

THE EFFECTS OF A NEW DECONTAMINANT SOLUTION ON ROOT CANAL BLEEDING DURING ENDODONTIC TREATMENT: A RANDOMIZED CONTROLLED STUDY

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Blood contamination of the canal during preparation and obturation can be a problem in Endodontics; this may result in apical microleakage. The purpose of this investigation was to observe and evaluate the hemostatic properties of biofilm decontaminant material (sulfonic/sulphuric acid solution, HybenX, EPIEN Medical) used in teeth with necrotic pulp and unstoppable bleeding after root canal shaping. A prospective study was designed with 2 randomized parallel groups: decontaminant material (experimental group) and sodium hypochlorite 5% (control group). The analysis of the root canal bleeding was evaluated by the clinician before and after the application of the sulfonic/sulphuric solution or sodium hypochlorite 5%, by measuring the millimeters of blood on a sterile paper point introduced in the root canal. Sixty patients with necrotic pulp and unstoppable bleeding were enrolled in this study and randomly divided into 2 groups: decontaminant material in 30 patients (experimental group) or sodium hypochlorite 5% in 30 patients (control group). *T*-test showed that the percentage change in millimeters of blood detected in the root canal was statistically greater for experimental group [mean difference: 0.74 (IC: 0.66-0.82); $p < 0.0001$]. The hemostatic properties were better in the experimental group than in the sodium hypochlorite 5% group (control). Further research may be needed to confirm the results of this study.

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ANALYSIS OF ORAL MUCOSA EROSION-ULCERATIVE LESIONS BY REFLECTANCE CONFOCAL MICROSCOPY

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***In vivo* Reflectance Confocal Microscopy (RCM) allows to optically biopsy vital tissues, non-invasively and in real time. It results in horizontal virtual slices at a microscopic resolution and correlating with conventional histopathology. The aim of the present work is to describe RCM cellular and architectural findings in oral mucosae affected by erosive-ulcerative diseases, thus highlighting in vivo the well-known histological peculiarities. A series of conventionally diagnosed Recurrent *Aphthous stomatitis* (RAS) and *Pemphigus Vulgaris* (PV) erosive and/or ulcerative oral lesions underwent RCM imaging to establish the application of RCM imaging to this kind of inflammatory non-tumoral lesions. A total of 12 RAS-related lesions and 8 PV-related lesions were considered. RCM imaging was capable to visualize their microscopic peculiarities, mainly inflammatory infiltrate, vessel dilation (RAS) and acantholytic cells, intraepithelial clefts and inflammatory cell carpets (PV). Despite RCM may result unnecessary to diagnose oral lesions referred to RAS and PV, its capability to highlight their main microscopic features could be advantageously used to monitor the healing or worsening of the clinical situation as well as the responsiveness/refractoriness to therapy.**

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ANALYSIS OF LIP PIGMENTATIONS BY REFLECTANCE CONFOCAL MICROSCOPY: REPORT OF TWO CASES

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Oral mucosa pigmentations belong to a heterogeneous variety of lesions, which are usually divided into two groups: exogenous or endogenous pigmentations. The pigmented lesions most frequently found in the oral mucosa are the amalgam tattoo, the melanotic macula and the nevus. All these lesions may affect every part of the oral mucosa, and they may represent a hard diagnostic challenge for the clinician; the clinical objective examination is not sufficient to make a correct diagnosis. Reflectance Confocal Microscopy provides a real-time microscopic evaluation of tissue layers, and is widely considered a useful auxiliary tool in monitoring skin and mucosa lesions. In this context, Reflectance Confocal Microscopy imaging is a valid aid in the management of oral mucosa pigmented lesions, to corroborate and support the diagnostic process.

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TOPICAL TOLUIDINE BLUE-MEDIATED PHOTODYNAMIC THERAPY FOR THE TREATMENT OF ORAL LICHEN PLANUS

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Photodynamic Therapy (PDT) is a minimally invasive approach that has shown promising results in management of oral, head and neck lesions. PDT can be used alone or in combination with other conventional treatments (surgery, chemotherapy, radiotherapy). Oral Lichen Planus (OLP) is a mucosal and cutaneous chronic disease characterized by an autoimmune insult of basal keratinocytes. We aim to evaluate the feasibility of topical toluidine blue-mediated PDT for the treatment of oral cavity multifocal homogeneous white lesions by oral lichen planus without dysplastic features.

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ASSOCIATION BETWEEN DENTURE STOMATITIS, *CANDIDA SPECIES* AND DIABETIC STATUS

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***Candida species* are commensal yeasts of the oral cavity, which, under predisposing systemic and/or local circumstances, are responsible for a wide variety of clinical manifestations, globally known as oral candidiasis. Candida-associated denture stomatitis is an oral candidiasis particularly affecting the oral mucosa covered by a dental prosthesis, with several degree of severity. Diabetics suffer oral candidiasis more frequently than healthy individuals do and if they are denture wearers, the risk increases. Since various controversies still remain regarding the interrelationship among diabetes, oral *Candida spp.* strains involved in denture stomatitis and the presence of dentures, the present review aims to investigate the differences in *Candida* species frequencies and degree of denture stomatitis severity existing among diabetic and non- diabetic individuals, with and without dentures.**

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CLINICAL FITTING OF A CAST METAL POST AND CORE OBTAINED BY MEANS OF AN INTRAORAL OPTICAL SCANNING (IOS) AND DIGITAL WORKFLOW

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Customization of post-and-cores using computer-aided-design and computer-aided-manufacturing (CAD-CAM) requires the scanning of a pattern and the subsequent digital design. This case report describes the production of a CAD-CAM customized post-and-core designed from an intraoral scan and milled from a metal block. The use of an intraoral scanner (IOS) for post-endodontic rehabilitation could lead to a faster and more efficient CAD-CAM customized post-and-core realization. The use of a high resistance material such as metal is paramount in cases with high loss of coronal structure. The patient has been treated with bisphosphonate (BP) for years. The risk of osteonecrosis of the jaw after extraction was high.

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COMPARATIVE ANALYSIS OF CLEANING ABILITY OF TWO ROTARY INSTRUMENT SYSTEMS: MTWO AND PROTAPER UNIVERSAL. AN *IN VITRO* SCANNING ELECTRON MICROSCOPIC STUDY

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This study is to compare the cleaning effectiveness of two Ni-Ti files systems. Thirty single-rooted human teeth were selected and two NiTi rotary systems were used. Group A: canal shaping with ProTaper® Universal (Dentsply Tulsa Dental Specialties, Tulsa, OK) (PTU); Group B: (n=15) canal shaping with Mtwo Ni-Ti instruments (Sweden & Martina, Padova, Italy) and apical finishing with Mtwo Apical Ni-Ti instruments (Sweden & Martina, Padova, Italy). The amount of debris and smear layer were quantified on a basis of a numerical evaluation scale. The data established for scoring the debris and the smear layer was recorded separately and statistically analysed using the Kruskal-Wallis test. No significant differences were found for debris. Mtwo instruments resulted in significantly less smear layer ($P<0.05$) compared with ProTaper® Universal. Under the conditions of this study, Mtwo resulted in significantly less smear layer compared with canal preparation with ProTaper® Universal.

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MODIFIED BONDED ACRYLIC EXPANDER IN PATIENT WITH ANTERIOR CROSSBITE AND PSEUDO-CLASS III

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The open-bite treatment can be considered one of the most difficult malocclusions to treat in children as well as in adult patients. Several papers show that the traditional maxillary expander device contribute to increase the vertical face dimension and bite opening due to posterior rotation of the mandible, buccal tipping of lateral segments and cuspal interferences. Other more specific studies compared the effects of traditional maxillary expander to those of bonded acrylic expander and evidenced that the acrylic expander can better control the vertical effects of the maxillary expansion by the resin bite plane on which the heavy occlusal forces are exerted. We decided to use an acrylic expander in order to prevent worsening of anterior openbite after a careful assessment of nasal airflow by the otorhinolaryngologist.

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PERIODONTAL DISEASE IN SUBJECTS SUFFERING FROM CORONARY HEART DISEASE

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The aim of present study is to evaluate the greater risk of periodontal disease in subjects affected by cardiovascular disease. The statistical study includes 200 patients equally divided into a test and a control group. The test group is made up of hospitalized patients from the cardiology division of the S. Salvatore hospital of L'Aquila and the second made up of subjects that frequented a dental clinic. All patients were subject to anamnesis and clinical evaluation for periodontal disease. The index used for this clinical examination were CPTIN index (Community Periodontal Index for Treatment Needs), pocket depth index (PPD), probing bleeding index (PBI), and plaque index (Silness, Loe). All data were collected and a comparative analysis was done of the results obtained from the two groups. Analysing the data concerning the average of lost and present teeth in the oral cavity and the damage of periodontal attachment we notice that cardiopathic subjects had a loss of periodontal attachment 2 times greater than in the control group and major condition of edentulism. A frequency test called the "chi-square test" showed that cardiopathic patients had a greater frequency of periodontal disease. The development of periodontal disease in subject suffering from coronary heart disease is faster and more aggressive than in healthy subjects. Therefore, the prevention of periodontal disease is simple and effective way to reduce the risk of cardiovascular disease.

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CHLORHEXIDINE GEL USED AS ANTISEPTIC IN PERIODONTAL POCKETS

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The aim of this study was to evaluate the adjunctive benefit offers by the administration of a chlorhexidine based local drug deliver (Chlo-SITE) into periodontal socket after a full mouth disinfection session. The study design was a randomized, crossover, clinical trial conducted on 60 non-smokers subjects with chronic periodontitis. Each volunteer was subjected to a one-stage full mouth disinfection session and, immediately after that, test product (Chlo-SITE) was inserted in 1 pocket in 2 quadrant. The 1° and 4° quadrant were used for the study with the application of antiseptic (Test); the 2° and 3° as a control. Periodontal probe (PD), bleeding on probing (BOP) and plaque index (PI) was collected at baseline (T0), after 7 days (T1), after 4 weeks (T2). The results of this study suggest that the application of xanthan-based chlorhexidine gel (Xan-CHX) offers a great benefit in improving of the indices in chronic periodontitis.

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APPLICATION OF THE RADIOSURGERY ASSISTED GINGIVAL DISPLACEMENT TECHNIQUE IN THE AESTHETIC AREA: A CASE REPORT

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The use of digital tools offers a new perspective to daily clinical activities even though sometimes different clinical approaches are necessary. This case report of a maxillary anterior rehabilitation demonstrates the application of a gingival displacement technique to enhance the recording of subgingival finish line by means of an intraoral optical scanner (IOS). The temporary restoration was used as a guide for the radiosurgery tip in order to displace the gingiva in a guided and mini-invasive approach. It was then possible to create the space between the tooth structure and the soft tissues for the light beam of the IOS to properly detect the finish lines of the dental preparation. Six single porcelain fused to zirconia crowns were delivered. This technique could be considered as a solution of complex cases with subgingival dental preparation to be detected by means of an IOS.

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**THE EFFECTIVENESS OF ENDODONTIC SEALERS AND ENDODONTIC
MEDICAMENTS ON THE ELIMINATION OF *ENTEROCOCCUS FAECALIS*: AN *IN
VITRO* STUDY**

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The aim of this study was to investigate the efficacy of endodontic sealers and endodontic medicaments: Aureoseal (OGNA), MTA (DENTSPLY), calcium hydroxide (CH) (Endoidrox OGNA) and iodoformic paste (OGNA) against *Enterococcus faecalis*. Thirty-six Biomeraux plates (18 MH and 18 DCO) were inoculated with the experimental suspensions. The *E. faecalis* broth culture suspensions were prepared and adjusted to no. 0.5-0.7 McFarland standard. In each agar plate, three cavities were created, each measuring 4mm in depth and 7mm in diameter, and then completely filled with the product to be tested. To investigate the root canal sealers' antimicrobial activity, the agar diffusion method is used. The diameters of the zones of microbial inhibition were measured in millimeters around the plate. The results showed that the antimicrobial activity of Aureoseal was superior to those of MTA, iodoformic paste and calcium hydroxide for the microorganisms tested. The study confirmed the resistance of *Enterococcus faecalis* to endodontic sealers. Aureoseal and Calcium hydroxide showed the best results in inhibition test suggesting to employ them in clinical cases.

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FIT EVALUATION OF CAD/CAM FABRICATED ALL-CERAMIC RESTORATIONS BASED ON DIRECT AND INDIRECT DIGITALIZATION IN VIVO: A SYSTEMATIC REVIEW

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The aim of this study was to compare the fit of all-ceramic restorations on natural teeth fabricated through a direct digital workflow or an indirect digital workflow. An electronic search of publications was established from three electronic databases: Cochrane, PubMed and Web of Science. The search strategy used a combination of controlled vocabulary and free-text words. The detailed search design and strategies, including keywords, are presented below. The authors used two filters to follow data for the research: papers written in English and published in the last 5 years. The search resulted in 3042 titles. Following the first stage of screening, after the records identification through database manual searching, 3047 potentially relevant studies were identified. After the second stage screening, 38 full text publications were obtained and analyzed and 17 were excluded. Afterwards, 22 articles resulted eligible after full text reading and a cross search of the articles references was accomplished and 5 articles were consequently added. At last, 6 articles were included in the quantitative analysis. This study was designed to compare the fit of restorations obtained by means of a direct or indirect digital workflow. The values reported on the maximum acceptable gap in scientific literature range from 50 to 200 μm , so there does not seem to be an objective limit based on scientific evidence. According to the most accepted marginal discrepancy in the literature, most of the values of the studies examined are in the 200 μm acceptability range. Within the limitations of this systematic review, computer-aided design and computer-aided manufacturing (CAD/CAM) fabricated restorations obtained by means of an intraoral scanner (IOS) showed better marginal and internal fit than restorations obtained through conventional impression and subsequent laboratory scanning. According to the results of this systematic review, the direct digital workflow resulted as a valid alternative to the indirect digital workflow to produce CAD/CAM all-ceramic restorations.

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WHY PATIENTS WITH CARDIOVASCULAR RISKS GO TO DENTISTS. IS THERE SUFFICIENT EVIDENCE OF INFLUENCE OF PERIODONTAL THERAPY ON CARDIOVASCULAR DISEASE?

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Cardiovascular disease (CVD) is a common cause of death, representing 29% of the mortality all over the world. Estimates for 2006 show that CVD is one of the world's main cause of death, with 17.1 million death per year. More than 70 million Americans have been diagnosed with various forms of CVD, including high blood pressure, coronary artery disease (acute myocardial infarction and angina pectoris), disorders of peripheral arteries etc. There is strong evidence that periodontal disease (PD) is associated with an increased risk of CVD. In addition many patients with CVD are also affected by PD, which can be mild or severe. The aim of this manuscript is to investigate the effects of periodontal therapy on the management of CVD. 34 randomised controlled trials and reviews were included in this manuscript to test the effects of different periodontal therapies for patients with CVD. In conclusion we may affirm that there is some lack of knowledge on relations between PD and CVD, however there is sufficient evidence to justify a periodontal treatment to prevent CVD, in fact PD is very prevalent in middle-aged population and can have a significant impact on the cardiovascular function.

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AN OVERVIEW ON PERIODONTAL CHANGES AND DENTAL MOVEMENTS

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Only in recent times has been enhanced the importance of gingival crevicular fluid in periodontal health and in particular in maintaining the integrity of periodontium during application of orthodontic forces. The aim of this short review is to evaluate the importance of substances as valid biomarkers of periodontal health during orthodontic movements. A search on PubMed and Cochrane database was performed considering the literature from 2003 to 2014, using the following key words: gingival crevicular fluid, biomarkers of periodontal tissue, orthodontic movements. After abstracts screening, the full-texts of selected papers were analyzed and the papers found from the reference lists were also considered. The search focused on clinical applications documented in studies in the English language: levels of evidence included in the literature analysis were I, II and III. Literature analysis showed 28 papers that fulfilled the inclusion criteria. The conclusion is that GCF is a powerful vehicle for clinical diagnostics, since it contains different biochemical and cellular arrays in relation to different clinical situations indicative of the state of periodontal health during orthodontic treatment.

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THE ROLE OF IMPLANT-ABUTMENT CONNECTION IN PREVENTING BACTERIAL LEAKAGE: A REVIEW

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Osseointegration can be affected by oral conditions; in particular, the micro gap at the implant-abutment-connection (IAC) represents a site for dental plaque aggregation favoring bacterial leakage that can increase inflammatory cells at the level of the IAC, causing peri-implantitis. This micro gap, once early colonized, may constitute a bacterial reservoir that could subsequently contaminate fixture's surroundings and interfere with peri-implant tissues health. The aim of this review is to describe, according to the most recent literature, the different kind of implant-abutment connection and their ability to reduce bacterial leakage and thus preventing peri-implantitis. The following database were consulted: Pubmed (n=26), Scopus (n=90), Research gate (n=7) and 123 articles were found. Duplicates were excluded and after reading abstract and titles, those articles that were off topic were also excluded. The remaining ones (n=24) were assessed for full-text eligibility. We excluded 5 articles because they were case reports, 2 because there was no clear reference to the relationship between IAC and bacterial leakage and 2 because they were not pertinent to the argument. Fifteen articles were included in the review. From the review, it is clear that a relationship between the IAC and bacterial leakage exists. All the connections presented an amount of micro-gap and bacterial micro-leakage but conical and mixed connection systems seem to behave better. Moreover, both connections seem to have a better load distribution and the mixed one has anti-rotational properties, very useful during the positioning of the prosthesis.

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PERIODONTITIS AND CEREBROVASCULAR DISEASE: A NEW NOVEL IN MEDICINE

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The aim of this review is to determine if there is a relationship between periodontal disease and stroke. The included case-control and cohort studies mediate the incidence of stroke and periodontal disease by analyzing different parameters. A literature review was carried out in PubMed, Scopus and Embase databases using the key word “stroke” AND “periodontal disease”. An amount of 932 articles came out from our research on these three databases. These articles were selected according to PRISMA criteria. The following inclusion criteria were established: studies conducted in humans, articles published in English and published in the last ten years. Exclusion criteria were: experimental studies on animals, articles published more than 10 years ago, non-English language articles, articles of non-indexed journals, and articles not directly related to the association between stroke and periodontitis. These criteria reduced the number of articles from 932 to 399. At the end, articles that appeared to be repeated in different databases have been eliminated: 254 articles remained. All these articles titles were reviewed by the authors, who decided whether or not to include them in the review. We selected an amount of 43 articles. These studies were reviewed by reading the titles and abstracts, and by finally selecting the ones with the same topic of this review. When titles or abstracts were not clear, the complete article was read. At the end 7 articles were selected. In addition, 2 systematic reviews and 1 article, cited in the discussion, and regarding the protocol used in patients suffering from cardiovascular diseases and periodontitis, were selected. The quality of these articles was evaluated through the JADAD system. In conclusion, patients with stroke have a higher prevalence of periodontitis.

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CURRENT CONCEPTS ON CLEFT LIP AND PALATE ETIOLOGY

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Nonsyndromic cleft lip with or without cleft palate is the most common craniofacial anomaly affecting around 1 in 700 live births worldwide. Clefts of the human face can be classified anatomically as cleft palate only (CPO), cleft lip only (CLO), cleft lip and palate (CLP) or a combined group of cleft lip with or without cleft palate (CL/P), based on different in embryologic development. These malformations have some genetic origin, in fact several association studies have been performed to obtain important information about the candidate genes; but more important are gene-environment interactions that play an increasing role in its etiology. Epidemiological studies have shown how environmental factors (alcohol, smoking, drugs), as well as possible gene-environment interactions, play an important role in the onset of the malformation. On the contrary, folic acid intake seems to have a protective effect. In this review we analyze the role of environmental factors related to onset of cleft.

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TWO-WAY RELATIONSHIP BETWEEN DIABETES AND PERIODONTAL DISEASE: A REALITY OR A PARADIGM?

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Diabetes mellitus (DM) and periodontal disease (PD) are both chronic diseases. From one side, DM have an adverse effect on PD, and on the other side PD may influence DM. Systemic therapy of DM with glycaemic control, affects the progress of PD. Reversely treatment of PD combined with the administration of systemic antibiotics seems to have a double effect on diabetic patients reducing the periodontal infection and improving the glycaemic control. Inflammation, altered host responses, altered tissue homeostasis are common characteristic of both DM and PD. The potential common pathophysiologic pathways of direct or reverse relationship of DM and PD are still unknown and further in vitro and in vivo studies are needed to explore this relationship.

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EFFICACY OF A NEW CHEMICAL DEVICE TO MINIMIZE MICROBIAL CONTAMINATION ALONG IMPLANT-ABUTMENT CONNECTION: AN IN VITRO STUDY

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Osseointegrated dental implants showed elevated success rates on the long-term treatment in the last ten years. However, the risk of peri-implantitis and implant failure is the main complication of implantology. The presence of a micro gap at the implant-abutment connection (IAC) allows microorganisms to penetrate and colonize the inner part of the implant leading to biofilm accumulation and consequently to peri-implantitis development. Some chemical devices (CD) has been studied to reduce bacterial penetration at IAC level but no one have been demonstrated to be effective for this purpose. Aim of the present study is to evaluate the effectiveness of a new chemical formulation STCX-1, placed in the internal part of dental implants for killing bacteria present in the IAC. To identify the antibacterial power of SXTX-1 at interface between implant-abutment connection, the passage of genetically modified *Escherichia coli* across IAC was evaluated. A total of eight implants were used (Edierre Implant System, Edierre SpA, Genova, Italy). The inner side of four out of the eight implants were firstly contaminated with few microliters of pure bacteria, subsequently were treated with SXTX-1 for few second and finally, the antibacterial was replaced with Lysogeny Broth (LB) and antibiotics without bacteria. The remaining four implants were not treated with SXTX-1 and just filled with LB with antibiotics. Bacteria viability was determined by measuring their Optical Density (OD) at 600nm. The analysis revealed that, in untreated implants, bacteria grew (internally and externally) for the first 48 hours, but subsequently they started to dye. In treated implants, instead, bacteria grew just in the space surrounding the device suggesting that, even if bacteria were able to get into, they immediately died thanks to the presence of SXTX-1. The STCX-1 liquid formulation have been demonstrated to be an adjuvant CD effective for prevention of of bacterial colonization at IAC level.

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COMPLICATION IN THIRD MOLAR EXTRACTIONS

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Mandibular third molars (MM3s) are responsible for pericoronitis, primary and/or secondary crowding of the dentition, odontogenic tumors and cysts, periodontal defects associated with the posterior part of mandibular second molars. Tooth extraction is indicated for prophylactic and therapeutic purpose in patients with problems caused by impacted teeth. Common postoperative complications associated with third molar extraction are alveolitis (0.5e32.5%), infection (0.9e4.2%), postoperative bleeding (0.2e1.5%), transient dysfunction of the inferior alveolar nerve (0.6e5.5%), and permanent dysfunction of the inferior alveolar nerve (0.1e0.9%). A literature review reveals number of individual case reports of accidental displacement to various anatomical locations, namely, the infratemporal fossa, pterygomandibular space, lateral pharyngeal space, submandibular space, and sublingual space.

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