

## TREATMENT WITH NOVEL HYBENX® ROOT CANAL CLEANSER SUGGESTS BIOFILMS BLOCKED HEALING OF HUMAN WOUNDS: CASE SERIES

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Pathogenic biofilms are considered a potential major obstacle to healing chronic wounds. The six-month evaluation period in this study assessed the effect of a single treatment of the HYBENX® (HYB) Root Canal Cleanser on chronic wounds, especially its ease of use, safety, potential for shortening duration of Inflammatory Phase, and promotion of granulation. HYB gel was applied to the wound bed and periwound skin for 10 seconds. Gel was removed by cotton gauze pads and low pressure saline rinsing. Standard wound dressings based on wound etiology, location, and exudate characteristics were applied. Duration of these seven HYB-treated wound cases (two pressure ulcers, one surgical wound, four lower extremity ulcers—a venous reflux-associated calf ulcer, one diabetic foot ulcer, and two animal-induced wounds—brown recluse spider and bovine bite) ranged from 12 days to 10 years. Three cases had sinus tracts. After HYB application, sinus tract closure occurred at 7, 16, and 21 days. The 10-year recalcitrant wound from brown recluse spider bite healed in 97 days. Diabetic foot ulcer responded to HYB treatment plus additional strategies and healed in six months. These data support the hypotheses that pathogenic biofilm actively prevents the healing of chronic wounds, and biofilm can be disrupted with a single HYB treatment.

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## **FRENULA IN THE ORAL CAVITY: AN OVERVIEW OF DIAGNOSIS, PROGNOSIS AND CLINICAL MANAGEMENT IN GROWING PATIENTS**

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**This study described the clinical complications and management of frenula. The frenula of the oral cavity are natural anatomical elements consisting of a triangular fold of mucous membrane, which extends in the sagittal direction from the gingiva in the submucosa of the lip, cheeks and tongue. Histologically, the oral frenula consist of a fibrous tract formed by collagen fibers placed in bands associated with thin perivascular nerve structures. These structures are coated by a stratified squamous epithelium. There are syndromes that cause repercussions in the oral frenula: Ehlerdanlos syndrome, Pallister-Hall syndrome, Opitz syndrome, Oral-facial-digital syndrome, Pediatric hypertrophic pyloric stenosis, Ellis-van Creveld syndrome, Holoprosencephaly; there are also non-syndromic conditions. Clinical examination must include the inspection and palpation integrated by the pull of the lips and the verification of the tongue protrusion capacity. Consequences of the upper and lower lip frenula are described as well as the relative surgical procedures (frenotomy and frenectomy).**

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## FACIAL SKELETAL ALTERATIONS IN MOUTH BREATHING PAEDIATRIC PATIENTS: CEPHALOMETRIC EVALUATIONS

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The morphogenesis of the dento-maxillofacial district is related to epigenetic factors and intrinsic genetic factors, and to local and general environmental factors, which interfere with the neuromuscular balance. Among the several local environmental factors that can interfere with a harmonious and balanced craniofacial growth, there are spoiled habits, such as mouth breathing. Mouth breathing represents the most serious condition, since not only plays a fundamental role in the development of the entire dento-maxillofacial apparatus, but also lead to negative consequences at the systemic level as far as pulmonary, circulatory, nervous, endocrine and digestive functions. The orthodontist plays an important role in the diagnosis, since the most significant symptoms are of orthodontic nature such as, for example, the alteration of the shape of the dental arches, of occlusion, and growth vectors of the maxillary. The aim of this study is to determine whether the tendency to develop a condition of skeletal hyper-divergence with high vertical anterior dimensions of the middle and lower facial third, are related to the degree of patency in the nasopharyngeal canal. Cephalometric data from 50 mouth-breathing subjects and 30 prevalent nasal-breathing subjects were analyzed, looking for a correlation between the degree of skeletal divergence of the jaw (the FMA angle in particular) and the degree of patency of the nasopharyngeal canal (AD-PTV). Data confirmed the correlation between facial morphology and the reduction of the nasopharyngeal space in mouth breathing subjects. The correlation between skeletal class II malocclusion and the reduction of the sagittal diameters of the rhino-pharyngeal canal wasn't relevant. Finally, although the table of percentages shows an increase in the diameters of the upper airways in older subjects, demonstrating the physiological atrophy during the growth, this correlation is not statistically significant. This study demonstrated a significant correlation between small nasopharyngeal canal size and facial skeletal hyper-divergence was also demonstrated.

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## **REGENERATIVE ENDODONTICS PROCEDURE OF AN IMMATURE PERMANENT MANDIBULAR MOLAR WITH A NECROTIC PULP USING BIODENTINE: A 16 MONTHS RADIOGRAPHIC FOLLOW-UP**

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**An ideal scenario for a tooth in necrosis with immature root would be to continue root development after the regeneration of pulp tissue. We report a case, where the regenerative endodontic procedure (REP) was done using biodentine as a scaffold in a immature mandibular molar tooth.**

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**EFFECT OF PRESSURE AND LIGHT CURING OF COMPOSITE MICRO HARDNESS**

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The aim of this study is to evaluate the micro hardness Vickers of a composite micro hybrid polymerized under constant pressure. Twelve experimental samples were made equally divided into two groups: an experimental group and a control. Enamel plus HRi (Micerium) microbotic composite resin, UD3 colour, was inserted into a syringe heater (ENA HEAT Composite Heating Conditioner) so that the material could be brought to a temperature of 39°C. A defined amount of composite resin is taken from the syringe with a Heidemann spatula and placed between two slides, previously cleaned with 90 ° alcohol. The samples are then inserted one at a time into a special device for constant pressure application. Vickers hardness measurements were made on the top of surfaces. The mean value of the samples belonging to the experimental group is  $56.81 \pm 0.71$ . The mean value of the control samples is  $52.02 \pm 2$ . The results obtained allow us to state that applying a constant pressure during the cementation phase of indirect adhesive restorations allows to obtain better mechanical characteristics of the composite used as a cementing agent.

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## DENTINAL SUBSTRATE VARIABILITY AND BONDING EFFECTIVENESS: SEM INVESTIGATION

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Though the literature reports a well-documented scientific evidence of the performance of modern adhesive systems on normal dentin, few researches are available on the interaction between adhesives and compromised dentin. In this study, the authors analyzed the microscopic structural aspects of the adhesive interface on two common altered dentin substrates: dentin contaminated by metallic oxides and caries affected dentin. Thirty teeth were selected and divided in three groups of ten teeth according to the different dentin substrate they had: (A) normal dentin, (B) caries-affected dentin and (C) dentin contaminated by metallic oxides. The experimental cavity preparation was realised exposing in each sample, portion of pathologic dentin and portion of sound dentin as control. Each cavity was restored with micro-hybrid composite, with total etching and a two-step adhesive system. Each sample was sectioned in two halves analysed with two SEM micro-morphological methods: direct observation and decalcification. SEM investigations were able to show the difference in thickness and morphology of the adhesive interface with the two different dentin variables. Caries affected dentin determined the formation of less distinctive resin tags with few micro-tags. Discoloured dentin showed a poor infiltration with few resin tags probably due to alterations in the tubular structures. The micro-morphological variability of dentin substrate influences the clinical efficacy of bonding restorations determining significant differences in the qualitative and quantitative aspects of resin tags.

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## MANAGEMENT OF PEDODONTIC PATIENTS IN MODERATE SEDATION IN CLINICAL DENTISTRY: EVALUATION OF BEHAVIOUR BEFORE AND AFTER TREATMENT

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The aim of this study is to evaluate the success of functional rehabilitation of one dental session in patients with severe disabilities such as severe autism, baby bottle syndrome and severe odontophobia, and to assess how patient compliance pre- and post-intervention changes in moderate sedation. Between the beginning of 2016 and the end of 2018, 20 pedodontic patients with severe odontophobia, severe autism and baby bottle syndrome who needed dental treatment came to our attention. Patients were aged between 3 and 12 years, including 9 males and 11 females, including 10 odontophobics, 6 with severe autism and 4 with baby bottle syndrome. During the first visit, these patients were evaluated with a rating scale to evaluate the need to carry out dental intervention in a moderate sedation regime. We were able to treat 18 of the 20 patients, and carried out a total of 45 extractions, 4 oral hygiene sessions, 60 dental caries, 29 root canal treatments and 13 sealing pits and fissures. Before and after treatment, each patient's mood was assessed by using a test. Control visits were performed after 30 days, 3 months and the last one after 6 months. After the last follow-up visit, the patient was asked to complete the assessment test of his mood so that it could be compared with the one completed before the intervention. Complete functional and aesthetic rehabilitation of the patient's oral cavity was carried out in a single session. Emotional state and patient compliance was improved one year after surgery in about 67% of patients, especially in children with odontophobia. Children with severe autism showed less collaboration in post-intervention assessment. The approach with moderate sedation was effective for the elimination of pain and for the treatment of preventive care, also improving the compliance and the mood of young patients.

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## **CONVERGENT IMPLANT TRANSMUCOSAL COLLAR AND HEALING ABUTMENT: AESTHETICS INFLUENCE ON SOFT TISSUES. A CLINICAL STUDY**

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**Two conditions are necessary for an correct and functional prosthetic implant rehabilitation: maintaining pre-implant soft tissue health and stability of bone tissue, in terms of implant osseous-integration and maintenance of optimal crestal attachment levels. In addition to these parameters - necessary for the longevity of the restoration - one of the main aspects of therapy is the achievement of a final aesthetic that reproduces as faithfully as possible the natural anatomy of the lost tooth and the associated soft tissues. To achieve this last objective, an implant system was designed and used by our group. This implant is characterized by a convergent trans-mucosal emergence fixture associated with a progressive closing system of trans-mucosa healing pillars (healing abutment). These guarantee, together with the micro and macrostructure of the implant, an immediate and highly aesthetic condition of the peri-implant soft tissues, and in the same time an optimal seal on the convergent neck of the implant itself.**

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## TRANSGINGIVAL IMPLANTS WITH A CONVERGENT COLLAR (PRAMA). SURGICAL AND SCREWED PROSTHETIC APPROACH. A CASE REPORT

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**Objective.** This article presents a case report of transmucosal implant with a convergent collar (PRAMA) inserted in the anterior maxillary esthetic area. The purpose of this study is to evaluate soft and hard tissue after 12 months. **Methods.** One implant was placed in aesthetic area. The implant was immediately loaded with a provisional screw. After 3 months the definitive screwed prosthesis was placed. The patient was reassessed at 12 months post implant placement. During the examination, the soft-tissue texture, color and amount of keratinized tissue were checked. **Results.** No statistically significant horizontal dimensional changes of the alveolar ridge were observed between each timepoint. Mean soft tissue levels significantly improved between baseline and 12 months. **Conclusions.** The reduced buccal width of the transmucosal component gives more space to the gingival thickness, promotes stability and gives a better seal. The use of transmucosal implant create a shift of the inflammatory cell infiltrate away from the crestal bone level.

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## **FULL-DIGITAL WORKFLOW TO REHABILITATE A HIGH VALUE AESTHETIC ZONE: A CASE REPORT**

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**Replacing missing teeth in the aesthetic area is a clinical challenge which must be solved by a multidisciplinary approach in order to obtain an esthetic and functional implant-prosthetic rehabilitation. First therapeutic choice should be the less invasive option, in accordance with patients' expectations. The present clinical case presents the rehabilitation of the upper incisor group using a full-digital workflow to reduce operative time, costs and patient discomfort. The use of computer-guided-surgery and 3D technologies, as intraoral scanners or cone-beam-computed-tomography, allows the clinician to visualize all patient's information when planning the rehabilitation in order to obtain a more predictable and a less invasive surgery.**

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## COMPARISON OF THE ACCURACY OF INTRAORAL SCANNING AND CONVENTIONAL IMPRESSION TECHNIQUES ON IMPLANTS: A REVIEW

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The aim of this review was to collect available evidence and evaluate accuracy outcomes of dental implant impression techniques, and to compare the accuracy of conventional implant impression *versus* digital implant impression. Inclusion and exclusion criteria were defined by the authors before the start of the study. The inclusion criteria were: all studies published in English language; studies no older than five years; analyzing the accuracy of digital *vs* conventional technique impression on implants. The exclusion criteria were: publications that reported the same data as later publications by the same authors and systematic reviews; commentaries and letters to the editor; case report and case series. The search resulted in 106 titles. Following the first stage of screening, after the records identification through database manual searching, 112 potentially relevant studies were identified. After the second stage screening, 33 full text publications were obtained and analyzed and 17 were excluded. Afterwards, 18 articles resulted eligible after full text reading and a cross search of the articles' references was accomplished; 3 articles were consequently added. At the end only 7 articles were included in the quantitative analysis. Within the limitations of this systematic review, digital impression on dental implants offers a comparable accuracy compared with conventional impressions technique. More clinical trials are recommended to investigate the accuracy of these scanners and their validity in clinical use.

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## **HELICOBACTER PYLORY AND ORAL DISEASES**

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*Helicobacter pylori* (*H. pylori*) gastric infection is considered one of the most common human infections. It occurs in half of the world population and is the most common cause of adenocarcinoma of the distal stomach. The risk of developing gastric cancer is believed to be related to differences among *H. pylori* strains and the inflammatory responses mediated by host genetic factors. The accepted evidence is that the *H. pylori* strains reach the stomach by ingestion through the mouth and, because of its non-invasive nature, the stomach is the definitive site for colonization. One of the key issues related to the eradication of gastric *H. pylori* has been the importance of oral hygiene and periodontal procedures. Dental plaque control and periodontal therapy can prevent gastric *H. pylori* infection recurrence for patients with gastric diseases associated with *H. pylori*.

## CALCIUM SULPHATE FOR CONTROL OF BLEEDING AFTER ORAL SURGERY IN ANTICOAGULANT THERAPY PATIENTS

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Control of bleeding after oral surgery is mandatory in patients taking anticoagulants. There are different haemostatic measures to prevent post-surgical bleeding. The aim of the present paper is to study the use of a haemostatic agent, calcium sulphate (CaS) (P30, Ghimas, Bologna, Italy) for controlling post-surgical bleeding in a group of patients treated with warfarin therapy for thromboembolic states. Twenty teeth (12 mandibular molars, 8 maxillary molars) in 20 patients (14 male and 6 females) with a mean age of 54.3 years ( $\pm 10.3$  years) were included in the study. The patients were divided into 2 groups; in the study group of 10 patients calcium sulphate was used in layers to fill the socket after extraction, while for the 10 patients in the control group put a gauze with tranexamic acid was put in the extraction site immediately after extraction, and half an hour after extraction. The outcome was bleeding in subsequent days. Bleeding at post-operative day 1 was significant in 5 patients of the control group, however, in the study group treated with calcium sulfate there was no bleeding in any patient (p value 0.0055). CaS demonstrated to be a good haemostatic agent for controlling bleeding after oral surgery in patients taking anticoagulants.

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## ORAL REHABILITATION OF MAXILLA: TECHNICAL CONSIDERATION

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Oral rehabilitation of edentulous maxilla is particularly difficult because of the lack of bone in correspondence of maxillary sinuses, therefore, the surgeon is forced to place implants in sites where bone is more prevalent. In addition, patients require more frequent oral immediate rehabilitation in order to reduce the discomfort related to wearing a total denture. A viable solution to provide stability and retention of the prosthesis in a short time is represented by the technique of intraoral welding supporting total denture or fixed prosthesis. This goal may be achieved thanks to the technique of welding titanium bars onto implant abutments. In fact, the procedure can be performed directly in the mouth, eliminating the possibility of errors or distortions due to prosthetic procedures. This paper describes a case report and the most recent data regarding long-term success and high predictability of intraorally-welded titanium bar in immediate loading implants.

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## ORAL REHABILITATION OF EDENTULOUS JAWS WITH ONE-PIECE IMPLANTS: A CASE SERIES

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**The popularity of one piece implants has increased considerably between patients and dentists. The advantages of one-piece immediate loading for rehabilitation of edentulous mandibles is to reduce the number of interventions and timing of prosthetic. These parameters can be better controlled with a one-piece implant. Twenty-one patients with one-piece implants inserted in totally edentulous mandibles were considered for this retrospective study. Inclusion criteria were: Good oral hygiene, absence of lesions of the oral mucosa, no smoking or smoking less than 20 cigarettes a day, drinking less than 2 glasses of wine a day, good general health no pregnancy. Twenty-one (12 females 9 males) patients were enrolled in this retrospective study. The mean follow-up was 1 years. A total 84 one-piece implants (Biohorizon, Italy) were inserted in edentulous mandible. Implants diameter was 3.0 mm in all fixtures. Implants length was equal and longer than 12 mm in 44 and 40 fixtures respectively. 48 were inserted in females 36 in males (range 33-67; mean age 58.3). One-piece immediate loading implants has no difference in survival rate respect to two-piece implant and delayed loading for rehabilitation of totally edentulous mandibles. In conclusion one-piece immediate loading implant is a reliable device for mandible rehabilitation.**

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## WHY DENTISTS AND DENTAL HYGIENISTS SHOULD IMPROVE PROGRAMS FOR INDUCING SMOKING CESSATION? THE EFFECT OF TOBACCO SMOKING ON PERIODONTAL HEALTH

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Periodontal diseases (PD) affect about half of the adult population all over the world. PD is caused by bacterial infection inducing an inflammatory response with progressive destruction of the periodontal tissues and finally the lost of teeth. Tobacco smoking (TS), alcohol consumption, and systemic conditions such as diabetes, osteoporosis, malnutrition and stress are considered additional risk factors. This short review examines the potential causal association between TS and PD. There are many studies for a higher level of PD among smokers. Greater levels of clinical alveolar bone loss, tooth mobility, probing pocket depth and tooth loss are more frequent in smokers than in non-smokers. The modification of the periodontitis micro-flora in smokers influences the development of PD. Also there are data suggesting smoking effects on both host responses in humans. Response to periodontal treatment is different in smokers and non-smokers. Various clinical studies have demonstrated that TS is a major risk factor for poor response to periodontal therapy. TS is a factor that has the potential to negatively affect healing and the outcome of implant treatment. It is mandatory for dentists and dental hygienist to promote smoking-cessation programs as well as educate our community on the benefits of not smoking.

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## COMPLICATIONS IN SINUS LIFT

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**Prosthetic rehabilitation of atrophic maxillary implants often requires grafting owing to vertical and transversal bone deficiency. The use of this procedure in order to insert implants was introduced by Tatum and published as a clinical study by Boyne and James. It can be performed via a lateral or crestal approach. This surgery is now widespread, with good results in terms of bone augmentation and implant osseointegration. Nevertheless, there is a small proportion of patients who have infectious complications with an incidence ranging from 3.5% to 10.5%. We observe that maxillary sinus augmentation is a successful preprosthetic technique for augmentation of the edentulous posterior maxilla. Preoperative assessment of the anatomy of the sinus reduces the rate of complications considerably**

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## **TONGUE REHABILITATION THROUGH THE FROGGY MOUTH DEVICE: CASE SERIES**

P. MANZINI<sup>1,2,3</sup>, M. ROSMARINI<sup>3</sup>, E. FRATI<sup>3</sup>, M. SEVERINO<sup>4</sup> and S. CARUSO<sup>4</sup>

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**Based on the knowledge supporting the position of the tongue in relation to the palate to be the guiding factor of oro-dental growth and the key factor in long-term orthodontic stability after treatment, 6 different case reports show how the Froggy Mouth device changes treatment strategy in rehabilitation of dysfunctional swallowing by relying on the subcortical process, following the principles established by pioneering studies on memorization mechanisms conducted by Eric Kandel (year 2000 Nobel Prize winner in medical field for his research on memorization process).**

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## TEMPOROMANDIBULAR DISC DISPLACEMENT WITH REDUCTION TREATED WITH ANTERIOR REPOSITIONING SPLINT: A 2-YEAR CLINICAL AND MAGNETIC RESONANCE IMAGING (MRI) FOLLOW-UP

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**Clicking may appear in the initial, middle, or final phase of mandibular opening. Magnetic Resonance Imaging (MRI) is the most appropriate diagnostic imaging for diagnosing disc position. With anterior repositioning splint (ARS), disc recapture is achieved through a change in the position of the condyle to encourage adaptation of the retrodiscal tissues. Three patients reported pain and sounds during movement and clicking in the final phases; also, the MRI confirmed anteriorized disc position and the treatments consisted of an ARS. The post-treatment examination confirmed a normal opening without deviations and deflections. After 2 years, the conditions were stable, and the MRI showed thickening of the retrodiscal tissues, including extra fibrous tissue, resulting in a pseudodisc. Treatment using ARS can stimulate tissue fibrosis and the formation of a pseudodisc. MRI is the gold standard for diagnosis and treatment planning of disc displacement cases.**

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## TECHNICAL NOTE: SURGICAL GUIDE FOR COMPUTER-AIDED ENDODONTIC SURGERY

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**Introduction:** CBCT combined to intra-oral scansion are the means to build an endodontic surgical guide to perform an easier and safer access to the apex in endodontic micro-surgery. **Method:** A 38-year-old woman presented chronic apical periodontitis, which involved the three roots of 16 that was treated by endodontic therapy several years ago elsewhere. The palatine channel was retreated, the mesio- and disto- buccal roots were instead treated with apicoectomy. A surgical template was printed by a 3D printer to obtain greater precision in the surgical access. **Discussion:** Endodontic microsurgery has evolved over the years. New tools have been introduced to improve therapy, even if the basic principles have not changed. In fact, according to the literature, it is necessary to cut at least 3 mm of root to be sure of eliminating the anatomical variations and the accessory channels. Several Authors have devoted themselves to creating an endodontic surgical template, some in vitro and others in vivo. The present paper introduces a new method that allows a more conservative osteotomy and greater precision the surgical access. **Conclusions:** Further investigation are needed to test and improve the effectiveness of the treatment but this technique seems very promising because it is less invasive for the patient and simplifies the work for the dentist who can perform micro-surgery in an easier and faster way.

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## SILICA SOLUTIONS (SL) IS EFFICACY IN THE TREATMENT OF CHRONIC PERIODONTITIS: A CASE CONTROL STUDY

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**Aim:** The objective of this study was to compare the efficacy of supportive periodontal therapy (i.e. scaling and root planning, SRP) alone versus a chemical device silica dioxide (SiO<sub>2</sub>) colloidal solutions (SL) used in association with SRP in the treatment of chronic periodontitis in adult patients. **Materials and Methods:** A total of 20 patients with a diagnosis of chronic periodontitis (40 localized chronic periodontitis sites) in the age group of 35 to 55 were selected. None of these patients have previously received any surgical or non-surgical periodontal therapy and demonstrated radiographic evidence of moderate bone loss. Two non-adjacent sites in separate quadrants were selected in each patient to monitorize treatment efficacy (split mouth design). Clinical pocket depth (PD) and microbial analysis (MA) were analyzed at baseline and 15th day. SPSS program and paired simple statistic T-test were used to detect significant differences. **Results:** Total bacteria loading, Tannerella Forsitia and Treponema Denticola loading were statistically reduced when SiO<sub>2</sub> is locally delivered. **Conclusion:** SL gel is an adjuvant therapy which should be added to SRP in the management of moderate to severe chronic periodontitis.

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