



ANNUAL CONGRESS ON

**ENDODONTICS, ORTHODONTICS,
PROSTHODONTICS AND DENTAL IMPLANTS**

AUGUST 17-18, 2018 TOKYO, JAPAN

Posters

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Evaluation of lower incisor alveolar bone in skeletal class-3 adults using CBCT images**Soonshin Hwang, Sanghee Lee and Kyung Ho Kim**
Gangnam Severance Hospital, Republic of Korea

The aim of this study is to investigate the alveolar bone width of lower incisors in skeletal class-3 adults of different vertical facial patterns. CBCT images of 90 skeletal class-3 patients were evaluated and 29 class-1 patients were assigned as the control group. Class-3 subjects were divided by mandibular plane angle; high ($SN-MP > 38.0^\circ$), normal ($30.0^\circ < SN-MP < 37.0^\circ$) and low ($SN-MP < 28.0^\circ$) group. Buccal and lingual alveolar bone thickness was measured at the alveolar crest and 3, 6, 9mm apical level. Linear mixed model, Bonferroni post-hoc test and Pearson correlation analysis was used for statistical significance. Buccal and lingual alveolar bone in class-3 high, normal and low angle subjects was not significantly different at the alveolar crest and 3mm apical level while the lingual bone was thicker at the 6 and 9mm apical level. Class-3 high angle group had thinner alveolar bone at all levels except at buccal alveolar crest and 9mm apical level on the lingual side compared to class-1 group. Class-3 high angle group showed thinner alveolar bone than class-3 normal or low angle groups in most regions. Mandibular plane angle showed negative correlations with mandibular anterior alveolar bone thickness. Class-3 high angle patients undergoing orthodontic treatment should be treated with care as the mandibular anterior alveolar bone showed relatively narrow widths compared to class-1 and class-3 normal or low angle patients.

Biography

Soonshin Hwang has completed her Dental education from Creighton University School of Dentistry and has completed her Advanced Education in General Dentistry program from Columbia University, New York and Orthodontic Specialty training from Yonsei University, Gangnam Severance Hospital. She is currently working at the Orthodontic Department of Gangnam Severance Hospital as a Clinical Assistant Professor.

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Treatment planning with use of dental implants on a patient with Marfan syndrome: A multidisciplinary treatment approach**Kenneth K H Cheung**

Morgan Street Dental Centre, Australia

Marfan Syndrome (MFS) is an autosomal dominant genetic disorder of the connective tissue that can affect multiple organs. The prevalence is estimated to be one to two affected individuals per 10,000 live births. Various oral manifestations have been associated with the syndrome. The replacement of missing teeth associated with MFS with dental implants is both challenging and demanding. This case report describes a multidisciplinary treatment plan on a MFS patient with skeletal Cl 2 and hypodontia involves oral maxillofacial surgery, orthodontics, implantology and restorative specialties. A well-coordinated treatment planning involving multidisciplinary approach requires close working relationship among team members. A clear understanding of patient's concerns, a detailed map of treatment in mind and thorough communication among team members are mandatory for the best result. The treatment has a positive impact on self-esteem, masticatory function, speech and facial aesthetic.

Biography

Kenneth K H Cheung maintains a private dental practice in NSW Australia, emphasizing on aesthetic, implant and restorative dentistry. After completing his degree at University of Toronto, he has completed his Dental degree from University of Western Australia. He has also received his Postgraduate Certificate from University of Adelaide, Post-graduate Diploma in Oral Implantology from University of Sydney and Masters in Aesthetic Dentistry from University of London. He has published a case report on Inman Aligner and a literature review on "treatment planning considerations for cemented versus screw-retained single tooth dental implant restorations in aesthetic zones" in the *Journal of Implant and Advanced Clinical Dentistry*.

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Enhancement of bone regeneration of calvarial defects through BMP2 polypeptide modified with 7E

Yue Xi and Guoli Yang

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With the aging population and the popularity of oral implants, how to promote or accelerate bone regeneration and repair bone defects is increasingly important to improve the quality of life for people with the dentition defect or edentulous and maintain a healthy mental state. Calcined Bovine Bone (CBB) is commonly used as an alternative to the autogenous bone. However, CBB lacks many osteoinductive factors. Given this issue, we have designed and prepared a heptaglutamate (7E) modified BMP2 polypeptide (BMP2pep) and carried out a series of comprehensive physical characterization *in vivo* and *in vitro* studies to evaluate its role in the repair of cranial defects. The main findings and conclusions are 7E modified BMP2 does not change the original morphology of CBB. Analysis by X-ray photoelectron spectroscopy and cumulative release curve, 7E modified BMP2pep can effectively promote the adsorption of the polypeptide on the surface of allograft. Addition of 7E to BMP2 peptide resulted in greater peptide loading on allograft and significantly greater retention. *In vitro* experiments, ALP quantitative analysis, alizarin red staining and PCR detection from molecular levels were employed to evaluate the effect of BMP2pep on the osteogenic differentiation of BMSCs. The results further confirmed that 7E could significantly promote the efficient adsorption of BMP2pep on the surface of bone powder and more effectively promote the osteogenic differentiation of BMSCs through osteogenic markers. *In vitro* experiments, Micro-CT, H&E staining and Masson's trichrome staining demonstrated that the 7E modified BMP2pep could increase its binding rate to bone powder, which could make it perform the good function *in vivo* and have good biocompatibility. The effect of osteoinduction is more pronounced. In summary, the 7E modified BMP2pep coated bone powder prepared in this study, is a novel bone augmentation material with simple, convenient, low cost and excellent clinical application prospect.

Biography

Yue Xi is currently pursuing her Doctor degree in Oral Clinical Medicine from Zhejiang University. In terms of stomatology implants, she has conducted in-depth research to explore the mechanism of osseointegration. Esthetic of implantation and restoration in anterior teeth area and dental implant surface bionic coating are her areas of scientific focus.

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Full implant bridges and overdentures with implants: An evidence-based for long term success**Alejandro Treviño Santos**

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We all have experienced the use of dental attachments in both fixed and removable implant-supported prostheses and bringing precision attachments to implant dentistry is a natural development. In edentulous jaws with fixed implant-supported and overdentures, there is not much room to innovate new concepts but the known concepts and analyze in an evidence-based team approach the advantages of favorable techniques and materials, splinting implants and the type of attachment will be reviewed. The number, size and distribution of implants for a full-arch fixed or removable prosthesis needs to be based on the implant-prosthetic plan, arch form and bone volume, regardless of the loading protocol. Therefore, careful case selection and treatment planning, as well as adequate knowledge, skill and experience of the clinician performing the procedures are keys. Our goal is to anticipate and facilitate maintenance of full implant bridges and overdentures and show techniques to plan easy prosthetic solutions with predictable bar structures design for any fixed or removable implant-supported prostheses. When planning fixed rehabilitation for edentulous patients we have to decide which material is the most adequate to assure prostheses long term success. In these cases, we often decide to deliver an upper fixed ceramic prosthesis and a lower fiber fixed acrylic prosthesis to create a pattern of wear out directed to the lower jaw. This way, we conserve the integrity of the ceramic upper teeth, where esthetic demand is higher, preserving the given occlusal plane and establish a low-cost maintenance to the lower prosthesis, where tartar and dental plaque tends to accumulate more. This working philosophy is based on the concepts of materials and teeth wear out, biomechanics and occlusal forces. To be rational with our working philosophy we need to be capable of determining the amount of vertical dimension reduction whenever assessing maintenance. In order to fulfill this task, a Wear out Indicator Device (WID) which consists in a 4 mm length self-cured acrylic bar is being created. The indicator is placed inside the resin teeth according to patient conditions using a 2 mm diameter drill and retained with self-cured acrylic to have an early alert of the vertical dimension reduction.

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VPT in permanent teeth: How to achieve clinical success with new materials

Angelo Itri

University of Genoa, Italy

Vital Pulp Therapy (VPT) is a biologic and conservative treatment modality to preserve the vitality and function of the coronal or remaining radicular pulp tissue in vital permanent teeth. The most important biological target of these therapeutic solutions is the dentinal bridge formation. Clinically, dentinal bridge formation is valued by Rx analysis where the pulp chamber is reduced after 3-6 months from VPT therapy. Usually, clinical practice success on VPT procedure is made when no spontaneous pain is present. Clinical parameters to achieve success in VPT are not encoded. Aim of this lecture is to show the clinical method to achieve clinical success in VPT cases on permanent teeth.

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All-on-4 concept vs. traditional implant placement methods with 25 years' experience and over 28,000 dental implants placed**Attila Kaman**

University of Münster, Germany

Statement of the Problem: The purpose of this lecture is to examine the incidence rate of early and late failure of dental implants and associated prosthetic problems with reference to a total number of 28,000 implants placed during 1992-2018 in patients requiring partial and full-arch rehabilitation.

Methodology: We have compared the nowadays popular and cost-effective all-on-4, all-on-6 rehabilitation solution with 8-10 implants placed in the maxilla and 6-8 in the mandible.

Result: Following the adaptation of various dental implant systems, our retrospective study shows that the rate of late implant failure and the associated prosthetic problems were lower in case of increased number of implants. We suggested that the result is due to the balanced distribution of the functional load on the implant and bone, the improved stress distribution against the opening force of the mandible and the overload of posterior implants.

Conclusion & Significance: The benefits of the all-on-4 and all-on-6 rehabilitation solution includes that (sometimes risky) bone grafting in the posterior mandible can be avoided, furthermore, the increased inter implant distance ensures improved blood supply. However, excessive overloading of the implants may lead to screw fracture, prosthetic fracture and bone loss. In case of unexpected complications, the increased number of patient visits make the cost-effective all-on-4, all-on-6 treatment concept a subject to controversy. When comparing the risks and complications of the all-on-4, all-on-6 rehabilitation solution with posterior mandibular bone grafting procedures, we can find similar results.

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Treatment of anterior crossbite with lower inclined bite plane: Effect on the dental arches**Carolina Rodríguez Manjarres**
University of Valle, Colombia

The identification of the different risk factors associated with the development of malocclusions is one of the challenges faced daily by the pediatric dentist to provide an early diagnosis and to avoid that these discrepancies are accentuated in the mixed and permanent dentition. According to the WHO, after dental caries and periodontal disease, malocclusions are considered a public health problem and occupy the third place of prevalence. Anterior crossbite is one of the most frequent malocclusions that can be found in the primary dentition which is defined as the overpassing of the lower anterior teeth to the upper anterior teeth, affecting the anteroposterior plane. To evaluate the dimensional changes of the primary dental arches treated with lower inclined bite plane as a method of correction of the anterior crossbite. 10 patients aged 3 to 5 years with complete anterior crossbite were treated with a lower inclined bite plane elaborated in acrylic. Average time of the plane position was 8.5 weeks. Dental casts were obtained in 3 moments T0: before treatment; T1: Six months after starting treatment and T2: At the end of the first year of treatment and changes in dimensions of dental arches were evaluated. In 100% of patients the anterior crossbite were corrected, statistically significant differences for the variables evaluated with the therapeutic employed were found. The lower inclined bite plane generated evident dental changes in a short time without relapses and improving the dimensions of the dental arches, especially the upper arch.

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Can bonding technics play a major role in keeping vital or pulpless teeth hermeticity?**Guastalla Olivier**

Villefranche-sur-Saone, France

Biological sealing is one of the major challenges in oral health. Whether in periodontology, implantology, restorative dentistry, or endodontics, our treatments are aimed at preserving or restoring the biological seal. In fact, facing bacterial aggression, the tooth occupies a special place in the human body. The prognosis of our treatments is influenced by the mechanical resistance, but especially by the tightness in time. A loss of tightness causes the recurrence of caries under a restoration, the bacterial colonization of a previously sealed root canal. Among the modes of assembly at our disposal, adhesive systems can play a double role in this search for sealing. The retention obtained by adhesion, allows keeping more healthy tissue of tooth by avoiding retention in the form of preparation. A less prepared tooth is a better protection for the pulp. A living tooth is more watertight than the best endodontic treatments. Adhesive systems are used for over 20 years now and show remarkable stability over time. Today adhesive systems must play a major role in protecting pulp vitality and in restoring a sealed integrity of the pulpless tooth. Through clinical cases and literature review, we will take stock of 20 years of dental bonding.

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Distalization of the maxillary posterior segments using efficient miniscrew implant mechanics

Hugo Terrones Garrido

Autonomous University of Nuevo Leon, Mexico

Purpose: To show how the posterior segments of the maxillary dentition can be efficiently distalized by using palatal miniscrew implants and a lingual bonded splint.

Method: A 14-year-old patient with class-2 malocclusion was treated by using a custom lingual splint (laboratory made) and bonding it to the palatal surfaces of the maxillary posterior teeth (first premolar, second premolar, first molar and second molar). This splint has one guiding tube per side at the level of the each first molar where the trans-palatal distalizing sliding tube is placed. Two miniscrew implants are placed in the parasagittal region of the palate at the level of the first molar so that the distalizer is activated using 250 grams of force per side. This activation creates two forces, one above and one below the center of resistance of the posterior segment that will distalize the whole posterior block of teeth as one unit with minimum tipping. The device is only activated once until the teeth have moved distally and more activation is required.

Result: In 6 months of treatment a distalization of 6 mm of the whole maxillary posterior segments was observed with minimum tipping. After this, retraction and space closure of the maxillary was possible to finish the case with good occlusion.

Conclusion & Significance: This case has shown the methods of simple way to distalize the maxillary posterior dentition. Vertical control was also possible by using this mechanics, when evaluated by radiographs.

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Three-dimensional surgical modeling with an open-source software protocol: Study of precision and reproducibility in mandibular reconstruction with the fibula free flap**Laurent Ganry**

Henri Mondor Hospital, France

Statement of the Problem: Many studies generate a high level of interest in computer-assisted surgical planning using bio models and surgical guides in oral and craniomaxillofacial surgery. However, very few surgical teams currently use total independent and free solutions for mastering three-dimensional (3D) surgical modeling for osseous free flaps in reconstructive surgery and oral surgery. We assessed the feasibility and technical reproducibility of our 3D surgical modeling protocol with open-source software in mandibular reconstruction with fibula free flaps and its surgical guides and present multiples used of this technology.

Methodology: Feasibility was assessed through millimetric (mm) accuracy determination between the 3D surgical modeling and the 3D-printed reconstructed mandible, although before and after sterilization process. Reproducibility was assessed in 3 surgical cases through volumetric millimetric value comparison between the 3D surgical modeling and the real patient reconstruction.

Result: A difference less than 0.1mm was observed between the 3D surgical modeling and 3D-printed surgical guides or reconstructed mandibles using Computerized Tomography (CT) scan. Almost no deformations (<0.05mm) were found after autoclave sterilization of our 3D-printed surgical tools. In the 3 cases, the modeling precisions of fibula free flaps were 0.3-0.5 mm and precisions of the complete reconstructed mandibles were around 0.8mm.

Conclusion & Significance: We demonstrated a good accuracy of the open-source software protocol and satisfactory results were obtained without complications. However, the precision of the surgical case is based on the precision of the 3D surgical modeling made by the surgeon. Therefore, surgeons need to be trained on the use of our 3D modeling protocol before using it in patients, which is a limit of this technology. On the other hand, it helps the surgeon to be more precise and aware about his surgical case and allow him to refine his procedure.

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Contemporary endodontics: From access cavity to shaping and cleaning, a minimal invasive concept**Mallet Jean Philippe**

Paul Sabatier University, France

Cleaning and shaping are the paradigm of success of endodontic treatment. For more than 25 years NiTi have been used to shape root canal space. Ever since companies have been trying to improve endodontic files in order to achieve a more predictable outcome of the shaping procedures and enhance the cleaning efficiency of endodontic irrigants. At the same time the knowledge of the coronal dentin structure is understood by reading their color shades throughout the operative microscope and the way to minimize the removal of the radicular dentin appears to be one of the challenges in order to preserve the initial integrity of the root canal. Operatives procedure all along the access cavity with specific micro tools allows the operator to reduce the removal of dentin even decreasing the constraints apply to the files at the entrance of the canal. Innovations focused on the designs of the files such as asymmetrical cross section and thermo-mechanical treatment of endodontic wires prior post machining of endodontic files enhanced the flexibility and the life time of these files for a better cleaning without increasing the initial canal shape. In this presentation we will describe the way to achieve Endodontics in respect of the coronal and the radicular part of the teeth, and pinpoint the wide range of clinical situation that could be addressed swiftly and safely. By the end of this presentation attendees will be able to:

- Prepare the access cavity respecting the integrity of the coronal
- Shape the main entire root canal in a 3D removal of the pulp
- Clean the root canal system and their walls on a minimal invasive concept

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Evidence based orthodontics: Retention; it is for life?**Norma Ab Rahman**

Universiti Sains Malaysia, Malaysia

Retention is the phase holding the teeth following orthodontic treatment in the treated position for the period necessary to maintain the treatment results. It is an important part of any orthodontic treatment and is the process by which orthodontists try to minimize relapse following treatment. Treatment stability is one of the most important objectives in orthodontics and widely agreed that the stability of aligned teeth is variable and largely unpredictable. The various elements leading to the relapse of treated malocclusions are incompletely understood, giving rise to a wide variation in retention protocols among clinicians. The orthodontic retention phase has always been an important part of maintaining a good and stable occlusion after active appliance treatment. Relapse during the post retention period is perhaps the most frustrating in orthodontic treatment. This is because stability of treatment is a major and laudable goal of orthodontics, any attempt to answer many pertinent questions related to this topic potentially carries great clinical importance. The lecture will review the causes of relapse, types of retainer and the best evidence behind attempts to reduce this relapse using retainers and other adjunctive techniques.

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**ENDODONTICS, ORTHODONTICS,
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Alabama Dental Center, UAE

Platelet gels have found usefulness in many disciplines of medicine and dentistry since first published studies on PRP by Robert Marx and his team in 1998. Different forms of platelet gels have been extensively used in surgical procedures in periodontics, implantology and oral surgery. They have a definite place in general dental practice as well. Choukroun Platelet Rich Fibrin (PRF) is truly an autologous therapeutic aid used in multitude of surgical disciplines. PRF positively impacts wound healing, both soft and hard tissue. It significantly improves postoperative pain, inflammation, infection and facilitates tissue regeneration, leading to shortened recovery time and reduced need for anti-inflammatory, analgesics and antibiotics medications. This presentation deals with the protocol of harvesting and preparation of PRF as well as its clinical applications and benefits to the patient and clinician.

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Evaluation of *in vitro* biofilm removal with 12% and 10% sodium hypochloriteSeyedeh Zahra Rahmani¹, Mohammad Smiee¹, Seyedeh Paria Rahmani¹, Look Vander Sluis² and Ferananda Hoffmann Busanello³¹Tabriz University of Medical Sciences, Iran²University of Groningen, Netherlands³Federal University of Rio Grande, Brazil

Introduction & Aim: Biofilms are communities of microorganisms attached to a surface and embedded in a matrix of polysaccharides and proteins forming a slimy layer. Oral bacteria have the capacity to form biofilms on distinct surfaces. Bacteria also form dense colonies on root canal walls and features like isthmuses and lateral canals. Microbial communities in biofilms are remarkably difficult to eradicate with antimicrobial agents for reasons that have yet to be adequately explained. Studies have shown that sodium hypochlorite (NaOCl) is the most effective anti-microbial irrigant used during endodontic treatment. The aim of this study is to evaluate the structure of biofilms and presence of EPS before and after the use of NaOCl 2% and 10%.

Materials & Methods: Dual species biofilms of *Streptococcus oralis* J22 and *Actinomyces naeslundii* T14VJ1 were grown under static conditions and in a Constant Depth Film Fermenter (CDFS). Biofilms grown in the CDFS mimic better the basal layer of an oral *in vivo* biofilm. For the static conditions, a confined space was created over saliva coated dentin discs with supply of 20 ml of modified BHI each 24 h for 4 and 10 days. For the CDFS, saliva coated hydroxyapatite discs biofilm was grown for 96 h at 37 °C under continuous supply modified BHI at a rate of 45 ml/h. The system was equipped with 15 sample holders and each sample holder contained 5 saliva coated hydroxyapatite discs, recessed to a depth of 250 μm. After growing the biofilms NaOCl 2% and 10% were applied for 60 s and 300 s for removing the biofilm. Optical Coherence Tomography (OCT) was used for high-resolution, real-time imaging of a three-dimensional structure of the biofilm. Confocal Laser Scanning Microscopy (CLSM) was used to visualize the biofilm matrix, structure and condition of bacteria (LIVE/DEAD staining).

Results: In the static biofilm group, OCT images showed reduction of biofilm thickness after applying the NaOCl 2% and 10% and there was a very fluffy structure observable. In the CDFS group, OCT images showed bubble formation in the biofilm after using NaOCl 10%, but the irrigant did not reduce the thickness of the biofilm or on its consistency. The bubble formation was also observed in CLSM images. The CLSM showed reduction of the biofilm structure but mostly living bacteria were found in the remaining biofilm.

Conclusion: Due to our study our simple irrigation methods are not efficient enough for biofilm removal and we suggest to use irrigants in several times with increased applying time to achieve better biofilm removal and better treatment results.

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Laser irradiation and pulp space sterilization: Where are we now?

Terry Farmakis

University of Athens, Greece

50 years have passed since the first laser irradiation of hard dental tissues. Over this time, our knowledge on lasers and most importantly, on laser-tissue interactions has greatly expanded. In the 21st Century, we are able to adopt this technology in several fields of dentistry, among them, Endodontics. In this presentation, the different wavelengths of laser irradiation will be presented, and their mode of bactericidal action will be discussed. This energy (under the correct parameters) can augment our efforts to eliminate the bacterial load of the pulp space, thus being a useful tool in the endodontic armamentarium.

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Orthodontic band and modified glass ionomer cement: An interim alternative to treat sever molar hypomineralization**Vidal Antonio Perez Valdes**
University of Talca, Chile

Molar Hypomineralization (MH) is an enamel defects characterized by demarcated opacities mainly affecting 6-year molars of about 1-in-6 children worldwide. Affected molars have greater susceptibility to post eruptive breakdown, extensive caries and in severe cases, are difficult to restore. When MH molars present severe crown destruction, it is necessary to perform an intermediate restoration to preserve the remaining dental structure to maintain occlusion, proper hygiene and periodontal health. Traditional restorations are not suggested in case of severe MH molars. Amalgam requires excessive removal of dental tissue to obtain adequate mechanical retention, leaving the tooth structurally weak and prone to fracture. Resins also present problems since their adhesion to MH-affected enamel is inadequate, favoring microfiltration, which may result in restoration failure. Preformed metallic crowns have been suggested as more definitive option; however, periodontal problems associated with molars restored with this technique discourage their use as permanent restoration. In these difficult clinical conditions, Glass Ionomer Cement (GIC) seems to be the restorative material of choice for the interim treatment of severe MH molars due to its favorable adhesive properties to enamel/dentin. However, in extensive restorations, GIC usually fractures, leading to retreatment, thus increasing the occurrence of painful clinical experiences and pulpal damage. Here we propose a novel approach to improve the robustness of GIC. After filling the MH molar with modified GIC, an orthodontic band is fitted as a strong metallic casing preserving gingival/pulpal health and tooth structure for at least 18 months.

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