to 15 Hz) provides to the patient a simple, reliable and lasting gingival regeneration.

• Results / Evolution description

After these successful gum results, similar studies were conducted at the surgery to stimulate bone growth, notably to make implant rehabilitation easier. This time food supplements rich in Calcium, Vitamin D and Silica were added. With this method, bone callus are formed and they are ideally situated for future operations. Here, the bone tissue is stimulated at high energy and low frequency (600 mJ, 1 Hz) in order to free the osteo-inducing proteins (BMPs) by tissue break.

• Conclusion

This association procured a lighter surgery than traditional graft assuring reliability, quality and operating simplification for the practitioner and comfort for the patient.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 17:00 - 17:15

Abstract n° : 64741
Ref # STL-33

Author(s) : D. Zezell*(1), D.Pereira(2), A.Freitas(1), E.Lins(2), P.Ana(2)

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THE USE OF OPTICAL COHERENCE TOMOGRAPHY AND FLUORESCENCE IMAGING SYSTEM TO DIAGNOSE AND MONITOR THE EFFECTS OF Nd:YAG LASER ON DENTIN WEAR

• Introduction

Dental erosion has an increased prevalence nowadays, since it is related to an excessive consumption of acidic beverages and foods. Considering that dentin wear lesions have a fast clinical evolution, it is important to have an efficient early diagnosis and prevention of these lesions.

• Aim

The aim of this study is to verify the potential of Nd:YAG laser and topical acidulated phosphate fluoride application (APF) on preventing dentin wear development and progression and to evaluate the potential of optical coherence tomography (OCT) and a fluorescence imaging system (FIS) on monitoring this process.

• Materials and Methods

120 bovine dentin slabs 8mm2 were randomized into 4 experimental groups: G1- untreated; G2- treated with APF gel (1.23% F-, 4min); G3- irradiated with Nd:YAG (1064nm, 84.9J/cm2, 10Hz); G4- APF application followed by Nd:YAG laser irradiation. Samples were submitted to an erosive and abrasive demineralization (Sprite Zero, pH=2.8, 90s, 4x/day), and remineralization (artificial saliva, pH=7.4) cycling for 15 days. Twice a day, slabs were brushed for 15s using a 0ppm F- dentifrice. Slabs were evaluated by OCT and FIS at the initial, 5th, 10th and 15th day of cycling.

• Results / Evolution description

OCT measurements found a significant increase on dentin wear depth and area of lesions with the increase of cycling days. It was observed that Nd:YAG laser promoted an increased roughness of dentin and, when associated with APF, decreased wear progression. FIS detected a decreased fluorescence on laser irradiated slabs, with can be related to the chemical changes promoted.

• Conclusion

. It was concluded that laser irradiation can be used to prevent dentin erosion, and both OCT and FIS techniques can be considered helpful tools to propitiate an early diagnosis and monitoring of the dentin wear lesion.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 17:15 - 17:30

Abstract n° : 64894
Ref # STL-34

Author(s) : I. Giovannacci*(1), G.Mergoni(1), M.Meleti(1), E.Merigo(2), C.Fornaini(1), P.Vescovi(1)

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Pain and Health-Related Quality of Life (HRQoL) after 118 oral surgical interventions: the advantages of the Nd:YAG laser.

• Introduction
Nd:YAG laser may offer potential advantages for the operator and the patient.

• Aim
to evaluate the differences in the post-operative course associated to the use of Nd:YAG laser and to cold blade after oral soft tissue surgery.

• Materials and Methods
One-hundred and eighteen comparable surgical were evaluated. Group 1 (G1) included 77 interventions performed with Nd:YAG laser; group 2 (G2) 41 with cold blade. The acute post-operative pain was evaluated with the visual analogue scale (VAS), the numeric rating scale (NRS) and the verbal rating scale-6 (VRS-6) at the same day of surgery (day 0), and at 1, 3 and 7 days after surgery. The HRQoL was evaluated on day 7 using a 0-45 score range questionnaire. Data were analyzed using the software STATA 12 (StataCorp LP, College Station, Texas, USA).

• Results / Evolution description
No statistically significant differences could be highlighted in the VAS and NRS scores. The comparison of the VRS-6 scores resulted statistically significant at day 1 and 3, close to significance at day 0 and not statistically significant at day 7. At day 1, 47.14% of patients in G1 and 13.16% in G2 had no pain; at day 3, 62.86% of patients in G1 and 21.05% in G2 had no pain. The HRQoL in G1 was statistically lower than in G2.

• Conclusion
The use of Nd:YAG laser in oral soft tissue surgery is associated to a reduction of patient's post-operative discomfort. The low HRQoL and pain may be associated to the possible analgesic and bio-stimulating effects of the laser.

SESSION : Laser- Tissues Interaction 1
7/3/2014 at 17:30 - 17:45

Abstract n° : 59242
Ref # STL-35

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Diods laser in orthodontics : interests and limits

• Introduction
Les laser diode ont fait leur entrée dans les cabinets d'orthodontie, une discipline jusqu'alors peu intéressée par cette technologie. Nous proposons une revue de littérature et des illustrations de ses applications et de ses limites dans une pratique orthodontique.

• Aim
Démontrer que les orthodontistes ont un intérêt direct à compléter leur arsenal avec les dernières générations de laser diode.

• Materials and Methods
Revue de littérature scientifique et "cases reports".

• Results / Evolution description
La littérature rapporte de nombreuses applications et dénonce aussi certaines limites.

• Conclusion
En fonction de l'étendue de sa pratique, un orthodontiste devrait y inclure l'usage du laser diode, l'obligeant à se former aux actes de petite chirurgie buccale et à s'astreindre aux règles de sécurité liées à l'utilisation d'un outil encore peu répandu de ce domaine.

SESSION : Miscellaneous
7/3/2014 at 16:15 - 16:45

Abstract n° : 62491
Ref # STL-36

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Acceleration of Canine movement by laser assisted flapless corticotomy (an innovative approach in orthodontics)

• Introduction

Corticotomy-assisted orthodontic treatment is done to induce a state of increased tissue tumover and transient osteopenia, which is followed by a faster rate of orthodontic tooth movement. It is considered as an adjunct treatment option for orthodontic treatment of adults.

• Aim

To elucidate the effectiveness of a new surgical approach for acceleration of maxillary canine retraction in human with laser assisted flapless corticotomy and evaluate its effect on vitality of pulp and gingival sulcus depth.

• Materials and Methods

15 patients with extracted maxillary first premolars to retract the canine were treated with Er:YAG laser (350mJ and 4Hz) to decorticate and perform series of holes mesially and distally to their maxillary canines without reflecting a surgical flap. The study was designed as a split mouth study. The net canine movement and molar anchorage loss were calculated after 6 weeks. Vitality test, radio graphical assessment and gingival sulcus depth have been investigated.

• Results / Evolution description

The canines on the laser corticotomy side showed statistically higher mean value of retraction than their controls during six weeks period. There was no significant difference in anchorage loss between sides. Pulp vitality response and post surgery gingival sulcus depth showed no significant difference between the pre-laser and post-laser surgery.

• Conclusion

The use of the Er: YAG laser (in a flapless corticotomy) to retract maxillary canine for orthodontic treatment has proved to be an efficient technique in comparison to the conventional method.

SESSION : Miscellaneous
7/3/2014 at 16:45 - 17:00

Abstract n° : 63566
Ref # STL-37

Author(s) : A. El gamal*(1), E.Darque-ceretti(2), J.Rocca(3), E.Medioni(3), N.Brulat-bouchard(3)

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Effects of CO2 and Nd:YAP laser on the hardness of lithiumdisilicate and zirconia dental ceramics

• Introduction

The demand of ceramics has become increasingly popular in dentistry and the continuous need of precisions is still a challenge to be achieved.The improvement of the CAD/CAM technology and to incorporate new technologies is one of these challenges.The search for non-destructive methods to modify ceramic surfaces and to achieve a functional surface is the demand of all dentists.Recently,the success of laser in many fields attracted the dentists who were penetrating for a new technology to be used in the dentistry.

• Aim

The aim of this study is to investigate the possibility of using laser for surface treatment of different high strength CAD/CAM ceramics,thus to improve their mechanical and chemical properties and to study the thermal effects before and after laser irradiation.

• Materials and Methods

Seventy-two CAD/CAM ceramic discs were divided into two different groups: (IPSe.maxCADs®) and (IPSe.maxZirCADs®, Ivoclar, Vivadent, Italy). The Laser used : CO2 laser (Dream Pulse Lasers®, at 5W, 10W CW and (Nd:YAP Lokkis® at 10W .Physical modifications of the irradiated ceramic discs were observed by (SEM).Surface hardness was realized with 300 g for Emax CAD and 1 kg for Emax Zircad using Vicker/knoop hardness tester (Buehler/Wilson ®VH3100).

• Results / Evolution description

The SEM observation showed a rough surface obtained with cracks, fissures in CO2 10w samples and melting areas in Nd: YAP samples.Treatment with Nd:YAP increase the hardness value Average (657,06 HV/ 0.3Kg) of EmaxCAD while thermal treatment increase the hardness value of control group of ZirCAD (2348,13 HV/ 1kg)

• Conclusion

CO2 laser and Nd: YAP laser modify the hardness value of the ceramics with a significant role of thermal effects on Zircad ceramics

SESSION : Miscellaneous
7/3/2014 at 17:00 - 17:15

Abstract n° : 67237
Ref # STL-38

Author(s) : I. Madan*(1)

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Marketing of Dental lasers and Laser based Education: A dual perspective

• Introduction
Marketing of such an idea needs a 3I model: an Image, Integrity and Identity. The “I” values that form the core of any practice come from the trainings at an institute of excellence.

• Aim
The science behind the laser education is what provides the dentist with the integrity to implement the Blue Ocean Strategy in their existing dental practices and thereby open new horizons for expansion.

• Materials and Methods

• Results / Evolution description
1. Discuss the Business Perspective of Marketing: Blue Ocean Strategy 2. Create familiarity with 3.0 marketing concept: From products to customers to human spirit. 3. Dental Perspective: The Why, How and What of Dental Lasers? To familiarize the end-users with the high-end Dentistry. 4. Discuss the importance of laser education: In-depth knowledge v/s being physical models of laser operation manuals.

• Conclusion
Contents: 1. Introduction 2. What is Blue Ocean Strategy? 3. Steps to implement Blue Ocean Strategy in the dental practice 4. Working model for the Laser supported Dental practice 5. 3.0 Marketing Concept 6. Marketing the mission to the patients 7. Marketing of the integral values. 8. Why Dental Lasers? Benefits to the Patients 9. How do we keep up the high-end laser-supported dental practice? 10. What is the science behind lasers in dentistry? 11. Importance of Institutional trainings in Lasers Dentistry.

SESSION : Miscellaneous
7/3/2014 at 17:15 - 17:30

Abstract n° : 59355
Ref # STL-39

ABSTRACT WITHDRAWN FROM THE CONGRESS

Author(s) : A. Yiannikos*(1)

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The power of scientific knowledge and strategic business planning for laser dentists

• Introduction
The decision of purchasing a laser device should not be based on impulse but on a strategic business plan. The same should apply if we are a laser dentist already, we must know our environment and ourselves!

• Aim
The aim of this presentation is to highlight the main topics that we should be aware of so to apply our lasers equipment profitably.

• Materials and Methods
Know your market, your industry, your colleagues, your strategy, your resources, your financials and the risks/opportunities if you plan to purchase or you already have a laser device

• Results / Evolution description
Business planning is a necessary tool for laser dentists

• Conclusion
The scientific knowledge is crucial, the same applies in a strategic plan so to be profitable and sustainable.

SESSION : Miscellaneous
7/3/2014 at 17:30 - 17:45

Abstract n° : 64809
Ref # STL-40

Author(s) : Ö. Tak*(1), M.Malkoç(2), S.Altintas(3), T.Sari(4), A.Usumez(4), N.Gutknecht(5)

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Effect of Er:YAG Laser on Different Resin Cements During Ceramic Debonding

• Introduction
Laser debonding procedure of adhesively luted all-ceramic restorations is based on the transmission of laser energy through the ceramic and the ablation of resin cement because of the transmitted laser energy.

• Aim
The aim of this study was to determine the effect of Er:YAG laser on five different resin cements during ceramic debonding.

• Materials and Methods
Five different resin cements were evaluated in this study (n=10). A ceramic disc was placed between the resin cement and the tip of the contact handpiece of an Er:YAG laser device (Lightwalker, Fotona). The resin cement discs were irradiated through the ceramic disc and the volume of the resin cement discs were measured with micro-CT system (Skyscan, Kontich) before and after the laser irradiation (600mj, 2 Hz, 1000µs). Decrease in the volume of the resin cement discs were calculated. The results were analyzed with one-way ANOVA and Tukey-HSD tests.

• Results / Evolution description
The highest volume loss was determined for G-Cem (1.1±0.6mm3) and Multilink (1.3±0.1 mm3) ($p<0.05$) and the lowest was determined for Rely X (0.3±0.07mm3), Variolink (0.4±0.2mm3) and Panavia F (0.6±0.2mm3) ($p<0.05$).

• Conclusion
Resin cement type should be taken into consideration to adjust the laser irradiation parameters during laser debonding of adhesively luted all-ceramic restorations.

WFLD CONGRESS

FRIDAY, JULY 4th 2014

- Short communications -

SESSION : Oral surgery 2
7/4/2014 at 08:30 - 08:45

Abstract n° : 64536
Ref # STL-41

Author(s) : J. Higuera*(1)

(1)University Kennedy, Buenos aires, Argentina

Surgical Diode Laser in Dentistry

• Introduction
Diode lasers have made an evolution for Dentistry. Molecular biology principles rule the actions and reactions to laser radiation. Several clínical cases and concepts are shown in this presentation, based on the experience, own scientific evidence and clínical investigations that will represent a biological treatment philosophy to give simple solutions to complex clinical situations.

• Aim
Show simple techniques with Diode Lasers in Implantology, Surgical Procedures and Endodontics based in bioogic principles, with a mollecular point of view.

• Results / Evolution description
Procedures made with lasers resulted more confortable, were simpler and predictable with scientific evidence and clinical protocols.

• Conclusion
Laser Procedures need to be protocolized and shown to general practice, in order to be released and communicated to the whole Dentistry Comunity.

SESSION : Oral surgery 2
7/4/2014 at 08:45 - 09:00

Abstract n° : 64431
Ref # STL-42

Author(s) : J. Caraballo zabala*(1), E.Valmaseda castellon(1), R.Figueiredo(1), J.Arnabat dominguez(1), A.España tost(1), C.Gay escoda(1)

(1)University of Barcelona, Barcelona, Spain

Efficacy of low-level laser therapy in the management of pain, facial swelling and postoperative trismus after impacted lower third molar extraction

• Introduction

The low level laser treatment (LLLT) has been proposed for the reduction of pain and swelling after lower third molar (L3M) surgical extraction.

• Aim

Evaluate the effect of low-level laser therapy in the reduction of pain, swelling and trismus after impacted L3M removal.

• Materials and Methods

A split mouth double blind randomized control trial was performed in six patients undergoing L3M extractions. LLLT was randomly applied only in one side after surgery (intraorally in buccal, lingual and occlusal aspect with 810nm of wavelength during 1 minute in each area with continuous pulse, and extraorally 1 minute in masseteric area). The effect of treatment on a visual analogue scale (VAS) of pain, paracetamol consumption, mouth opening and distances between 2 facial points (gonion-commisure, tragus-commisure and gonion-eye cantus) were measured.

• Results / Evolution description

LLLT and control groups had similar mouth opening and distances gonion-commissure or tragus-commissure. The LLLT group had a significant reduction in the gonion-eye cantus distance ($p<0.05$). VAS of pain and paracetamol total consumption were similar in both groups.

• Conclusion

This preliminary report shows that LLLT does not seem to affect pain or postoperative trismus after surgical L3M extraction. LLLT might have a limited effect on the reduction of swelling on the first postoperative week.

SESSION : Oral surgery 2
7/4/2014 at 09:00 - 09:15

Abstract n° : 64725
Ref # STL-43

Author(s) : S. El toum*(1), A.Cassia(1)

(1)Lebanese University School of Dentistry, Beirut, Lebanon

-Two different approaches in the treatment of oral vascular tumors with diode laser.

• Introduction
Oral vascular neoplasms are more common in females compared to males, hemangioma is a typical one and it presents as a benign and enlarged hamartoma. Dorsal tongue, gingiva, buccal mucosa and pelvi-lingual mucosa are common anatomic locations for vascular tumors

• Aim
Management of this type of lesions has always been a therapeutic challenge: in this regard, the use of haemostatic effect of diode LASER has proved to be an efficient therapy for these specific pathologies, this LASER being used either for biopsy or for photo-coagulation.

• Materials and Methods
In our presentation, we will emphasize on LASER treatment of oral vascular tumors by addressing a number of clinical cases depicting the importance and several advantages of such therapy

• Results / Evolution description
This hemangioma can be treated with non invasive surgery and with a good result

• Conclusion
the diode laser can be safety used on the hemangioma. It is a haemostatic effect .

SESSION : Oral surgery 2
7/4/2014 at 09:15 - 09:30

Abstract n° : 64707
Ref # STL-44

Author(s) : P. Kleemann(1)

(1)Private Institute for Laser Dentistry and Orthodontics, Dinslaken, Germany

Process reliable and low risk aesthetic crown lengthening by laser

• Introduction

Primary aesthetic indicated surgical interventions, such as the aesthetic crown lengthening, impose high requirements on the indication wherefore many procedures based on conventional oral surgery are omitted.

• Aim

The aim was to develop a low risk but process reliable treatment concept employing laser technology in order to facilitate the indication for aesthetic crown lengthening.

• Materials and Methods

For gingivectomy the gingiva was gradually removed up to a defined marking with an Er:YAG laser with a cylindrical sapphire tip oriented tangentially to the dental crown. The gingivectomy with ostectomy was performed without any flap procedures: A gradual osteoplastic of the alveolar crest in vertical direction was executed applying the Er:YAG laser with a long cone-shaped sapphire tip with depth mark using air-/water-spray. The correct biologic width was ensured by exploration of the DGC.

• Results / Evolution description

Both the gingivectomy and the flapless ostectomy with Er:YAG laser could be realized with high precision and predictability and optimal wound healing. In contrast to the application of scalpels the pulsed laser provides controlled ablation of tissue layer by layer and for contouring no additional instruments are needed. The ostectomy could be performed process reliable without direct view employing a special Er:YAG laser procedure with regard of the correct angle of application.

• Conclusion

In case of aesthetic crown lengthening oral surgery based on laser technology can avoid comprehensive conventional instrumentation. Simultaneously the process uncertainty by not surely predictable wound healing after flap procedures with its negative impact on the final aesthetic outcome can be avoided.

SESSION : Oral surgery 2
7/4/2014 at 09:30 - 09:45

Abstract n° : 64732
Ref # STL-45

Author(s) : G. Mergoni*(1), P.Passerini(1), E.Merigo(1), D.Corradi(2), R.Maestri(2), M.Bianchi(3), R.Sala(3), O.Bussolati(3), P.Vescovi(1)

(1)Dentistry Section, University of Parma, Parma, Italy, (2)Pathology and Laboratory Medicine, University of Parma, Parma, Italy, (3)Unit of General Pathology, University of Parma, Parma, Italy

Effect of LLLT on the post-extractive socket healing in rats treated with zoledronic acid and dexamethasone: a pilot study

• Introduction
The effect of Low Level Laser Therapy (LLLT) on the healing process could be useful for the prevention of post-extractive Bisphosphonate-related Osteonecrosis of the Jaws (BRONJ).

• Aim
The aim of the study was to investigate the effect of LLLT on the post-extractive socket healing in rats treated with zoledronic acid and dexamethasone.

• Materials and Methods
Ten Wistar rats in the experimental group received zoledronic acid and dexamethasone. Two controls were infused with vehicle. After 8 weeks the first maxillar molars where extracted bilaterally. The post-extractive sockets of half rats in both groups were irradiate with Nd:YAG laser every 2 days for 8 days (1064 nm; 1,25 W; 15 Hz; VSP; 5 min; fluence: 117,94 J/cm2; power density: 1769,29 W/cm2). Macroscopic and microscopic evaluation of post-extractive sockets at 8 days was performed, altogether with Western Blot analysis of osteopontin expression.

• Results / Evolution description
Rats in experimental group showed macroscopic and microscopic delayed healing compared to controls. Osteopontin expression was higher in irradiated rats of experimental group.

• Conclusion
Our results confirmed that rat is a suitable animal model for BRONJ studies. Further researches with larger populations are needed to test the preventive effect of LLLT on post-extractive BRONJ development.

SESSION : Oral surgery 2
7/4/2014 at 09:45 - 10:00

Abstract n° : 64881
Ref # STL-46

Author(s) : E. Rasca(1)

(1)Department of Dental Sciences, University of Liège, Liège, Belgium

The laser tissue welding as an alternative to sutures in oral surgery

• Introduction
The use of laser to fuse different tissues has been studied for 50 years, but none of these experiments concerned the oral soft tissues.

• Aim
Our objective was to assess the feasibility of the laser gingiva welding.

• Materials and Methods
Incisions performed in calibrated samples of porcine full-thickness gingival flaps were closed either by conventional suture or by laser tissue welding (LTW). To determine the irradiation conditions yielding the best tensile strength, 13 irradiation conditions (Fig 1) were tested on six indocyanine green (ICG) concentrations. The tensile apposition strength was compared between the laser welded and the sutured gingiva. The thermal damage extent was histologically evaluated. The temperature rise during the LTW was measured by thermocouples and by thermal camera.

• Results / Evolution description
The best tensile strength of the laser welded gingiva was yielded by the 9 % saline solution (117 mM) at 4.5 W, 10 Hz and a fluence of 31.3 kJ/cm² (Fig 2). The apposition strength revealed no statistically significant difference ($p < 0.05$) between the sutured and the laser welded gingiva. The mean temperature was 74 ± 5.4 C° at the upper surface and 42 ± 8.9 C° at the lower surface. The damaged zone averaged 333 µm at the upper surface.

• Conclusion
The 808-nm diode laser associated to ICG can achieve oral mucosa LTW, conceivable as a promising technique of gingival repair.

SESSION : Restaurative dentistry 2
7/4/2014 at 08:45 - 09:00

Abstract n° : 64805
Ref # STL-47

Author(s) : M. Johari*(1), M.Mirzaie(2), A.Hadadi(3), N.Chiniforush(1), E.Kosarieh(4), S.Hashemi(3)

(1)Laser Research Center of Dentistry, Tehran, Iran, (2)Restorative department, Tehran University of Medical sciences, Tehran, Iran, (3)Tehran university of Medical Sciences, Tehran, Iran, (4)School of dentistry, Zanjan University of Medical Sciences, Zanjan, Iran

The evaluation of thermal changes of pulp after photo-activated disinfection by two different photosensitizers

• Introduction
Photo-activated disinfection has been used in caries treatment as an aid in dentine decontamination.

• Aim
The aim of this study was to evaluate the temperature rise of dental pulp after photo-activated disinfection by two different photosensitizers and laser source in caries treatment.

• Materials and Methods
48 freshly extracted single-rooted teeth were used. Class I cavities with dimension of 5mm*5 mm, 0.5 mm thickness to pulp chamber were prepared. The samples were divided in 4 groups as following: group 1: LED (632±10 nm) + TBO, group 2: Diode laser (810nm) + Emundo, group 3: Diode laser 0.5W (CW), group 4: Diode laser 1W (CW). The temperature was assessed by using a thermocouple. Measurements were recorded every second during each irradiation.

• Results / Evolution description
The mean temperature rise in the groups 1 to 4 were namely 1.769±0.52,4.5±0.32,4.21±0.83,0.541±0.17. None of the groups showed higher temperature than the safety level (5.5°C) for pulp damage.

• Conclusion
Based on the results, it can be concluded that the dental pulp temperature rise following the use of photo-activated disinfection technique can be considered as a safe method.

SESSION : Restaurative dentistry 2
7/4/2014 at 09:00 - 09:15

Abstract n° : 64142
Ref # STL-48

Author(s) : P. Parhami*(1), S.Pourhashemi(1), M.Ghandehari(1), N.Chiniforoush(1)

(1)Tehran University of Medical Sciences, Tehran, Iran

Comparative study of the shear bond strength of Flowable composite in permanent teeth treated with conventional Bur and contact and non-contact Er;YAG Laser.

• Introduction

In recent years, there were some great advances in caries removal techniques towards conservative techniques. Despite all the advances in dentistry, yet using conventional high-speed rotary is common in practice which could cause some discomforts. Erbium Lasers are the most practical alternative techniques for caries removal, with advantages like no noise or vibration, no smear layer formation, decreased tooth sensitivity and reduced need to use local anesthesia. Er;YAG Laser, has a great potential to remove caries and hard tissues and therefore can replace high-speed rotary.

• Aim

the aim of this study was to evaluate and compare the shear bond strength of flowable composite to enamel treated with Er;YAG laser as in contact / non-contact and conventional method

• Materials and Methods

75molar teeth were used In this study, divided into 5 groups, randomly: Group 1 and 2 : treating with non-contact Er;YAG Laser pulsed mode(2940 nm, 500mj, 5 W, 10 Hz, 4 mm distance) Group 3 and 4: treating with contact Er;YAG Laser (2940 nm, 5 W, 500 mj,10 Hz) Group 5 (control): treating with diamond fissure bur group 1 and 3: etching with Er;YAG laser (2940 nm, 5 w, 10 Hz, 50 mj ,4 mm distance) Group 2,4 and 5: etching with Acid phosphoric 37% Then adhesive was applied on the surafces of teeth and. Resin cylinders were fabricated from flowable composite(height and diameter 3mm).

• Results / Evolution description

The amount of Shear Bond Strength (SBS) in the 5 treatment groups was not the same (P-Value < 0.05). conrtol group had the highest mean shear bond strength (19.92±4.76) and the group 3 had the lowest mean shear bond strength (10.89±2.89). Mann-whitney test showed there was a significant difference in shear bond strength between the control group and the three groups 1, 3 and 4 (P-Value < 0.05) but there was no significant difference in shear bond strength between other groups (P-Value > 0.05).

• Conclusion

Based on the results of this study and considering the limitations of in vitro studies, it can be concluded that: • The specimens treated with conventional technique using a bur previous to acid-etching had higher shear bond strength than the ones treated with Er;YAG laser (contact or non-contact hand-piece). • Enamel treating with non-contact Er;YAG laser previous to acid-etching could be an alternative technique regarding its benefits, but further evaluations are mandatory.

SESSION : Restaurative dentistry 2
7/4/2014 at 09:15 - 09:30

Abstract n° : 64831
Ref # STL-49

Author(s) : A. Efthimiou*(1), A.Kallis(2)

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An innovative pulse duration by Er:YAG laser at 2940nm, enhances the results of conservative dentistry! !

• Introduction

There was the FDA approval of Er:YAG in 1997. After that, new wavelengths and technology improvements inducted in the dentistry field. An updated dentist involves lasers in everyday clinical practice.! The golden standard for a clinician is to be fast, painless with accurate diagnosis and precise treatments. These requirements are fulfilled by the latest lasers innovations.! The possibility to use different wavelengths, followed by the induction of new pulse duration modes.!

• Aim

The latest mode is the quantum square pulse(QSP) that combines precision and performance. It is applied at the Er:YAG and it is the optimal mode offering the efficacy of a long pulse with the precise of a short pulse.A series of cases are presented involving the cavity preparation in premolars, incisors and subgingival

• Results / Evolution description

The Lightwalker AT of Fotona, with wavelengths at 2940nm(Er:YAG) and1064nm(Nd:YAG), was applied. Different settings for various water content tissues were used. Pulse energy from 200mJ to 1000mJ, Pulse duration from 50μs to 250μs and frequency from 10Hz to 30Hz and QSP mode at 500mJ, 10 Hz, or at 200mJ, 10HZ, Nd:YAG at pulse energy of 100mJ, pulse duration of 100μs and frequency 15 Hz for disinfection. No etching was applied, surface modification was achieved by QSP mode at 120mJ, 10HZ. !

• Conclusion

The acceptance of the treatment with no use of anaesthesia was excellent. The optimal selection of laser setting provided fast ablation and grate precision; followed by fast healing of soft tissue.!

SESSION : Restaurative dentistry 2
7/4/2014 at 09:30 - 09:45

Abstract n° : 67132
Ref # STL-50

Author(s) : A. De dycker*(1)

(1)University of Liege, Brussels, Belgium

Clinical treatment of dental hypersensitivity by means of diode laser (980 nm).

• Introduction
Cervical dentin hypersensitivity is a frequent claim in daily dental practice

• Aim
This study aimed to evaluate the effectiveness of diode laser (980 nm) use in cervical dentin hypersensitivity.

• Materials and Methods
Materials and methods :The sample consisted of 30 teeth. Prior to the desensitizing treatment, the dentin hypersensitivity status of each tooth was assessed by an evaporative stimulus; the patient's response was evaluated using the Visual Analogue Scale (VAS) after constant stimuli by a dental air syringe. For each patient, the sensitive teeth were irradiated with diode laser (980 nm) in CW, 1 watt, at a speed of 1 mm/sec with graphite applied on the sensitive part of the teeth. Re-evaluations of the treatments occurred immediately at the end of the treatment and after 7, 15, 30 and 90 days.

• Results / Evolution description
Immediately after treatment, a significant reduction of the pain was observed in lased teeth.

• Conclusion
The use of Diode laser (980 nm) can be considered as an alternative and effective therapeutic method for dental hypersensitivity.

SESSION : Restaurative dentistry 2
7/4/2014 at 09:45 - 10:00

Abstract n° : 64702
Ref # STL-51

Author(s) : S. Hashemi*(1), S.Arami(2), M.Hasani tabatabae(2), N.Chiniforush(3), M.Johari(1), A.Hadadi(1)

(1)Tehran University of Medical Sciences, Tehran, Iran, (2)Department of Restorative Dentistry, Tehran, Iran, (3)Laser Research Center of Dentistry, Tehran, Iran

Effect of Diode and Nd:YAG Laser on Treatment of Dentin Hypersensitivity Compared to Bonding Agent

• Introduction
Dentin hypersensitivity is characterized by short, sharp pain arising from exposed dentin in response to external stimuli, typically thermal, evaporative, tactile, osmotic or chemical and which cannot be described to any other form of dental defect or pathology. There are several ways of treatment for such condition, including the low level lasers and dentin bonding agent.

• Aim
The aim of this study was to compare the clinical efficacy of the Nd.YAG laser, Diode and dentin bonding agent in treating dentin hypersensitivity.

• Materials and Methods
136 teeth from 23 patients (6 male and 17 female; aged 30 to 65 years) diagnosed with dentin hypersensitivity, were divided into 3 groups: In group I, teeth were applied with CLEARFIL SE BOND in group 2 teeth were irradiated Diode laser with 1w ,C.W for 20 sec and in group 3, teeth were irradiated with Nd:YAG laser 1w,10Hz for 40 sec. Treatment with laser was carried out in 3 sessions, with intervals of 7 days between sessions, during a period of 3 consecutive weeks. Sensitivity was assessed with the criteria proposed by Uchida at baseline and after treatment; immediately, at 1, 3 and 6 months.

• Results / Evolution description
The reduction of dentin hypersensitivity was observed in all treatments using the Diode laser, Nd:YAG laser and dentin bonding agent in all 3 evaluation periods. There was significant difference in reduction of pain between Nd:YAG laser and bonding group ($p<0.001$) and Diode laser and bonding group ($p<0.001$) in 3 months follow up.

• Conclusion
Among three different methods, Nd:YAG laser can be suggested as a suitable treatment procedure for dentin hypersensitivity.

SESSION : Periodontology 2
7/4/2014 at 10:45 - 11:00

Abstract n° : 59382
Ref # STL-52

Author(s) : R. Al-falaki*(1), F.Hughes(2), R.Wadia(2)

(1)Private Practice and Guys Hospital, London, United Kingdom, (2)Guys Hospital, University of London, London, United Kingdom

Treatment of infrabony defects using Er,Cr:YSGG lasers as an adjunct to root surface instrumentation: a retrospective clinical and radiographical analysis

• Introduction

The use of non-surgical treatment for the management of periodontal pockets associated with infrabony defects is an unpredictable treatment modality. These defects often require surgical intervention, commonly using a regenerative material. While using an Erbium ,Chromium: Yttrium Scandium Gallium Garnet (Er,Cr:YSGG) laser in such defects as an adjunct to conventional scaling, marked pocket depth resolution was noted clinically, along with radiographic increases in bone volume

• Aim

To carry out an extensive retrospective clinical and radiographical analysis of an extended case series. 48 patients with a diagnosis of Chronic Periodontitis and some evidence of infrabony defects radiographically, were treated non-surgically, firstly using ultrasonic scalers, followed by Er,Cr:YSGG, using 14mm radial firing tips (1.5W, 30pps, short pulse, 20% water; 11% air). Probing depth analysis was carried out after 2 months and radiographs repeated after at least 5 months.

• Results / Evolution description

The mean age of patients was 35-76 years; the mean pocket depth reduction associated with infrabony defects (88 in total) was 5.42 +/-2.07mm. 4 blinded examiners analysed 77 pairs of radiographs and unanimously identified before and after treatment radiographs based on seeing marked increases in bone volume in 67.2% of cases

• Conclusion

Treatment resulted in conversion of more than 95% of deep sites to < 5mm, which is considered a critical outcome for long term stability. Alongside this, extensive gains in bone volume were evident on many radiographs. The use of Er,Cr:YSGG laser as a non-surgical adjunct in periodontal pockets seems to be effective and bony infill in infrabony sites may suggest significant advantages. Further studies, including well designed RCTs are required

SESSION : Periodontology 2
7/4/2014 at 11:00 - 11:15

Abstract n° : 64491
Ref # STL-53

Author(s) : T. Akira*(1), N.Takayuki(2)

(1)Clinical Society of Er:YAG Laser, Japan, Kamakura, Japan, (2)Clinical Society of Er:YAG laser,Japan, Obihiro, Japan

Root debridement of Er:YAG laser with the dental endoscope procedure ,Case report

• Introduction

Since most forms of periodontal disease are plaque associated disorders, it is obvious to remove the dental plaque is main treatment of periodontal therapy. Recently, Er:YAG Laser is appreciated to remove subgingival calculus without flap surgery. However, we cannot confirm what removed the subgingival calculus from root surface and granulation tissue without flap surgery. Then, we developed the laser and the endoscope of the all-in-one design.

• Aim

This is a case report of periodontal pocket elimination procedure by Er: YAG laser under the dental endoscope.

• Materials and Methods

8 tooth (anterior tooth 4 premolar 2 tooth molar tooth2) of five patients who had the periodontal pocket depth of 4mm or more (4~8mm average 5.3mm) were treated by the Er: YAG laser with dental endoscope. And we evaluated it about pocket depth and clinical attachment.

• Results / Evolution description

. The mean probing pockets depth decreased from 4~8mm (average 5.3mm) to 2~5mm (average 3.4mm), Clinical attachment levels were increased 1~3mm (average 0.5~4.1mm). Gingival recession was small and there were no problem of esthetics.

• Conclusion

The periodontal pocket therapy of the endoscope of 2mm in the diameter and Er:YAG laser is an effective method in periodontitis. However, this dental endoscope is necessary to improve, because the operativeness of this device is difficult.

SESSION : Periodontology 2
7/4/2014 at 11:15 - 11:30

Abstract n° : 63497
Ref # STL-54

Author(s) : B. Rashidisangsary*(1), R.Franzen(1), N.Gutknecht(1)

(1)University Hospital Aachen RWTH Aachen University, Aachen, Germany

Effects of Er,Cr:YSGG and Diode 940nm laser on root surface: Morphological and Thermal Analysis

• Introduction
Lasers are one of the most promising new advancements for non-surgical periodontal treatment due to strong tissue ablation, detoxification, and bactericidal effects, especially Erbium laser family and diode laser.

• Aim
The aim of the present study was to evaluate if the proposed laser settings are suitable and safe for root debridement and pulp, respectively.

• Materials and Methods
30 single-rooted mandibular and maxillary teeth were collected. Root canal therapies were done to place thermocouples within the root canal. The specimens were mounted within an acrylic resin. The samples were divided as follows, group1: Er, Cr: YSGG, 25mJ/pulse, frequency of 50 Hz, 50 µs and water/air spray, group2: Er,Cr:YSGG (same setting) and 20% diode 940nm, 2 W (chopped mode) group3: Er,Cr:YSGG (same setting) and 50% diode 940nm, 2 W (chopped mode). The whole laser therapy for each tooth took 60 seconds.

• Results / Evolution description
The mean thermal changes within the pulp cavity for group 3 was 1.68 °C ± 0.98. The other two groups showed the average thermal changes ≤ 0.5 °C± 0.19. SEM photographs, 12 out of 30 samples, up to magnification of 1000X, did not show any thermal or physical damages such as melting, carbonisations, and craters to the root surfaces, but irregularities and roughness of superficial layer of Cementum.

• Conclusion
Er, Cr: YSGG laser, 25mJ/pulse, 50 Hz, 12.73 J/cm2 along with diode 940nm, 2 W, chopped mode, can be utilised for root surface debridement, disruption and ablation of biofilm, and smear layer removal without any thermal and ultra-structural damages. Moreover, it does not elevate the temperature beyond the critical point in Pulp.

SESSION : Periodontology 2
7/4/2014 at 11:30 - 11:45

Abstract n° : 67211
Ref # STL-55

Author(s) : Y. Blagovesta(1)

(1)Medical University, Plovdiv, Bulgaria

One year clinical results after Er:YAG treatment of chronic periodontitis

• Introduction
Chronic periodontitis is one of the most common dental diseases. Many hand and power-driven instruments are used for its treatment. Recent years the lasers are widely used in the periodontitis therapy as alternative or adjunctive treatment but there are no convincing results showing better effectiveness of the Er:YAG laser in comparison with the conventional treatment.

• Aim
The aim of the present study is to evaluate the long-term effectiveness of a fiber less Er:YAG laser in the treatment of moderate chronic periodontitis in comparison to hand instrumentation.

• Materials and Methods
In the study are included 30 patients with moderate chronic periodontitis (1099 periodontal pockets). They are treated in a split mouth design either with fiber less Er:YAG laser – 2940 nm, 1.5 W (test group) or with Gracey curettes (control group). Clinical data – periodontal pocket depth (PPD), gingival recession (GR), clinical attachment level (CAL), bleeding on probing (BoP), plaque presence (P), are evaluated baseline and 1, 3, 6 and 12 months after the therapy with Florida probe.

• Results / Evolution description
The total mean reduction of the PPD after one year in the hand instrumented group and in the Er:YAG laser treated group is 1.55 mm and 1.70 mm respectively ($p<0.05$). The mean gain of CAL in the control group is 1.40 mm and in the Er:YAG laser group is 1.59 mm ($p<0.05$). The reduction of the BoP and plaque presence is also significantly greater in the laser treated group one year after the therapy ($p<0.05$).

• Conclusion
The Er:YAG laser is effective method in the treatment of the moderate chronic periodontitis that leads to significant reduction in the periodontal pocket depth, clinical attachment level, bleeding on probing and plaque presence. The results are significantly lower in the laser treated group in comparison with the control hand instrumented group. The statistically significant differences between both groups demonstrate that the Er:YAG laser has better long-term and clear pronounced clinical effectiveness.

SESSION : Periodontology 2
7/4/2014 at 11:45 - 12:15

Abstract n° : 62799
Ref # STL-56

Author(s) : L. Theodoro*(1), M.Longo(1), N.Assem zanini(1), M.Alves ferro(1), E.Ervolino(1), V.Gouveia garcia(1)

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Effect of repeated episodes of aPDT on the experimental periodontitis in rats subjected to chemotherapy with 5-FU

• Introduction
Experimental studies in animals have shown the usefulness of antimicrobial photodynamic therapy (aPDT).

• Aim
The aim of this study was to evaluate the influence of repeated episode of adjunctive aPDT on bone loss (BL) in furcation of areas with ligature induced periodontitsi in rats immunosuppressed with 5-fluorouracil (5-FU).

• Materials and Methods
After seven days, ligature was removed and 96 animals were divided into groups: GI - animals treated with 5-FU; GII - 5-FU and scaling and root planing (SRP); GIII - 5-FU, SRP followed by methylene blue (MB) and laser (660 nm; 0.0283 cm2; 74.2 J/cm2; 0.035 W; 2.1 J; 60 seconds; 1.23 W/cm2); GIV - 5-FU, SRP followed by treatment with aPDT (0, 24, 48 and 72 hours). Eight animals from each group were euthanized at days 7, 15, and 30. The area of bone loss in the furcation region was histometrically analyzed. Data were analyzed statistically ($P<0.05$).

• Results / Evolution description
Histometric analysis showed more bone loss in animals of GI, GII and GIII when compared to GIV at 7 days. At 30 days, the animals of GIV showed less bone loss when compared to GII ($P<0.05$).

• Conclusion
Repeated episodes of aPDT were effective to reduce alveolar bone loss in areas with experimental periodontitis in rats immunosuppressed with chemotherapeutic 5-FU.

SESSION : Endodontics 2
7/4/2014 at 10:45 - 11:00

Abstract n° : 64888
Ref # STL-57

Author(s) : . Todea(1)

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MicroCT investigation of Er:YAG root canal debridement

• Introduction
Studies have demonstrated that conventional chemo-mechanical preparation is limited regarding the decontamination of the endodontic space. Moreover, root canal instrumentation produces smear layer. This may limit optimal penetration of the irrigating agents and it can act as a barrier between the filling material and the root canal walls, altering the filling's quality and promoting further infiltration.

• Aim
The present study aims to assess, by MicroCT using Synchrotron radiation, the ability of Er: YAG laser in root canals debridement. 14 teeth were subjected divided into 3 study groups: control and 2 laser groups.

• Materials and Methods
We used 14 extracted monoradicular teeth, which were subjected to the same initial biomechanical protocol. The control group, has not been treated with laser; the second group was exposed to Er:YAG laser radiation using the PIPS fiber tip (10 mJ, 10 Hz mode, VSP 10 seconds); the third group of teeth, received treatment with Er: YAG laser using Xpulse fiber tip 400/14 10 mJ, 10 Hz, VSP mode 10 sec). After the laser irradiation, all 3 groups were analyzed at SEM and MicroCT (Synchrotron radiation).

• Results / Evolution description
Results. The samples treated with Er:YAG showed mostly clean dentin surfaces in all three areas of the canal, with open dentinal tubules. In some areas, the debridement was not very effective, leaving traces partly or wholly covered by the smear layer. The debridement was superior to the one using only the conventional biomechanical treatment.

• Conclusion
Conclusion. MicroCT using Synchrotron radiation represents a valuable in vitro method of investigating the root canal debridement, after Er:YAG laser irradiation with two different geometry peaks being superior to SEM investigation.

SESSION : Endodontics 2
7/4/2014 at 11:00 - 11:15

Abstract n° : 64547
Ref # STL-58

Author(s) : S. Watanabe*(1), A.Ide(1), K.Yao(1), K.Satake(1), M.Ichikawa(1), T.Anjo(1), A.Ebihara(1), C.Kobayashi(1), H.Suda(1)

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Pressure generated outside the apical foramen during root canal irrigation activated by diode laser

• Introduction
Although root canal irrigation is a very important process for root canal treatment, there is a risk of extrusion of sodium hypochlorite into the periapical region. However, extrusion generated by laser-activated irrigation (LAI) using diode laser have not been studied yet.

• Aim
To investigate pressure generated outside the apical foramen by LAI with pulsed diode laser in comparison with the conventional irrigation (CI).

• Materials and Methods
Plastic root canal models shaped to apical size #40 were filled with distilled water. They were assigned to two groups with two different lasing/needle tip positions each: LAI group: pulsed diode laser (Alta MLS, Dental Photonics, 120mJ 16Hz) with a tip (DS1-200) positioned 5 and 10 mm short of the working length (LAI 5, 10). CI group: hand irrigation with 1 ml was performed with a 27 G flat needle positioned 5 and 10 mm short of the working length (CI 5, 10). The pressure caused by the irrigation for 20 seconds was measured by a pressure sensor (AP-12S, Keyence).

• Results / Evolution description
The mean maximum pressure caused by LAI 5, 10 and CI 10 was significantly lower than that caused by CI 5 ($p<0.05$), and there were no significant differences among the LAI 5, 10, and CI 10 groups ($p>0.05$).

• Conclusion
Under the conditions of this preliminary study, pulsed diode laser did create irrigation pressure. Although it was smaller than that caused by the conventional irrigation method, the possibility of irrigant extrusion through the apical foramen should be considered also in LAI.

SESSION : Endodontics 2
7/4/2014 at 11:15 - 11:30

Abstract n° : 61858
Ref # STL-59

Author(s) : O. Muhammad*(1), M.Chevalier(1), J.Rocca(1), E.Medioni(1)

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Evaluation of different PDT protocols to interrupt an artificial endodontic biofilm, an ex vivo study

• Introduction

The success rate of endodontic treatments is higher when the canal is bacterial free and it is filled. Decontamination of root canal cavity with its complex system of dentinal tubules is a complicate mission to accomplish. A protocol that can be useful to clean a 3-dimensionally invasive infection is desirable. In endodontics photodynamic therapy is used as a disinfection protocol

• Aim

To evaluate the ability of Photodynamic therapy to disrupt an artificial multispecies biofilm inside root canal space in a clinically acceptable working time

• Materials and Methods

Thirty extracted teeth were prepared, then infected by an artificially formed biofilm of Streptococcus salivarius,Enterococcus faecalis,Prevotella intermedia,Porphyromonas gingivalis bacteria.The samples were divided in 3 groups.First group was treated by Aseptim+ disinfection system. Second group was treated by a 650nm Diode laser and a solution of 15 µg/ml of Toluidine Blue. The last group, as control group was treated by a passive ultrasonic irrigation(PUI) using of EDTA17% and NaOCl 2.6% solutions.Results were verified by aerobic and anaerobic cultures and SEM.

• Results / Evolution description

Statistical analysis showed a significant difference between 3 groups in both aerobic and anaerobic condition cultures ($p<0,00001$). But, after 72 hrs. in anaerobic conditions Aseptim+® showed better results than Diode laser and Toluidine Blue ($p<,0043$). Both groups had no significant difference ($p=0.6267$) in aerobic conditions. In the group treated with PUI and NaOCl, there was a significant destruction of microbial biofilm.

• Conclusion

In clinical condition (3-D infection, Working time,…), Ultrasonic irrigation has the best effects in disruption of microbial biofilm and reduction of bacterial biofilm. Photodynamic therapy without NaOCl (using both Aseptim+® or 650nm Diode laser and Toluidine blue as photosensitizer) has not significant effect in killing of bacteria associated in biofilm. However PDT using LED had slightly better results in matter of bacterial load reduction

SESSION : Endodontics 2
7/4/2014 at 11:30 - 11:45

Abstract n° : 64515
Ref # STL-60

Author(s) : G. Tomov*(1), N.Bibova(1), M.Filipova(1), P.Zagorchev(1)

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IN VITRO EFFECTIVENESS OF ER:YAG LASER IRRADIATION ON THE ENDOTOXIN INACTIVATION

• Introduction

The endotoxin is released by death Gram (-) bacteria, causing a series of biological effects that lead to an inflammatory reaction and bone resorption. Er:YAG lasers are discussed as alternative of the traditional irrigation methods in endodontic. However, the effectiveness of Er:YAG lasers on endotoxin inactivation is still not investigated.

• Aim

The objective of this laboratory study was to investigate the effect of Er:YAG laser irradiation on the endotoxin inactivation in vitro.

• Materials and Methods

Laser parameters: An Er:YAG laser with a wavelength of 2 940nm was used to irradiate the endotoxin contained water (1EU/ml). The energy output of 15mJ at 20Hz with an average power of 0.3W and endodontic sapphire tip (0.4/17mm) was used to activate the test liquid with endotoxin for 60s (Group I) and for 120s (Group II). Non irradiated liquid was used for positive control. The endotoxin concentration was measured by Chromogenic LAL assay by extrapolating the absorbance of the test samples against the standard curve (absorbance at 405nm), using ELISA reader. The statistical analysis was performed using t-test.

• Results / Evolution description

Group II (Endotoxin 1EU/ml + Laser 120s) presented greater endotoxin reduction after irradiation which was similar to Group I (Endotoxin 1EU/ml + Laser 60s); ($P > 0.5$) and different from the positive control without laser irradiation; ($P < 0.5$).

• Conclusion

Under the conditions of this study, the Er:YAG laser achieved significant endotoxin deactivation in the irradiated liquid in contrast with the control group. The hypothesis developed is that the plasma emission and the associated cavity expansion, collapse and acoustic transients are possible mechanisms of the endotoxin molecules breakdown.

SESSION : Endodontics 2
7/4/2014 at 11:45 - 12:00

Abstract n° : 64827
Ref # STL-61

Author(s) : S. De meyer(1)

(1)Ghent University, Gent, Belgium

Effect of Laser Activated Irrigation on biofilms in artificial root canals

• Introduction
Laser-activated irrigation (LAI) has recently been introduced as a novel and more effective technique for activation of root canal irrigants. It is suspected that the turbulent action of the irrigant induced by LAI results in better biofilm removal than traditional (syringe based) and passive ultrasonic irrigation (PUI).

• Aim
The purpose of this in vitro study is to evaluate the antimicrobial effect of LAI on biofilms in simulated root canals.

• Materials and Methods
A dual-species biofilm of E. faecalis and S. mutans was grown in resin root canal models. After 48 hours of incubation, the canals were subjected to the following treatments: syringe irrigation using a 27G needle at 1 mm from working length, PUI with a #20 Irrisafe for 20 seconds at 1 mm from working length, and LAI with an Er:YAG laser (2940 nm, 20 Hz, 50 µs pulses, 20 seconds, 20 or 40 mJ). All treatments were executed in duplicate using both sterile saline and NaOCl 2.5 % as the irrigant. Surviving bacteria were harvested and the number of CFU per resin block was determined by plate counting.

• Results / Evolution description
Using saline as the irrigant, significant reductions (ANOVA, $P < 0.05$) in viable counts were observed for LAI (> 1 log10 reduction), but not for syringe irrigation and PUI (< 1 log10 reduction). The use of NaOCl as the irrigant resulted in significant reductions in viable counts for all treatment groups (> 2.5 log10 reductions).

• Conclusion
Within the limitations of this in vitro study, it was found that LAI resulted in the best physical biofilm removal. This effect became less clear when NaOCl was used as the irrigant.

SESSION : Endodontics 2
7/4/2014 at 12:00 - 12:15

Abstract n° : 47665
Ref # STL-62

Author(s) : I. Madan*(1)

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Laser assisted Pediatric Endodontics: Conventional v/s laser assisted root canal treatments in primary teeth- An in vivo study

• Introduction

In the root canals of primary teeth, it is quite common to see the infection spreading into the periradicular areas. One of the main criteria of success for endodontically treated teeth is the achievement of significant microbial reduction. Use of laser thus becomes a significant tool under such conditions and may prove to be a definite or better alternative in achieving the required sterilization of the root canals.

• Aim

To have a comparative analysis of conventional and laser assisted root canal treatments in primary teeth with different stages of periapical changes.

• Materials and Methods

A total of twenty primary upper/ lower carious molars were selected in this study and divided randomly for conventional and laser assisted Root canal treatment. METHODS: Group I: Conventional root canal treatments under rubber dam. Group II: 940nm Diode laser assisted root canal treatment without rubber dam. Mann Whitney test and Fisher's exact tests were used for statistical analysis.

• Results / Evolution description

Pain Assessment: There was no significant difference with regards to change in pain scores when compared in between the two groups. Clinical Assessment: No statistical difference between the two groups was seen. Radiographic Changes: No significant difference between groups with regards to Radiographic Assessment grades.

• Conclusion

In conclusion, 940 nm Diode laser assisted root canal treatments can prove equally or more effective than conventional root canal treatments in clinically limiting situations where ideal armamentarium of pulpectomies such as rubber dam and conventional irrigation, fails to get followed. Further research in this direction will certainly open a new horizon in the field of laser assisted root canal treatments in primary teeth.

SESSION : Laser-tissues interaction 2
7/4/2014 at 14:00 - 14:30

Abstract n° : 63536
Ref # STL-63

Author(s) : G. Zhegova*(1), M.Rashkova(1), B.Mihailova(2), R.Titorenkova(3)

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Micro-structure of permanent enamel treated with an Er-YAG laser- Raman and IR reflection spectroscopic study

• Introduction
Er-YAG laser has many advantages compared to conventional techniques for hard dental tissues treatment. Spectroscopy studies are needed to better understand the Er:YAG laser's effects.

• Aim
To analyze the structure of permanent enamel treated by an Er-YAG pulse laser operating at various laser energies by using Fourier transform infrared reflection and UV Raman microspectroscopy.

• Materials and Methods
Six dental discs cut from six defect-free permanent molars treated by a varied energy 200-400 mJ and pulse frequency 20 Hz of Er-doped yttrium-aluminium-garnet pulse laser (λ = 2940 nm) with pulse duration 50 μs as well as by classical drilling tools for 6 s were studied by IR reflection and ultraviolet Raman microspectroscopy. A comparison between the enamel spectra (IR and Raman) collected from treated and control areas was made.

• Results / Evolution description
The IR spectra collected from laser treated, conventionally treated and control areas revealed no differences, except parameters 400 mJ/20 Hz that led to appearance of additional phosphate-group peaks. The Raman spectra showed no changes in intensity of peaks of hydroxyl groups (3575 cm-1), a decrease in the intensity of the peak at 1069 cm-1 generated by B-type CO_3, a slight increase in the position of the symmetric v1(PO_4) stretching peak at 960 cm-1 and an enhancement of the peaks, caused by vibrations of protein functional groups.

• Conclusion
The most important conclusion is that after the Er-YAG laser treatment, the hydroxyapatite structure in permanent enamel is preserved: the apatite Ca-P-O framework remains intact, and the content of channel OH- groups is not changed within experimental uncertainties. The only alterations in enamel induced by laser as well as by mechanical drilling are reduction of the amount of CO_3^{2-} in apatite and changes in the protein conformation.

SESSION : Laser-tissues interaction 2
7/4/2014 at 14:45 - 15:00

Abstract n° : 64587
Ref # STL-64

Author(s) : I. Pinto(1)

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QUANTUM DEPIGMENTATION OF MELANIN GINGIVAL STAIN, WITHOUT TISSUE REMOVING WITH 810nm DIODE LASER

• Introduction

When a question came up, during a post-graduation class, regarding the characteristics of the spectrum of Laser light in the near infra-red (IR), as its high selectivity for chromophores hemoglobin, oxyhemoglobin and melanin, its transparency to other gingival soft tissues with large amounts of water, I realized that there would be no need to remove the superficial tissues, as done in abrasion / scaling / curettage / surgical laser type hot spot scarification.

• Aim

Transporting this insight into practice, I got an ischemia on the basal layer, where melanin occurs, leaving the superficial tissues untouched. On the next day all melanin stain had disappeared, leaving the normal appearance of the collagen structure.

• Materials and Methods

I used the DMC Thera Lase Sugery 4,5Watts, wavelength IR λ=810nm, I used continuous wave (CW), a clean fiberglass 600µm without pre-initiation, bringing the fiber close to the target tissue without touching it.

• Results / Evolution description

The advantage on this new approach, is that in addition on preserving the most superficial and adjacent tissues, and in most cases, practically painless, it is used a topical anesthetic, or, in rare cases without any anesthetic. Along with it, without touching the tissues, a more effective removal of melanin stain occur, unlike when the tissue is touched when a discrete charring shows and is often confused with a trace of melanin stain, making difficult the complete removal of the stain.

• Conclusion

Therefore, one can conclude that the quantum depigmentation without physical contact and without tissue removal is virtually painless and optimized when taking advantage of the quantum physics properties on laser light and its interaction with biological tissues.

SESSION : Laser-tissues interaction 2
7/4/2014 at 15:00 - 15:15

Abstract n° : 65019
Ref # STL-65

Author(s) : T. Simonazzi*(1), M.Sozzi(2), C.Fornaini(1), E.Merigo(1), A.Cucinotta(2), P.Vescovi(1), S.Selleri(2)

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Effects of 1064 nm, 500 ps, diode-pumped solid state laser on oral hard and soft tissues: a preliminary "ex vivo" study.

• Introduction

Laser technology was successfully proposed in dentistry in 1981 for the soft tissues surgery (CO2) and in 1990 for the hard tissues ablation (Er:YAG). Today a great number of wavelengths are used in dentistry, all based on the photo-thermal effects produced by the absorption of the laser energy.

• Aim

The aim of this study was to test the efficacy of a 1064 nm, 500 ps, diode-pumped solid state laser for the ablation of soft and hard tissues.

• Materials and Methods

Several samples of enamel, dentine, muscle and bone were irradiated by a a solid-state picosecond laser. The samples were exposed to laser energy at 1064 nm at a frequency of 30 kHz and a 500 ps pulse width. All the tissues were water-cooled during irradiation. The internal temperature of the pulp chamber, as well as of the soft and hard tissues close to the beam was monitored with thermocouple during the irradiation. The samples were observed by microscope.

• Results / Evolution description

Optical microscope images showed effective ablation with the scanty carbonisation and micro-cracks. The cooling maintained the temperature rise under the biological compatibility, in particular inside the pulp chamber below the permitted 5.5°C.

• Conclusion

In this preliminary study with a picosecond domain DPSS laser using water cooling for the target, effective tissue ablation was achieved keeping the thermal increase within the permitted range. The results suggest that this system could be used in clinical practice with appropriate modifications.

SESSION : Laser-tissues interaction 2
7/4/2014 at 15:15 - 15:30

Abstract n° : 67215
Ref # STL-66

Author(s) : Y. Stas*(1), A.Hassan(2), R.Shaari(2), P.Samsudin(3)

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Gingiva Melanin Depigmentation Histological and Clinical Animal and Human Study Using Er:YAG Laser by 24 Different Power Settings

• Introduction
Many clinicians and authors suggested various chemical and surgical methods to depigment melanin. Recently lasers were introduced to the field with different wavelengths. Very little high quality studies focused on lasers use in depigmentation. Er:YAG laser is one of the most used in oral soft tissues intervention.

• Aim
The aim of this study is to determine the proper Er:YAG laser power settings to suggest applying them in humans for gingiva depigmentation. The objectives: 1. Speed of removing pigmentation from the pigmented tissues that was measured by a stop watch 2. Controllability of stopping applying the laser when desired, that was measured by numbers 3. Amount of carbonized area 4. Histological evaluation 5. The best power setting for depigmentation depending on the results of the previous four objectives.

• Materials and Methods
Four pulse durations VLP, LP, SP, and MSP “that already exist in the AT Fidalis Fotona laser machine” were the basic for applying six power settings measured by J/cm2 for each pulse duration. Choosing of the power settings depended on trying the lowest setting available in the laser machine and increasing the power gradually up to 6J/cm2 “below the ablation threshold of dentin, cementum and enamel. The animal is a sheep sacrificed less than 6 hours before the experiment. Upon results, four power setting were selected to study them in human.

• Results / Evolution description
The objective were answered by tables include numbers and cumulative results were concluded.

• Conclusion
It seems that power settings range from 2J/cm2 to 4J/cm2 for VLP, LP, and SP are predictable as a basic safe settings to apply in human study.

SESSION : Low Power Laser 2
7/4/2014 at 14:00 - 14:15

Abstract n° : 64806
Ref # STL-67

Author(s) : K. Ramalho*(1), S.Cunha(1), C.Freitas(1), C.Adde(1), W.Jorge(1), R.Rocha(1), C.Eduardo(1)

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Photodynamic Therapy in the treatment of recurrent herpes labialis. Cases Report.

• Introduction

Recurrent herpes labialis (RHL) is a worldwide problem. RHL remains an unsolved, life-long oral health problem. RHL causes frequent pain and discomfort episodes, as well as social restriction due to compromised aesthetics.

• Aim

Considering the effectiveness of PDT in virus decontamination, the therapy was applied in 10 patients with RHL manifestation.

• Materials and Methods

Technique was performed using Methylene Blue (0.005%) as photosensitizer. Irradiation was performed using a GaAlAs - diode laser, with 0.04cm2 spot area, 660nm, 40mW, 120J/cm2 and 2 minutes of irradiation per point. Depending on the lesion size, sufficient number of points to cover the whole lesion was performed. Patient was instructed to score every day until complete healing of RHL the pain, erythema and edema on a scale 0-3 corresponding to: 0 (none), 1 (mild), 2 (moderate) and 3(severe). The size of the the lesions was also monitored.

• Results / Evolution description

All patient related reduction of pain, erythema and edema in the subsequent days after PDT. Healing time after PDT occurred in an average of 7 days between patients.

• Conclusion

Further clinical trials should be performed in order to analyse any beneficial of PDT in the treatment of RHL in comparison to conventional applied treatments.

SESSION : Low Power Laser 2
7/4/2014 at 14:15 - 14:30

Abstract n° : 64811
Ref # STL-68

Author(s) : J. Lahmouzi*(1)

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LASER AND ORAL HEALING

• Introduction

In oral surgery, an important element, is a good wound healing of the tissue with less post-op complications, no tissue shrinkage, shorter healing time and minimum post-op discomfort for patients. The advances in laser treatment over the past decade have been remarkable and today we can obtain good and interesting results with some lasers. The inherent properties of low level laser therapy (LLLT) such as selective absorption, and stimulatory effects on vital structures make it the treatment of choice in some clinical situations.

• Aim

to analyze “in vitro” and “in vivo” animal and human studies to assess the qualitative and quantitative sufficiency of evidence for the efficacy of LLLT in improvement wound healing.

• Materials and Methods

Literature review, 1923 to 2014

• Results / Evolution description

Many articles about the effects of LLLT on cell cultures in vitro report an increase in cell proliferation and collagen production. Some studies, describe improvements in surgical wound healing in an animal model. In humans studies, beneficial effects on wound healing found in few cases have not been replicated in larger studies;

• Conclusion

LLLT, produces benefical photochemical and photobiological interactions that can improve the rate, the quality and the time of healing. However, to have better understanding of the LLLT’s utility in wound healing, good clinical studies that correlate cellular effects and biologic processes are needed.

SESSION : Low Power Laser 2
7/4/2014 at 14:30 - 14:45

Abstract n° : 63493
Ref # STL-69

Author(s) : L. Hedström*(1)

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Recurrent aphthous stomatitis and pain management with low-level laser therapy: a randomized controlled trial

• Introduction
A RCT study which are going to be published this spring in Triple O

• Aim
Objective. The aim of the study was to determine whether low-level laser therapy (LLLT) has an analgesic effect in patients with recurrent aphthous stomatitis (RAS).

• Materials and Methods
Study Design. A randomized single-blinded placebo-controlled trial was conducted with LLLT (wavelength, 809 nm; power, Q2 60 mW; pulse frequency, 1800 Hz; duration, 80 seconds per treatment; dose, 6.3 J/cm2) in 40 patients with RAS. The intervention group was treated with LLLT on 3 occasions, with a 1-day interval. The control group was treated similarly, without any laser power. Pain perception (visual analog scale [VAS] rating) and patients' experience of eating, drinking, and brushing teeth was registered.

• Results / Evolution description
Results. VAS rating decreased (day 0 until day 2) from 84.7 to 31.5 (LLLT) and from 81.7 to 76.1 (placebo) ($P < .0001$). LLLT also relieved the difficulty of drinking, eating, and brushing teeth.

• Conclusion
Conclusions. LLLT reduced the pain and the inconvenience of eating, drinking, and brushing teeth for patients with RAS, compared with placebo. (Oral Surg Oral Med Oral Pathol Oral Radiol 2014;-:1-5)

SESSION : Low Power Laser 2
7/4/2014 at 15:00 - 15:15

Abstract n° : 50149
Ref # STL-70

Author(s) : A. Saafan*(1)

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Diode Laser Treatment of different vascular tongue lesions

• Introduction

Along with the efforts of physicians to reduce the risks and costs of medical care, new operation techniques have to be found that allow for a safe, effective treatment by means of short-time operations

• Aim

Assessment of the effectiveness of Diode laser in eliminating different tongue vascular malformation, while conserving as much as possible lingual tissues through intralesional photocoagulation (ILP).

• Results / Evolution description

At the end of the treatment, hemangioma lesions showed complete elimination and at least 60% regression of the size of venous malformation lesions. There were no serious complications, such as bleeding or invasive infection.

• Conclusion

Intralesional photocoagulation (ILP) with a Diode laser 980nm is effective and safe for treatment of vascular tongue lesions

SESSION : Low Power Laser 2
7/4/2014 at 15:15 - 15:30

Abstract n° : 62665
Ref # STL-71

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Use of lasers in treatment of oral lichen planus

• Introduction

Oral lichen planus (OLP) is a chronic immunologic mucocutaneous inflammatory disease of oral mucosa. Since etiopathology of OLP is idiopathic, treatment is usually symptomatic, therefore showing low predictability. To date, topical corticosteroids are widely accepted as the standard therapy. However, for patients unresponsive to standard therapy of OLP, the new treatment modalities were sought. Lasers have recently been accepted as alternative or adjunctive treatment modalities for many conditions in medicine and dentistry.

• Aim

The aim of this study was to present advantages and disadvantages of different kinds of lasers (high-level, low-level laser irradiation/laser therapy and the excimer laser) used in treatment of OLP.

• Materials and Methods

The main outcome measures compared were improvement of signs (clinical parameters of inflammation, erythema, reticulation, ulceration of OLP), symptoms (pain, discomfort) and OLP recurrence.

• Results / Evolution description

Lasers demonstrated uneventful faster healing process with minimal post-operative discomfort, minimal pain, swelling or bleeding and without visible scarring. Also, minor discomfort during and after the laser treatment and a rapid disappearance of symptoms (immediate relief in all patients of associated burning sensations and a tolerance to hot and spicy foods) was reported. The lasers were thus proven to be effective in the immediate relief of symptoms and contribute to the clinical improvement of OLP.

• Conclusion

Even though lasers demonstrated beneficial effects, there is no solid evidence-based basis for the treatment of OLP, mainly due to inconsistent laser wavelengths and sets of laser irradiation parameters used. Therefore, further researches, especially long-term follow-up randomized controlled clinical trials are needed to give any solid recommendation on the use of this phototherapy approach in the field of OLP therapy

SESSION : Endodontics 3
7/4/2014 at 16:15 - 16:30

Abstract n° : 67080
Ref # STL-72

Author(s) : Y. Salapata*(1)

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PHOTODYNAMIC THERAPY IN ROOT CANALS ARTIFICIALLY INFECTED WITH ENTEROCOCCUS FAECALIS ; AN EX VIVO STUDYSalapata Y,et al

• Introduction

Photodynamic therapy protocols, involve a variety of revolutionary treatment approaches which include anti-cancer therapy, antimicrobial therapy and many other biostimulation procedures performed in the medical field of therapeutics known as LLLT. They are carried out by using visible spectrum laser sources (635-690 nm) in combination with non toxic chemical dyes called photosensitizers. This innovative method is often used in dental procedures whenever antibiotic administration is ineffective

• Aim

The purpose of this study was to investigate the advantages of photodynamic therapy when used in root canal treatment by inoculating, E. faecalis in single rooted teeth in vitro and compare the results of this antibacterial approach alone or in combination with clinical procedures involving irrigation with either saline or sodium hypochlorite and mechanical instrumentation.

• Materials and Methods

Fifty extracted single-rooted human mandibular premolars were decoronated to a standardized length of 16 mm. Specimens were shaped to ProTaper F4 (Dentsply Maillefer) E. faecalis CCM 2541 was used in order to experimentally infect the dental root canals.The laser source of 635nm involved a 200 optical fibre in CW at 100mW.The dye used was TBO solution of 15 μg/ml. The teeth were then randomly divided in six groups according to the use or not of laser device in different irradiation times (either alone or in conjunction with mechanical instrumentation and irrigation, .

• Results / Evolution description

Data derived from at least three independent experiments were expressed as mean values ± standard deviation (SD). Statistical analysis was performed using the Student's t test for unpaired data. p values of ≤0.05 were considered significant. In the groups laser + hypochlorite, and only hypochlorite the reduction of the bacterial load was statistically significant in relation to the control group (no treatment)

• Conclusion

Our experimental results, in agreement with the scientific literature, show the effectiveness of pdt technique when used in combination with hypochlorite.

SESSION : Endodontics 3
7/4/2014 at 16:30 - 16:45

Abstract n° : 64405
Ref # STL-73

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The Comparison of Penetration Depth of Tolonium Chloride and Indocyanine Green Photosensitizers in Root Canals with and without Smear Layer: An in vitro study

• Introduction

PDT is based on the concept that a nontoxic photosensitizer (PS) can be preferentially localized in certain tissues and subsequently activated by light of the appropriate wavelength to generate singlet oxygen and free radicals, which are cytotoxic to cells of the target tissue. In biological systems, the lifetime of singlet oxygen and its radius of action are very short. It means that the penetration depth of the PS in dentinal tubules and lateral canals will determine the killing effect of PDT on microorganisms.

• Aim

The main objective of this study was to evaluate the penetration depth of suggested photosensitizers in the lateral wall of the human root canal.

• Materials and Methods

40 extracted single-rooted human teeth were decorated, instrumented and then, the external root surfaces were sealed with two layers of nail polish.The apical foramen was subsequently closed with composite material. Teeth were divided randomly in two major groups consist of indocyanine green solution (ICG) and tolonium chloride solution (TCH) with and without EDTA in their subgroups. All specimens were split in two halves with a stainless steel chisel. In three zones of each specimen the penetration depth of dye was measured.

• Results / Evolution description

The results of this study showed that the mean of lateral penetration depth of ICG (224.04 µm) was significantly ($P<0.05$) higher than TCH (70.15µm).Regarding to the influence of EDTA, in ICG group without consideration to the different regions, the usage of EDTA improved the mean of lateral penetration depth of ICG, but this improvement was not statistically significant ($P>0.05$). But in the TCH group, the mean of lateral penetration depth of TCH into the lateral wall of the canal was significantly improved by EDTA usage ($P=0.004$).

• Conclusion

Further to the findings of this study, it could be assumed that ICG could kill bacteria in deeper regions of the root canal wall. Therefore, it could be used as an alternative to the tolonium chloride in PDT.

SESSION : Endodontics 3
7/4/2014 at 16:45 - 17:00

Abstract n° : 67166
Ref # STL-74

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Positive pressure, passive ultrasonic and laser activated irrigations on removal of the smear-layer, baiofilm from the root canal surface. With clinical case

• Introduction
Cleaning and shaping the root canal system during endodontic treatment produces a smear layer and hard tissue debris. Three irrigation techniques were tested for solution infiltration of this layer: positive-pressure irrigation, passive ultrasonic irrigation and laser-activated irrigation.

• Aim
1. Aim: To evaluate three techniques of smear layer , biofilm removal from the root canal surface: positive pressure irrigation, passive ultrasonic irrigation and laser activated, using 17% EDTA as the irrigation solution. 2. To determine the best technique for using each irrigation method, specifically the coronal third only or irrigation at the working length.

• Materials and Methods
60 extracted teeth were divided into 6 equal groups. 17% EDTA was used for irrigation in 5 groups for 60 sec. Group 1: treated only with Protaper™ F3 Ni-Ti files. Group 2: positive pressure irrigation, with a syringe. Group 3: passive ultrasonic irrigation 1 mm short of working length. Group 4: passive ultrasonic irrigation in the upper coronal third of the root only. Group 5: Er:YAG laser , energy 0.5w activated irrigation 1 mm short of working length. Group 6: Er:YAG laser ,energy 0.5w activated irrigation in the upper coronal third of the root only.

• Results / Evolution description
Scanning Electron Microscope at X1,000 magnification showed that the smear layer was removed most efficiently when laser activated irrigation was used in low energy with 17% EDTA either at the working length or only in the coronal third. . surface morphology: EDTA17% as an irrigation solution in combination with Er:YAG laser shows the best results of removing bacteria from the root canal walls.

• Conclusion
smear layer removal was most effective when the root canals were irrigated using a low energy an Er:YAG laser with a 17% EDTA solution. Interestingly, the removal of the smear layer along the entire canal was similar when the laser was placed in the upper coronal third and at the working length of the root canal. This effect was not observed with the ultrasonic and the positive pressure techniques

SESSION : Endodontics 3
7/4/2014 at 17:00 - 17:15

Abstract n° : 54396
Ref # STL-75

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Treatment of Dentinal Hypersensitivity by means of Nd:YAP Laser: A Preliminary in Vitro Study.

• Introduction
There is an important need to increase the therapeutic possibilities for the removal of fractured files in root canals during endodontic treatments .

• Aim
The aim of this study is to evaluate the effectiveness of Nd:YAP laser to seal dentinal tubules at different parameters.

• Materials and Methods
: 24 caries free human wisdom impacted molars were used. The crowns were sectioned transversally in order to totally expose the dentin. The smear layer was removed by a 1 min application of EDTA. Each surface was divided into four quadrants irradiated at a different output power setting (Irradiation speed 1 mm/ sec; optical fiber diameter: 320 µm; non contact mode). Samples were smeared with a graphite paste prior to laser irradiation. All specimens were sent for SEM analysis. Pulp temperature increases in additional twenty teeth were measured by a thermocouple.

• Results / Evolution description
Morphological changes in dentin surfaces depend on the value of energy density used. Higher energy densities induce higher dentin modifications. Our results confirmed that Nd:YAP laser irradiations can lead to total or partial occlusion of dentin tubules without provoking fissures or cracks. Measurements of pulp temperature increases showed that Nd:YAP laser irradiations can be considered as harmless for pulp vitality under certain conditions.

• Conclusion
Nd:YAP laser beam was able to seal the dentin tubules without damaging dentinal surfaces and without harming pulp vitality. Nd:YAP laser may be effective and may be safely used for future in vivo treatments of dentinal hypersensitivity.

SESSION : Endodontics 3
7/4/2014 at 17:15 - 17:30

Abstract n° : 47673
Ref # STL-76

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Measurement of pressure changes during laser-activated irrigant by an erbium, chromium: yttrium, scandium, gallium, garnet laser

• Introduction

The use of Erbium lasers to activate irrigants results in the creation of vapor bubbles and shockwaves. High velocity of the irrigant has been demonstrated, and hence the risk of overextrusion of irrigant becomes obvious. Pressure in the root canal higher than the resistance by the periodontal ligament against extruding irrigant may therefore result in overextrusion. Data on the pressure created in the root canal during laser activated irrigation are scarce.

• Aim

The present study evaluated the magnitude of pressure changes in the root canal during laser-activated irrigation with an Er,Cr:YSGG laser (Biolase Technology, San Clemente, CA, USA).

• Materials and Methods

The root canal of a single extracted maxillary canine was enlarged to a size 40/.06 file. A pressure sensor was attached to the apex. The tooth was processed as follows. In the EDTA condition, the tooth was irrigated with 17% EDTA; in the NaOCl condition, the tooth was irrigated with 3% NaOCl. In all conditions, the irrigants were activated at 1 and 2 W for 60 seconds using RTF2 and MZ2 tips; to analyse the effect of tip placement, the tip was inserted 5 mm deeper than the orifice.

• Results / Evolution description

Data showed no significant difference between irrigation regimens ($P > .05$). There were no significant differences of the pressure between Endolase and plain tips ($P > .05$). The placement of tips closer to the apex resulted in significantly higher pressure than at the orifice ($P < .001$). The use of 2W power resulted in a significantly higher increase of pressure compared to 1 W ($P < .001$), regardless either the type of solutions or tips used.

• Conclusion

The magnitude of the pressure changes in the root canal at 1 W were significantly lower than 2 W regardless of either type of tips or solutions used. The closer the insertion of the tip to the apex, the higher the pressure.

SESSION : Endodontics 3
7/4/2014 at 17:15 - 17:30

Abstract n° : 64709
Ref # STL-77

Author(s) : M. Hadeiba*(1)

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Temperature increase during endodontic treatments by means of Diode lasers (810 nm).

• Introduction

There is a lot of interest for the use of diode lasers (810 nm) in endodontics ,

• Aim

The aim of this study is to evaluate the optimal irradiation conditions for a harmless use of diode lasers in endodontics.

• Materials and Methods

In our study, We used diode laser (810 nm). Different irradiation conditions ranged from 0.5 W to 12 Watts were used in different modes (pulsed and continuous) in dry and irrigated canals. A thermocouple in contact with superficial dentinal surfaces was used to measure the temperature increase at periodontal tissues during the irradiation of root canals for endodontic applications. The laser fiber was placed at 1mm far from the apex of roots . The irradiation was done in circle movement during the desertion of the fiber.

• Results / Evolution description

Our in vitro results showed that the temperature rise is harmless for periodontal tissues in the following irradiation conditions: The temperature rise of dentinal cements remained below 10 °C during endodontic treatments when the irradiation power was lower than 1 W in continuous mode.

• Conclusion

Laser diodes can be used safely without damaging the periodontal tissues at a specific irradiation conditions.

SESSION : Endodontics 3
7/4/2014 at 17:30 - 17:45

Abstract n° : 64875
Ref # STL-78

Author(s) : A. Kabaş sarp*(1), S.Sahar helft(2), A.Stabholz(2), M.Gulsoy(3)

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COMPARING THERMAL EFFECTS OF TWO WAVELENGTHS IN ROOT CANAL TREATMENT

• Introduction

Lasers are the most powerful alternative to conventional technique that can penetrate dentin to a better depth and reach even to the side branches. The most important problem of this method is the high energies that are delivered to surrounding tissues which can lead to irreversible thermal damage to neighboring structures. Two different wavelengths : 240 nm to 1940 nm were compared in this study. Temperature changes on the root surface were recorded and 11°C temperature increase was set to a threshold as in order to prevent any irreversible thermal damage to the periodontal tissue.

• Aim

The aim of this preliminary study was to upgrade the optimum laser parameters and minimize the thermal side effects of 1940- nm Thulium Fiber Laser while comparing this new wavelength to a commonly used wavelength, Er:YAG laser, in conventional root canal treatments.

• Materials and Methods

The experimental set up was consisted of a universal testing machine, a K-Type thermocouple measurement set and a laser set up. Temperature changes at the outer root surface during irradiation were registered by means of a K-Type thermocouple. Root canal was irradiated from apical to coronal in slow movements with a constant speed and ten cycles for 60 seconds of irradiation time. There were three different irradiation groups for each wavelength : 1 W, 0.75 W and 0.50 W. Then sample roots were divided into two halves and observed under microscope for carbonization effect.

• Results / Evolution description

In 1940 nm, time to exceed the threshold for groups 1W, 0.75 W, 0.50 W were 3.03, 4.93, 7.85 seconds respectively.In addition to this, only difference between 1 W and 0.75 W group was unsignificant. In Er:YAG laser groups: W, 0.75 W, 0.50 W were 4.77, 6.76, 8.92 seconds respectively. All groups were significantly different from each other. While comparing two different wavelengths in 1 W, 0.75 W, and 0.50 W lased groups, there was no significant difference between two lasers in 0.75 W, and 1 W lasers groups. In 0.50 W laser comparision Er:YAG laser was significantly different from 1940 nm Laser.

• Conclusion

The water absorbance of 1940- nm Thulium fiber Laser is less than Er:YAG so penetration of this new wavelegth is better but negative thermal effect is higher. According to the thermal results and microscopial observations of these two lasers the results in 0.75 W and 1 W do not show any significant difference. This means 1940- nm Thulium fiber is a promising laser in endodontia if the optimum laser powers are used

SESSION : Periodontology 3
7/4/2014 at 16:15 - 16:30

Abstract n° : 64902
Ref # STL-79

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Periodontal probing using Optical Coherence Tomography: a non-invasive approach

• Introduction

Early diagnostic in health care is necessary since it implies a better patient prognostic. Among the diversity of imaging modalities, optical coherence tomography (OCT) has been widely exploited in Dentistry, both for hard and soft tissue.

• Aim

The aim of this study was to exploit two OCT systems operating in the Fourier Domain for morphological analysis of periodontal tissue in porcine jaws, including measurement of the gingival sulcus depth and thickness of the free gingiva.

• Materials and Methods

Two commercially available OCT systems were employed, operating at 930 nm and 1325 nm respectively, and with 7 and 12 μm axial resolution in air. Five porcine jaws stored in formalin solution at 10% during 24h were employed. Images were obtained from the buccal surface of incisors, premolar and molar. Stereomicroscopic images of the teeth surface were performed before and after the OCT analysis. 2D and 3D images of tooth/gingiva interface were obtained and measurements of the gingival sulcus could be noninvasively obtained.

• Results / Evolution description

Through the image analysis it was possible to identify the free gingiva and the attached gingiva, the calculus deposition over teeth surface and also the subgingival calculus.

• Conclusion

In conclusion, regarding the ability of the two optical coherence tomography systems to visualize periodontal structures, 1325 nm showed a better performance, due to longer central wavelength, that allows to deeper penetration imaging, and the faster image acquisition, an essential factor for clinical setting.

SESSION : Periodontology 3
7/4/2014 at 16:30 - 16:45

Abstract n° : 64508
Ref # STL-80

ABSTRACT WITHDRAWN FROM THE CONGRESS

Author(s) : M. Sadighi*(1), M.Sadighi shamami(1), S.Rikhtegaran(1)

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Evaluation of Nd:YAG laser for root surface modification in treatment gingival recession using subepithelial connective tissue graft and coronally advanced flap

• Introduction

Root surface conditioning (RSC) has been used to improve the outcome of different root coverage techniques for many years. The aim of this randomized clinical trial was to evaluate the use of Nd: YAG laser for root surface modification in treatment of Miller Class I and II gingival recession using sub epithelial connective tissue graft (SCTG) and coronally advanced flap

• Aim

Thirty –two teeth in 16 patients with two bilateral buccal recessions were selected for the study.16 teeth were assigned to receive SCTG and coronally advanced flap alone (control group) and 16 teeth (test group) were treated with Nd: YAG laser (1 W, 10 Hz, 100 MJ, 60 S, 1064 nm) and SCTG and coronally advanced flap . Mean root coverage, complete root coverage, Recession depth (RD), probing depth (PD), keratinized tissue width (KTW) ,and Clinical attachment loss (CAL) were measured at baseline and six months post surgery

• Results / Evolution description

After 6 months follow up, the mean RD decreased from 3.25 ± 0.48 to 0.54 ± 0.50 mm and from 2.85 ± 0.67 mm to 0.62 ± 0.45 mm and CAL decreased from 2.50 ± 0.32 mm to 0.54 ± 0.50 mm and from 2.75 ± 0.58 mm to 0.54 ± 0.45 mm in the test and control groups, respectively ($P < 0.05$). The mean PD and KTW were not change statically significant ($p=0.762$ and $p=0.814$, respectively)

• Conclusion

Both techniques are effective in treating Miller's class I and II recession. The Nd: YAG laser application provides better results in RD and CAL reduction, but it seems to have no statistically significant results in PD reduction and KTW changes.

SESSION : Periodontology 3
7/4/2014 at 16:45 - 17:00

Abstract n° : 64518
Ref # STL-81

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Evaluation of Fibroblast Attachment in Root Conditioning With Er,Cr:YSGG Laser versus EDTA: A SEM Study

• Introduction

Evaluation of Fibroblast Attachment in Root Conditioning With Er,Cr:YSGG Laser versus EDTA: A SEM Study

• Aim

. The aim of this in vitro study was to investigate the fibroblasts attachment on root surfaces after conditioning with Er,Cr:YSGG laser and EDTA, using scanning electron microscopy (SEM).

• Materials and Methods

81 root plates of approximately 6 mm×4 mm×1mm in dimension prepared from 27 single-rooted human mature teeth and divided into three groups. One group lased with a 600µm G6 tip of Er, Cr: YSGG laser (2.78 µm, 0.75 W, pulse duration of 140 µs, repetition rate of 20 Hz) for 5 to 7 min, and the other group conditioned with EDTA (17%, PH: 8) for 1 min. The control group was subjected neither EDTA nor laser exposure. Subsequently, Viability and proliferation rates were done using MTT assay on days 3 and 5. Finally the cell attachment was observed using SEM.

• Results / Evolution description

The data derived from MTT and cell-attachment analysis indicated Er,Cr:YSGG conditioning tended to increase cell-viability by lapse of time (within 3 to 5 days), with significantly better cell-attachment compared to other groups on days 3 and 5 ($p<0.05$). Also, the cell-attachment obtained by EDTA conditioning compared to the control group was statistically significant on day 5 but not on day 3($p<0.05$).

• Conclusion

Within the limits of the present study, Er,Cr:YSGG laser conditioning may promote fibroblast attachment on dentinal root surfaces more than EDTA.


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- POSTERS -

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64769
Ref # P-01

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Evaluation of CEM cement as a retrofilling biomaterial in root-end cavities prepared by Er,Cr:YSGG laser and Ultrasonic

• Introduction
Various methods have been introduced for cavity preparation during periapical surgery.

• Aim
This in vitro study is aimed to compare apical microleakage of calcium enriched mixture (CEM) cement as a root-end filling material in root-end cavities prepared by Ultrasonic and Er,Cr:YSGG laser.

• Materials and Methods
After cleaning, shaping and obturation of sixty single-root teeth, 3mm of root end was resected]. In groups 1 and 2 root-end cavities were prepared by ultrasonic and Er, Cr: YSGG laser systems, respectively. After retrograde cavity preparation, the cavities were filled by CEM cement. Rhodamine B dye penetration method was utilized for leakage evaluation. Comparison of dye penetration was done by one-way ANOVA test, Tukey post hoc. ($P<0.05$)

• Results / Evolution description
Microleakage in laser, ultrasonic, and positive control specimens was 7.12 ± 1.99, 4.30 ± 1.24, and 9.08 ± 1.70 respectively. One-way ANOVA indicated that there was a significant difference between tested groups ($P=0.000$). Tukey's post-hoc analysis revealed significant difference in all pair-wise comparisons ($P<0.05$).

• Conclusion
Based on this In-vitro study, microleakage in Ultrasonic-prepared specimens was significantly lower than Laser groups.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64532
Ref # P-02

Author(s) : F. Carvalho*(1), A.Andrade(1), L.Rasquin(1), A.Pinheiro(1), L.Ramalho(1)

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EVALUATION OF LASER PHOTOBIOMODULATION (λ 780 nm) ON REPAIR OF DENTAL REPLANTATION IN RATS

• Introduction
The success of tooth replantation is limited. As the tooth is lost due to a progressive external root resorption.

• Aim
The aim of this study was to assess histologically the effect of laser photobiomodulation on the tissue repair after tooth replantation.

• Results / Evolution description
60 Wistar Albinus rats had the right upper incisor extracted and then were divided into 4 groups: G1 - absence of storage medium; G2 - milk as storage medium; G3 - milk as storage medium, laser irradiation of the root surfaces and at the entrance of alveolus (780 nm; 70 mW; CW; DE = 21J/cm2); G4 - the same procedures of G3 and after reimplantation, laser irradiation on the buccal and palatal mucosa (8,4 J/cm2 per session) every 48 hours for 15 days. The results showed that after 15 days G4 exhibit intense chronic inflammation, and moderate inflammatory root resorption ($p<0.05$).

• Conclusion
At 30 days in G1, G2 and G4 was observed severe external root resorption. G3 remained with no inflammation and inflammatory root resorption at 15, 30 and 60 daysIt is concluded that laser irradiation on the dental surface and the entrance of the alveolus prior to reimplantation has a positive biomodulative effect on the healing process after tooth replantation in rats.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64551
Ref # P-04

Author(s) : A. Ebihara*(1), Y.Iino(1), T.Yoshioka(1), T.Hanada(1), Y.Sumi(2), H.Suda(1)

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Observation of resected apical surfaces of human premolars by swept-source optical coherence tomography

• Introduction

In endodontics, apicoectomy is performed for the management of apical periodontitis when orthograde root canal treatment is not effective or unable. In the surgery, the root apex is resected, and the resected apical surface is usually observed under a dental operating microscope (MS). However, the subsurface structure cannot be evaluated by MS. Recently, a new diagnostic system, optical coherence tomography (OCT), has been developed to observe subsurface anatomical structures.

• Aim

The purpose of this study was to observe resected apical surfaces/subsurfaces of human maxillary premolars by OCT in comparison with MS.

• Materials and Methods

Five extracted human maxillary premolars were used. After micro CT scanning of the apical portion of the teeth to establish a gold standard, 1 mm of the apex was cut by a low speed saw perpendicular to the long axis of the tooth. Each resected surface was treated with EDTA, irrigated with saline solution, and stained with methylene blue dye. Then, the surface was observed with MS and OCT. This sequence was repeated 3 times. The number of root canals, crack lines, isthmuses, and accessary canals was counted and statistically evaluated.

• Results / Evolution description

As to the accuracy rate for the detection of root canals, crack lines, isthmuses, and accessary canals, there was no significant deference between MS and OCT ($p>0.05$, McNemar test) , while OCT detected subsurface structures including an isthmus and three canals that did not extend to the resected surfaces.

• Conclusion

We conclude that OCT may be useful for the observation of resected apical surfaces/subsurfaces in apicoectomy.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 59844
Ref # P-05

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Microleakage and temperature rise of obturated root canals after disinfection with Nd:YAG laser, PDT and NaOCL and EDTA

• Introduction

The obturation must seal the pulp space both apically and laterally, thus preventing further apical irritation. The use of lasers and photo-activated disinfection in endodontic treatment may cause morphological changes in the dentin and thus influence hermetic obturation of root canal system. The use of Resilon/Epiphany with warm condensation could rise the temperature of outer root surface.

• Aim

The purpose of this laboratory study was to compare the degree of hermetic obturation of root canals after endodontic treatment and disinfection with Nd: YAG laser, photo-activated disinfection with Fotosan, NaOCL 2,5% + EDTA 17% and obturated with Resilon and Epiphany sealer and to mesure the rise of temperature of outer root surface.

• Materials and Methods

For the laboratory study we used 30 freshly extracted single rooted teeth. The teeth are divided into three groups, depending on the mode of additional root canal disinfection: I group – PAD with Fotosan; II group – Nd: YAG laser; III group – 10 ml 2,5% NaOCl and 10 mL 17% EDTA. The teeth are obturated with Resilon and Epiphany sealer by warm condensation. After that the hermetic obturation and the rise of the temperature were observed. The temperature rise was measured with thermovision camera Flir T620.

• Results / Evolution description

Microleakage and the rise of the temperature were observed in all studied groups. Least leakage was at group № I and III, and the most leakage in a group № II.

• Conclusion

The application of PAD with Fotosan does not lead to increase in root canal microleakage. After application of Nd: YAG laser is appropriate to rinse the root canal with a solution of 17% EDTA for better elimination of the smear layer. The degree of temperature rise depends on the thickness of root canals walls.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64557
Ref # P-06

Author(s) : Y. Iino*(1), T.Yoshioka(1), T.Hanada(1), A.Ebihara(1), Y.Sumi(2), H.Suda(1)

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Detection of the second mesiobuccal canal of maxillary molars by swept-source optical coherence tomography-Comparison between inexperienced and experienced dentists-

• Introduction
The maxillary molar often has two canals in the mesiobuccal root. Detection of the second mesiobuccal canal (MB2) has been clinically challenging.

• Aim
The purpose of this study was to investigate the detection rate of MB2 in maxillary molars by swept-source optical coherence tomography (OCT) in comparison with that by naked eye (NE) and dental operating microscope (MS) in inexperienced and experienced dentists.

• Materials and Methods
Forty extracted human maxillary molars were used. After the crown removal, the coronal third of the first misiobuccal canal (MB1) was preflared. The existence of MB2 was determined using a micro CT as a gold standard. Six examiners (Group 1; three inexperienced dentists, Group 2; three experienced dentists) evaluated the presence/absence of MB2 by OCT, NE and MS. Based on the obtained date, sensitivity (SE), specificity (SP), accuracy (AC) and inter-examiner agreement for each group were calculated and statistically analyzed.

• Results / Evolution description
There were no significant differences between inexperienced and experienced dentists in SE, SP and AC for OCT, whereas significant differences were found between the two groups in SE for NE (Group 1: 0.316/ Group 2: 0.684) and MS (Group 1: 0.421/ Group 2: 0.947), and in SP for MS (Group 1: 0.714/ Group 2: 0.333). The kappa value of MS in Group 1 (0.511) was significantly higher than that in Group 2 (0.326).

• Conclusion
In this study OCT was effective to detect MB2 especially for inexperienced dentists. We conclude that OCT could be a useful tool for the detection of MB2.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64564
Ref # P-07

Author(s) : K. Satake*(1), A.Ide(1), K.Yao(1), M.Ichikawa(1), S.Watanabe(1), T.Anjo(1), A.Ebihara(1), C.Kobayashi(1), H.Suda(1)

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Apical Extrusion of Root Canal Irrigants during Root Canal Irrigation Activated by Diode Laser

• Introduction

Although root canal irrigation is a very important process for root canal treatment, there is a risk of extrusion of sodium hypochlorite into the periapical region. However, extrusion generated by laser-activated irrigation (LAI) using diode laser have not been studied yet.

• Aim

To compare the extrusion of LAI using diode laser with that by passive ultrasonic irrigation (PUI) and by the conventional irrigation (CI).

• Materials and Methods

A root shaped to apical size #40 was filled distilled water. Three canal irrigation methods were applied each with three different tip positions (2, 5, or 10 mm short of the working length): LAI group : diode laser (Alta MLS, Dental Photonics, 120mJ 16Hz) with a tip (DS1-200). PUI group: an ultrasonic device (Piezon Master 400, EMS, the highest setting) with #20 a file. CI group: hand irrigation with a 27 G flat needle. Each irrigation was performed repeatedly 7 times for 5 seconds. The weight of extruded irrigant was calculated using an electric balance (AE240, Mettler Toledo).

• Results / Evolution description

The mean volume of extruded irrigant caused by LAI and PUI groups was significantly smaller than that by CI ($p<0.05$). There were no significant differences between LAI and PUI ($p>0.05$).

• Conclusion

Under the conditions of this preliminary study, less apical extrusion of root canal irrigant was found in LAI and PUI compared to CI. The actual volume of extruded irrigant that may cause clinical problems is unknown. However, the extrusion of root canal irrigants should be minimized as little as reasonably possible.

SESSION : Poster session group 1 Endodontics
7/3/2014 at 10:00 - 10:45

Abstract n° : 64558
Ref # P-08

Author(s) : K. Yao*(1), A.Ide(1), K.Satake(1), M.Ichikawa(1), S.Watanabe(1), T.Anjo(1), A.Ebihara(1), C.Kobayashi(2), H.Suda(1)

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Er:YAG Laser-activated Irrigation for Lateral Canals

• Introduction
Several studies showed that laser-activated irrigation(LAI) using Er:YAG laser was significantly more effective at removing dentin debris from the apical part of the root canal than passive ultrasonic irrigation(PUI) and CI. However, the efficacy for lateral canals caused by LAI using Er:YAG laser have not been studied yet.

• Aim
To investigate the cleaning efficacy of irrigation into simulated lateral canals by LAI using Er:YAG laser, PUI, and CI.

• Materials and Methods
Thirty plastic root canal models which have lateral canal positioned 6 mm short of the apex were used. The Ca(OH)2 paste was injected into the lateral canals. They were assigned into three groups each with two positions: LAI group: Er:YAG laser(30 mJ 10 pps) with a tip (R200T). PUI group: an ultrasonic device (lowest setting) with a file. CI group: hand irrigation with a 27 G flat needle. Each irrigation was performed for 60 s with tips positioned 6 or 12 mm short of the working length(WL-6, -12). Measurement of the Ca(OH)2 paste was performed by the software(Photoshop CS5).

• Results / Evolution description
The removal rate of the calcium hydroxide-based paste in the lateral canal caused by LAI and PUI was significantly higher than that caused by CI at the position of WL-6($p<0.05$), and that caused by LAI was significantly higher than that caused by PUI and CI at the position of WL-12 ($p<0.05$).

• Conclusion
In this preliminary study, although PUI could remove the calcium hydroxide-based paste in the lateral canal close to the file, LAI using Er:YAG laser could remove it even at a distance from the tip.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 64278
Ref # P-45

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Er:Yag laser in treatment of sialolithiasis of wharton's duct

• Introduction

Salivary stones are one of the main causes of chronic sialadenitis. Classic symptoms of this condition are pain and swelling of the involved gland during eating due to excretory duct obstruction. Chronic obstruction of the ducts and subsequent infectious episodes result in salivary gland fibrosis. Salivary stones are, in 80% to 90% of cases, localized in the submandibular gland in the distal third of the duct .

• Aim

This study reports the results of minimally invasive surgical treatment of sialolithiasis of Wharton's duct using the erbium yttrium-aluminium-garnet (Er:YAG) laser in three patients.

• Results / Evolution description

Three patients (1 men, 2 women) affected by unilateral submandibular sialolithiasis with up to 8-mm stone diameters were treated surgically. The procedure was performed under local anaesthesia followed by the use of Er:YAG laser (Fotona, Ljubljana, Slovenia), the 500µm laser fiber was introduced into the Wharton's duct and the Er:YAG laser was then activated with the following settings: 50 to 80 mJ, 40Hz VSP.Salivary stones were removed and the wound sutured. All ther patients experienced a regular postoperative course without complications in the first two weeks.

• Conclusion

Treatment of sialolithiasis of Wharton's duct with Er:YAG laser is an effective technique enabling the avoidance of more invasive approaches.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 62812
Ref # P-46

Author(s) : V. Gouveia garcia*(1), M.Longo(2), V.Noronha novaes(2), L.Rodrigues knoll(1), E.Ervolino(2), L.Theodoro(2)

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Effectiveness of adjuvant probiotic and aPDT on the treatment of experimental periodontitis in rats immunosuppressed

• Introduction
Antimicrobial photodynamic therapy (aPDT) can be used as an adjunct to SRP and has been shown to be able to kill periodontopathogenic bacteria. The microbial antagonism of probiotic species toward oral pathogens has been described recently.

• Aim
The aim of this study was to histometrically compare the effect of the use of probiotic and adjunctive antimicrobial photodynamic therapy (aPDT) on bone loss (BL) on furcation in induced periodontitis areas in rats subjected to chemotherapy with 5-fluorouracil (5-FU).

• Materials and Methods
After seven days, ligature was removed and 96 animals were divided into four groups: C - no treatment; 5-FU - animals treated with 5-FU; aPDT – 5-FU, Scaling and Root Planing (SRP) and aPDT (methylene blue 100 µg/ml; 660 nm; 74.2 J/cm2; 2.1J; 60 seconds; 0.035 W; 1.23 W/cm2); PRO - 5-FU, SRP and probiotic local administration (Saccharomyces cerevisiae). Eight animals from each group were euthanized at days 7, 15, and 30 after local treatment. The area of bone loss in the furcation region was histometrically analyzed. Data were analyzed statistically ($P<0.05$).

• Results / Evolution description
Histometric analysis showed that the animals treated with aPDT showed less bone loss when compared to animals treated only with SRP at 7 and 15 days ($P<0.05$).

• Conclusion
Adjunctive antimicrobial photodynamic therapy was more effective than probiotic to reduce bone loss in furcation areas in rats submitted to treatment with chemotherapy.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 64375
Ref # P-47

Author(s) : T. Lin*(1), R.Kawamura(2), A.Aoki(2), S.Ichinose(2), K.Mizutani(2), Y.Taniguchi(2), T.Eguro(3), N.Saito(4), Y.Izumi(2)

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Changes in energy output and surface morphology of quartz tips following Er:YAG laser contact irradiation

• Introduction
The Er:YAG laser (ErL) has been increasingly used for various applications in periodontal therapy in recent years. However, the damage of contact tips has not been studied in detail.

• Aim
The aim of the present study was to evaluate the change of energy output and surface morphology of quartz tips following contact irradiation.

• Materials and Methods
Thirty brand-new quartz tips were employed. Soft tissue and calculus on extracted human teeth and porcine bone were irradiated by ErL (wavelength: 2.94μm) at 14.2 or 28.3 J/cm2/pulse and 20 Hz with or without water spray for 60 min. After irradiation, the energy output was measured and the energy output ratio was calculated. The contact surface was assessed by stereomicroscopy, scanning electron microscopy, and energy dispersive X-ray spectroscopy.

• Results / Evolution description
After irradiation, the energy output ratio declined the most in the calculus group, followed by the bone group, and the soft tissue groups with and without water spray during irradiation. The surface of used tips exhibited various alterations and attached substances, depending on the target materials. Furthermore, contamination by C element was detected in all the groups, which was most highly detected in the soft tissue group with water spray, and contamination by P, Ca and/or other inorganic elements were characteristically observed in the calculus and bone groups.

• Conclusion
The energy output of the contact tip declines after contact usage and the rate of energy output reduction as well as the degree of surface alteration/contamination is variously influenced by the targeting tissues as well as the use of water spray during irradiation.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 64730
Ref # P-48

Author(s) : M. Longo*(1), V.Noronha novaes(1), M.Ferro alves(1), N.Assen zanini(1), E.Ervolino(1), S.Mogami bomfim(1), V.Gouveia garcia(1), L.Theodoro(1)

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Effect of aPDT on the furcation bone loss in rats subjected to chemotherapy

• Introduction
There are few studies that reported the outcome of antimicrobial photodynamic therapy monotherapy for the treatment of periodontitis.

• Aim
The aim of this study was to evaluate the influence of antimicrobial Photodynamic Therapy (aPDT) without the mechanical treatment on bone loss in furcation areas of experimental periodontitis in rats subjected to chemotherapy with 5-fluorouracil (5-FU).

• Materials and Methods
After seven days, ligature was removed and 96 animals were divided into four groups: GI – control; GII - animals treated with 5-FU; Group III - 5-FU and scaling and root planing (SRP); Group IV - 5-FU and single application of aPDT using methylne blue (100 µg/ml) and laser (660 nm; 74.2 J/cm2; 0.035 W; 2.1 J; 60 seconds; 2.1 J; 1.23 J/cm2. Eight animals from each group were euthanized at days 7, 15, and 30 after local treatment. The area of bone loss in the furcation region of the molar was histometrically analyzed. Data were analyzed statistically ($P<0.05$).

• Results / Evolution description
Histometric analysis showed more bone loss in GII, GIII and GIV at 7 days ($P<0.05$). The animals of GII and GIII demonstrated more bone loss than G1 at 15 days ($P<0.05$).

• Conclusion
5-FU has increased bone loss in furcation region, independently of the used treatment in initial period of evaluation, and aPDT isolated was so effective than SRP in treatment of experimental periodontitis in rats.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 64567
Ref # P-49

Author(s) : M. Ogita*(1), S. tsuchida(2), A.Aoki(3), M.Sato(2), S.Kado(2), M.Sawabe(3), H.Nanbara(3), H.Kobayashi(3), Y.Takeuchi(3), K.Mizutani(3), S.Yoshiyuki(3), F.Nomura(2), Y.Izumi(3)

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Increased cell proliferation and differential protein expression induced by low-level Er:YAG laser irradiation in human gingival fibroblasts: proteomic analysis

• Introduction

Er:YAG laser has been increasingly applied in periodontal therapy and favorable wound healing after Er:YAG laser treatment has been reported. However, a detailed study about the biologic effects of the Er:YAG laser on periodontal wound healing has not yet been conducted.

• Aim

The aim of this study was to clarify the effect of the low-level Er:YAG laser irradiation on the proliferation of human gingival fibroblasts (HGFs) and to investigate the laser irradiation-induced protein expression changes of HGFs by gel-free proteomic analysis.

• Materials and Methods

HGFs were treated with low-level Er:YAG laser (2.94 μm wavelength) irradiation. The total energy density was set at 1.65, 2.11, and 2.61 J/cm2. 3 days after laser irradiation, cell proliferation and damage were evaluated. Proteomic analysis was performed on day 1. Peptides prepared from HGFs were analyzed by using hybrid ion-trap Fourier transform mass spectrometer, the MASCOT search engine and the UniProtKB database.

• Results / Evolution description

A significant increase in cell proliferation without cell damage after Er:YAG laser irradiation was observed. Among the identified 377 proteins, 59 proteins including galectin-7, which was associated with the process of wound healing, were upregulated in laser-treated HGFs. The increase in mRNA and protein expression of galectin-7 after irradiation were validated by quantitative real time PCR, Western blotting, and ELISA analyses. In addition, the effect of recombinant human galectin-7 on modulation of cell proliferation was revealed.

• Conclusion

Low-level Er:YAG laser irradiation can promote HGFs proliferation and induce a significant change in protein expression, and the upregulation of galectin-7 expression may contribute to the increase in cell proliferation.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:30

Abstract n° : 64488
Ref # P-50

Author(s) : D. Rakasevic*(1), S.Jankovic(1), B.Rakonjac(2), B.Rakonjac(2), Z.Aleksic(1)

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Efficiency evaluation of photodynamic therapy in the treatment of peri-implantitis. Randomized controlled clinical trial. Pilot study

• Introduction

Peri-implantitis is defined as an inflammatory process caused by microorganisms affecting the tissues surrounding an osseointegrated implant in function, resulting in loss of supporting bone. Surgical therapy of peri-implantitis with application of adjunctive therapies of implant surface decontamination enables the elimination or reduction of pockets and re-osseointegration of implant system. Antimicrobial photodynamic therapy (aPDT) could be used as an adjunctive therapeutic method for decontamination of implant surfaces and surrounding tissue.

• Aim

The aim of this study was to evaluate the clinical and microbiological outcomes, before and after therapy of peri-implantitis, using surgical methods combined with adjunctive photodynamic therapy.

• Materials and Methods

Ten patients were divided into two groups: experimental and control group. In the experimental group, during surgical procedure, after flap opening and debridment, for decontamination of implant surface and peri-implant tissue photodynamic therapy was used. In control group, for decontamination of implant surface chlorhexidine gel followed by saline was used. Clinical parameters (BOP, PPD, PI, MR, CAL) were assessed at baseline and one and three months after therapies. Samples for microbiological analyzes were collected before and during surgical therapy.

• Results / Evolution description

The use of photodynamic therapy for decontamination of implant surface and surrounding peri-implant tissues resulted in significant improvements in probing depths and reduction of bleeding on probing compared with chlorhexidine. The photodynamic therapy with application of photosenziter onto the surface of implants and peri-implant tissues and its activation by a laser beam, achieved significant decontamination of implant surfaces and peri-implant tissue with complete elimination of anaerobic bacteria.

• Conclusion

The photodynamic therapy can be used as an adjuvant therapy for decontamination of implant surface and surrounding peri-implant tissues in treatment of peri-implantits. Application of adjuvant therapy can improve clinical parameters. Disappearance of bleeding on probing as well as reduction of peri-implant pockets can be expected, as well as the re-osseointegration with restoring of the function of implants in the oral cavity.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 60221
Ref # P-51

Author(s) : S. Tantananugool*(1), S.Sattayut(1), A. teerakapong(1), T. damrongrungreung(1), N.Phumala(2)

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Efficacy of Erythrosine and Anthocyanin mediated Photodynamic Therapy on Porphyromonas Gingivalis Biofilms using green light.

• Introduction

Photodynamic therapy has been advocated as an alternative to antimicrobial agents to suppress subgingival species and to treat periodontitis.

• Aim

The purpose of this in vitro study was to evaluate efficacy of erythrosine and anthocyanin (cyanidin) as photosensitizers in photodynamic therapy (PDT) on killing of the P. gingivalis biofilms.

• Materials and Methods

P.gingivalis biofilms were obtained from a subject with chronic periodontitis that were mixed with a variety of photosensitizers as follows:- 110, 220, 330, 440µM erythrosine, 101, 202, 303, 404µM anthocyanin (cyanidin), 440µM erythrosine with 404 µM anthocyanin for 15 min. All 9 experiment groups were exposed to 532 nm green light at power density of 21.5 mW/cm2 for 60 seconds. The controls were the groups of the biofilms without light exposure, with green light exposure and with chlorhexidine. After PDT process, the survival fraction was calculated at 1h, 3h and 6h. The bacteria viability test was undertaken at 1h.

• Results / Evolution description

The results showed that the PDT groups; 330 µM and 440 µM erythrosine groups and mixed 440 µM erythrosine with 404 µM anthocyanin had bacterial colony forming units less than the other experimental groups and the controls in every period of evaluation (ANOVA, P=0.02, 0.017 and 0.049). Form the bacterial viability test, the percentage of live bacteria in the PDT groups of 330 µM and 440 µM erythrosine groups and mixed 440 µM erythrosine with 404 µM anthocyanin were 15.51, 2.09 and 4.31, respectively.

• Conclusion

The PDT using 330 µM, 440 µM erythrosine and 440 µM erythrosine with 404 µM anthocyanin irradiated with green light were statistically significant killing P. gingivalis in biofilms than anthocyanin and the control groups.

SESSION : Poster session group 2 Periodontolgy
7/3/2014 at 10:00 - 10:45

Abstract n° : 64770
Ref # P-52

Author(s) : A. Uekubo*(1), K.Hiratsuka(2), A.Aoki(1), Y.Takeuchi(1), Y.Abiko(2), Y.Izumi(1)

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The influence of oxygen in blue LED irradiation with Rose Bengal on the growth of Porphyromonas gingivalis

• Introduction

A combination of blue light and Rose Bengal (RB) has emerged as a new technical modality for antimicrobial photodynamic therapy (a-PDT). Our group has previously showed that blue LED (BL) irradiation delayed the growth of Porphyromonas gingivalis and the a-PDT using BL with RB would be promising in the suppression of bacterial proliferation.

• Aim

However, the influence of oxygen on the antibacterial effect of BL irradiation with/without RB remains unclear.

• Materials and Methods

P. gingivalis cell suspensions were mixed with RB (0.01mg/ml)/physiological saline and irradiated with/without BL (450–470 nm; 1 W/cm2, 5 s) in anaerobic/aerobic condition. They were incubated in an anaerobic chamber that was impenetrable to light. The cell density (OD600 nm) was measured at 6, 12, 18, 36, and 48h after irradiation.

• Results / Evolution description

In the anaerobically-irradiated group, BL delayed the growth of P. gingivalis, and BL with RB more remarkably inhibited bacterial growth. In the aerobically-irradiated group, BL delayed the growth more effectively than in the anaerobically-irradiated group, and especially, concomitant use of RB inhibited the growth of P. gingivalis up to 48h after irradiation.

• Conclusion

Anaerobic irradiation (without oxygen) of BL combined with RB may have a bacteriostatic effect, whereas aerobic irradiation (with oxygen) may show bactericidal action in a-PDT

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 53668
Ref # P-30

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INFRARED LASERTHERAPY EFFECTIVENESS EVALUATION IN TEMPOROMANDIBULAR DISORDERS USING ELECTROMYOGRAPHY – A PRELIMINARY STUDY

• Introduction

Temporomandibular disorder (TMD) is a term used for a large number of clinical signs and symptoms that affect the muscles of mastication, the temporomandibular joint and associated structures. The use of laser photobiomodulation to reduce TMD pain and promote anti-inflamatory effects has been of great importance in the recent literature.

• Aim

The aim of this study was to evaluate the effectiveness of lasertherapy in temporomandibular disorders (TMD) treatment.

• Materials and Methods

Twelve patients selected for the experiments were randomly distributed in two groups. Patients in the first group were submitted to laser irradiation procedure using an AlGaAs laser – 808 nm, 100 mW, in contact mode, spot of 0.0028 cm2 and energy of 2.8 J/point. Patients in the second group, control group, were submitted to an interocclusal device.

• Results / Evolution description

The evaluation of laser radiation effectiveness on the muscular tissue was made through electromyography surface and electrodes before and after laser irradiation. The statistical analysis showed lasertherapy effectiveness. The procedure reduced the muscular electric activity, providing muscular relaxation; it was also responsible for reduction of pain and of the inflammatory condition.

• Conclusion

Conclusion. Therefore, it was verified the effectiveness of the laser as an auxiliary treatment for TMD.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 59989
Ref # P-31

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Thermographic monitoring of wound healing in patients treated with laser (aPDT) after the third impacted mandibular molar removal

• Introduction

Laser therapy has been reported as an effective tool for treatment of post-surgical conditions due to its analgesic and anti-inflammatory effect, as well as to the stimulating effect on tissue healing. Infrared thermography is a diagnostic method based on its ability to record infrared radiation emitted by the skin and convert it into electronic video signals.

• Aim

The objective of this study was to assess post-extraction wound swelling and wound temperature after surgical removal of impacted lower third molars in patients who received low laser modality: antimicrobial photodynamic therapy (aPDT) and to compare them with the placebo group.

• Materials and Methods

Forty patients who had impacted lower molars which had to be removed surgically participated. One group received antimicrobial photodynamic therapy (aPDT) and the other group received no additional therapy (placebo group). LaserHF (Hager & Werken GmbH & Co., Germany) was used in the research. Temperature measurements were performed using the infrared thermographic camera on the 3rd and the 7th postoperative day.

• Results / Evolution description

Prior surgical treatment there was no difference between groups. Significantly lower temperature and less wound swelling was recorded on the 3rd postoperative day in the laser aPDT group ($p<0.001$). Participants in the aPDT group had also significantly lower OHIP14-CRO summary scores ($p<0.01$).

• Conclusion

The present study approved beneficial effects of the aPDT modality of low laser therapy on the reduced postoperative wound swelling and decreased wound temperature together with better OHRQoL through the 7-day period in comparison to placebo group.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 64704
Ref # P-32

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Increase of calmodulin concentration in parotid glands of diabetic animals

• Introduction
Diabetes mellitus causes a series of biochemical and histological changes in the salivary glands of streptozotocin-induced diabetic rats. Furthermore, our group has investigated the effect of laser irradiation upon salivary glands and our data demonstrated that this therapy would be helpful in cases of hypofunction of the salivary glands and xerostomia. However, the action mechanism of this therapy on the glandular tissue is unclear. In this sense, continuing our studies.

• Aim
The present study aimed to observe the effect of laser irradiation on calmodulin concentration, an important protein related to the saliva secretory process.

• Materials and Methods
For this purpose, 18 Wistar rats was divided into 3 groups: C0 (control): simulation of irradiation, D0 (diabetic) simulation of irradiation, D20 (diabetic) : 20 J/cm2. Then, a diode laser (660 nm), 100 mW of power, was applied in the areas corresponding to the parotid and submandibular glands. The rats were euthanized 24h after irradiation and salivary glands removed for biochemical (calmodulin concentration) analysis for Wester Blotting.

• Results / Evolution description
The animals with irradiation showed higher calmodulin concentration than the animals without irradiation, furthermore the diabetic animals that didn't recieve irradiation showed lower calmodulin concentration than control group.

• Conclusion
Based on these results, low power laser therapy alters the calmodulin concentration in parotid glands of diabetic animals and, therefore, can act in the saliva secretory process.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 64727
Ref # P-33

Author(s) : C. Fukuoka*(1), U.Bhawal(2), V.Arana-chavez(1), N.Kuboyama(2), Y.Abiko(2), A.Simões(1)

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LLLT reduced inflammation in diabetic salivary glands through NFκB signaling pathway

• Introduction
Diabetes can lead to dysfunction of the secretory capacity in salivary glands.

• Aim
Since the activation of the receptor for advanced glycation end products (RAGE) and its ligands has been suggested to participate in chronic disorders, such as diabetes and its complications, the expression of RAGE, high mobility group box 1 (HMGB1) and advanced glycation end products (AGE) were evaluated, as well as the effects of low-level lasertherapy (LLLT) in diabetic salivary glands, and the mechanisms involved.

• Materials and Methods
Expression of RAGE and HMGB1 protein expression and, mRNA levels, were observed in streptozotocin- induced diabetic rats submandibular glands (SMG). A diode laser was applied at 660nm, 70mW, 20J/cm², and its effects and pathway involved were evaluated in vivo. Immunohistochemistry and western blotting analysis were performed for HMGB1, AGE, RAGE and NFκB expression in SMG.

• Results / Evolution description
Diabetes upregulated HMGB1/AGE/RAGE axis gene expression markedly in ducts of SMG. This was associated with activation of the nuclear factor kappa B (NF-κB) pathway. Interesting, LLLT reduced these inflammatory markers, HMGB1, AGE probably through downregulation of NFκB signaling pathway.

• Conclusion
These findings demonstrate that diabetes-induced effects on salivary glands is mediated by HMGB1, AGE, RAGE axis and NFκB activation and elucidate a mechanism for LLLT in the survival of diabetic salivary glands, mediated by NF-κB signaling.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 64526
Ref # P-34

Author(s) : M. Gerbi*(1), A.Santos neto(1), N.Araújo(1), R.Menezes(1), V.Martínez(1), V.Carneiro(1), L.Moreno(1)

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EVALUATION OF PHOTODYNAMIC EFFECTS OF CURCUMIN IN MICROORGANISMS OF CARIES

• Introduction
The presence of Streptococcus mutans and Lactobacillus acidophilus in dental structure is an indicator of a cariogenic biofilm. Photodynamic therapy is a technique that produce reactive radicals capable of inducing cell death. Reduction of bacteria levels can provide additional means of preventing dental caries.

• Aim
To evaluate the susceptibility of Streptococcus mutans and Lactobacillus acidophilus to photodynamic therapy grown as multi-species in the biofilm phase versus in dentine carious lesions.

• Materials and Methods
A brain-heart infusion culture medium supplemented with 1% glucose, 2% sucrose, and 1% young primary culture of L. acidophilus 108 CFU/mL and S. mutans 108 CFU/mL was used to develop multi-species biofilms and to induce caries on human dentine slabs. Five different concentrations of curcumin (0.75 g/L, 1.5 g/L, 3.0 g/L, 4.0 g/L, and 5.0 g/L) were used. The photosensitizer was activated with exposure to blue light with central wavelength of 450 nm, intensity of 19mW/cm2 and fluency of 5.7 J/cm2. Four different groups were analyzed: L-D- (control group), L-D+ (drug group), L+D- (light group) and L+D+ (photodynamic therapy group). ANOVA/Tukey tests were utilized to compare groups. For significant bacterial reduction ($p < 0.05$).

• Results / Evolution description
A significant reduction ($p<0.05$) in cell viability was observed for the biofilm phase following photosensitization with all curcumin concentrations tested. For significant bacterial reduction ($p<0.05$) in carious dentine, it was necessary to utilize 5.0 g/L of curcumin in association with blue light. No significant reduction was found for L-D+, proving the absence of dark toxicity of the drug.

• Conclusion
S. mutans and L. acidophilus were susceptible to curcumin in the presence of blue light. However, due to blue light penetration and drug diffusion difficulties, these microorganisms within dentine carious lesions are less affected than in the biofilm phase.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 64598
Ref # P-35

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Influence of sodium alendronate and zoledronic acid associated or not to Laser Phototherapy on the viability and proliferation of cultured fibroblasts and osteoblasts

• Introduction
Despite several forms of treatment of bisphosphonate (BP) related osteonecrosis of jaw (BRONJ) have been reported, no consensus protocol has been established. The sodium alendronate and zoledronic acid in different concentrations are BPs currently applied for treating BRONJ. Laser phototherapy (LPT) using red wavelength has shown positive effects on BRONJ lesions healing

• Aim
This study aimed to evaluate the viability and proliferation of osteoblasts and fibroblasts submitted to sodium alendronate and zoledronic acid associated or not to LPT.

• Materials and Methods
Cells were cultured in DMEM containing one of the BPs in different concentrations for 24 hours. The LPT was then applied by using a continuous diode laser (InGaAlP, 660nm, 30mW, spot size of 0.028 cm2) in two different energy densities (5J/cm2 and 10J/cm2, 4,5 and 9s, respectively), on punctual and contact mode. Two irradiations with 6 hours-interval were performed. Cell viability and proliferation were determined by MTT (3-[4,5-dimethylthiazol-2-yl]-2,5-diphenyltetrazolium bromide) reduction assay in three different periods 24h, 48h and 72h after first irradiation.

• Results / Evolution description
Both bisphosphonates were cytotoxic to osteoblast and fibroblasts in culture in a dose-dependent manner. The amount of viable cells was similar in lased and non-lased groups.

• Conclusion
Then, LPT, at least in the parameters tested, was not able to compensate the sodium alendronate neither zoledronic acid cytotoxicity.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 48373
Ref # P-36

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CO2 laser irradiation and fluoride enhances CaF2 uptake and inhibits lesion progression of demineralized dental enamel – In vitro study.

• Introduction

No investigation has been made about the ideal moment of the irradiation, if before, after or during fluoride application as well as about the role of CO2 laser irradiation in increasing fluoride uptake by demineralized enamel.

• Aim

To evaluate the combination effect of CO2 laser irradiation and acidulated phosphate fluoride gel application (APF-gel) on fluoride uptake by demineralized enamel specimens (DES) and on consequent lesion progression.

• Materials and Methods

We conducted two studies and DES were subjected to APF-gel combined with CO2 laser irradiation at 11.3 or 20.0 J/cm2 performed before, during or after APF-gel. In Study 1, 150 DES were allocated to 10 groups and CaF2 formed on enamel was determined. In study 2, 150 DES (10 groups, n=15) were subjected to a pH-cycling model and the enamel mineral loss and lesion depth were evaluated by microhardness and polarizing light microscopy.

• Results / Evolution description

CO2 laser and APF-gel alone arrested the progression of enamel demineralization compared with the control ($p<0.05$) but there was no synergistic effect between them ($p>0.05$). Laser at 11.3 J/cm2 during APF-gel application significantly increased CaF2 retention on enamel surface($p<0.05$). Melting, fusion and cracks were observed on enamel surface of irradiated groups before and after CaF2 extraction.

• Conclusion

We showed that CO2 laser irradiation, at λ 10.6 μm, in combination with a single application of APF enhanced CaF2-like material uptake on enamel surface and a synergistic effect was found. However, regarding the inhibition of caries lesion progression, no synergistic effect was found.

SESSION : Poster session group 3 Low-Power Laser
7/3/2014 at 15:30 - 16:15

Abstract n° : 64898
Ref # P-37

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Low intensity laser as an alternative treatment for oral ulcers associated with Therapy in Organ Transplantation (TOR) inhibitors

• Introduction

Adverse events (AEs) associated with Therapy in Organ Transplantation (TOR) inhibitors have been well-characterized in several clinical trials and classified according to the Brazilian National Cancer Institute Common Terminology Criteria for Adverse Events. The most prevalent AEs reported are oral ulcers (OU), dermatitis, asthenia, anorexia, and nausea/vomiting, which are usually observed at grades 1 or 2. OU are a common and potentially dose limiting toxicity associated with the use of TOR inhibitors in cancer treatment

• Aim

The aim of this study is to provide a new option with the LILT as a promising treatment for the most common side effect of OU caused by TOR inhibitors.

• Materials and Methods

Five patients were treated with low intensity laser therapy (LILT). The irradiation parameters were: 660 nm InGaIAP laser emitting in continuous mode, with spot size of 0.04 cm2. The irradiation was performed in contact, 10 seconds per spot, over all OU area with 40 mW during 10 seconds, resulting in 10 J/cm2 of energy density.

• Results / Evolution description

The results obtained after the use of lasers after irradiation were a reduction in pain as demonstrated by the VAS scale after 10 sessions, and an accelerated healing process on all lesions as demonstrated by the OU pictures taken on day one and compared to day 10 after the laser therapy.

• Conclusion

The use of the LILT in all clinical cases in this study demonstrated to be a promising treatment for the patients who take this kind of TOR inhibitors, decreasing pain, and fast healing process, allowing patients to continue their medications and also eat with reduced discomfort, improving life quality overall.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 65903
Ref # P-21

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Evaluation of the biomodulation of the peri implant bone, using diagnodent in patients undergoing low intensity laser therapy. In vivo study.

• Introduction

The success of the implantology in oral rehabilitation depends on the osseointegration of implants. This process is bone quantity and quality dependent, which for its part is directly related to the ability to repair bone tissue, blood supply, besides the presence and proper function of cells involved in the repair.

• Aim

Evaluate the effectiveness of laser therapy in the peri-implant bone healing process after 15 and 30 days of placing implants in patients undergoing implant surgery, in the Implantology Lab in FOP-UPE, through the method of diagnosis of laser fluorescence.

• Materials and Methods

Peri-implant area of 40 implants were divided into two groups G1 control (n-20) and G2 experimental (n-20), G2 received 7 rays, the first being during surgery, and the other was evaluated with periods of 48 hours apart. NSEW four points were irradiated and below apex, for such Thera laser machine was used, which has IR Laser 830nm, 50mW, 0.6 spot, dose per session 20J/cm ², 4J/cm² per point was used. Measurements were analyzed by DIAGNodent 4 observation periods (pre-surgery, 48h, 15 days and 30 days) in the medium third buccal and palatal / lingual along the insertion of implants.

• Results / Evolution description

The results obtained from the scores of the laser fluorescence device DIAGNOdent have demonstrated that G2 has achieved an increase in peri-implant bone quantity mineralized in observation times of 15 and 30 days compared to the control group; showing the efficacy of low power laser in accelerating bone repair periiimplantar.

• Conclusion

According to the obtained results and the statistical analysis with the protocol used, it can be concluded that laser therapy in peri-implant the implant mineralization process was statistically significant.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:00

Abstract n° : 64899
Ref # P-22

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Relationship between the degree of dental enamel mineralization and the optical attenuation coefficient

• Introduction

The detection of caries in the early stages provides a choice of different treatments based on the preservation of the tooth structure. Thus, the use of tests able to diagnose these early lesions, such as Optical Coherence Tomography (OCT) is appropriate. Changes in optical properties of tooth enamel can be evaluated by this technique.

• Aim

The objective of this study was to evaluate the ability of OCT to quantify the stages of enamel demineralisation during the development of simulated caries lesions, taking as reference standard sectional micro-hardness testing.

• Materials and Methods

Were used 40 sound third molars, which had the crowns sectioned to obtain 160 samples distributed into 4 groups with cycling times of 0, 7, 14 and 21 days. To evaluate possible changes, these were examined using OCT before and after the cycling period and compared to cross-sectional micro-hardness test.

• Results / Evolution description

The optical attenuation coefficient difference for demineralised and healthy sample, 0.0274 μm-1 and 0.0267 μm-1, was determined with sensitivity (93%) and specificity (96%). The difference between the optical attenuation coefficients, obtained before and after the pH cycling, showed a high degree of correlation with the cross-sectional micro-hardness ($\rho = 0.97$).

• Conclusion

According to the results, with OCT was able to determine a linear relationship between the OCT and micro-hardness techniques for detection of demineralisation in enamel, demonstrates the potential of OCT for quantitative assessment of mineral loss.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64764
Ref # P-23

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Femtosecond laser ablation of enamel and the application of acoustic emission as a monitoring method for laser treatment of dental caries

• Introduction

Femtosecond laser has been considered an effective technique for treatment of dental caries. Research works on laser ablation of dentin show that structure of dentin is preserved and no significant chemical modification was detected. Nevertheless, influence of femtosecond laser on human enamel has not been studied. In addition, there is a need for an online method to monitor the laser treatment of dental caries. The required method needs to be capable of distinguishing laser ablation of various tooth components.

• Aim

Study the morphology and chemical modification caused by femtosecond laser treatment of human enamel. In addition, as a non-destructive and evasive method, which has been use to monitor laser ablation of various materials, acoustic emission technique will be tested.

• Materials and Methods

The laser treatment was carried out using a femtosecond infrared laser with 500 fs pulse duration, 1050 nm wavelength. Scanning speed and repetition rate were varied from 0.8 mm/s to 10 mm/s and from 0.5 kHz to 2 kHz, respectively. For acoustic emission study, disks, that contain containing enamel on the outer ring, dentin and carious dentin on the inside, were obtained from partially carious human third molars. Linear scans were carried out across the disk surface using laser fluence of 2 J/cm2. The airborne acoustic shock wave was recorded using a microphone.

• Results / Evolution description

The ablation threshold of enamel using this laser was determined to be 1.6 ± 0.3 J/cm2. The treated surface is porous and does not present trace of melting or carbonization or cracking. The results obtained from Raman and infrared spectroscopy show that the chemical composition of the enamel is preserved within the processing parameters range used. Acoustic emission signals recorded during the linear scan across the sample's surface reveal clear differences in energy of the airborne shock wave produced by ablation of different tooth components.

• Conclusion

The treatment of human enamel using femtosecond laser leads to a porous surface. Thermal effects such as melting or carbonization are not detected. The capability of airborne acoustic emission technique in distinguishing ablation of carious dentin, normal dentin and normal enamel is demonstrated. Nevertheless, further investigation into the formation of shock wave is needed to fully understand the observations and to increase the applicability of this technique in laser dentistry.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64735
Ref # P-24

Author(s) : L. Moreno(1), M.Gerbi(1), A.Santos neto*(1), N.Araujo(1), V.Carneiro(1), R.Ferraz(1), V.Martinez(1), L.Bispo(1), A.Nascimento(1)

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Benefits of Lasertherapy in trigeminal neuralgia. Series of clinical cases

• Introduction

The use of lasertherapy in the treatment of trigeminal neuralgia has been a relief for patients suffering from this evil, recoverying the injured nerve branches, by increasing the level of cellular ATP and in the maintenance of osmotic balance of nerve fibers. Described as a monosymptomatic paroxysmal pain, it comes and goes suddenly, lasting seconds to minutes, comparable to an electrical discharge. Attacks can last for days, months or years, and is limited to the territory of the trigeminal nerve (cranial nerve V).

• Aim

The objective of this study was to evaluate the effectiveness of laser therapy in the treatment of trigeminal neuralgia using red light (685nm) and infrared (830nm) through reports of cases treated at the Center of Laser FOP -UPE.

• Results / Evolution description

20 Patients were referred from various centers to Laser Center with the diagnosis of trigeminal neuralgia, treated with neurologist. 80 % were taking 600mg of carbamazepine per day and showed no improvement in the overall related pain. With weakened health, could not use dentures, eating poorly. Needed help to move around and kept their tongue out of mouth, reporting fear to speak. After 24 laser therapy (685 to 830 nm) sessions, there was a regression of the disease and improvement in the general condition of the patient.

• Conclusion

With the findings of this study, we confirmed that laser therapy eliminated the need for more aggressive treatments, such as neurological surgeries and constant use of drugs, ie, the use of laser eliminates pain without compromising the face sensitivity or causing any addiction.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64423
Ref # P-25

Author(s) : N. Nabavinejad*(1)

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Laser Bleaching

• Introduction

Dental Bleaching is common over hundred years and for a success bleaching,dentists have to gain sufficent knowledge about methods,indication and non indications and side effects.

• Aim

There are 2 kind of bleaching : 1-Internal Bleaching suited for those theeth that have root canal therapy. 2-External Bleaching is suited for discolored vital thooth : a.Home Bleaching b.Ofice Bleaching c.Dual Bleaching d.Laser Bleaching

• Results / Evolution description

Laser Bleaching is the best choice for everyone because this method: -Decrease Time of Treatment -Has very considerable result -Has less sensitivity for patients But unfortunately the cost of this method is still very high .

• Conclusion

Tooth stays cool during laser bleaching thus this method has no harm effect on vital tissues.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64466
Ref # P-26

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New Applications of Optical Fluorescence

• Introduction

The aim of this study was to demonstrate the use of widefield fluorescence imaging in the diagnosis of various lesions of the oral cavity. Fluorescence techniques can be used as an adjunct to clinical examination of the mouth, detecting tissue changes in hard dental tissues, which might be unnoticed by the dentist or even difficult to detect under white light examination.

• Aim

It was used an optical fluorescence system with emission in the violet region (Evince, MMOptics, São Carlos, SP, Brazil). For image acquisition, the fluorescence system was coupled to a digital camera (Nikon D90, Nikon, Bangkok, Thailand). It was observed changes in hard dental with the fluorescence system tissues such as bright spots, dental plaque and calculus, incipient carious and marginal microleakage lesions.

• Results / Evolution description

The system facilitated the differentiation between restorative materials (such as composite resin and ceramic) and between such material and the tooth structure, allowing for the selective removal of material during the restoration, promoting the maintenance of healthy tooth tissue.

• Conclusion

Therefore, we conclude that the fluorescence optical system allows the dentist to identify structures and alterations in the oral cavity in a simple, noninvasive, and in real-time procedure, revealing injuries that would not be easily detected with conventional illumination.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64895
Ref # P-27

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Methodology Development for Optical Characterization of Vascular Lesions

• Introduction

Port-wine stain (PWS) is a congenital, capillary, progressive vascular malformation of the dermis. Often involve the head, neck and oral cavity. These lesions have been the subject of much controversy and discussion over the past century. Optical Coherence Tomography (OCT) is a biomedical diagnosis that generates high-resolution images, showing the cross-sectional microstructures favoring a differential diagnosis of these lesions.

• Aim

We aim to provide information about skin structure of the patient vascular lesion morphology as well as quantitatively evaluate the blood flow, vessels concentration and diameter by OCT.

• Materials and Methods

A male patient 54-year-old presenting PWS vascular lesion on the right side face was monitored by OCT (OCS1300SS, Thorlabs). The OCT used a swept source laser centered in 1325nm, 10mW average power, 100 nm bandwidth. Microvasculature of the PWS skin and normal skin were obtained by Doppler OCT.

• Results / Evolution description

We demonstrate high-resolution imaging of PWS and normal skin, using Doppler OCT comparing the OCT image of PWS lesions and contralateral normal skin. OCT images of healthy skin showed stratum corneum, epidermis and dermis layers without special vessels and without structures. Instead, the images from vascular lesion presented empty structures that can be pots or caves. The use of Doppler determined the blood flow within the vessels.

• Conclusion

OCT has become a safe method for obtaining high resolution images generated in real time that allow the viewing of cellular and extracellular structures, with a spatial resolution ranging from 1-20 µm approaching the conventional histology.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 64872
Ref # P-28

Author(s) : B. Zancopé*(1), A.Borges carvalho(1), L.Pagotto rodrigues(1), T.Parisotto(1), C.Steiner-oliveira(2), C.Steiner-oliveira(2), C.Steiner-oliveira(2), L.Rodrigues(3), M.Nobre dos santos(1), L.Soares(4)

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Repeated CO2 laser applications enhances the inhibition of primary enamel demineralization.

• Introduction

Carbon dioxide lasers were developed in 1964 by Patel et al. and seem to be the most appropriate lasers for preventing dental caries. Moreover in all previous studies, the inhibition of enamel demineralization effect was obtained when CO2 laser irradiation was performed over the enamel surface only one time. However, it should be considered that the higher carbonate content of primary enamel may require more than one laser application for a better effect on the inhibition of deciduous enamel demineralization.

• Aim

This in vitro study investigated if irradiation of primary enamel with repeated application of CO2 laser enhances the inhibition of enamel demineralization, under a high cariogenic challenge.

• Materials and Methods

80 specimens of sound primary enamel were selected and randomly divided into 4 groups: control (C), one CO2 laser application (L1), two CO2 laser applications (L2) and three CO2 laser applications (L3). The specimens were evaluated by µ-EDXRF before laser applications and after pH cycling and then, were submitted to Micro- hardness (MR) and Scanning Electron Microscopy (SEM) analyses. The results were analyzed by ANOVA followed by t- test, Kruskal-Wallis test, a paired t test and simple logistic regression analysis($p<0.05$).

• Results / Evolution description

The MR data showed that among irradiated groups, the L3 group provided the highest protection against enamel mineral loss ($p<0.01$). The µ-EDXRF results showed that calcium content was higher only in primary enamel submitted to two laser applications ($p=0.046$). The SEM results showed more strongly marked surface changes after three CO2 laser applications.

• Conclusion

Our results demonstrated for the first time that three repeated of CO2 laser applications promoted marked morphological changes on surface of primary dental enamel turning it more resistant to dental caries.

SESSION : Poster session group 4 Laser-Tissue Interaction
7/3/2014 at 15:30 - 16:15

Abstract n° : 65016
Ref # P-29

Author(s) : B. Dallari*(1), M.Sozzi(2), C.Fornaini(1), E.Merigo(1), A.Cucinotta(2), P.Vescovi(1), S.Selleri(2)

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Effects of 4W power 1950nm diode laser on oral hard and soft tissues: a preliminary "ex vivo" study.

• Introduction
The introduction of diode lasers in dentistry had several advantages, principally consisting on the reduced size, reduced cost and possibility to beam delivering by optical fibers. The two wavelengths normally utilized in the dental field are 810 and 980 nm, this limiting the use to the soft tissues.

• Aim
The aim of this study was to test the efficacy of a 6 W power 1950nm diode laser laser for the ablation of soft and hard tissues.

• Materials and Methods
Several samples of human extracted teeth and veal tongue were irradiated by a 6 W power 1950nm diode laser. The samples were exposed to different laser energies with and without water cooling during irradiation. The internal temperature of the pulp chamber, as well as of the soft tissues close to the beam was monitored with thermocouple during the irradiation. The samples were observed by microscope.

• Results / Evolution description
Optical microscope images showed effective ablation with little zones of carbonisation and micro-cracks. The water cooling maintained the temperature rise under the biological compatibility, in particular inside the pulp chamber below the permitted 5.5°C.

• Conclusion
In this preliminary study with a 6 W power 1950nm diode laser using a water spray for target cooling, effective tissue ablation was achieved keeping the thermal increase within the permitted range. The results suggest that this system could be used in clinical practice with appropriate modifications.

SESSION : Poster session group 5 Laser and Bone surgery ; Laser and Prosthetics ; Laser and Safety ; Pedodontic

7/4/2014 at 10:00 - 10:45

Abstract n° : 64462
Ref # P-17

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Surgical excision of mandibularis torus with Erbium Cromium laser

• Introduction

Mandibularis tori are slow-growing non-neoplastic bony protuberance formed by a dense cortical bone with no haversian canals and a limited amount of bone narrow; a thin poorly vascularized mucosa is covering them. They are commonly bilateral and localized lingual to the premolars. Most of the time they are not removed but excision could be necessary during prosthetics rehabilitations or interference with the patient's diet or speech.

• Aim

Er,Cr:YSGG is a useful for all oral tissues. Four mandibularis tori were removed with a Er-Cr:YSGG under local anestesia (Three patients). One patient was functionnally disturbed and the other two needed a partial denture rehabilitation.

• Results / Evolution description

The parameters used were: Power : 7.5 W, 43 % water, 64 % air, 25 pps, 140 □s pulse duration, Power Density : 2652 W/cm2 Fluence : 9,28 J/cm2. The complete surgery of the tori's removal was accomplished by the Er-Cr:YSGG (soft tissue incision and hard tissue ablation) with no per-op bleeding neither post operative complications .

• Conclusion

Mandibularis tori's excision by laser is an alternative method to the cold blade and rotatory strumentation traditionnally used. It is more confortable for the patient, easier and safer for the practitionner : no risks of traumatic lesions of the surrounding tissue as observed with the drill.

SESSION : Poster session group 5 Laser and Bone surgery ; Laser and Prosthetics ; Laser and Safety ; Pedodontic

7/4/2014 at 10:00 - 10:45

Abstract n° : 64528
Ref # P-18

Author(s) : A. Santos neto*(1), M.Gerbi(1), L.Portela(1), V.Asfora(1), V.Carneiro(1), V.Martínez(1), L.Bispo(1)

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EVALUATION OF LASER PHOTOBIOMODULATION EFFECTS IN PERI-IMPLANTAR BONE REPAIR THROUGH BIOMECHANICAL TEST AND X-RAY FLUORESCENCE: STUDY IN DOGS

• Introduction

Bone loss has been one of the major problems in odontology and its rehabilitation is a great concern in oral repair by dental implants. Studies have evidenced the positive effects of lasertherapy for soft and hard tissues repair, but there are only a few studies of these effects over the bone around implant healing.

• Aim

Evaluate the effects of the (AsGaAl 830nm – 40mW, CW, Ø ~ 0,3mm, 140J/cm2) laser radiation in the peri-implant bone, using Biomechanical test of rotation and energy-dispersive x-ray fluorescence analysis of the concentration of calcium on titanium dental implants placed in shin bones of mongrel dogs.

• Materials and Methods

Two groups were settled: G1 control (n-20), two dental implants in each animal (10 animals); G2 experimental laser (n-20), one dental implant in each animal + lasertherapy (20 animals). G2 received 7 rays, the first being during surgery and the others was evaluated with periods of 48 hours apart. NSEW four points were irradiated and below apex, dose per session 20J/cm2, 4J/cm2 per point was used. The specimens were removed 15 and 30 days post operation in order to measure of the periimplantar calcium concentration by deployment of the energy-dispersive x-ray fluorescence analysis. The biomechanical test to evaluate the rotation strength was carried out on the trans-surgical of a second surgical time with a digital torque meter TQ-8800. The Mann-Whitney statistical tests were applied to evaluate the findings ($p < 0.05$)

• Results / Evolution description

The rotation strength and the calcium concentration of the specimens submitted to the radiation had significant improvements ($p < 0.05$) compared to the control group.

• Conclusion

According to the obtained results and the statistical analysis with the protocol used, it can be concluded that effect of laser radiation in the increase of imbrication of the implants to the bone compared to the control group was statistically significant.

SESSION : Poster session group 5 Laser and Bone surgery ; Laser and Prosthetics ; Laser and Safety ; Pedodontic

7/4/2014 at 10:00 - 10:45

Abstract n° : 62573
Ref # P-19

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Microleakage of a resin cement after disinfection pretreatments: Effects of laser irradiation and chemical antibacterial agents

• Introduction

Cavity disinfection prior to cementation of indirect restorations is important step upon adhesive cementation.

• Aim

This study evaluated the impact of chlorhexidine, laser irradiation and an antibacterial adhesive on the microleakage of composite inlays bonded by a self-etch resin cement.

• Materials and Methods

Class V cavities were prepared on thirty human molars and randomly assigned into four groups of 15 each. Inlays were cemented with ED primer/Panavia F as follows: G1 (control) no pretreatment. G2: chlorhexidine pretreatment. G3: Laser irradiation (Er,Cr:YSGG laser, wavelength 2.78µm, 20 Hz, 600-µm fiber tip at 140 µs pulse duration, 0.75 W, 15% water, 15% air,37 mJ/pulse, energy density of 6.7 J/cm2) pretreatment. G4: Clearfil Protect Bond instead of ED primer. Microleakage were determined using dye penetration technique. The data were analyzed using non-parametric tests.

• Results / Evolution description

There was a significant difference among four groups at the gingival and occlusal margins ($P<0.05$). The specimens treated with laser and antibacterial adhesive exhibited lower microleakage at both margins than those of the control and chlorhexidine-treated groups ($P<0.05$). There was no significant difference between the control and chlorhexidine groups at the gingival margin.

• Conclusion

Chlorhexidine application had a detrimental effect on the enamel marginal sealing but no effect was observed on the dentinal sealing. Clearfil Protect Bond and laser treatment could improve sealing of the inlays bonded by Panavia F at both margins.

SESSION : Poster session group 5 Laser and Bone surgery ; Laser and Prosthetics ; Laser and Safety ; Pedodontic

7/4/2014 at 10:00 - 10:45

Abstract n° : 64407
Ref # P-20

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Assessment of blinding success among laser clinical trials.

• Introduction

Blinding is one of the key design features of randomized clinical trials (RCTs). Studies not involving blinding could yield biased estimates of the effect of treatment. A meta-analysis found that double blind RCTs found 14% lower treatment effect on average than similar RCTs not described as double-blind.

• Aim

To evaluate the prevalence and quality of test of blinding success among laser clinical trials.

• Materials and Methods

PubMed, Google Scholar and Cochrane Controlled Trials Register were searched with the following key words; “Laser” and “Blinding Index” or “blinding success”. Search was done at 11 April 2014.

• Results / Evolution description

Disappointingly, we cannot find any laser clinical trial which used statistical methods to assess success of blinding.

• Conclusion

The severe under-reporting on the success of blinding may improve with awareness of existing quantitative methods. The two statistical methods, James' blinding index (BI) and Bang's BI, are currently available. More details are available via:
https://www.researchgate.net/publication/26816103_Towards_a_proposal_for_assessment_of_blinding_success_in_clinical_trials_up-to-date_review?ev=prf_pub

SESSION : Poster session group 5 Laser and Bone surgery ; Laser and Prosthetics ; Laser and Safety ; Pedodontic

7/4/2014 at 10:00 - 10:45

Abstract n° : 67171
Ref # P-44

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The use of Laser in Different Field of Paediatric Dentistry: Two Cases Reports

• Introduction

Laser has found widespread use because of most advantages. Little or no need for anesthesia is a further advantage in pediatric dentistry to facilitate behavior management.

• Aim

The purpose of this presentation is to report two cases, one is treatment of complicated crown root fractured upper incisors and the other is exposure of unerupted upper incisor for eruption.

• Materials and Methods

CASE 1: A 11-year-old patient applied withcomplicated crown root fracture of the two upper incisors, the coronal fragments were removed and laser was used to excite gingival tissue overlying the margin of fracture line. After placing reinforced glass fiber, fragment reattachment was performed. CASE 2: A 8-year-old patient applied with eruption problem of left maxillary central incisor. Radiological examinations showed tooth was impacted. Retained soft tissue obstacle was removed by laser. The patient was scheduled in a regular follow-up. (Diode laser, 810 nm, cw, 3.5 - 4 W)

• Results / Evolution description

CASE 1: In 6th month visit tooth revealed good periodontal health, aesthetics and normal function.
CASE 2: At the end of the 6 months, the completely eruption of tooth was observed.

• Conclusion

Lasers are increasingly replacing surgical instruments in pediatric dentistry. In literature, lasers provide new treatment options to basically modify some treatment modalities, change some, and supplement some others. Easier acceptance of children for soft tissue surgeries with the use of lasers has been demonstrated.

SESSION : Poster session group 6 Oral Surgery
7/4/2014 at 10:00 - 10:45

Abstract n° : 65018
Ref # P-38

Author(s) : M. Chiusano*(1), E.Merigo(1), G.Mergoni(1), G.Mergoni(1), M.Meleti(1), M.Meleti(1), M.Meleti(1), C.Fornaini(1), P.Vescovi(1)

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The use of Nd:YAG laser for the treatment of vascular anomalies: 50mpatients case-series of the University of Parma

• Introduction

Vascular anomalies are a highly heterogeneous group of congenital or acquired lesions of the circulatory system characterized by morpho - structural and / or functional alterations of different nature, severity and extent that can affect every type of vessel . The vascular anomalies of the oral cavity are a fairly common disorder and can occur in childhood , youth and adulthood. Although in most cases do not constitute a serious disease, in rare cases lead to severe hemodynamic , functional, aesthetic and psychological problems.

• Aim

In this study a review work of the cases of vascular anomalies treated at the Oral Pathology and Medicine and Laser Surgery Unit of the University of Parma has been made with special emphasis on treatment with Nd: YAG laser .

• Materials and Methods

Data were collected and analyzed for all patients with vascular anomalies of the oral cavity and perioral tissues evaluated between 1999 and 2013 .

• Results / Evolution description

From 1999 to 2013 67 patients with vascular anomalies or arteriovenous malformations (AVMs)were evaluated. Of these 35 (52.2 %) were men and 32 (47.8%) were women. The average age at diagnosis was 67 ± 14.2 years (range : 14-86 years). In these patients a total of 71 lesions was detected. Laser treatment gained complete resolution of the lesion in 87,5% of cases

• Conclusion

Laser photocoagulation , when used , is the gold standard for the treatment of vascular anomalies of the oral cavity . Nd: YAG laser maybe particularly advantageous for this treatment.

SESSION : Poster session group 6 Oral Surgery
7/4/2014 at 10:00 - 10:45

Abstract n° : 62538
Ref # P-39

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EVALUATION OF USING DIGITALLY CONTROLLED HANDPIECE OF ER:YAG LASER FOR SURGICAL TREATMENT OF LEUKOPLAKIA

• Introduction

In recent years, lasers are considered to be highly effective instrument in surgery of precancerous lesions due to the properties of coagulation during surgery and post-operative swelling and pain reduction.

• Aim

The aim of this study was to evaluate the effectiveness of digitally controlled handpiece of Er:YAG laser for the treatment of leukoplakia, the frequency of recurrence after laser therapy and postoperative discomfort for patients.

• Materials and Methods

The study consisted of 28 lesions with histologically confirmed diagnosis of leukoplakia. Er:YAG laser with non-contact digitally controlled handpiece in QSP mode was used. The laser settings were as follows: pulse energy 120mJ, pulse mode QSP, frequency 20 Hz. The handpiece was held at the distance of 15 mm with water spray of 10ml/min. At the follow-ups during 2 months lesions were re-measured and re-treatment for patients with relapse was scheduled. VAS and OHIP-14 questionnaire were used for patient's subjective evaluation of postoperaive pain and discomfort.

• Results / Evolution description

Statistically significant differences between men and women according to location of the lesion, number of the ablations and VAS. Significant differences correlation between recurrence and locations of the lesion, as well as degree of hyperkeratosis were also found. There were no significant correlation between VAS and size and location of lesion or between VAS and number of treatment.

• Conclusion

Laser-assisted removal of the precancerous lesion with the non-contact, digitally controlled handpiece is safe and pleasant treatment for the patient and very effective and comfortable for the operator.

SESSION : Poster session group 6 Oral Surgery
7/4/2014 at 10:00 - 10:45

Abstract n° : 62929
Ref # P-40

Author(s) : P. Libert(1), D.Gabrić pandurić*(2), M.Blašković(3), J.Brozović(4), D.Katanec(2), I.Filipović zore(2), M.Sušić(2)

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LASER-ASSISTED SURGICAL TREATMENT OF EXCESSIVE GINGIVAL DISPLAY USING LIP REPOSITIONING TECHNIQUE AS AN ALTERNATIVE TO ORTHOGNATHIC SURGERY

• Introduction

Excessive gingival display (EGD), commonly termed gummy smile, is a condition when there is an overexposure of the maxillary gingiva during smile, in severe cases the overexposure is present in repose of mouth and lips. The etiology of EGD is various. Different techniques have been reported for the treatment of the hyperactive upper lip.

• Aim

The aim of presented clinical study was to evaluate the laser-assisted lip repositioning technique (LRS) in combination with laser gingivectomy for treatment of EGD in patients who refused orthognathic surgery.

• Results / Evolution description

Three young female patients, with the chief complaint of „gummy smile“, reported dissatisfaction with smile line. During clinical evaluation, up to 10 mm of gingiva was displayed during smile. Reversible lip repositioning trial was marked using diode laser (1.5W, CW, fiber 320 µm). Partial-thickness incisions using scalpel were made. Frenectomy and gingivectomy in intercanine area using diode laser (975µm, 3W, 10ms, 1:2) were performed. Gingival display was 5.5-10 mm and decreased significantly to 1-2 mm bilaterally on follow-ups during 6 months.

• Conclusion

Laser-assisted LRS might be a valid alternative to the more costly procedures with higher morbidity rate for reduction of EGD caused by hyperactive or short upper lip.

SESSION : Poster session group 6 Oral Surgery
7/4/2014 at 10:00 - 10:45

Abstract n° : 64762
Ref # P-41

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Effectiveness evaluation of combined erbium and diode laser application among patient suffered from periapical lesion.

• Introduction

The main goal of surgical treatment patients with chronic periodontitis and radicular cysts is periapical inflammatory center elimination with tooth preservation. The main methods of surgical treatment remain cystectomy with one-stage root apex resection infected tooth and cystotomy. Surgical treatment by means of cutting and rotor tools often leads to ratio violation tooth-root, appearance of inflammatory complications and recurrence. Application of modern surgical laser technologies and optical equipment can positively affect the solution of this problem.

• Aim

Improvement of surgical treatment of patients with periapical lesions by means of laser technologies, dental microscope and with biochemistry monitoring.

• Materials and Methods

We carried out treatment of 30 patients with periapical lesions. Cystectomy performed by means of rotor and cutting tools among some patients, we used Er:YAG and Diode (808 nm) lasers among another one. Healing was estimated according to clinic, biochemistry and thermometry data

• Results / Evolution description

Results of clinical, X-ray and biochemical data testify to positive influence of high-intensity lasers in cooperation with microscope on wound healing. Clinically: edema isn't expressed, there is no pain and rehabilitation terms are reduced. According to a radiology we discovered high-grade osteoregenerat in shorter terms. Biochemical researches specify expression of the fibroblast growth factor without changing of omocisteina. Bakteriostatic effect of laser radiation was confirmed by the smaller contents of lactoferrin.

• Conclusion

Application of laser technologies promotes improvement of surgical treatment of patients with periapical lesions as regeneration processes are thus accelerated, treatment terms are reduced, the risk of periapical tissue infection and recurrence decreases.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 67189
Ref # P-42

Author(s) : A. Petrini*(1)

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LLLT Periodontology in Orthodontic Treatment

• Introduction
How to treat very difficult case with quite important occlusion problems, only by orthodontic treatment and bio-stimulation or LLLT.

• Aim
How to use new technic to treat very difficult orthodontic case with parodontal problem without surgery. We can let grow new hard and soft periodontal tissue and change arc form and severe malocclusion without surgery, without blooding, without pain and in very shot time.

• Materials and Methods
Orthodontic treatment Damon System and periodontal Laser terapy.

• Results / Evolution description
Adults treated with this new protocols have shorter treatments time, no pain and stability.

• Conclusion
We think that this innovative technology moves teeth fast and comfortably with very nice smile and facial results. Treatmentis not only shorter, it is also far more comfortable. Many people experience little to no discomfort in treatment.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 64874
Ref # P-43

Author(s) : L. Rodrigues*(1), B.Zancopé(1), C.Tabchoury(1), C.Steiner(2), T.Parisotto(1), M.Nobre-dos-santos(1)

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Effect of CO2 laser and fluoride dentifrice on demineralization around orthodontic brackets - an in situ study.

• Introduction
The literature has shown the benefits of using CO2 laser and fluoride compounds. Both have been evaluated in combination due to the preventive potential in relation to the dissolution of enamel in situations of high cariogenic challenge.

• Aim
Verify whether the irradiationof CO2 laserwith an energy density of 20.0J/cm2 combined with theuse of an orthodontic adhesive could reduce enamel demineralization aroundorthodontic brackets

• Materials and Methods
During two phases of 14 days each, 20 volunteers used a device intraoral palatal containing four specimens of human enamel, which were randomly divided into 4 groups: 1- Adhesive +NonFluorideToothpaste (NFT)(control), 2-CO2Laser + Adhesive + NFT, 3- Adhesive + Fluoride Toothpaste (FT)and 4-CO2Laser + Adhesive + FT. Volunteers dripped on the slabs a 20% sucrose solution eight times a day at predetermined times. After each phase, the biofilm was collected and the fluoride concentration was analyzed. The mineral loss was determined by microhardness analysis.

• Results / Evolution description
Higher fluoride concentrations in the biofilm were found for groups 3 and 4than for groups 1 and 2.

• Conclusion
The adhesive system showed to be effective in reducing demineralization in situ around orthodontic brackets and the presence or absence of CO2 laser and fluoride toothpaste had no influence on the enamel mineral loss around orthodontic brackets.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 62120
Ref # P-53

Author(s) : E. Tzannou*(1)

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Three stage study of psychological effects and pain or discomfort felt by patients, by the use of the max mode of the Fotona Fidelis Er: YAG laser in Class I fissure preparations.

• Introduction
A 3-step study conducted in 2010, 2013 and 2014, comparing the max mode to the dental drill.

• Aim
The aim of the study is to evaluate the patients' perception of pain or discomfort as well as the acceptance of the max mode of the laser.

• Materials and Methods
The laser used was the Fotona Fidelis Plus III with the RO2 non-contact handpiece and the max mode of 20W and the high speed handpiece was the KAVO GENTLE silence LUX turbine 8000B at maximum speed of 300,000 rpm with an ISO 314 108 524 009 diamond bur, both without anesthesia. 100 Class I cavity preparations in permanent molars, 1 with each method in every patient, were performed in 50 patients after clinical, x-ray and DÜRR DENTAL Vista Proof camera examination, randomly distributed in the 2 groups. The results were evaluated using the Wong-Baker faces pain rating scale.

• Results / Evolution description
The max mode presented 68% of the cases with no pain or discomfort, 26% with just a little bit of pain or discomfort and 6% with a little more pain or discomfort, while the drill presented 6% with no pain or discomfort, 28% with just a little bit of pain or discomfort, 48% with a little more pain or discomfort and 18% with even more pain or discomfort. The drill results were higher than the max mode results in 84% of the cases, and the average pain or discomfort measurement was 4.68 times bigger for the drill in comparison with the laser.

• Conclusion
The max mode was accepted much better by the patients, relatively to the high speed drill. All patients have denoted that they would prefer laser treatment, even with the max mode, for future cavity preparations. The findings of this study strongly suggest the sufficiency of the max mode for wider use in cavity preparations.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 59570
Ref # P-54

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Effects of Diode Laser on Direct Pulp Capping Treatment A pilot study Iraj Yazdanfar1, Norbert Gutknecht2,Rene Franzen3

• Introduction

At the present time, evidence-based, best practices have yet to be established for maintaining the vitality of teeth by managing caries associated pulp exposure in permanent teeth. In terms of bio-mechanical and aesthetic considerations, pulp capping has proven to be more effective than root-canal therapy.Given the low success rate of conventional methods, new techniques,such as laser-assisted repairs, should be developed.

• Aim

The purpose of this study was to compare the effectiveness of conventional and diode laser-assisted methods in direct pulp capping of carious teeth.

• Materials and Methods

Ten patients ranging in age from 12 to 40 were assigned randomly to experimental and control groups in this clinical trial in which the participants' teeth were treated with different techniques, i.e., conventional treatment and diode 808-nm laser-assisted treatment. For each of these groups, five cases were chosen for treatment with the same method under rubber dam isolation. The data were analysed by the Runs test using SPSS software.

• Results / Evolution description

The success rate was significantly different between conventional (60%) and diode 808-nm, laser-assisted (100%) groups after one year ($P > 0.05$).

• Conclusion

The laser-assisted procedure proved to be more effective than the conventional technique in enhancing the outcomes of pulp-capping therapy in carious exposures.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 64355
Ref # P-55

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Effect of Er,Cr:YSGG laser at pre-sintered zirconium oxide compared to different surface treatments on microshear bond strength

• Introduction
Optimized methods are needed to improve the adhesive bonding between resin cement and zirconium oxide (ZrO2) ceramic.

• Aim
The objective of this study was to evaluate the effect of erbium chromium doped: yttrium, scandium, gallium, and garnet (Er,Cr:YSGG; λ=2780nm) laser irradiation of pre-sintered ZrO2 compared with different surface treatments.

• Materials and Methods
Fifty pre-sintered blocks (6x6x4 mm3) of IPS e-max ZirCAD (Ivoclar-Vivadent) were fabricated and randomly divided into 5 groups (n=10): G1- control; G2- ceramic primer; G3- tribochemical silica-coating + Clearfil Bond Activator; G4- Er,Cr:YSGG Laser (Waterlase, Biolase); 3 W/20 Hz; air-water proportion 65%/55%, during 30s; G5- Er,Cr:YSGG Laser + ceramic primer. The energy density used for each laser group was 53.57J/cm2. Two cylinders of resin cement (Panavia F2-Kuraray) were built up on each ceramic surface and microshear bond strength test (uSBS) was performed after 24hs.

• Results / Evolution description
Data was statistically analyzed by one-way ANOVA and Tukey tests (α=0.05). Mean uSBS (SD) in MPa were: G1-1.9(2.2)B; G2-1.7(2.9)BC; G3-8.7(6.9)A; G4-0.4(0.8)C; G5-6.4(6.8)A. Groups with different upper case letter were significantly different from each other ($p<0.05$).

• Conclusion
Er:Cr;YSGG laser irradiation at pre-sintered ZrO2 improved uSBS values to groups that received ceramic primer. Er:Cr;YSGG laser irradiation at pre-sintered ZrO2 followed by ceramic primer achieved similar uSBS values that tribochemical silica-coating treatment.

SESSION : Poster session group 7 Orthodontics ; Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 68798
Ref # P-56

Author(s) : R. Pallás*

COMPARATIVE STUDY OF THE SHEAR BOND STRENGTH OF DENTIN PREPARED WITH BUR AND Er,Cr:YSGG LASER

• Introduction
This study provides further insights in the use of the laser in preparing dentin to obtain good bonding results.

• Aim
This work assesses the dentin adhesion values when working with water-cooled high-speed handpiece and laser at low fluence, and after applying a self-etch bonding system.

• Materials and Methods
Sixty sound third molars were used after being extracted and having obtained an informed consent from all the patients. First of all, each tooth was vertically divided into two parts from occlusal to apical, obtaining a mesial and a distal portion. The number of samples obtained was of 120, which were randomly assigned into 2 groups. Half of the samples were prepared conventionally with water-cooled high-speed handpiece and the other half were irradiated with an Er,Cr:YSGG laser at a low fluence of 6.6J/cm2 (spot diameter 1.5mm; energy per pulse 112.5mJ; frequency 20 Hz). Afterwards, a composite cylinder was built up on the coronal dentin surface of each sample using the same self-etch bonding system in all cases. Finally, the samples were assessed in a shear bond strength test.

• Results / Evolution description
The results showed significant differences between groups ($F=33.201$, sig. <0.05). The group irradiated with laser showed better bonding results in the shear bond strength test in relation to the one prepared with high-speed handpiece.

• Conclusion
The samples prepared with the Er,Cr:YSGG laser at low fluence offer better resistance results in the shear bond strength test than the ones prepared conventionally with high-speed handpiece.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 67700
Ref # P-57

Author(s) : A. Belcheva*(1), G.Tomov(1), M.Kukleva(1)

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LASER-ASSISTED TREATMENT OF CERVICAL RESORPTION-CASE SERIES

• Introduction

The cervical resorption is a relatively uncommon form of external root resorption. Etiological factors include trauma, orthodontic treatment, intracoronal bleaching, and inflammation. Most often cervical resorption is idiopathic.

• Aim

The aim of the study is to show laser –assisted treatment of three clinical cases with cervical resorption using Er:YAG laser.

• Results / Evolution description

Clinical case 1: An 18-year-old male, with a history of dental trauma showed an invasive cervical defect in the coronal aspect of his maxillary left central incisor. The surgical procedure was carried out under local anesthesia by raising a full thickness flap. The resorptive tissue was removed by Er:YAG laser 2940 nm (200mJ/15Hz). The cavity margins were then smoothed under water spray. The resorptive defect was examined and a small pulpal communication was observed and immediately capped with MTA. The root portion of the cavity was restored with a conventional glass ionomer cement (Ketac Fill Aplicap, 3M ESPE), protected with a light-activated unfilled bonding resin. The visible, crown portion was restored with hybrid composite resin (Herculite, Kerr). The flap was repositioned apically and sutured. Clinical case 2: 23-year-old female came with complain of a pink spot in her mandibular left central incisor. The clinical examination showed cervical resorption and lost of pulp vitality. After raising a full thickness flap, the resorptive tissue was again removed by Er:YAG laser 2940 nm. The tooth was endodontically treated and then restored. The adapted flap was sutured. Clinical case 3: 27-year-old male came for a routine examination and has pink discoloration in his mandibular right central incisor and profuse bleeding on probing. After clinical and paraclinical examination diagnose cervical resorption was established. The replacement of granulation tissue was made using Er:YAG laser 2940 nm. The pulp was involved by the resorptive process. Endodontic treatment was performed. The cavity formed from the resorption was filled with glass ionomer cement and the tooth restored with composite resin. Regular follow-up examinations were made for two years after the first treatment. There was no any evidence of pulpal or periapical pathology. There was no continuation of the resorptive process, and the restorations and the adjacent gingival tissues were assessed as satisfactory.

• Conclusion

There were two described in the scientific literature methods for treating cervical resorbtion – non-surgical and surgical. Non-surgical treatment is directed toward complete removal of the resorptive tissue. Some authors recommend the use of chemical agents to destroy the resorbing tissue by coagulation necrosis. It was anticipated that this chemical agent would affect not only the resorptive tissue in the body of the lesion, but also the tissue contained in the deeper and often interconnecting channels. The use of a slow-speed handpiece is recommended to remove all resorptive tissue and to develop a round dentinal margin. The surgical approach for treating cervical resorption has generally involved flap reflection, curettage, restoration of the defect with composite resin, or glass-ionomer resin, and repositioning of the flap to its original position. There are no previous reports in the literature regarding laser removal of resorptive tissue in cervical resorption cases and follow-up of the clinical effect. The presented clinical cases regard a multidisciplinary approach for cervical resorption treatment. Non-traumatic removal of the resorptive tissue by Er:YAG laser seem to be an alternative of chemical necrotization and mechanical removal. The proposed method gives opportunity to preserve vital pulp tissue when available and leads to a good periodontal tissue healing.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 64713
Ref # P-58

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Evaluation of enamel surfaces irradiated with Er:YAG or Nd:YAG laser by FT-Raman spectroscopy

• Introduction

Although dental caries is a preventable disease, it is still common and remains a public health problem. One of the potentially effective preventive measures is laser irradiation. Raman spectroscopy has proved to be a powerful technique for studying the microcrystalline structure of dental enamel.

• Aim

The study assess the chemical alterations chemical alterations occurring in enamel irradiated with Er:YAG or Nd:YAG lasers, by means of FT-Raman spectroscopy.

• Materials and Methods

Fifteen freshly-extracted human molars were treated as follows: no treatment in group A (n=5); 10 seconds irradiation with Er:YAG laser at 4 mm from the tooth surface, under water and air spray, in group B (n=5); 10 seconds irradiation with Nd:YAG laser, at 1 mm from the tooth surface, with 300 µm fiber used in a sweeping motion, in group C (n=5). After treatment, specimens were analyzed by FT-Raman spectroscopy.

• Results / Evolution description

Analysis of the carbonate content in terms of the integrated area under the curve (1065/960cm–1) showed a statistically-significant reduction in the integrated area ratio, in both laser-irradiated groups. The integrated area of organic content (2935/960 cm-1) showed a statistically-significant reduction after laser irradiation, in both irradiated groups.

• Conclusion

The results show that laser irradiation affects both mineral and organic matrix of dental enamel, and may thus be a suitable strategy for caries prevention; the FT-Raman technique appears appropriate to detect such compositional and structural changes.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 64904
Ref # P-59

Author(s) : C. Mota*(1), A.Gomes(2), R.Castro(1), A.Araujo(1)

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Evaluation of the influence of Nd:YAG and Er:YAG treatment of cervical hypersensitivity on the microtensile resistance in resin-dentin interface

• Introduction
In recent years the use of high power laser has been considered the most efficient alternative in the treatment of dentin hypersensitivity.

• Aim
This study aimed to evaluate, in vitro, the bond strength compromising of resin composite restorations in dentin surfaces irradiated with Er:YAG (2940 nm, 90 mJ, 2 Hz, 300 µs, spot diameter 0.9 mm, 60 s/cm2, using the handpiece at 6 cm of distance to surface) and Nd:YAG (1064 nm, 1 W, 10 Hz, 300 µs, optical fiber diameter 300 µm, 60 s/cm2, using the handpiece at 2 mm of distance to surface) lasers to the treatment of cervical hypersensitivity.

• Materials and Methods
45 bovine teeth were selected, and removed the enamel portion of the buccal surface for laser irradiation and restorative procedure. Samples were divided into three groups: G1: control, only restorative treatment performed; G2: irradiated with Er:YAG laser previously to restoration; G3: irradiated with Nd:YAG laser and subsequently restored. Samples were sectioned into sticks for microtensile tests of achievement. ANOVA analysis of variance for the maximum force (N) and strength (MPa), with a significance level of 5% was performed.

• Results / Evolution description
It was observed that G3 presented lower performance of maximum force (38,8 ± 11,3 N) and resistance (26,0 ± 9,3 MPa), and the G2 presented better results (51,0 ± 13,5 N and 36,5 ± 10,1 MPa), but still lower than those one obtained for G1 (56,0 ± 12,3 N and 43,5 ± 8,6 MPa).

• Conclusion
Although both lasers are effective in the cervical hypersensitivity treatment, when the esthetic factor is the priority, the use of Er:YAG is preferable.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 64865
Ref # P-60

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Analysis of the progression of dentine erosion after Nd:YAG laser irradiation and/or fluoride treatment

• Introduction
Nd:YAG laser and its association with fluoride has been proposed as an option for dental erosion prevention.

• Aim
The objective of this study was to evaluate the progression of dentine erosion after treatment with protocols of Nd:YAG laser (1064nm) and fluoride.

• Materials and Methods
120 dentine specimens were prepared from human molars and protected by a tape, leaving an exposed surface area of 4X1mm. The specimens were immersed in 1% citric acid (pH 2.3) for 10 min to create an initial lesion. After that, specimens were divided in 8 groups: negative control (no treatment), 1 min application of 2% NaF, Nd:YAG1 (0.5W/10Hz/contact), Nd:YAG2 (0.7W/10Hz/contact), Nd:YAG3 (1W/10Hz/defocused), NaF+Nd:YAG1, NaF+Nd:YAG2 and NaF+Nd:YAG3. Samples were submitted to a 5-day erosion-remineralization cycling model using 1% citric acid, 6x/day.

• Results / Evolution description
Dentine surface loss was analyzed by optical profilometry after the treatments, and cycles 1, 3 and 5. Data were statistically analyzed (alpha=0.05). Groups showed statistically significant differences among them in all time periods ($p<0.001$). There was surface loss after the irradiation with the Nd:YAG laser protocols. The association of fluoride and laser did not differ significantly from laser alone. The fluoride had the most satisfactory results and the Nd:YAG2 presented the greatest surface loss.

• Conclusion
Within the limitation of this in vitro study, laser irradiation was considered an invasive treatment and not efficient to stop the dentine erosion progression.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 65137
Ref # P-61

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INFLUENCE OF CAVITY PREPARATION WITH ER,CR:YSGG-LASER AND RESTORATIVE MATERIALS ON IN SITU SECONDARY CARIES DEVELOPMENT

• Introduction

Some in vitro experiments and in situ studies were able to demonstrate the potential of erbium lasers for increasing the acid resistance of enamel using low energy densities

• Aim

Evaluated the influence of the cavity preparation and restorative materials containing fluorides in the prevention of in situ development of secondary caries lesions was evaluated.

• Materials and Methods

120 human teeth slabs were divided in 2 groups and prepared with burs (DB) or Er,Cr:YSGG-laser (20Hz, 4.0W, 22.7J/cm2, 55% water, 65% air-LA), and subdivided into 3 sub-groups of glass-ionomer cement (GI), resin modified glass-ionomer (RM), or composite resin (CR) restorations (n=20). Slabs were fixed on intra-oral appliances worn in situ for 20 humans, who dropped 8x daily 20% sucrose's solution. After 21 days, slabs were removed and restorations were cross-sectioned to evaluate microhardness (KHN) from 30µm below of enamel surface to 200µm.

• Results / Evolution description

Factors “Cavity preparation”, “Restorative materials” and “Depth” were evaluated by 3-way ANOVA, Tukey’s test ($p<0.05$). The results showed lower microhardness in cavities prepared with DB than with LA. At 30µm, there were no statistical significant differences regardless of “Cavity preparation” or “Restorative materials” factors. In depth evaluation, the enamel microhardness progressively increase as function of depth for GI. In the LA groups at 60µm/90µm there were no differences between GI and RM materials, whose microhardness were significantly higher than CR.

• Conclusion

Cavity preparation using the Er,Cr:YSGG-laser increase caries resistance of enamel walls and reduce caries lesion depth development regardless of fluoride presence in the restorative material.

SESSION : Poster session group 8 Restaurative Dentistry
7/4/2014 at 15:30 - 16:15

Abstract n° : 68718
Ref # P-62

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Photo Activated Intracoronal Dental Bleaching: Case Report

• Introduction
Darkened teeth, especially in the anterior region, which can result in considerable aesthetic impairment. The whitening of these teeth is a relatively non-invasivean alternative therapeutic method that conserves the dental hard tissue. Intracoronal bleaching of pulpless discolored teeth can be performed with the association of laser or leds irradiation to hydrogen peroxide and be accomplished in one or two sessions.

• Aim
This clinical case aims to show that internal bleaching done within a secure protocol can achieve satisfactory results. Materials used for bleaching pulpless teeth are evaluated for their speed and efficacy in reestablishing the natural color of teeth and their potential to cause damage to surrouning structures. The indications for appropriate use of tooth-whitening methods and products depend on corret diagnosis of the discoloration.

• Materials and Methods
The clinical case shows an endodontically treated tooth submitted to bleaching using blue leds associated with orange hydrogen peroxide 35%. The proposed protocol used Bright Max (MMOptics, São Carlos – São Paulo Brasil) system with 4 blue LEDs, 470nm, P= 50 mW each led, total output of 200mW, with special bleach tip. The gel used was (Quick Smile ,Taubaté, São Paulo Brasil) hydrogen peroxide 35%, orange color, because this color has the ideal absorption peak for blue leds, allowing maximum photochemical interaction without generating heat, according to spectrophotometry and thermal reaction studies previously published by the authors. VAS scale was used to measure patient's satisfaction degree regarding the tooth element recovering same color as neighboring teeth. Data of VAS table were transported to an individual form so that a score based on notes could be given. Very dark was considered score 1; dark score 2; slightly darkened score 3; same as other teeth score 4. Satisfaction degree of patients regarding bleaching result was evaluated one week after end of procedure, with duly hydrated teeth. Data of VAS table were transported to a score table with following values: A. very satisfied; B.satisfied; C. dissatisfied; D. very dissatisfied.

• Results / Evolution description
Protocol proved appropriate for the photoassisted dental bleaching technique using blue LEDs system to Photo Activated Intracoronal Dental Bleaching.

• Conclusion
Results show the technique was very satisfactory and the VAS table was 4. Internal bleaching with Leds is a conservative technique that bleaches or recovers dental color performed within biological principles and fundaments, searching for color harmony and delivering satisfactory aesthetical results to the patient.

SESSION : Poster group 9 Implantology

Abstract n° : 64885
Ref # P-09

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Provisional prothesis for a one tooth edentulous

• Introduction

Temporization in implantology , occupies an essential place in the therapeutic management . It can, like any provisional prosthesis, have a functional , aesthetic , biological, psychological and phonetic role. In addition , it should reduce the risk of poor healing mucosa and an non-osseointegration of implants.

• Aim

Various kind of provisional prothesis can be used depending on the type , location and extent of tooth loss , as well as the timing and sequence of treatment. Faced with a tooth missing inset , we use either a removable partial denture , a bonded bridge , or sometimes a fixed provisional prosthesis immediately .

• Results / Evolution description

Through different cases, we will show three kinds of provisional prothesis used before, while, or after implanting a one tooth edetulous site.

• Conclusion

Our work will focus on different ways to delay if a tooth missing recessed, and the advantages and disadvantages they offer to the patient , the practitioner and the success of this important phase of treatment that is temporization.

SESSION : Poster group 9 Implantology

Abstract n° : 64747
Ref # P-10

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Evaluation of biocompatibility of photodynamic therapy in rat calvarial defects. A pilot study

• Introduction
Photodynamic therapy (PDT) has been widely investigated and has been shown satisfactory results in bacteria, fungal, and virus decontamination in several dentistry fields. In peri-implantitis, this therapy has been shown bacteria control in vitro and in vivo with different photosensitizers and light sources. Despite the large knowledge of effectiveness of PDT in microorganism's control, the knowledge of any positive or negative interference of PDT in new bone formation should be further investigated.

• Aim
This study aimed to perform qualitative analysis of new bone formation in rat calvarial defects after photodynamic therapy.

• Materials and Methods
6 Wistar rats were anesthetized and a bone defect with 3.7mm diameter was created in rat calvarial in control (n=3) and experimental group (PDT) (n=3). In control group, no additional treatment was performed. In experimental group (PDT), the bone defect was fulfilled with Methylene Blue (0.005%) and 5 minutes was considered as pre-irradiation time. Irradiation was performed with the following parameters: GaAlAs - low level diode laser, 660nm, 30mW, 9J, 5 minutes of irradiation. Irradiation was performed perpendicularly in one point over the bone defect.

• Results / Evolution description
New bone formation after PDT presented similar characteristics of control group.

• Conclusion
Within the limitations of this pilot study, it seems that PDT is a safe clinical procedure concerning bone repair. Treatment with methylene blue in association with PDT may exhibit a clinical possibility of bacterial control with no change in osseous tissue.

SESSION : Poster group 9 Implantology

Abstract n° : 66159
Ref # P-11

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To Be Failured Or Not To Be

• Introduction

Like a “success” we need the participate the “failure” and “ complication”. All the dentist placing implants need to know the management of the complication if occurs.

• Aim

Aim of this presentation participate some failure and management of complications of in our clinic.

• Results / Evolution description

İmplants are the attractive alternative for tooth replacement because of their functionality and durability for the clinicians and the patients. Rising usage can arise complication at any part of treatment

• Conclusion

develepment of implant technology show that in the future implant will be more attractive alternative for missing tooth replacement. the clinicians will need more skill for management of the complication if occurs

SESSION : Poster group 9 Implantology

Abstract n° : 67164
Ref # P-12

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In Vivo Effect Of Biodegradable Membrane In Immediate Implant Placement In the Esthetic Zone On Bone And Soft Tissue Profile.

• Introduction

Dental implant was placed to restore the function of the teeth as well as satisfactory appearance.The combination of extraction and implantation in one session complicates the task of the surgeon while a reduced treatment period can be accomplished by immediate placement of the implant. On the other hand it makes the patients more satisfied especially from the esthetic point of view.

• Aim

The aim of the study was to evaluate the effect of collagen membrane on bone and soft tissue in immediate implantation in the aesthetic zone.16 patients indicated for extraction of a single rooted tooth were divided into two equal groups; group I were subjected to open extraction and immediate implant placement while group II were subjected to the same protocol plus collagen membrane. After 1,3,and six months the results have been evaluated and showed a better reduction in crestal bone loss and improvement in soft tissue profile in group II than group I along the time.

• Materials and Methods

16 patients were divided into 2 groups. Immediate implant was placed without membrane and with membrane in group I & II respectively. 4 weeks later, healing abutment was placed, and then it was replaced by prosthesis. Crestal bone loss & soft tissue thickness was compared using T- test.

• Results / Evolution description

At 6-months, Group I & II attained a mean of 0.83mm & 0.49mm crestal bone loss respectively. While the keratinized tissue in group II was thicker than group I, A mean width of 2.5mm was attained in group II with no change in group I. These differences was statistically significant.

• Conclusion

The collagen membrane was effective and predictable in improving the soft tissue profile especially in patients with thin biotype . Additionally this membrane was effective in decreasing the rate of crestal bone loss around the dental implant in patients with thin and thick soft tissue biotype.

SESSION : Poster group 9 Implantology

Abstract n° : 64893
Ref # P-13

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fortuitous discovery of an aspergillosis within the preimplant evaluation

• Introduction

When a sinus floor elevation is indicated within the context of implant therapeutic, a full examination of the sinus is required. Fortuitous discovery of an intra sinusal lesion involves carrying on clinical and radiological investigation, and often implies the participation of an otorhinolaryngologist.

• Aim

The aim of this article is to show that a chronicle lesion of the maxillary sinus is not a contraindication to oral implantology.

• Materials and Methods

A sixty years-old woman consulted for the replacement of the first superior right molar. This tooth had received an endodontic treatment and endodontic filling material had been projected in the right maxillary sinus. The tomodensitometry showed the typical aspect of an aspergillosis and an insufficient residual bone height for the placement of a dental implant. The otorhinolaryngologist peformed a middle meatal antrostomy. After wound healing, the sinus floor elevation with biomaterial graft has been conducted and the dental implant has been placed at the same time

• Results / Evolution description

The three years follow-up shows the stability of the implant rehabilitation and a sinus clinically and radiologically healthy. No complications occurred.

• Conclusion

This clinical case shows how important is the preimplant evaluation and that a sinusal pathology isn’t an absolute contraindication to realize the sinus floor elevation and the placement of a dental implant at the same time.

SESSION : Poster group 9 Implantology

Abstract n° : 64750
Ref # P-14

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ORCA Overdenture Retained by Clip and Attachment

• Introduction

The prosthetic rehabilitation of the edentulous which offers comfort, function and aesthetics is a challenge exposed to practitioners worldwide. Indeed, anatomical features of the edentulous plus the high number of prosthetic systems can make it difficult for the unaccustomed practitioner. It is now known that the placement of implants overdenture is the treatment of choice in the treatment of edentulous.

• Aim

We realized a system combining a clip attachment bar and an upper bar with a male-female attachment system to answer optimally the requirements of the triad Housset: lift, retention and stabilization.

• Materials and Methods

We are presenting two cases using this system The first case is a patient with sharp jaw resorption, particularly in the anterior region. Six posterior implants were placed at a previous regenerated alveolar ridge. The second case is showing three mandibular implants. The patient has a removable prosthetis maxillary and mandibular. This is highly unstable and has no retention. An implant attachment system was proposed.

• Results / Evolution description

We achieved excellent results with the ORCA system, obtaining the most highly acceptation by the patients . In the maxillary case it was possible to remove the prosthesis palatal area and improve the foods perception with no detrimental of the stability , retention and balance. In the mandibular case the patient recover her masticatory function and her dignity because her prosthesis does not get away of her mouth any more while she speaks and eats.

• Conclusion

We conclude that treatment plan presented can be an excellent option and can be part of the arsenal of possibilities in the clinical practice to manage this oral impairement situation. The system does not need a lot of maintenance do the attachment between the metallic bars that conjugates clips with a precise prosthetic axis insertion male and female.

SESSION : Poster group 9 Implantology

Abstract n° : 67135
Ref # P-15

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Peri-Implantitis – And They Lived Happily Ever After

• Introduction

Yes! this is possible because prevention is still better than cure. It's our responsibility to train and equip our patients to care for their precious implants. Dreaded Peri-implantitis can be nipped in the bud using novel and practical ideas. Come and see what you can pick up and use with successful results. Dr Michel Ossais Beirut,Lebanon "Lise's presentations are cutting edge and practical".

• Aim

To equip clinicians with knife edge practical tips and information to use in their practice and for their patients to use during their home care regime.

• Materials and Methods

Several international oral care products and practical ideas that have proven to be successful during my 35 yrs as hygienist.

• Results / Evolution description

As specialist dental hygienist I have confidence in the products and techniques that I use and teach about because of my high rate of success with my patients.

• Conclusion

Delegates will take home with them several practical information on how to combat the time bomb of peri-implantitis. They can start using these techniques the very next day back in the clinic.

SESSION : Poster group 9 Implantology

Abstract n° : 67115
Ref # P-16

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Immediate implant placement combined with titanium granules

• Introduction

The immediate implant placement even in the esthetic zone is an often performed procedure. The position of the implant is closed to the palatal part of the socket. There are different concepts for the management of the remaining gap between the implant and the lingual bone plate. The aim is to keep the contour of the alveolar process.

• Aim

The aim of this study was to check, if it is possible to keep the alveolar contour using a non adsorbable material as gap filler in combination with immediate implant placement

• Materials and Methods

In this study, the gap was filled up with titanium granules. 25 implants were placed in maxilla in the region of incisors, canines and bicuspids. A temporary crown was fixed to the abutment and adhered to the adjacent teeth. After a healing time of 3 months, the abutments and temporary crowns were replaced by definite reconstruction. To evaluate the stability of the alveolar process, clinical pictures were taken before extraction and after the delivery of the final crown. In addition measuring was made using the planning model and the master cast.

• Results / Evolution description

The healing period was uneventful in all cases. The restorations showed a healthy gingival margin and no discoloration of the soft tissue, when white titanium granules were used. All patients were satisfied with the clinical results so the minimal collapse of the alveolar process as the result of the measuring of the models seems not to result in a compromised clinical situation.

• Conclusion

The healing period was uneventful in all cases. The restorations showed a healthy gingival margin and no discoloration of the soft tissue, when white titanium granules were used. All patients were satisfied with the clinical results so the minimal collapse of the alveolar process as the result of the measuring of the models seems not to result in a compromised clinical situation. These early results justify further use for this indication