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Primary intraosseous squamous cell carcinoma

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Aim: The aim of this work is to report a rare case of Primary intraosseous squamous cell carcinoma, that is a cyst-like lesion in the mandible rarely developing into malignancies, with a reported incidence between 0.3 and 2%. The case here described is a rare case of primary intraosseous squamous cell carcinoma of the mandible arised from an odontogenic cyst.
Methods: A 80-year-old male with history of diabetes type II, chronic renal insufficiency and cardiac issues, was referred to Trieste University Maggiore Hospital (Trieste, Italy), with acute pain in the left retromolar area. At the first visit a Warthin's tumor affecting the left parotid gland was also reported. An initial examination revealed extraoral swelling without paresthesia of the omolateral NAI. Following intraoral examination, the oral mucosa was edematous, pain on percussion was experienced on the lower left second molar. Panoramic radiography revealed a retained lower left third molar and an irregular radiolucent area between it and the lower left second molar and a mandibular angle with mostly clear margins. In addition computer tomography revealed diffuse bone resorption and an extensive loss of cortical bone on the lingual side. During the surgery aimed to remove the second and third lower left molars, a biopsy was performed and the pathological diagnosis was of a squamous cell carcinoma arising from the epithelial lining of the odontogenic cyst. Computed tomography with contrast agent was performed showing a primitive neoformation located into the horizontal branch of the left mandible eroding both the cortical and lingual walls and extending from the lower left retromolar region towards the omolateral lower cuspid, infiltrating the buccinator and medial pterygoid muscles. The patient was proposed a segmented mandibulectomy with laterocervical radical neck dissection associated with plastic reconstruction using the fibula and radial flap. During the surgical procedure it was assessed that it was not possible to use the fibula flap.
Results: The histopathological analysis showed a primary squamous cell carcinoma staged as follows: pG2. C2. T4a. N1.
Conclusions: Primary Intraosseous squamous cell carcinoma has a predilection for adult men, occurs most frequently in the mandible and is associated mainly with an odontogenic cyst. Surgery alone or combined surgery and radiation therapy are the most common approaches. Following enucleation of a cystic jaw lesion, the entire surgical specimen should always be examined histopathologically.

Transposition of the inferior alveolar nerve: obsolete technique or alternative therapeutic strategy?

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Aim: When an implant-prosthodontic rehabilitation of the posterior mandibular bone appears necessary, the biggest challenges are in height and thickness of the bone tissue above the inferior alveolar nerve (IAN). The challenge is heightened even more when the patient presents a certain degree of alveolar crest atrophy. In some cases, when there are no teeth in

the interforaminal space, it is possible to adopt the All-on-four protocol, devised by Malò et al., id est the insertion of 4 fixtures, two of which are tilted in order to bypass the chin-holes. Among the topics addressed, we investigated the different types of reconstructive techniques, such as guided bone regeneration, and inlay bone grafts or block grafts. Nonetheless, they are all characterized by long timescales, high risk of morbidity and high biological cost. Only when the residual crest has adequate thickness and a height of at least 4 mm it is possible to opt for less invasive techniques, such as the insertion of short or ultrashort implants. In case of insufficient thickness, but height exceeding 5 mm it is possible to use wedge implants or perform a bone expansion, such as the split crest. Finally, when the residual crest is non-existent but there are teeth in the anterior sector and the patient does not wish to be subjected to bone graft, the lateralization of the inferior alveolar nerve is considered a good therapeutic alternative. In this study we evaluated the implant survival and post-operative complications of 5 cases resolved with the inferior alveolar nerve transposition technique and with the help of piezo-electric surgery.
Results: After 6 weeks all 5 patients showed a normal function of the inferior alveolar nerve. The success rate of the 11 implants after a follow-up of at least 18 months was 100%. We also made a systematic literature review and we found that this technique is supported by a satisfactory implant success rate (97%) and a very low risk rate of permanent neuro-sensory disorders (of 0.53%).
Conclusions: In the transposition of the inferior alveolar nerve a careful preoperative surgical and prosthetic planning, a 3D imaging and an extremely precise surgical technique are essential. However, in selected patients with important posterior mandibular atrophy, lateralization of the inferior alveolar nerve through piezo-surgery and with simultaneous immediate positioning of the implants can be a useful and safe surgical procedure.

Modified double-layered flap technique for closure of an oroantral fistula: surgical procedure and case report

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Aim: The formation of an oro-antral communication following avulsion of the lateral and posterior teeth of the maxilla is not an exceptional event in dental practice; it can undergo spontaneous resolution or the formation of a fistula that requires surgical treatment in order to create an absolutely hermetic barrier between the oral environment and the maxillary sinus. The intraoperative diagnosis is based on the inspection of the damaged area. In fact it will present a connection between the oral cavity and the maxillary sinus. Making the patient perform the Valsalva maneuver, it will sometimes be noticed, at the level of the communication, the appearance of small bubbles due to the passage of air: more rarely the leakage of blood from the nose or extroflection of the mucous membrane of the sinus can occur. The aim of the study was to provide a review of the literature on the surgical techniques currently in use for the resolution of oro-antral communications, that are the trapezoidal, rotated vestibular, rotated palatine, buccal fat pad and double-layered flap techiniques; therefore to describe the central theme of the study that is the technique of mucogingival plastic surgery called modified double-layered flap techinque moderately invasive and less subject to medium and long term recurrences.
Methods: We performed a review of the methods used to solve small oroantral communications and carried out a case report on the alternative technique proposed by the Odontostomatology Unit of the Galliera Hospital in Genoa, i.e. the modified double-layered flap technique. The intent therefore remains to propose a valid protocol that is not a substitute but an alternative to the pre-existing ones, which have already been exhaustively described in the literature. The present protocol has also been recognized and published by the authoritative source of the British Journal of Oral and Maxillofacial Surgery.
Results: With regards to the satisfactory results obtained, we can state that this method is predictable. For the execution of this technique, an in-depth knowledge of the anatomy and pato-physiology of the maxillary sinus is extremely important. It's also important the early diagnosis that allows the clinician to plan a therapeutic treatment that offers the best guarantees of success.
Conclusions: The oro-sinus and in particular the alveolus-sinus communications are mostly sequelae of previous dental treatments and avulsions. The dentist is required to diagnose and identify the most appropriate therapeutic approach. Among the various techniques available, the modified double-layered flap technique is certainly a valid choice, as it has good predictability. A thorough knowledge of the anatomy and patho-physiology of the maxillary sinus is extremely important for a correct surgical approach. The early diagnosis allows to plan a therapeutic treatment that, if performed in the absence of sinus pathology, offers the best guarantees of success; for this reason it is necessary to sanitize the maxillary sinus in advance. The soft tissues must be managed in such a way as to obtain the plastic closure of the perforation free from

tension and with an adequate vascular tropism.

The use of dorsum of tongue flap for the closure of an oroantral fistula with no contiguous tissue available to be used: surgical procedure and case report

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Aim: The formation of an oro-antral communication, a not uncommon event in dental practice, may lead to spontaneous resolution or to the formation of a fistula that requires surgical treatment in order to create an absolutely hermetic barrier between the oral environment and the maxillary sinus. Oro-antral communications are determined with the maximum frequency when the apices of the latero-posterior teeth of the upper arch are in close relationship with the floor of the maxillary sinus; favoring conditions are represented by an extensive sinus pneumatization and by the presence of very divergent and long tooth roots. The aim of the study was to provide a summary review of the literature on the surgical techniques currently in use for the resolution of oro-antral communications, that are the trapezoidal, rotated vestibular, rotated palatine, buccal fat pad and double-layered flap techniques; then to describe the central theme of the study, that is the technique of mucogingival plastic surgery with the use of a dorsum of tongue flap if it is not possible to use adjacent tissue to close the communication. In fact, when the tissues adjacent to the oro-antral or oro-nasal communication are unsuitable for the closure of a large sized fistula, a muscolar-mucosal flap from the tongue dorsum can be used and rotated upwards. Once this initial phase is performed, the peduncle of the flap is dissected and the excess will be repositioned to partially reconstruct the area of the dorsum of tongue used. We prepared a case report and we have photographs of the clinical situation 20 years after the surgery was performed.
Methods: We performed a review of the techniques used for the resolution of oro-antral communications and carried out a case report on the alternative technique in the specific clinical situation described proposed by the Odontostomatology Unit of the Galliera Hospital in Genoa. The intent therefore remains to propose a valid non-replacement but alternative protocol to those already existing in this specific case of absence of adjacent tissue available to close the communications.
Results: With regards to the satisfactory results obtained, we can state that this method is predictable. For the execution of this technique, an in-depth knowledge of the anatomy and pato-physiology of the maxillary sinus is extremely important. It's very important also the early diagnosis that allows the clinician to plan a therapeutic treatment that offers the best guarantees of success.
Conclusions: The intent of the authors was to describe their experience in this regard, through a synthetic revision of the literature and the description of the technique of mucogingival plastic surgery with the use of tissue from the dorsum of the tongue, in their opinion moderately invasive and less subject to recurrence in the medium and long term in the specific case in which the communication is extensive and there is no adjacent tissue sufficient for resolution: this is why it is necessary to look for a donor site. With regards to the satisfactory results obtained, we can assert that this method is predictable. The intent therefore remains to propose a valid protocol that is not a substitute but an alternative to the pre-existing ones, already exhaustively described in the literature in the specific case described.

Craniofacial fibrous dysplasia: diagnosis and treatment options

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Aim: Fibrous dysplasia (FD) is a rare benign congenital condition characterized by the replacement of normal bone with fibrous connective tissue mixed with irregular bone trabeculae. CT Cone Beam represents the most effective mean for the evaluation of craniofacial FD (CFD). In addition to this, bone scintigraphy represents a useful examination to verify the presence and distribution of skeletal lesions. There are three possible approaches to the treatment of CFD: monitoring, pharmacological therapy and surgical treatment. The aim of the study was to clarify on the basis of the present diagnostic means the best one to define the most appropriate therapeutic approach in the case shown in our work, i.e. a woman of about fifty years of Brazilian origin, who came to us with an asymptomatic deformation of the left mandibular body.
Methods: The CT Cone Beam showed in the left mandibular body a large 20mm long, roundish osteolytic area with a maximum width of 15x15mm with a radiopaque area inside, which could be an included tooth. The lesion was in close proximity to the inferior alveolar nerve which appeared to bifurcate near the retained tooth. In addition to the aforementioned radiopaque area, it was possible to visualize another one located a few millimeters behind the previous one which also affected the mandibular branch. In addition to the exams already in our possession, the

patient was invited to perform a bone scan to evaluate radiopharmaceutical uptake and the possible presence of other skeletal lesions, as indicated by the hospital protocol for cases of suspected fibrous dysplasia. From the performed scintigraphic examination a significant asymmetry of the distribution of the osteotropic tracer on the left lower jaw was highlighted. To confirm the diagnostic suspicion of fibrous dysplasia, a biopsy was performed by taking a wedge of fibrous tissue from the area of the mandibular body which was then sent to the pathologist for histological examination. Having ascertained the nature of the lesion, a conservative surgical approach was therefore deemed appropriate, aimed at restoring the bone size of the mandibular body without intervening on the branch, where the lesion did not have an extension such as to cause aesthetic alterations. The surgery involved an osteotomy with removal of the hypertrophic segment and a curettage of the bone gap with removal of fibro-osseous particulate and of the included tooth. The flap was then closed by a single interrupted suture which was then removed after one week; the patient was monitored until the wound was completely healed.

Results: The final result was satisfactory with a restoration of facial aesthetics and no neurological consequences. After 3 years from the intervention, a Cone Beam control examination was performed which showed the maintenance of a good alveolar morphology and the partial reoxification of the defect.

Conclusions: FD is a rare condition that can frequently involve the facial district. The lesions are generally asymptomatic but may cause significant functional and aesthetic complications. Three-dimensional radiology and bone scintigraphy can help the clinician in identifying this pathology, but the diagnosis is not always easy and cannot in any way disregard histopathological examination. The indication for surgical treatment is not absolute, but a careful evaluation must be performed by the clinician, based on the location of the lesions and the aesthetic and functional implications that these may entail, reserving a more radical approach to cases of suspected neoplastic evolution.

Upon surgical management of two different types of pathological fractures caused by hidden cysts

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Aim: Pathological fractures of the maxillary bones are quite rare; they occur when a weakening of the bone is generated by unrecognized bone diseases or surgical practices and so the fracture margin results in close proximity to the lesion. In this paper we describe the different surgical management of two maxillary bone's fractures related to cysts, in order to promote a new surgical approach.

Methods: Examining the CT scan of our first patient, a 54-year-old woman with a history of accidental trauma, not only a zygomatic-maxillary complex (ZMC) fracture was found, but also an intrasinusal cystic lesion (22.5 x 28.8 mm) that had been expanded massively in the anterior and lateral walls. At first, alterations in cutaneous sensitivity or damage to eyesight were excluded; subsequently oral antibiotic therapy was prescribed and after 4 days a surgical session in GA was planned. During surgery we recornized that the right buccal cortex of the maxilla was deformed by the lesion. After isolation of the right infraorbital nerve, the maxillary fracture was reduced, fixing it with a microplate and titanium screws. Necrotic teeth 15 and 16 were extracted (the apexes were included in the lesion) and the cyst was easily enucleated using the bone gap created by the fracture's margin. Then the anterior maxillary wall was replaced and, in order to overcome bone fragility, a large titanium plate was fixed. The procedure ended with reduction and fixation of other fractures and intraoral and cutaneous sutures.
Further on, a 21-year old patient came to our observation with a traumatic mandibular fracture resulted from a scuffle. The physical examination excluded paresthesia, but showed altered occlusion and mandibular excursions. OPT and CT showed a left paramedian fracture of the mandible and another one near tooth 38; moreover, as occasional finding, a cyst was detected. After 6 days during surgicery under GA, a full thickness flap, from tooth 33 to 43, was raised and a traditional approach was chosen by opening a vestibular bone trap helped by piezoelectric instrument. Within the endosseous cavity only blood and minimal residuals of soft tissue were found. Finally the bone trap was repositioned, the fractures were reduced using miniplates and fixing screws and the flap was repositioned and sutured. At the end of the surgery, an intermaxillary fixation was applied and maintained for 15 days.

Results: Histological examination of the first case gave a diagnosis of odontogenic cyst. At 13 days after surgical session the facial symmetry and the physiological eye mobility were restored; the surgical wound was on way of consolidation. The histological examination of the fragments found within the bone deficiency that had caused the mandibular fracture confirmed a diagnosis of SBC. The last check (within 21 days) showed: good stability of the applied titanium plates, optimal healing of hard and soft tissues and physiological mandibular movements.

Conclusions: Using the same surgical time to enucleate cyst

and reduce a pathological fracture has the rationale to improve postoperative morbidity and prognosis. Therefore, if the more traditional approach has its undoubted value, the opportunity to access the cystic lesions by using the gap caused by the fracture line, the way we decided to approach our first case, should be, in our opinion, taken into serious consideration in similar clinical and surgical situations.

CBCT radiological features as predictors of nerve injuries in third mandibular molar extraction

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Aim: The surgical extraction of impacted mandibular third molars exposes the patient to the risk of peripheral neurological injuries. The first aim of this work was to study the distribution of radiographic proximity of the third molar to the inferior alveolar canal, considering Maglione's Classification, in a population at risk. The second aim was to evaluate the influence of specific factors (age, gender, operator experience, duration of surgery, depth of impaction, absence of corticalization) on the development of neurological complications.
Methods: This prospective observational cohort study was conducted on 378 patients, undergoing third mandibular molar's extraction, in a year's time. The patients were informed about the study procedure and informed consent was obtained.
Surgical procedures were performed in a standardized way, using the same surgical and pharmacological protocols. Each patient underwent first radiologic investigations (OPT and/or intraoral radiography) and 193 patients underwent CBCT scan, because of diagnostic suspect of NAI proximity. Preoperative and postoperative data were collected. The patients were visited again for suture removal after seven days and postoperative neurological disorders were investigated. A therapy with ALAnerv® was prescribed and a thorough follow up at 14 days was applied in order to monitor the development of symptoms until the eventual resolution. At the end of one year period, data collected were statistically processed using the Pearson chi-square test for evaluating variables distributions within the population with paresthesia with respect to patoents without complications.
Results: Results showed a significant prevalence of teeth belonging to 3a and 3b classes, according to Maglione classification, in which the mandibular canal runs touching the tooth apically or buccally. 12 patients (3.17%) developed a neurological complication. 1 patient (0.26%) showed a permanent NAI paresthesia. 6 patients (1.58%) suffered IAN complications, 4 patients (1.06%) LN complications, 1 patient (0.26%) IAN and LN complications, 1 patient LN and BN complications. 1 patient showed dysesthetic symptoms in the region innervated by IAN. Third molar's lingual position in close contact with IAN (classes 4a and 4b) was correlated with increased risk of paresthesia. Age older than 25 years was statistically associated to neurological risk, probably due to the differences in bone biodynamics and regenerative capacity of nerve trunks in youth age. A statistically significant correlation was noted between longer duration of surgery procedures and neurological injuries. Operative time could influence postoperative edema and could be directly proportional to the intrinsic difficulty of surgical extraction.
Conclusions: Classes 4a and 4b of Maglione's classification, age older than 25 years and operative duration longer than 30 minutes represent indicators of increased risk for neurological complications in mandibular third molar surgery.

A rare case of mandibular exostosis at the mental hole

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Aim: Exostoses are localized, non-pathological bony protuberances that arise from the cortical and sometimes from the spongy bone. Tori mandibularis are the most common exostosis of the jaws. The purpose of the present study is to report an atypical case of mandibular exostosis.
Methods: A 22-year-old male patient reported having a hard and asymptomatic swelling at the right side of the mandible, present for many years and slowly increased over time causing difficulty in maintaining proper oral hygiene as well as aesthetic and functional problems. The swelling, which was already perceptible extra-orally, on both inspection and palpation, appeared as a sessile mass of about 1.5 cm of maximum anteroposterior diameter, located on the buccal wall of the right mandible at the level of the canine and the first premolar, which were vital at the cold test. It was covered by normotrophic mucosa, hard-wood in consistency and painless on palpation. On the orthopanoramic radiograph, a roundish shaped homogeneous radiopaque area, located at the level of the lower right premolars, was clearly visible. The subsequent dentascan CT revealed that the swelling

was bony in nature and was located just above the mental hole. The preliminary diagnosis was mandibular exostosis. Surgery, performed under local anesthesia, involved the exostosis resection. A linear incision was made in alveolar mucosa, extended for about 3 cm, from the canine to the second premolar, at the level of the maximum convexity of the neoformation. The upper and lower flaps of the incision were then lifted to expose the neoformation, paying attention to the mental nerve isolation. The separation from the mandibular cortical bone was performed from the upper side of the neoformation, using a truncated conical tungsten carbide burr firstly, and a chisel afterwards. Once the neoformation was removed, the resection surface was regularized, and the two flaps were sutured with multiple silk stitches. The removed bone neoformation had a polypoid appearance and it was 1.2x0.8x0.6 cm in dimensions. It was sent to the histopathologist for microscopic examination.

Results: The healing process took place without complications and the patient did not report any neurological problems. The microscopic analysis of the surgical specimen described a compact bone tissue, with essentially empty osteocyte lacunae and focal reshape phenomena, partially covered by periosteal fibrous tissue, making the diagnosis of torus mandibularis/exostosis.

Conclusions: The present case differs from those reported in the literature regarding mandibular exostosis both for the buccal localization and for the young age of the patient (22 years). Actually, according to the known epidemiology, tori mandibularis are extra-osseous accretions which, in the mandible, are observed mainly on the lingual side, especially in the canine and premolar area, and in adult patients in 35-65 year age range. The performed surgical technique provided for a very conservative surgical approach. The linear incision, without release cuts, allowed the preservation of the mental vascular-nervous bundle, while guaranteeing an optimal detachment and adequate exposure of the neoformation. Furthermore, it allowed healing with minimal discomfort, and without neurological sequelae or anti-aesthetic scars.

Guided implant surgery: high level results obtained with CAD/CAM system

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Aim: Traditional surgery is gradually changing in favour of minimally invasive and guided surgery. In the field of implantology the diagnosis is made using a scanner or an orthopantomography, but the practical planning of surgical treatment is rather poor. Today, new techniques have been developed for the creation of surgical guides that allow to improve the predictability of the treatment when placing the implants. This technique is achievable thanks to a scanner and a 3D computer system, a virtual simulator that allows the surgeon to visualize the surgical process that will be performed, exhaustively indicating the depth of the implants before the surgical procedure and allowing its planning. When the operation is planned, according to the surgeon's preferences, maximum safety, precision and comfort are guaranteed for the patient, and most of post-operative problems are definitely reduced. Treatment planning is based on cases of single, complete or partial edentulism in patients who have the general requirements to undergo oral surgery and with a fair quantity and a good quality of maxillary bone; the ability to open the mouth to be able to insert the necessary tools for oral surgery is also required. The steps of the treatment are the following: to create the radiographic guide and make sure of its precision and stability, to obtain the patient's CT or CAT scan, to plan the treatment through software and finally realize the surgical guide. The radiographic guide is used to simulate the oral soft tissues, the edentulous spaces and the teeth still in mouth in order to obtain an extremely neat and precise CT image. The correct creation of the radiographic guide is a fundamental requisite for a successful treatment. Tomography can be performed with a traditional scanner or conical beam (cone-beam). The study of the image is based on the 3D visualization of oral structures thanks to a program capable of digitally incorporating the implants. The software offers the possibility to modify the treatment plan as wanted, considering each case individually. In this way the system will be planned according to the specialist's criteria, positioning the desired type of implant with personalized inclination and orientation. Also some anatomical characteristics of the patient will be known, such as the exact position of the inferior alveolar nerve and maxillary sinuses. Once the virtual planning is finished, it is digitally sent to the laboratory or to the manufacturing company which will produce a surgical guide for the surgeon. The guide has holes of adequate diameter to place the implants chosen in the previous phase. The surgical guide produced in a conventional way, with a manual wax-up in laboratory, has limits in achieving high level results: during its production on the diagnostic model, the soft oral tissues are of rigid plaster, which does not provide information on the thickness of the mucosa. It also might happen that during the surgical process they are not as stable as the ones created by CAD/CAM technology.

Virtual–planned GBR for extended 3D defects: how much predictable is this treatment?

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Aim: Extended alveolar defects are challanging for the irregularity of their shape and the lack of supporting bone. A virtually planned GBR with the design of customized scaffold-meshes to shape and contain particulate autologous bone can optimize and standardize the treatment. The rational is to plan the minimal entity of bone reconstruction needed according to the prosthetic evaluation not to stress the impaired soft tissues, reducing the risk of exposure that heavily affects GBR procedures. The aim of this study is to verify if a virtual planning with a customized scaffold could improve the predictability of a complex bone reconstruction, evaluating the device exposure, and the superimposition of the results to what planned in terms of mesh fitting, bone volumes and implant and prosthetic outcomes.
Methods: 21 complex defects were virtually reconstructed according to a prosthetic-guided virtual placement of 63 standard implants. On the basis of the calculated bone reconstruction a scaffold-mesh was designed and printed to be fitted to each defect during surgery with autologous and bovine bone as a particulate graft. After at least 6 months a new CBCT was taken and the implants were placed after the device was removed. Pre- and post-operative CT datasets were converted into 3D models with and digitally aligned for the overlap of the treated regions. This allowed to precisely verify the mesh fitting by means of the comparison of the virtually planned bone volumes (VPBV) with the volumes under the mesh from post-operative CBCT (actually expected bone volumes: AEBV); moreover, AEBV were compared with the lacking bone volumes (LBV) to calculate the reconstructed ones (RBV). The entity of exposure and peri-implant bone resorption were calculated.
Results: 11 (52%) exposures of the mesh for soft tissue dehiscence were observed and 5 out of these sites (23.8%) did not show any bone formation (failures). No differences (p = 0.086) resulted between the virtually planned bone volumes (VPBV) and the actually expected bone volumes (AEBV), demonstrating a perfect fitting of the mesh. The amount of reconstructed bone volume (RBV) in respect to AEBV was 59.7% and 87.2% with and without considering the failures respectively. RBV was 71% and 78% with respect to AEBV in case of exposure and uneventful healing respectively. 39 implants were inserted. Apart from the failed sites, the number of the placed implants was 95% of that virtually planned; implant survival and success was 97% and 73% respectively. The follow-up from the prosthetic loading was 2.5 (2-5.2) years.
Conclusions: The virtual planning of the GBR with customized scaffold increased the predictability of the procedure in terms of reconstructed volumes and complications considering the different skills of the surgeons and the difficult anatomical situations to be treated. Additional procedures, like peri-implant soft tissue management, may improve the implant results over time. s

Treatment of severely atrophic upper jaw: virtual planning of iuxtameatal implants

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Aim: In the edentulous maxilla an advanced level of bone atrophy is often observed, implant placement in these cases could become difficult. Nevertheless, a volumetric evaluation of anatomical structures using a proper diagnostic software could semplify the implant planning. The purpose of the present study is to reveal the existence of a sufficient bone volume in the mid-maxilla region in patients presenting a severely atrophic maxilla. Furthermore, tilted iuxtameatal implants have been virtually positioned in CBCT volume reconstruction in order to show that this bone volume could be an adequate base for implants placement.
Methods: The study was conducted on patients referring to the Department of Dentistry, IRCCS Hospital, and Milan, Italy from January 2016 to December 2018. The CBCT scans were taken for diagnostic reasons. All included CBCT scans were acquired with a Field of View of 12 x 8 cm, at 90kV 10 mA 16 s and 0.2 mm Voxel size with a NewTom VGi evo Cone Beam 3D Imaging Device. A sample of CBCT images of 59 patients (28 males and 31 females) was evaluated. 220 iuxtameatal implants were placed in the pre-maxilla region after a detailed 3D anatomical planning with RealGuide5.0 (3DIEMME, Cantù, Italy) software. All implants were virtually placed with the same procedure, geometrically angulated at 30 and 45 degrees, with at least 1 mm of bone around each implant. The length, palatal angle and diameter of each implant were then recorded. Bone quality was also calculated using a bone grayscale measurement software.

Results: Only 8 emi-maxillae showed an insufficient bone volume for an adequate implant placement. The average measurements of the virtually inserted implants were 13.508 mm in length and 3.48 mm in diameter, with an average buccal-palatal angle of 6 degrees. In some simulations the implant axis was negative, which means that the most coronal point of the fixtures was more palatal than the apex. The average density around the implants was 570 in grayscale. After the statistical analysis implant length was found significantly higher at 45° degrees than at 30° degrees. So, when considering tilting degree of the implant, significant effects of implant length were found. Then, a greater inclination of an implant could increase its length during the virtual surgical planning.
Conclusions: A considerable amount of patients shows a significant maxillary bone atrophy. Implant-supported treatment plan can rely on the three dimensional imaging of the residual bone as a guiding tool to establish the most effective implant position for each specific case. In this study it was found that in the majority of the maxillary atrophy the volumetric evaluation of the mid-maxilla region could suggest the possibility of iuxtameatal implants placement.

Periodontal healing after extraction of the mandibular third molar: evaluation between four different flap designs

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Aim: The extraction of the third molar, especially in the lower arch, violates an important part of the surrounding bone and soft tissue. In the literature several articles analyze the distal periodontal health of the second molar after third molar extraction as well as the flap design (envelope, triangular and modified triangular flaps) used to approach the procedure. However, to date, there have been conflicting reports on the periodontal influence of different flap designs used for surgical removal of affected third molars. We believe that it is also important to evaluate the periodontal aspect of the first molar, since it is frequently involved in the flap design in particular when a papilla detachment or an intrasulcular or a decapitation flap is performed. The purpose of the study is to analyze four types of flaps to assess their influence on the loss of periodontal attachment of teeth 6 and 7 after lower third molars extraction.
Methods: Sixty healthy patients aged between 15 and 35 years where selected for mandibular removal of the wisdom tooth. The third molars were classified according to the Pell and Gregory classification. Patients were randomly classified into 4 different groups in order to receive a different type of flap design to approach the third molar: in group 1 the extraction was approached with an intrasulcular flap (G1IF), group 2 with a papilla detachment flap (G2DF), group 3 with a trapezoidal flap (G3TF) and group 4 with a decapitation flap (G4DaF). All surgeries were conducted by the same operator. Vestibular and lingual periodontal parameters (PPD, REC, plaque, BOP) of teeth 6 and 7 were recorded with a periodontal probe at the following time points: before extraction (T1), 15 days (T2), 1 month (T3) and 2 months (T4) after extraction.
Results: All flaps showed significant differences with regard to increase of PPD and REC between T1 and T2. Regarding the behavior of each single flap the following data were obtained: G1IF and G2DF reported excellent results between T1 and T4, while G3TF presented a slight increase of PPD and REC; G4DaF presented a recession outcome at T4 in 50% of cases.
Conclusions: According to this study, it seems that the best flaps to approach third molar extraction in order to maintain the periodontal health of the first and second molars are the detachment flap and the intrasulcular flap. Further studies are required to relate Pell and Gregory classification with these results.

Healing of hard tissues post surgical extraction of the lower third molar: comparison between two different extraction methods. Retrospective study of 300 patients and literature review

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Aim: The aim of this study was to focus on the healing process of hard tissues in post surgical extraction sites of lower third molars in healthy patients.
Methods: A group of 300 patients was treated by two different surgeons (respectively 150 the first and 150 the second), each of whom followed his own standardized surgical protocol. Basic differences were: the first operator did not administer antibiotic prophylaxis and the surgical phase was conducted with significant use of water-rotating instruments, while the second operator provided the use of the antibiotic prophylaxis and a significant use of the lever, despite

minimal use of water-based rotary instruments. All other points of the two surgical extraction protocols were similar.

Results: The percentages of delayed healing, alveolitis, osteitis and osteomyelitis of the two groups were compared and a higher percentage of complications was recorded with the First operator than the Second one (14.09% versus 12.08%). From this analysis, subgroups of the population were created based on the risk factors related to the patient most involved in these complications, such as sex, age, smoking and oral contraceptives assumption. The respective percentages of complications were calculated and the data were compared with literature, showing that: the influence of sex and age, despite having obtained conflicting results between the two cohorts, is supported by literature and may be relevant or not. Regarding smokers and women who take contraceptives, in both cohorts a higher percentage of complications was obtained as clearly supported by literature. Once the smoking and contraceptives were defined as two evident risk factors for healing complications, these patients were removed from the initial pools and the complication rates were recalculated for both groups, showing a marked difference of complication rate: 12.75% versus 7.25%. Regarding the surgical protocols, a literature review showed that there is no statistically significant difference on the use of antibiotic prophylaxis in healthy patients to reduce the percentage of hard tissue complications; while the duration of the surgery, in particular the time spent in osteotomy, seems to increase the risk of complications referred to the hard tissues healing. On opposite, the extractions operated with a marked use of the lever (cohort 2) presented a high rate of temporary impairment of sensory function of the NAI and of the lingual nerve as secondary outcome.

Conclusions: The following study allows to conclude that smoking and oral contraceptive are risk factors for the healing of hard tissues that increases the possibility of complications by 2.8 times the first and 1.75 times the second; temperature increase generated by prolonged osteotomy procedure influences the healing capacity of hard tissues after an extraction; the use of strong pressure with the lever increases the risk of temporary paresthesia.

Rehabilitation of severely atrophic maxilla with sinus pathology after failure of GBR: case report

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Aim: The reconstruction of the atrophic maxilla is required before implant placement, because of the proximity of the maxillary sinus and its insufficient bone height. The most adopted procedure for bone augmentation is maxillary sinus lift with bone graft placement by lateral approach. Although this procedure has a low complication rate, there are several intraoperative and post-operative risks: sinus floor perforation, bleeding, wound infection, sinusitis, exposure of the graft or barrier membrane, graft infection and flap dehiscence. Sinus pathology represents an absolute contraindication of the severe atrophic maxillae rehabilitation with GBR. Moreover, implant placement in the atrophic posterior maxilla is a challenging procedure due to the risk of perforation of the sinuses during surgical procedures. The "V-II-V" is a viable surgical strategy for the immediate rehabilitation of the edentulous maxilla, avoiding bone grafting or sinus augmentation. This technique consists of an immediately loaded full-arch bridge supported by six implants. Two distal implants engage the posterior wall of the maxillary sinus, being tilted 30-45 degrees with respect to the occlusal plane. Tilting the implants parallel to the anterior maxillary sinus wall and in maxillary tuber using residual bone allows to obtain high levels of initial primary stability, avoiding bone-grafting procedures. Improved implant anchorage can be achieved exploiting the cortical bone of the anterior wall of the sinus and nasal fossa. Due to many failures of GBR, our goal was to restore the masticatory function and aesthetic in a single step, removing sinus pathology at the same time.

Methods: A 65-years male patient came to our observation with a previous clinical history of many regenerative and implant failures. From the OPT and CBCT examination a radiopaque lesion in the right sinus and marked atrophy of the upper jaw were observed. During the surgical procedure, the V-II-V rehabilitation was performed with immediate loading of the implants in the pre-maxilla. Implants placed in tuber were not loaded due to low primary stability. The sinus neoformation was removed and sent to the histological examination.

Results: One week after the surgery the patient was re-evaluated and the follow-up were fixed at 6 month and 1 year. No implants failed. The prosthesis was stable and functional. No adverse events occurred.

Conclusions: This technique, according to our school philosophy, can be considered a first choice treatment for the immediate rehabilitation of the edentulous maxilla, providing an optimal support in the posterior region, avoiding distal cantilevers and bone grafting or sinus augmentation procedures.

Post-oncological rehabilitations of the maxillo-facial area

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Aim: The treatment for head and neck cancers has evolved with multiple modality treatments, including radiotherapy and chemotherapy, to improve local and regional disease control, reduce distant metastasis, preserve anatomic structures, and improve overall survival and quality of life. Surgery can result in cosmetic, functional and psychological impairment greatly affecting the patient's quality of life. Advanced cancers can destroy structures, which may include soft and hard tissues of jaws, facial skeleton, oral tissues, lips, nose and eyes, and many other tissues of the maxillofacial region. The defect may result in oro-antral and oro-facial communication. When surgical reconstruction of these defects is limited by unfavorable conditions, such as vascular impairment of the surgical bed due to radiotherapy or insufficient soft and hard residual tissue, the rehabilitation of patients with large oro-maxillo-facial defects is performed using implant-supported prostheses, which can offer the best aesthetic solution.
Methods: Professor Brånemark, in 1977, first installed a titanium implant in an extraoral site to support a hearing aid. Since then, osseointegrated implants are widely used for both intra- and extraoral rehabilitation in selected patients. Their use decreases the problems related to traditional prostheses such as the use of the adhesive which causes discoloration and deterioration of the prosthetic material. Also the cutaneous and mucous surfaces are less subject to mechanical (from rubbing) and chemical (from adhesives or solvents) irritation. Many scientific and clinical studies confirm the success of their practical application and the improvement of the patient›s quality of life. A pre-operative planning by the whole multidisciplinary team (these rehabilitations involve the oncologist, maxillofacial surgeon, implantalogist and prosthodontist) is essential.
Results: The implants allow a better support for the prosthesis, increasing its comfort and stability with consequent greater acceptance by the patient; these benefits are not achievable with traditional retention methods. Even surgeons have come to appreciate the reduced need for numerous and complex reconstructive surgical procedures in favor of implant- prosthodontic rehabilitations.
Conclusions: Referring to some implants-prosthetic rehabilitative treatments of the oro-maxillo-facial district, some cases show that extensive facial defects (a direct consequence of resective oncological surgery) can be compensated by intraoral prostheses, extraoral prostheses, or a combination of the two types, using an individualized treatment and without the need for an important and long reconstructive surgery.

Central giant cell granuloma associated to Von Recklinghausen's neurofibromatosis: a case report

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Aim: The term neurofibromatosis (NF) is referred to a group of genetic disorders that primarily affect the cell growth of neural tissues. There are two forms of NF: Type 1 (NF1) and type 2 (NF2). These two forms have few common features and are caused by mutations on different genes. NF1 was first described by Von Recklinghausen and Festscher, and since then, it has been known as the Von Recklinghausen disease. It is inherited as an autosomal dominant trait, therefore, is a hereditary condition. NF1 is due to alteration of NF1 gene, which is a tumor suppressor gene located in the long arm of chromosome 17. The prevalence of NF1 is 1:2200/3000 births, without any preference for gender or race. The most common sign on the skin are multiple neurofibromas that can occur anywhere in the body, called "cafè au lait spots". Oral manifestations may occur in this disease as high as 72% to 92% of all cases. Common sites of the oral solitary neurofibromas include the tongue (26%), buccal mucosa (8%), alveolar ridge (2%), labial mucosa (8%), palate (8%), gingiva (2%), nasopharynx, paranasal sinuses, larynx, floor of the mouth and salivary glands. Oral radiographic findings includes an enlarged mandibular canal, mandibular and mental foramens.
Methods: A 44 years-old female patient was referred to our Department of Dentistry and Oral Surgery at Hospital San Raffaele, Milan because her dentist during an occasional orthopantomography check-

up found an osteolitic formation in the left side of the jaw. During the general physical examination we noticed the presence of "cafè au lait" spots on the skin of the neck, the face and the hands of the patient. Intraoral examination revealed an asymptomatic swelling in the buccal side in region 3.5–3.6, resilient on palpation, with 1.5 cm of diameter. Excisional biopsy was performed and the clinical suspicious for the histopathological examination was neurofibroma (due to the general medical history).
Results: The histological result did not confirm the clinical suspect of Von Recklinghausen's disease, but revealed a central giant cell granuloma.
Conclusions: In literature, at the moment, there is no correlation between NF1 and central giant cell granuloma. This type of granuloma is considered an aggressive osteolitic lesion that must be surgically treated, growing from the bone and expanding with the possible involvement of the soft tissues. An orthopantomography of control has been realized 3 months later and it will be repeated at 6 and 12 months to monitor every year the possible relapse of the granuloma.

3D Printer as programming and predicibility aid in complex oral surgery

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Aim: The aim of the work was to plan a complex oral surgery (surgical extraction of a bigeminal tooth included in the left bone mandibular site on a 12-year-old patient) through the creation of a 3D model that reproduced the exact anatomy of mandibular bone of the patient, starting from a CT Cone Beam exam. This 3D model was used for two purposes: 1) improving effectiveness of doctor-patient communication, exposing to the child's parents the mandibular anatomy and showing them the clinical/pathological condition they had required the intervention for, explaining in a simple way the treatment we expected to do: 2) obtaining an important aid to better plan the surgery, for the presence of noble anatomical structures, allowing to correctly visualize, before surgery, the position of tooth inclusion in the bone structure. It was therefore possible to minimize the size of the surgical breach, speeding up surgery and favoring a more predictable post-operative outcome.
Methods: A 12-year-old child still in orthodontic treatment with fixed braces, accompanied by his parents, came to AOE Cannizzaro (Catania) at the UOS of Dentistry and Stomatology. After oral examination, II Level diagnostic investigation (CT Cone Beam) was requested to highlight the presence of a bigeminal tooth included in the left mandibular bone site. Through this radiological survey it was possible, using a specific software, to acquire and extract Dicom format files for conversion into 3D format file (stl) for digital modeling (highlighting the surgical area of interest, removing scattering phenomena) and printing with transparent resin using a stereolithographic printer certified for oral models. The choice of the resinous material was not casual because it possessed, during the printing processes, high accuracy and precision in the details we wanted to obtain on the final model.
Results: Anatomical replica was printed in 3D from the converted patient's radiological images, so totally "patient-specific" with 1:1 scale ratio. Noble structures had been highlighted by different colors. It was possible not only to better communicate with the little patient's parents, showing them all steps necessary for the proposed operation, but also to plan surgery as best as possible, preparing it in advance, avoiding any possible unforeseen events and reducing errors, making surgical procedures faster, safer and more accurate. A kind of surgery we define "tailor-made", resolved in the best way and with the full recovery of the surgical site.
Conclusions: Thanks to modern technologies in medical field, the usefulness of 3D printing is now proven and undisputed. This technology is often used in orthognathic surgery to visualize jaws' movements on the model. It would be desirable, in the next future, to make it a possible routine in oral surgery. Fields of application could be many: in bone regeneration, it would be possible, before surgery, to shape membranes or bone grafts, increasing precision and saving time. However, the use of these anatomical replicas requires careful digital modeling under the supervision of the doctor. Oral surgeons would have to upgrade about this subject, software and 3D printers certified for medical use would have to be used, in order to improve quality and precision of the work. Finally, these models would be made of materials compatible to sterilization processes for contextual intraoperative use in the sterile field as programming and predictability aid in complex oral surgery.

Evaluation of the angiogenic and osteogenic potential of Tetranite®: a new adhesive bone graft

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Aim: Tetranite® (TN) is a new biocompatible, osteoconductive and resorbable bone alloplast, with the extraordinary ability to form high strength adhesive bonds with bone and metals, including titanium, even in a wet environment. Chemically, TN is composed of an active reaction mixture of tetracalcium phosphate and phosphoserine in water, which hardens to an amorphous solid. The adhesion of TN to bone and metals is due to calcium bridges that form between tetracalcium phosphate, phosphoserine, and hydroxyapatite in the bone, and between tetracalcium phosphate, phosphoserine, and titanium oxide on dental implants. Thanks to its biological, mechanical and adhesive properties, TN can be used as bone graft in dentistry, or as bone adhesive to treat and glue bone fractures. The aim of this *in vitro* study was to evaluate the potential of TN to induce vascular proliferation and osteo-differentiation of W-20-17 murine skeletal progenitor cells.
Methods: Quantitative Reverse Transcription-Polymerase Chain Reaction (qRT-PCR) was used to evaluate the expression of genes involved in osteogenesis (RUNX2, Osteocalcin) and angiogenesis (VEGF, ANGPT1) in W-20-17 cells grown in contact with TN. A comparative evaluation was performed with W-20-17 cells grown in contact with two bone graft materials currently used in clinical practice, which therefore served as positive controls: DFDBA (OraGRAFT®, LifeNet Health®) (OG) and bioactive calcium phosphosilicate glass (PerioGlas®, NovaBone®) (PG). Prior to cell seeding, TN (test), OG (first positive control), and PG (second positive control) were placed in three wells of a 6-well plate, whereas a fourth well was left empty (negative control). Since the three materials have different particle sizes, to equalize the surface of the materials available to cells, the same volume of each material was utilized (0,250 cc). Subsequently, 200.000 W-20-17 cells were seeded in each well with DMEM. After 48 hours of incubation (37°C, 5% CO2), RNA was extracted and quantitative expression of VEGF, ANGPT1 and RUNX2, Osteocalcin genes was performed. The experiment was repeated three times and data were expressed as means ± Standard Deviation of the measurements obtained in the experiments. Analysis was performed by Kruskal-Wallis and Dunn tests, $p<0.05$ was considered significant.
Results: Compared to OG and PG, TN induced equivalent gene expression of growth factors related to angiogenesis (VEGF, ANGPT1), and transcriptional factor (RUNX2) and osteoblastic differentiation marker (Osteocalcin) related to osteogenesis.
Conclusions: In this in *in vitro*, TN was able to induce osteogenic differentiation of W-20-17 stromal cells and expression of angiogenesis factors to levels comparable to those observed using OG and PG, thus confirming the great potential of this biomaterial to substitute OG and PG in current clinical practice. In conclusion, thanks to its unique adhesive qualities, in dentistry TN can be used both as bone graft without the need for a barrier membrane, or as bone adhesive to stabilize post-extraction implants with low primary stability. In orthopedics, TN can be used for bone fractures fixation, thanks to its ability to hold the two ends of fracture together and its high resistance to compressive and shear forces, thus avoiding the use of plates and screws and the surgical re-entry required for their removal. Therefore, TN can revolutionize dental and orthopedic clinical practice thanks to its adhesive properties and bioactive properties, which will have to be investigated with additional *in vivo* studies.

Pathological fracture of the mandible resulting from a metastatic osteolytic lesion from a primary pulmonary adenocarcinoma: a case report

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Aim: Metastatic tumors to bone must be considered in all patients with unexplained bone pain, but in particular in patients who present with known cancer, localized pain at multiple sites, and findings suggestive of metastasis. The purpose of this report is to present a case of a pathological fracture of the mandible as a consequence of metastatic pulmonary adenocarcinoma.
Methods: In July 2018, a non-smoking 68-year-old male patient, came to our clinic, referred by the geriatric ward, for specialist evaluation. He complained of pain (VAS: 5) in the right temporomandibular region exacerbated, over the past few days, by chewing, and resulting in a reported functional limitation. The patient was hospitalized with a primary diagnosis of pulmonary adenocarcinoma (T2-T3 N2 Stage IIIA) diagnosed in December 2017 and treated with a completed course of radiation therapy and chemotherapy. Intense corticosteroid therapy for the adenocarcinoma led to heart and liver complications as well as vertebral collapse. Physical examination showed monolateral swelling of the right temporomandibular joint (TMJ) in the absence of joint clicks. A slight limitation of motion was observed with mouth opening. Intraorally, diffuse white lesions compatible with pseudomembranous candidiasis were

detected. A Panoramic radiograph demonstrated a right intracapsular condylar compound fracture associated with an osteolytic lesion at the condyle base with jagged margins. A CT scan with contrast of the facial solid mass and fine-needle aspiration of the lesion were performed.
Results: CT confirmed the presence of a right mandibular condyle fracture associated with a large osteolytic lesion, located at the neck of the condyle. The size was approximately 9 mm antero-posteriorly, 6 mm medial lateral, and 17 mm cranial caudal. The lesion was characterized by irregular margins and cortical involvement both on the medial and lateral sides. The above confirmed the pathological nature of the fracture. Suspicious lymphadenopathy was not observed in the cervical lymph nodes. Fine-needle aspiration of the metastatic lesion confirmed the presence of medium and large size adenocarcinoma cells with a large cytoplasm, sometimes apocrine in appearance with focal secreting aspects, mostly central nuclei with severe anisonucleosis and gross eosinophilic nucleoli. It was not possible to proceed with a mandibular resection due to the critical clinical condition of the patient who died in September 2019.
Conclusions: Lung cancer frequently produces lytic-type metastases. In patients with a known diagnosis of pulmonary malignancy, panoramic radiographs are recommended to search for early areas of bone radiolucency in the symptomatic jaw.

Interdisciplinary approach within surgical extraction of a supernumerary tooth in patient with reduced periodontium in aesthetic zone: case report

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Aim: Nowadays when talking about oral surgery, we should always also consider its biological cost. The ultra-specialization of the different dental disciplines, when combined with an interdisciplinary approach, allows to achieve different goals, such as saving severely compromised teeth. The case report here presented, involves the surgical removal of a supernumerary tooth which caused the slow but progressive periodontal bone resorption and the mobility of a tooth whose root was contiguous to it. In order to maintain the contiguous tooth and thus to minimize the biological cost, the surgery was performed with the more typical approach within the different regenerative periodontal surgery techniques.
Methods: The 51-year-old male patient, previously treated with causal therapy because of generalized chronic periodontitis, and since ten years under periodontal support therapy, came to our observation with a III degree mobility on tooth 4.2, with reduced periodontium though with full-mouth plaque score (FMPS) and full-mouth bleeding score (FMBS) <20%. After radiographical evaluation using intraoral X-ray, a supernumerary tooth between teeth 4.2 and 4.3 was detected, that caused the periodontal deficit and which prevented a possible non-surgical treatment on that site. Therefore, the surgical removal of the supernumerary tooth and the periodontal regeneration of the deficit using GTR were planned. The correct position of the tooth was detected thanks to a previous CBCT taken several years before. for planning an implant restorative procedure in the posterior area of the mandible. The design of the flap, on the buccal side, was realized according to the modified papilla preservation technique (MPPT). The supernumerary tooth was removed using a minimally invasive approach, while the remaining periodontal defect, similar to an horizontal defect, was treated with GTR using a combined regenerative procedure with deproteinized bone graft mixed with enamel matrix derivates, all covered by a resorbable membrane.
Result: Seven months after the surgery, the mobility of tooth 4.2 passed from grade III to grade I also showed a marked improvement in the level of clinical periodontal attachment. As recognized in literature, the benefits for the supplementary intrabony defect, reached using GTR procedures are more effective than the ones obtained by only using the flap surgery.
Conclusion: Thanks to the design of the flap, that allowed an excellent stability of the clot, reabsorbable membranes that avoided a second intervention for removal were used. Since this is an interdisciplinary treatment on reduced periodontium in an area with a high aesthetic value, such approach has allowed to avoid a further loss of clinical attachment. It was possible to reach best results thanks to the different biological principals of the combined periodontal therapy. When the correct flap design avoids the membrane exposition and guarantees the stability of the clot, it is possible to obtain a more predictable treatment, on both the clinical and esthetical side.

Peri-implant and periodontal diseases: plaque-induced pathologies or simple disbiosis? *In vivo* experimental study with an original protocol design

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Aim: A real challenge for the clinician is nowadays

represented by peri implant diseases, with a prevalence between 20% and 48% for peri implant mucositis, and 18% and 44% for peri-implantitis. Although the peri implantitis and the periodontal disease have the same bacterial etiology, there are many differences between them on both the therapeutic and therefore prognostic profiles. The aim of this study is to assess, with the help of metagenomics techniques and with an original study protocol, whether the differences between the periodontal and peri implant microbiota can explain the different evolution of the two pathologies. The purpose of this study is to offer an holistic view of the results and a new reading key of the pathogenesis and of the possible aids for the traditional therapies.
Methods: To find out what are the microbiological basis of the relationship between the two diseases at the intrasubject level, the microbiological populations around healthy teeth (HE), implants in peri-implantitis (PI) and periodontitis teeth (PA) were examined within the same subject. The study population includes 24 patients all previously treated for periodontal disease. The sampling of the study was carried out by inserting sterile paper cones for endodontic use into gingival and mucosal sulci at the deepest probing sites. Before inserting the cones, a professional supragingival hygiene session was carried out with rubber cups and toothbrushes to debride and thus eliminate the supragingival biofilm and plaque. Subsequently, the paper cones were placed inside sterile Eppendorf tubes containing NaCl solution and stored in an airtight refrigerated container and shipped to the metagenomics analysis center for the sequencing of the 16S gene of the ribosomial RNA thanks to the MiSeq™ Illumina® platform.
Result: As it is shown by the results of this research, there has been a variation of microbial communities in periodontally involved, peri-implantitis and healthy niches in all enrolled patients. By comparing the alpha-diversity in each group of samples and in their clustering, the periodontal and peri implantitis microbial population are in some cases very similar, while they are sometimes statistically different from healthy samples. The triggering of the inflammatory mechanisms responsible of the pathogenesis of these diseases is therefore attributable to an alteration of the oral microbiota, in fact, a statistically significant data has been identified in healthy sites, in which were detected bacteria that could play a key role in order to maintain oral health.
Conclusions: The qualitative and quantitative differences found in the three examined samples, suggests that the pathogenic profile, determined in cases of periodontitis and peri-implantitis is similar to a real disbiosis, as well as other chronic inflammatory diseases. On the basis of these results, in order to maintain or restore a healthy condition, it could be appropriate to add to the classic therapeutic approaches a probiotic therapy that could aid to rebalance or maintain the oral microbiota in the conditions of eubiosis.

Guided tissue regeneration of a furcation ii defect in lower first molar with combined regenerative procedure. a case report

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Aim: The presence of teeth with the involvement of furcation, in patients affected by periodontal disease may influence the treatment and prognosis. The assessment of the furcation involvement is obtained by measuring the horizontal exposure of the root or the loss of attachment within the root complex. The treatment of a deficit in the furcation area aims to remove the etiological agent from the radicular complex exposed surfaces and to create an anatomy of the affected surfaces that could establish an adequate plaque control by the patient. The predictability of the treatment's results is influenced by the degree of impairment of the furcation, by the anatomy of the tooth and by the coexistence of a vertical bone defect component. Different therapeutic solutions have been proposed for the treatment of mandibural molars with grade II furcation, all previously treated with non-surgical treatment consisting of debridement and scaling. Multiple researches have shown that GTR is able to provide predictable results in the treatment of lower molars with grade II furcation.
Methods: A GTR was performed on a grade II class C furcation on tooth 3.6. linked to an infrabony defect, which includes the buccal area of the mesial root, in a 60 years old male patient, who had previously been treated for generalized chronic periodontitis through causal therapy. He was a healthy non-smoking patient. After two years of SPT, at the re-evaluation the case presented FMPS 12% and FMBS 8%. For this conditions we decided to apply a regenerative combined procedure with deproteinized bone graft mixed with derivatives of the enamel matrix covered by a resorbable membrane.
Result: Two years after GTR it was possible to observe, from both a clinical and X-ray point of view, the closure of the furcation which reached grade I. This result is reflected by the current scientific evidence that supports how Grade II furcation, in the first or second mandibular molars, can benefit from GTR treatment with a prognosis of 62-100% after 5-12 years.
Conclusions: Clinical outcomes obtained with GTR can be maintained in the long term, as long as an adequate

home oral hygiene is practiced and if a correct recall control program of the infection is carried out.

Evolutions and comparisons between analogue and digital techniques

De Benedictis Giovanni

Aim: To perform oral implantology, sufficient bone volumes are needed to accommodate the fixtures. If the ideal conditions are not met, we are forced to use advanced techniques to obtain the volumetric increase of the implant sites. Obviously, implantology, like all branches of medicine in recent decades, has made great progress thanks to digital and information technology. Implantology was born in 1960 by dr. Branemark and since then it has been a succession of studies and research, both from a biological and biomechanical point of view. Biological because the cornerstones have been revised to achieve osseointegration while preserving the most important namely primary and structural stability with continuous updates on the various types, shapes and processing of implant surfaces. Branemark had suggested four fundamental points for achieving osseointegration, namely primary stability, the absence of immediate loading, submerged healing and bicorticalism. Today the only confirmed cornerstone is the primary stability at the time of the surgical act, so much so that we can load the implants in the same surgical session. However, it is clear that the greater the number of solidarized implants the greater peace of mind on the clinical result. It is clear that we need to consider the difference between a single implant that prudently does not functionalize and prosthetic restorations such as all-on except that we can load with temporary prosthetic restorations in resin.
Methods: In order to perform implantology we need to access the bony ridges by performing an access flap with everything that entails (bleeding, post-operative swelling, pain and not lastly bone resorption due to the removal of the periosteum). Therefore we tried to perform operations less and less invasive, flapless (i.e. without access flaps), to reduce post-operative discomfort as much as possible, we have therefore sought to identify the thickness of the bone crest through plaster models or with measurements through the thickness of the tissues, thus making a template on a model. However this was very empirical and imprecise also because the two-dimensional analogical radiology examinations did not support us yet. The surgical techniques advance over time for the requests of the patients and, as a consequence, also the investigative examinations to try to better understand the volumetric characteristics of implant sites from 2D orthopantomography to volumetric examinations with Cone beam CT that provides us with the three-dimensionality of the implant site on which, with specific programs, we can plan the position of the implants based on the prosthetic requirements. Today the flapless technique is made safer with the advent of computer science through three-dimensional examinations that allow us to visualize the real volumes of the bone crests and using dedicated softwares, virtual designs are performed. Three-dimensional examinations are performed using the cone beam CT.
Result: The dedicated software allowed us to perform virtual designs. The advantages of guided surgery can be summarized as follows: reduction of surgical invasiveness; reduction of operating times (Arisan et al., 2010); reduction of trauma and post-operative symptoms (Hultin, 2012); reduction of risks in patients with systemic pathologies (diabetes, anticoagulant therapy); plan the position of the implants based on the prosthetic needs (prosthetically guided surgery); reduction of stress by the operator and patient. As far as the disadvantages of guided surgery are concerned, they can be summarized as follows: inability to perform advanced surgery, increased bone volumes (split crest and lifting of the maxillary sinus floor); inability to improve peri-implant tissues.

Sinus floor elevation and tilted implants compared in posterior edentolous maxilla rehabilitation: retrospective clinical study

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Aim: Rehabilitation of the posterior maxilla represents for clinicians a real challenge, due to bone resorption and maxillary sinus pneumatization. When the bone height is too reduced for axial implants placement, as reported by several Authors, different procedures can be applied: bone grafting, sinus floor elevation techniques, short implants and tilted implants. The aim of this paper is to compare axial implants placement after sinus floor elevation techniques and tilted implants insertion in basal bone.
Methods: 60 patients (32 male, 28 female) with posterior edentulous maxilla (Appelgate-Kennedy Class I or II) were enrolled for this retrospective study. Inclusion criteria were: residual bone height in posterior maxilla less then 9 mm and fixed prosthetic rehabilitation required. Smokers, patients with systemic disease, or undergoing bisphosphonate therapy, or oncological therapy were excluded. According to the procedure applied, the sample was divided in three groups: Group

A was subjected to transcrestal sinus floor elevation, Group B to lateral approach and Group C to tilted implants placement with one axial for each one. The first outcome was implants survival rate; the second outcomes were marginal bone loss and complications associated to each procedure. The follow-up period considered was from 24 to 48 months. All patients were monitored and subjected to professional oral hygiene every 4 months. The screening was performed 6 months after surgical procedure, 12 months and once a year in the following period. During every session intraoral x-rays were made in order to evaluate marginal bone loss around the implants. Implants' loss and other possible complications were reported.
Results: The most reduced implant survival rate was found in Group A, while Group C showed the highest scores. No statistically significant differences between groups were found about marginal bone loss. The only complication recorded during the follow-up period was Schneider membrane's perforation, which had no interference with implants' placement and survival.
Conclusions: According to several Authors (Krekmanov L., Maló P. and Aparicio C.) tilted implants can be a valid alternative to sinus floor elevation techniques in posterior edentulous maxilla rehabilitation. Implants' placement in basal bone allows to avoid several complications as Schneider membrane's perforation, lesion of alveolar antral artery, postoperative maxillary sinusitis, local wound dehiscences, graft infections, loss of graft and loss of implants.

Inferior alveolar nerve dislocation, surgical techniques: literature review and personal notes

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Aim: In the case of implant-prosthetic rehabilitation of the posterior mandible, mandibular bone atrophy is often so severe that the placement of an implant of regular length is not possible without running the risk of injury of the Inferior Alveolar Nerve (IAN). In view of this, the rehabilitation of severely atrophic edentulous posterior areas of the mandible is provided using specific surgical techniques, such as the positioning of short implants or procedures of regenerative techniques using bone grafts, in order to increase vertical dimension. A therapeutic alternative consists in the dislocation of the IAN, which allows the positioning of longer implants without risks of damaging the nerve. This surgical maneuver can be performed with two different techniques: transposition (IANT) or lateralization (LNAI) of the Inferior Alveolar Nerve, depending on whether the incisal nerve is sacrificed or not. In the first case, in fact, this nerve is transacted in order to dislocate the mental foramen and consequently the NAI is repositioned more posteriorly. In the second case there is no interference with the incisive nerve; the IAN is exposed and tractioned laterally while the implants are placed. The IAN is then left to fall back into position against the fixtures. Through the review of the existing literature and the comparison with the clinical experience of the dentistry department of the San Raffaele Hospital, the two techniques described above, namely the TNAI and the LNAI, were compared and their advantages and disadvantages were listed.
Methods: A literature review was conducted on the Pubmed search engine with the following search parameters: (inferior alveolar nerve OR mandibular nerve OR trigeminal nerve OR fifth cranial nerve) AND (lateralization OR transposition) AND (implant OR dental implant OR implant placement). The results of the literature review were then compared with the clinical ones obtained in our dental department.
Results: Of the 78 resulting articles, the ones in English that dealt with studies on adult humans and referred to the techniques of dislocation or lateralization of the NAI were taken into consideration. Thus articles were examined from 1993 to 2018 relating to the surgical techniques in question in cases of severe mandibular atrophy. From the literature review it emerged that the preferred surgical technique is the transposition of the NAI. From the analysis carried out it was also possible to frame the two techniques from the point of view of indications, contraindications and possible complications. However, both techniques present a high surgical difficulty and a slow learning curve. This result coincides with our clinical experience.
Conclusions: The dislocation of the IAN with simultaneous positioning of dental implants appears to be, in the most severe cases of mandibular atrophy, a valid therapeutic option in order to obtain a rehabilitation with fixed prosthesis. Despite there is always risk of complications, especially paresthesia or dysesthesia, through an extremely meticulous preoperative analysis and a perfectly executed surgical technique, in fact, this maneuver can give both clinical and radiological favorable and predictable results in the long term.

Surgical repositioning of tooth 4.7

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Aim: Surgical repositioning is a conservative surgical method which consists in modifying the axial

inclination of the tooth by means of a luxative action until it is aligned along its physiological eruptive pathway. In surgical repositioning the mobilisation of the tooth regards its whole structure involving the entire root. The indications for surgical repositioning include the following: tooth in retention deemed to have a considerable inclination; tooth in partial impaction (closed apex) with a noticeable inclination; fully impacted tooth (apex closed) regardless of the degree of inclination; element in total or partial impaction (closed apex) without inclination anomalies. The tooth to be repositioned must have a normal corono-radicular morphology or with slight anomalies: the existence of accentuated apical curvatures exposes to the risk of fracture, especially when they are oriented in the opposite direction to the luxative movement to be performed, on the other hand an excessive divergence of the roots could hinder recovery. The roots should be formed for at least half, or even better two thirds, of their final length. The presence of a large apex is a favourable prognostic element for the preservation of pulpal vitality, as it guarantees a greater elasticity of the vascular bundle, a reduced chance of apical fractures, and it allows a higher tolerance to mobilization. An adequate degree of root mineralization is, on the other hand, indispensable for obtaining an effective movement of the tooth and for guaranteeing the stability of the position obtained both immediately after surgery and in the long term, should the surgical trauma cause a root growth arrest. The incomplete maturation of the root apex is of fundamental importance for the molars that, once realigned, must spontaneously complete the eruptive process to reach their physiological position on the alveolar crest. As far as the dental arches are concerned, it is necessary that the space required for the coronal dimensions of the non-erupted molar is already present or can be obtained with a short term orthodontic therapy and that the antagonist elements are positioned in such a way as not to create a traumatic occlusion.
Methods: A 17-year-old patient sent by another specialist to the "UOC of Paediatric Dentistry", Policlinico Umberto I in Rome, in order to perform the surgical extraction of tooth 4.7. After a careful evaluation of the case and having assessed the first and second level x-ray examinations, a careful attempt is made to recover tooth 4.7 through its surgical repositioning. It was decided not to consider the possible germectomy of 4.8 as it did not hinder the surgical manoeuvre of the 4.7 repositioning. In addition, in case of failure, the third molar could replace the unrecovered tooth. The operation was then carried out with the final application of a splint.
Results: Post-operative follow-up allowed monitoring the healing of soft and hard tissue, pulp vitality tests were performed after 7, 14 and 30 days with subsequent splint removal. Clinical radiographic check ups were performed regularly in order to ascertain the success of the treatment. Once healing was completed, orthodontic therapy could be undertaken for the resolution of Class II skeletal malocclusion, which involved the full banding of the upper and lower arches. The results of the orthodontic therapy are to be assessed in the future.
Conclusions: We considered it appropriate to report this case because it is rare to perform this type of treatment and even less frequent is its success.

Combined orthodontic-surgical management of an impacted maxillary canine in a pediatric patient at risk of osteonecrosis of the jaw: preliminary results

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Aim: Osteogenesis imperfecta (OI) is an autosomal dominant transmission genetic disease characterized by an abnormality of type I collagen synthesis; it is characterized by bone fragility disorder and several other pathological conditions affecting ears, joints, eyes, skin, and teeth. Optimal management of OI requires a multidisciplinary approach involving several clinicians, such as pediatrician, endocrinologist and, in some cases, even the dentist. Among therapeutic possibilities, bisphosphonate (BPs) therapy represents the gold standard of OI therapy; even if related to a potential risk of osteonecrosis of the jaw. This case report is the multidisciplinary management of an impacted maxillary canine in a growing patient affected by osteogenesis imperfecta.
Methods: A 12-year-old boy, affected by OI, was referred to our department of Pediatric Dentistry (University Hospital "P. Giaccone" of Palermo, Italy) with a chief complaint of the absence of the upper right canine. Due to repeated bone fractures related to OI, the patient has been treated with BPs since March 2012 (i.e. quarterly administration of Neridronic acid ev). Intraoral examination and panoramic x-ray confirmed the presence of the impacted canine and revealed the presence of 6.3. In order to plan a minimally invasive surgery, a computed tomography scan (CT) was requested to assess the exact position of the impacted canine. Additionally, drug suspension was requested and

orthodontic brackets were applied before the surgical phases. Applying the PROMaF protocol (http://www.policlinico.pa.it/portal/index.php?option=displaypage&Itemid=264&op=page&SubMenu=), pre- and post-operative antibiotic systemic treatment was given (amoxicillin and clavulanic acid plus metronidazole per os) as well as the use of chlorhexidine mouthwashes and sodium-hyaluronate gel topically. The surgical protocol included: 1) anesthesia without adrenaline; 2) full-thickness mucoperiosteal flap; 3) tooth exposure associated with cyst removal; 4) bracket application on the impacted canine; 5) irrigation with rifamycin sodium; 6) tension-free suture. Post-operative instructions were given. Follow-up visits were scheduled 10 days after removal of the suture, then at 1 and 3 months.

Results: The drug suspension was approved by the prescriber and started 30 days before the surgical procedures. Due to the analysis of the CT scan, it was decided to apply a palatal surgical approach. One week after surgery, the mucosa closure was achieved; there were no clinical signs of inflammation or swelling as in the following follow-ups at 4, 8 and 12 weeks. The histopathological examination revealed the diagnosis of a dentigerous cyst.

Conclusions: Even if some authors have reported delayed healing of osteotomy sites after major bone surgery procedures in children with OI receiving BPs, there are no cases of ONJ reported in the literature and it may be assumed that the risk of ONJ developing in pediatric patients is negligible. Although with the great limitation of this report, these preliminary results suggest that combined orthodontic-surgical management of an impacted maxillary canine in a pediatric patient in treatment with BPs may be a safe procedure. Further prospective studies are needed to confirm this statement with a larger patients sample and a longer follow-up period.

Mandibular nerve dislocation in the management of limited vertical bone eight of the posterior mandible: decision tray

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Aim: For many years, osteointegrated implant placement in the posterior region of the mandible was hindered by the presence of the inferior alveolar nerve (IAN). This area also suffers from bone resorption, depending on the loss of teeth or incongruous prosthesis. Many patients show an insufficient bone width and/or height to allow implant placement. Today, these restrictions can be overcome thanks to recent surgical techniques such as bone grafting and IAN mobilization techniques. The purpose of the present study is to present the indications of IANL (inferior alveolar nerve lateralization) and IANT (inferior alveolar nerve transposition).

Methods: The major reason for using these techniques is to prevent IAN injury during implant placement in edentulous posterior atrophic mandibles. With careful pre-operative surgical and prosthetic planning, imaging, and extremely precise surgical technique, this procedure can be successfully used for implant placement also in extremely atrophic mandibles. In this study we present selection criteria in the choice of the two different approaches to the nerve, when lateralization is preferred choice, depending on anatomical findings.

Results: IANL lateralitazion, which consists in the lateral displacement of the nerve from its canals and IANT transposition, performing a corticotomy around the mental foramen to allow a posterior reposition of the nerve, occupying the original space of the incisive neuro-vascuolar bundle.

Conclusions: Inferior alveolar nerve lateralization and transposition in combination with the installation of dental implants is sometimes the only possible procedure to help patients to obtain a fixed prosthesis, in edentulous atrophic posterior mandibles.

Improving biopsy procedures in oral surgery: UHFUS-guided minor salivary gland biopsy in Sjögren patients

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Aim: Minor salivary gland biopsy (MSGB) is an integrating part of Sjogren's syndrome (SjS) diagnostic algorithm. MSGB is employed to obtain histological confirmation of SjS, employing a dedicated scoring system, the Focus Score (FS), which allows to quantify the number of foci of lymphocytic infiltration evaluated on an area of at least 4 mm^2. According to the 2016 American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) criteria, the

coexistence of positive anti-SSA/Ro antibody, focal lymphocytic sialadenitis (Focus Score ≥1 foci/4mm^2), positive Schirmer's test result (≤5mm/5 min), and unstimulated salivary flow rate of ≤0.1mL/min, are suggestive of disease. Histology and serology are therefore extremely important in drawing final SjS diagnosis. However, MSGB, being a surgical procedure, may be subject to complications, such as the lesion of vascular and nervous structures of the lower lip (in particular, labial artery and nerve) and/or sampling insufficient tissue for FS evaluation. Lack of standardization in MSGB still remains an issue in performing SjS diagnosis. The aim of the present study is to describe a novel approach to MSGB, with the support of Ultra-High Frequency Ultrasound (UHFUS) guidance.

Methods: UHFUS is a recently introduced diagnostic technique characterized by the use of higher frequencies compared to conventional ultrasonography, allowing high resolution imaging of the first centimeter from the surface of application of the probe. In 100 patients with suspect of SjS and eligible for MSGB, intraoral UHFUS was performed prior to biopsy. The mucosa of the lower lip was scanned, and local anatomy evaluated. Minor salivary glands which appeared altered in terms of echogenicity were considered eligible for biopsy. After the identification of a group of minor salivary glands which did not show close relationship to blood vessels or nerves, the surgical site was marked, and subsequently local anaesthesia performed in the selected site. MSGB was then carried out following conventional procedure, with the incision being performed with a n.15 surgical scalpel, blunt dissection of the group of glands, and excision. The procedure was completed with suturing using a 5-0 resorbable suture thread. The performance of UHFUS-guided MSGB was compared with the results of the previous year, in which conventional procedure was performed.

Results: Statistical analysis showed improvement in sampling, with a significant improvement in terms of sampling (p-value 0.033). UHFUS guidance supported the outcome of surgical performance, with an increase of eligible samples (<4 mm^2) from 62.5% to 83.6% (p-value 0.004). in the UHFUS-guided group, the majority of samples were 4-8mm2, with a mean area of 7 mm^2. A recent paper fixed the new cut-off for the estimation of FS at 8 mm^2. Considering recent clinical trials, our sample collected suitable samples in 27% of cases.

Conclusions: Our data suggest that UHFUS-guidance in MSGB could improve the performance of the surgical biopsy, increasing the sample area and allowing better FS estimation. Further studies are mandatory to evaluate the potential role also in other bioptic procedures.

Histological evaluation of the thermal damage induced by diode laser in the peripheral portion of soft tissue: in vivo study

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Aim: Lasers have become standard tools for the surgical treatment of oral lesions. The use of laser technology in the surgical treatment of oral lesions aims to provide benefits to both the surgeon and the patient. The aim of the study was to compare the histological peripheral area in a lesions treated by conventional surgery vs lesions treated by laser-assisted surgery.

Methods: The study was conducted on a group of 12 patients with a mean age of 39.6 years. Healthy subjects and patients with cardiovascular disease, diabetes, hemophilia, both smoking, and non-smoking patients were included. All patients were randomized into two groups: group A of 6 patients treated by oral lesion excisional biopsy performed with laser-assisted technique and group B, of 6 patients treated by oral lesion excisional biopsy performed with cold blade technique. For laser-assisted techniques patients underwent low level laser therapy performed with a diode laser (Wiser Lite λ 980nm, maximum power 2.5 in CW) Patients of group A were randomized and divided in group A1 (max power 1.5W), group A2 (max power 2W) and group A3 (max power 2.5W). All histological samples, immediately after excision were placed in a test tube with paraffin. After fixation and inclusion, the histological sections were subsequently observed by an expert histopathologist.

Results: Five patients of group A showed better perioperative healing after 15 days compared to patients in group B. All patients in group A showed a negligible intraoperative and postoperative bleeding compared to the group in which the cold blade was used. As regards the duration of the intervention: group A had an average of 17.6 minutes whereas group B had an average 8.8 minutes. We can therefore say that with the laser we certainly have less intraoperative bleeding but a longer duration of the intervention due to the need to clean the tip of the laser. The patients in group A showed a moderate degree of examinability with jagged targeted cuts but clarity of cells and tissues to be analyzed; in fact by carefully modulating the laser emission power, it was possible to reduce the incidence of thermal tissues alterations of the peripheral portion of the sample. Much higher laser power more thermal tissue damage was present. In group A3 signs of slight thermal damage in the

ephithelium and lamina propria and no damage in subepithelial corium were found. The patients of group B showned good well-defined margins, and cellular portions well characterized by the surgical blade, without cellular damage, in fact normal epithelial tissue was observed. The experience of the histopathologist was fundamental to guarantee a correct histological diagnosis.
Conclusions: This research suggest that the diode laser represents a valid therapy tool in the treatment of oral lesions due to its positive effects linked to the reduced bleeding and the reduced presence of post-operative infections, but longer time of surgery. However, more studies on a higher number of patients are needed in order to better understand if different lasers and/or time of surgey and/or energy and power of the lasers can influence the peripheral portion of the histological sample, especially on very small samples they can modify the histological report.

Dental implants in elderly patients: a longitudinal prospective study with 3-year follow-up

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Aim: The elderly population in Europe (>65 years) was 97.2 million in 2017. About one in every five persons is considered an older European: persons reaching 65 years of age have a life expectancy of an additional 20.6 years. As a consequence, the number of edentulous elderly patients will increase. Accordingly, it could be expected that these elderly patients will ask for more fixed restorations when teeth are lost, both supported by adjacent teeth as well as by implants. Rehabilitation with dental implants is a highly successful therapeutic option for the partially/completely edentulous jaws, with predictable and long-term success rates. Reports on implant function in elderly patients are contradictory in dental literature, furthermore, little is known on the long-term influence of age on dental implant therapy, in the old and the very old patients. Therefore, the aim of this 3-year prospective study was to determine the prosthetic, clinical and radiographic outcomes of dental implants placed in elderly subjects aged 65 years or older.
Methods: The study is a 3-year prospective clinical study that was designed to evaluate the cumulative success rate (CSR) of implants placed in elderly patients. Treatments were performed on a total of 134 patients (61 males and 73 females over 65 years) from 2015 to 2016 at the Dental Clinic, San Raffaele Hospital, Milano, Italy. The following criteria were used to select eligible patients: age>65 years, need for tooth extraction and implant placement (immediate or not). Exclusion criteria from the study were as follows: pathologies or drugs contraindicating oral surgical procedures; uncontrolled systemic pathologies (diabetes type I, cardiovascular diseases, osteoporosis and reumathoid arthritis; need of bone grafting or sinus lifting. At the end of the surgical procedure flaps were closed, achieving complete soft tissue closure. All the implants showed good primary stability. Sutures were then removed after 1 week, and patients were seen monthly for prophylaxis. The second-stage surgery was performed 3 months after implant placement. Patients were evaluated periodically for periodontal health and radiographic marginal bone level changes. The radiographic measurements were taken at the second appointment (prior to implant restoration) and longest follow-up evaluation was saved in a computer. The CSR was evaluated for the entire 3-year follow up period.
Results: As a result, a total of 134 patients over 65 years were enrolled in this 3-year longitudinal study. The 134 patients who received 197 dental implants included 56 males and 78 females, with 105 and 51 implants placed in patients aged 65–69 and 70–74 years, respectively. The mean age at the time of implant placement was 70 ± 4 years. Six implants were removed due to failure during the follow-up period in 5 patients. Most (n=4) of the failures occurred in patients aged 65-69 years, followed by failure of an implant in a patient aged 70-74 and another one of 75-79 years. The overall survival rate of the implants was 96.95%; 3.05% of the implants had failed.
Conclusions: Based on the results of this study, implant treatment in the elderly edentulous patient performed well during the 3 years follow-up indicating that implant treatment in the elderly edentulous jaw is a predictable clinical protocol in the long-term perspective.

Mandibular angle fracture as complication of an impacted third molar extraction associated with cyst enucleation: a case report

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Aim: Extraction of impacted third molars is a common surgical procedure performed in dentistry. A

reported, but nevertheless rare, complication of third molar extraction is mandibular angle fracture. Hence the desire to present the case of a patient with a mandibular angle fracture after the extraction of the left lower third molar associated with follicular cyst enucleation that was treated with maxillomandibular fixation.

Methods: The patient who came to our observation was a 62-year-old woman with impacted left mandibular third molar associated with follicular cyst. Intraoral examination revealed absence of the left mandibular third molar. Panoramic radiograph and Cone Beam computed tomography revealed that the left third mandibular molar was impacted in mesioversion and associated with an osteolytic lesion, covered by sclerotic border, that was extended from the mandibular angle to the inferior surface of the mandible, involving also the roots of the homolateral second molar. Considered the radiological characteristics, we decided to proceed with the extraction of the left mandibular third molar and with the excision of the associated neoformation and its subsequent histological examination, that was compatible with the diagnosis of follicular cyst. The patient was recommended to follow a soft diet for at least 4 weeks postoperatively and to restrict mandibular movements. During the follow-up visit, 10 days later, the patient reported that she heard a crackling noise during chewing. She also reported pain and neurologic injuries. Moreover, intraoral examination revealed swelling in the left jaw area. Panoramic radiograph showed a left mandibular angle fracture in the same site of the previous extraction. The patient rejected the surgical approach, therefore the fracture was treated through maxillomandibular fixation only, which was made through the placement of orthodontic brackets with a passive arch on mandibular teeth. Because of the presence of a fixed prosthesis on natural teeth, we also placed fuor miniscrews, long 8 mm, between central incisor and canine and between canine and first molar, on the right and on the left side. Maxillomandibular connection was made by orthodontic elastics (6 ounces), that connected miniscrews with ortodontich brackets.

Results: During a follow-up visit, 2 weeks later, intraoral examination revealed absence of swelling. The patient reported absence of pain. Moreover, 3 and 6 months later, panoramic radiograph and cone beam computed tomography showed the bone healing.

Conclusions: The late mandibular angle fracture is a rare but significant complication that may result from third molar extraction associated with follicular cyst enucleation. For this reason, to avoid this complication is essential to introduce a soft diet, for at least 4 weeks, and to limit mandibular movements postoperatively.

Conservative surgical treatment of Medical-Related Osteonecrosis of the Jaw: validation of a new surgical score system

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Aim: Medication-related osteonecrosis of the jaw (MRONJ) is a side effect of antiresorptive and antiangiogenetic medications. The management of MRONJ has not been completely elucidated, and its treatment can vary from no or limited surgery to more extensive surgery. Aim of the present study was to evaluate the efficacy of localized surgical treatment of MRONJ lesions in a cohort of patients and also to validate a new surgical score system in order to predict the success rate.

Methods: We retrospectively evaluated all subjects diagnosed with MRONJ that had undergone localized surgery in the Department of Oral Surgery of the University of Pisa from January 2004 to December 2017. Data on demographics, health status, type and duration of antiresorptive medication and osteonecrosis characteristics were collected retrospectively. The primary outcome was a complete healing of MRONJ lesion. We performed a multiple regression analysis in order to evaluate which factors influence the surgical outcome and all variables with a level of significance $p < 0.05$ were maintained in the model. According to the score we identified three risk categories.

Results: Two hundred and sixty seven patients, with 277 MRONJ lesions, were identified and included in the present study. 190 patients (71.2%) received intravenous bisphosphonates (zoledronic acid 4mg IV) for the treatment of oncologic pathologies. The MRONJ lesions were mainly symptomatic (240 lesions, 86.6%) and bone exposure was detectable in the vast majority of cases (216 lesions, 78%); 189 lesions were located in the mandible. The main event leading to MRONJ was dental extraction (153 lesions, 55,3%). The most frequent stage of MRONJ was stage II (147 subjects, 53,1%), whereas stage I (37 subject, 13,4%), and stage III (93 subject, 33,6%) were less common. 197 lesions showed complete healing after surgical treatment. According to the risk score we stratified the sample in three risk categories: low, medium and high. Patients with low risk had a success rate of 93%, with medium risk of 81% and with high risk of 49%.

Conclusions: Our data suggest that patients with MRONJ lesions may benefit from local surgical treatment. The surgical score seems to be a suitable diagnostic tool in order to assist clinicians in the choice of the most appropriate therapy.

Surgical planning in third molar surgery: introducing the potential role of segmentation

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Aim: The relationship between impacted lower third molar and inferior alveolar nerve (IAN) still represents an issue in oral surgery, being nerve injury the main complication related to third molar extraction, with an incidence ranging between 0.4 to 13.4%. Among the factors contributing to the risk of IAN injury, a predominant role has been claimed for the presence of a close relationship between third molar roots and IAN canal. In cases where panoramic radiograph shows close relationship between the impacted tooth and IAN, CBCT can be employed to better understand root anatomy and IAN course. However, CBCT images can be of difficult interpretation, especially for less experienced surgeons. The aim of the present study is to evaluate the potential role of segmentation techniques in the preoperative study of the relative relationship between IAN and impacted third molar.
Methods: 15 CBCT examinations performed for lower third molar impaction were retrospectively retrieved from the RIS/PACS database of the University Hospital of Pisa, Pisa, Italy. DICOM data were acquired and post-processed using open-source software ITK-Snap. Segmentation process was performed using manual thresholding technique, to selectively highlighted IAN, third molar, and mandibular cortical bone. From the processed images, a dataset of three reconstructions for each surgical case, namely a panoramic reconstruction, cross-sectional reconstruction, and segmented images, was obtained. The 15 datasets (45 images in total) were submitted for evaluation to four oral surgeons of different experience, labelled as OS 1 (25-year experience), OS 2 (15-year experience), OS 3 (10-year experience), and OS 4 (<10-year experience). Parameters evaluated were the estimated surgical difficulty and the degree of visualization of anatomical structures of interest. The influence of the image modality employed to determine surgical difficulty was also evaluated for each surgeon in terms of frequency of opinion change when studying the case with different diagnostic techniques.
Results: For what concerns the degree of visualization of anatomical structures, segmented images in most cases provided information of easier interpretation compared to panoramic and cross-sectional images. The perception of surgical difficulty varied depending on the imaging technique, with segmented images decreasing the perceived level of surgical difficulty, even when evaluated by surgeons with higher experience. The rate of opinion change in difficulty evaluation was statistically significant when comparing cross-sectional and segmented images, the latter obtaining a lower difficulty score. Our results show that while surgeons with different levels of experience generally improve their evaluation when studying segmented images with respect to cross-sectional images, more experienced surgeons change their opinion also when comparing panoramic reconstruction with segmentation.
Conclusions: Segmentation showed good performance in identifying the relationship between impacted lower third molar roots and IAN, often leading to opinion change in difficulty estimation. Interestingly, we found that surgeons of different experience were consistently more confident in estimating surgical difficulty on segmented images, suggesting a real advantage in the application of post-processing techniques to pre-surgical evaluation. Further studies, possibly employing automatic and/or semiautomatic segmentation techniques, could potentially lead to an introduction of segmentation as a fundamental step in surgical planning of complex clinical cases.

Antibiotic therapy for erupted tooth extractions

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Aim: Tooth extraction is a common procedure performed by general dentists. Antibiotics are generally administered to prevent the risk of infection or alveolitis. The aim of this trial was to assess the efficacy of antibiotic treatment in reducing post-operative complications after erupted tooth extractions, third molars excluded, and to evaluate the use of a probiotic (Lactoferrin and Bifidobacterium longum) in preventing or reducing gastro-intestinal side effects of the antibiotics.
Methods: A randomized, parallel, single-blind, controlled trial was performed on adult patients needing erupted tooth extractions at our clinic between 2016-2018. Exclusion criteria were third molars extractions, general contraindications to oral surgery and patients with systemic conditions needing antibiotic prophylaxis. The extractions were conducted at T0. Subsequently, patients were randomly allocated to one of the three study groups. Patients allocated to Group 1 received only antibiotic (amoxicillin + clavulanic acid 825/125 mg, twice a day for six days) after surgery; patients allocated to Group 2 received antibiotic and probiotic ,while patients belonging to Group 3 received neither antibiotic nor probiotic. All patients were provided with a painkiller's prescription (Ibuprofen 600 mg, maximum 3 times/day) and required to take note of the painkillers

needed during the first 7 days. Follow-up visits were performed at 7, 14 and 21 days after extraction. The clinical parameters assessed were pain (0-10 NRS), presence of abscess, fever, alveolitis, trismus and gastro-intestinal symptoms.

Results: 165 patients meeting the inclusion criteria were enrolled in this study, 15 patients were excluded for missed follow-ups. Decay was the main reason for extraction in each group, followed by periodontal disease. At T1 edema was present in 5 patients belonging to Group 3 (10%) with a statistically significant difference between Group 3 and the other two groups (p=0.007). No sign of surgical site infection was observed at T1 in all the groups, while alveolitis was present in 2 patients of Group 3. No patient showed trismus. At T1, 28 (56%), 21 (42%) and 34 (68%) patients reported pain respectively for Group 1, Group 2 and Group 3. No statistical difference was found among groups. At T2 pain was further reduced in all the groups with a mean NRS close to 0. A half of patients for each group assumed painkillers, most of them for a couple of days in all the groups, no statistical difference on the length of the therapy was observed among the groups. At T1 gastric symptoms were observed in 12 (24%), 10 (20%) and 1 (2%) patients belonging respectively to Group 1, Group 2 and Group 3. A statistically significant difference was found between the antibiotic groups and the control group (p= 0.01). At T1 17 patients (34%) of Group 1 showed intestinal distension or pain. A statistically significant difference was found between Group 1 and the other two experimental groups (G1vsG2 p= 0.0001, G1vsG3 p= <0.0001). At T2 the differences were reduced even though still significant. Diarrhea was present in 11 patients only in the Group 1 at T1, while not a single occurrence was observed in the other two groups (p= <0,0001).

Conclusions: According to our results the number of patients reporting pain was not significantly higher in the control group. Gastro-intestinal side effects were related to the antibiotic exposure and intestinal symptoms seemed to be tackled by the probiotic administration. Post-extraction complications seemed mostly mild and self-limiting. We do not have sufficient data to support the administration of antibiotics for routine erupted tooth extraction.

NobelGuide™ pilot surgical template: retrospective study on 15 consecutive cases

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Aim: Technological and computer development for guided implantology has enabled the introduction of programs that allow clinicians to plan implant insertion with beneficial prosthetic emergence and produce surgical templates to guide inserting the pilot drill only. Pilot Drill Template implantology is a turning point between flapless surgery and traditional surgery while maintaining the computer guidance in using the first pilot drill and having a direct view of bone tissue. The aim of this study was to evaluate patients who are candidates for the pilot template, thus partially edentulous.

Methods: For each patient a dental impression and a diagnostic wax-up of the areas to be rehabilitated were performed. They were then scanned via Nobel Procera® scanner, and the images were imported into the NobelClinician® software. The SmartFusion algorithm allows the automatic matching of the data deriving from the scan of the stone model with the DICOM files of the patient's CT scan. A pilot drill template was virtually created; it includes the housing of 2 mm diameter bushings for each implant position. After local anesthesia, the surgical template was fitted on the present teeth, and the Guided Twist Drill Ø 2.0 × (10+) 7-18 mm was used, with a fixed stop at the predetermined length. Once the guided milling was performed, the template was removed, a crestal incision was made, a mucoperiosteal flap was raised and the implant site was prepared according to Nobel Biocare® protocols. A total of 32 implants were placed using 14 surgical templates in 14 partially edentulous patients. Only one patient was excluded from surgery for the inadequate vestibulo-lingual bone thickness.

Results: Patients' average age is 49 years (21-64 years). 9 patients are females (60%) 6 males (40%); they were rehabilitated respectively with 22 (68.75%) and 10 implants (31.25%). 7 rehabilitations were performed on the maxilla (21 implants), and 8 on the jaw (11 implants). The average number of implants placed per patient is 2.286. In 12.5% of cases implants were placed at the incisive level, in 3.12% at the canine level, in 25% at the premolars level and in 59.38% at the molars level. The average length of the 32 implants inserted is 11.19 to 1.10 mm. The average diameter of the 32 implants inserted is 3.82 to 0.29 mm. Of the 32 implants inserted, 6 are Nobel Active® (19%), 7 are Speedy Groovy (22%) and 19 are the Brånemark System® MK III (59%). Of the 32 holes performed with the Guided Twist Drill, 12 were reprepared with the first Ø 2.0 drill to have a better anatomical and prosthetic position. In 2 cases the therapeutical pathway was modified in the vestibulo-palatal sense, 6 in the mesio-distal sense and 4 in both vestibulo-palatal and mesio-distal senses. In 4 the implant length was changed, in 3 the diameter, in 3 the type, in 6 diameter-length, in 1 type-diameter, in 5 type-length-diameter and in 10 no changes were made.

Conclusions: The advantages of this technique are: a

lower loss of keratinized mucosa, the direct vision of bone tissue, a reduction of the degree of bone overheating and a less bulky bushing than the Fully Guided protocols, the possibility of reviewing the planning during surgery with implant parameter changing. Pilot Drill Implant Template implantology is a compromise between flapless and traditional surgery, with the aims of mantaining the advantages of both techniques, overcoming their different limits.

Oral surgery and oral pathology: a synergic team for the early diagnosis of oral cancer and precancerous lesions

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Aim: Early diagnosis of mucosal diseases and conditions has been extensively described in the literature as the most important measure to reduce oral cancer mortality rates and to improve the quality of life of the patients. Globally, approximately 60% of patients die from intraoral cancer within 5 years from diagnosis. In the last decades, there has not been any real improvement in the survival rates; indeed recent studies show that the incidence of oral cancer is increasing. More than 40 to 60% of the patients are diagnosed with large lesions (> 2 cm), that in most cases, imply a significantly worse prognosis. After the definitive diagnosis, the management of the patients is often based on a multidisciplinary approach involving surgery, and/or radiotherapy with or without adjuvant drugs, and followed by reconstruction, rehabilitation and counseling of various medical and health professionals. The surgical treatments required often cause a considerable physical and psychological morbidity that may not prolong the patients' life, and significantly reducing their quality of life. A practical intervention to anticipate the unfavorable outcomes is a precise early diagnostic assessment of all the lesions of the oral mucosa when they are still confined in their size.
Methods: 639 patients accessed the oral pathology unit in the San Raffaele University Hospital, Milan, Italy, in 3 years of activity, receiving 1224 clinical procedures. The oral pathology team comprises a senior oral pathologist, a RDH as the clinical manager of the unit, four postgraduate students of the specialty in oral surgery and the consultant senior oral surgeon. The clinical procedures included comprehensive first visits, 14-days follow-ups, trimestral follow-ups, surgical biopsies, laser therapies and minor excisions. A dedicated database was set-up with the aim to collect and record all the information about the demography of patients, their medical conditions, the characteristics of oral diseases and the follow-up information.
Results: 639 patients, 65.3% females and 34.7% males, with a mean age of 55.3 years. The clinical unit performed 639 first visits, 212 biopsies, 347 follow-ups, and 49 low level laser therapies. The diagnosis of oral cancer was finalized in 22 patients (3.44%) after an incisional surgical biopsy and a histopathologic examination. The most representative was oral squamous cell carcinoma (OSCC) followed by two cases of cell B lymphoma, plasmocytoma, melanoma and a leiomyosarcoma. Just 7 patients were classified with cancer at stage I and II, while the others were already at stage III and IV, requiring an extensive demolitive surgery, with emimaxillectomy, glossectomy and unilateral or bilateral neck lymph-nodes removal. The oral potentially malignant diseases (OPMD) were diagnosed in 101 patients (15.80%) during their first visit and are currently under treatment or in follow-up. The most common OPMD was represented by oral lichen planus (OLP) followed by oral leukoplakia (OL), proliferative verrucous leukoplakia (PVL) and erythroplakia (EK). The 212 biopsies performed showed also benign neoplasms and pseudo-tumors in 154 cases, mainly represented by traumatic fibromas and gingival epulis.
Conclusions: Surgical procedures in the clinical activities of an oral pathology unit represent the correct and successful pathways for the diagnosis and treatment of oral mucosal diseases and conditions, particularly in patients with oral precancerous lesions and oral cancer.

Preservation of the third trigeminal branch in the surgery of mandibular neoformations: literature review and personal notes

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Aim: Ameloblastoma is a rare odontogenic tumor characterized by a slow evolution and usually appearing in the lower jaw. Although in most cases it is a benign tumor, it presents very different biological behaviors, with possible aggressive evolution with infiltration of adjacent tissues; for this reason, the surgical management of this tumor is controversial. If the ameloblastoma occurs in the posterior part of the mandible, the inferior alveolar vascular nerve bundle can be directly involved in the lesion, requiring, in most cases, its resection. The purpose of the present study

is to present a case of excision of an ameloblastoma in close contact with the inferior alveolar nerve, maintaining its integrity by means of a lateralization technique and comparing it with the cases currently present in the literature.
Methods: A 32-year-old female patient came to our attention, at the Department of Dentistry of the San Raffaele Institute in Milan. On clinical examination, the patient declared an homolateral anesthesia corresponding to the lesion. Panoramic x-rays revealed a well-defined, multilocular radiolucency with sclerotic margins. The cross-section views of the Cone Beam Computed Tomography showed an expansive lytic lesion involving the left mandible, including the inferior alveolar nerve. It was therefore decided to remove the lesion trying to be as conservative as possible, keeping the nerve bundle of the IAN intact and trying not to resect it to allow the patient to maintain the sensitivity of the ipsilateral area. The surgical procedure, under general anesthesia, consisted of a crestal incision, with two further vertical incisions to raise a flap, exposing the bone surgical field. Through osteotomy and thanks to the use of a piezoelectric device, trying not to cut the nerve bundle, the lesion and the surrounding bone including three teeth were completely removed. Given the amount of residual bone, a graft was taken from the anterior iliac crest and positioned into the oral surgical field. The specimen was immediately sent for histopathological examination with the suspicion of ameloblastoma. The post-operative course presented transient hypoesthesia with a progressive improvement of the clinical situation. 12 months after the surgery, after several strict follow-ups, we did the prosthetic implant rehabilitation of the area.
Results: At the 8 years follow-up, the patient declared a complete remission of the pain symptomatology and the restoration of both the previously lost sensibility and function. Radiographic follow-up, revealed the complete bone healing of the area and the osteointegration of the implants. Moreover, from the review of the literature no cases comparable to the one described above were found, since only cases of lateralization of the inferior alveolar nerve were present in rehabilitations of severely atrophic mandibles.
Conclusions: This report presents a case of ameloblastoma treated with lateralization of the inferior alveolar nerve and preservation of the nervous structure, allowing for the maintenance of the sensitive function, which otherwise would be irreparably compromised during the excision of tumor lesions. In the currently literature there are no cases of valid therapeutic alternatives to the resection of the inferior alveolar nerve during surgical exeresis of an adjacent lesion in the posterior mandibular. Further studies will be needed to demonstrate the predictability of the described surgical technique.

Role of local flaps to achieve primary wound closure in MRONJ osseous-resective surgery: a retrospective analysis with 13 patients

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Aim: MRONJ outcome after surgical treatment is evaluated in terms of clinical wound healing without dehiscence or evidence of recurrence. Surgical treatment of focal MRONJ showed higher success rate when osteotomy was performed and primary wound closure was achieved without tension on the mucoperiosteal flap. To achieve this, local flaps may be mobilized and either advanced or rotated into the defect to be closed. Nevertheless only a small number of articles clearly describes the soft tissue management for achieving a safe wound closure. Techniques range from advancement to propeller (rotations up to 180 degrees around the pedicle) flaps with multilayered (bilayered/three-layered) wound closure suturing to submucosal connective tissue, flaps, mylohyoid, and others. The use of advancement and propeller flaps has expanded the possibilities of covering large complex defects after MRONJ osseous-resective surgery with local tissue. This retrospective review has been designed to evaluate the most suitable surgical technique in relation to location and extent of MRONJ through comparison of success rate between the routinely used mucoperiostal flaps and different local flaps designs and propose a standardization of surgical procedures according to MRONJ stage and localization with two objectives: to provide the surgeon with an algorithm of treatment according to MRONJ localization and extension; to maximize the success of surgical treatment.
Methods: 13 consecutive patients affected by focal MRONJ were surgically treated with radical osteotomy at the Center for Treatment of the Osteonecrosis of the Jaws (University of Messina, Italy). Initial defects were classified according to the classification of the Italian Societies of Oral Medicine and Maxillofacial Surgery (the SICMF-SIPMO staging system) which consider not only bone exposure but also radiological bone involvement. Treatment outcome was retrospectively assessed according to the different adopted surgical procedure: mucoperiostal flaps (group A) advanced mucoperiostal flaps or rotation flaps (group B) local flaps (group C).
Results: Outcome after surgical treatment of focal MRONJ was positive in all groups (group A 80%; group B 100%; group C 100%), which is in agreement with success rates reported in the literature (group A

78,42; group B 63,18; group C 87,70) irrespectively to MRONJ localization and extension.
Conclusions: The results obtained demonstrated that focal MRONJ surgical treatment is a reliable procedure irrespective of the initial clinical situation and this may be due to the appropriate selection of surgical procedure. Radical osteotomy combined with appropriate selection of soft tissue management is crucial. Local flaps are an important tool in the surgical treatment of MRONJ. Oral advancement and rotation mucoperiosteal flaps facilitate healing and may represent a reliable and effective option for one-stage reconstruction of focal MRONJ defects with local mucosa.

Surgical management of maxillary ossifying fibroma: a rare location of a rare pathological entity

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Aim: Ossifying fibroma is a rare benign osteogenic neoplasm arising from undifferentiated cells of the periodontal ligament. The diagnosis of ossifying fibroma is oriented by the clinical and radiological aspect of the lesion. Histology confirms the diagnosis. Clinically, these lesions appear as a round or ovoid, expansile, painless, slow-growing mass with root displacement associated or not to root resorption; radiologically the lesion appears as a dense radiopaque mass surrounded by a thin, well-defined regular radiolucent rim. In this report a case of an unusual occurrence of ossifying fibroma in maxilla is described with its surgical management.
Methods: A 20-year-old healthy male presented to the unit of Oral Surgery, School of Dentistry-University of Messina, with a history of gradual symptomless swelling in the right anterior maxilla since 4 years. Intraoral examination revealed a expansively lesion of the right maxillary vestibular alveolar process covered by healthy mucosa. Clinically the lesion was firm to bony hard in consistency and located between teeth 1.3 and 1.4 determining displacement of teeth crowns. Computed tomography scan revealed a unilocular radiopaque well-defined mass involving the right maxilla with root divergency, although root resorption was lacking. After incisional biopsy the patient was diagnosed with ossifying fibroma. The lesion was treated by total excision. Under local anesthesia, the lesion was surgically removed through a maxillary vestibular approach. Intra-operatively, it was found to be encapsulated with a cleavage plane to allow it to be shelled out from its surrounding structures. Surgical cavity was debrided completely, hemostasis was performed and the full thickness flap sutured. Post-operative recovery was uneventful. Histopatologic diagnosis was based on examination of the hematoxilyn and eosin stained tissue sections.
Results: Since ossifying fibromas are unusual lesions epidemiological data are lacking. They occur in the second to fourth decade of life with female predilection, in this case the patient was a 20 years old man. The most common site of occurrence is premolar/molar region of the mandible. In this case the lesion arose in the canine fossa region of the maxilla, according to the literature the canine fossa and the zygomatic arch area is the most frequent location in the maxilla. Clinically, massive bone expansion of buccal and or lingual cortical plates is the most common clinical sign of ossifying fibroma. Due to the slow growth, the overlying mucosa or skin and the cortical plates of the bone are invariably intact. Ossifying fibromas are usually asymptomatic in nature until noticeable swelling and facial asymmetry is observed. In this case, the patient presented a symptomless swelling since 4 years referring previous orthodontic traction of retained right upper canine. The enucleation or curettage of the lesion is the initial treatment.
Conclusions: Distinguishing between ossifying fibroma and other fibrous osseous lesions is the primary diagnostic challenge. In this case the clinical and radiological aspects and finally the histopathological features led to the diagnosis of ossifying fibroma. Enucleation is the treatment of choice to prevent further expansion of the lesion and symptoms occurrence; anatomic location and tumor size guide the surgical approach.

Inflammatory chronic sialadenitis of minor salivary gland in a 70-years-old smoking patient: a case report

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Aim: Scialadenitis is an infectious or inflammatory disorder of the salivary glands. The course of scialadenitis may be acute or chronic. The chronic conditions generally involve the parotid and submandibular glands. Sialadenitis of minor salivary glands is rarely reported in the literature. The etiopathology can be

bacterial or viral infection, radiation treatment and allergic reaction, trauma and autoimmune disorder. Smoking has a direct effect on the minor glands and its most common presentation is nicotine stomatitis.
Methods: A 70-year-old female was referred to the Department of Dentistry, San Raffaele Hospital, complaining for painless swelling of the right lower lip. Her medical history was positive for mild iron deficiency managed with oral therapy but negative for any other systemic diseases. The patient reported smoke habit (>15 cigarettes/day) and had very poor oral hygiene. On clinical examination the lesion appeared as a well-circumscribed round mass, measuring approximately 5 mm in diameter. The lesion was a fluctuant mass covered with normal mucosa, similar in colour to the oral mucosa. After the informed consent was signed, an excisional biopsy was performed under local anaesthesia. The wound was finally sutured with 4/0 vicryl and the mass was sent for the histopathological examination. The histopathological response was minor salivary gland with exacerbated chronic inflammation (chronic scialadenitis).
Results: Based on the clinical examination of the lesion, the initial suspicion was pleomorphic adenoma of the salivary gland. The pleomorphic adenoma usually presents as a slowly progressive painless mass. However, painful presentation in some cases might be related with necrotic foci found in the histopathological examination. Adenomas have already been reported in the major and minor salivary glands. The localization of the lesion on the lower lip could suggest mucoceles, which is the most common lesion on oral mucosa that occurs in oral soft tissues which results from the accumulation of mucous secretion due to trauma and lip biting habits or alteration of minor salivary glands. The lower labial mucosa is the most frequently affected site, but it can also develop in the cheek, tongue, palate, and floor of the mouth.
Conclusions: The clinical presentation could be common to many different swellings arising in the oral soft tissue, but the complete excision is the easiest way and treatment of choice. Histopathological examination is always needed for a definitive diagnosis.

Observer-related variability in the clinical assessment of autofluorescence of oral mucosal lesions

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Aim: To date, early detection and clinical risk classification of oral mucosal lesions is based on conventional oral examination (COE). Alongside the issue of correct interpretation of clinical appearance, the presence of inter- and intra-observer cannot be neglected when a correct diagnosis relies on visual assessments of not completely objectified parameters. Therefore, a diagnostic aid able to reduce the observer-related variability could represent an effective benefit in the clinical assessment of oral mucosal lesions. In the presence of dysplasia or carcinoma leading to altered epithelial and stromal architectures, the oral mucosa may show a loss of autofluorescence. Therefore, the assessment of tissue autofluorescence has been proposed as an adjunct to comprehensive examination in order to enhance the detection of dysplastic or cancerous oral mucosal lesions. This study evaluates interobserver and intraobserver variability in the clinical assessment of loss of autofluorescence (LAF).
Methods: Couples of clinical pictures, acquired under white incandescent dental operatory light (WL picture) and during the assessment of loss of autofluorescence performed by VELscope (AF picture) were retrieved. After a brief workshop aiming to illustrate the study protocols and to inform participants about the assessment of LAF, seven oral surgery residents were asked to assess the pictures and to score the lesion. Kappa statistics allowed the assessment of inter- and intra-observer related variability, Fleiss' extension of Kappa test and Cohen's Weighted Kappa test respectively.
Results: One hundred nine lesions representative of all oral mucosal sites and all the clinical appearances were selected. The inter-observer moderate agreement (k=0.513) observed in a 2-scores model (positive versus negative) lowered down to a fair agreement in the 3-scores (k=0.335) and 4-scores (k=0.318) models (including uncertain judgements). No significant differences were found when comparing inter-observer agreement at T1 and T2. Most of raters had a substantial intra-observer agreement, without significant variations depending on the score model: mean k value 0.541 in a 2-scores model, 0.537 in a 3-scores model and 0.538 in a 4-scores model.
Conclusions: A good agreement (k>0.8) was never observed and the present results are similar to previously reported data about conventional oral examination. Irrespective of the diagnostic accuracy, the assessment of AF seems not to improve observer-related variability.

Possibilities and limitations of Guided Bone Regeneration in the treatment of peri-implantitis

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Aim: The purpose of the following study is to perform a systematic review (SR) of Randomized Controlled Clinical Trial (RCTs) to assess the efficacy of regenerative surgical techniques in the treatment of peri-implantitis.
Methods: A revision protocol has been designed according to the guidelines proposed by the PRISMA statement. A systematic literature search was conducted on three online databases (Cochrane Library, PubMed, Embase) updated in December 2017 and supplemented by a paper search.
Results: According to predefined inclusion criteria 220 articles were individuated. Among these only RCTs were selected, for a total of 43 studies. After reading the abstracts only articles that concerned the treatment of peri–implantitis with procedures of guided bone regeneration were selected. This research led to the final selection of 5 RCTs. The five studies reported the results of 5 different types of regenerative surgical treatments: autogenous bone graft plus collagen membrane vs bovine–derived xenograft plus collagen membrane; open flap debridement plus amelogenine gel vs open flap debridement; open flap debridement plus titanium granules vs open flap debridement; access flap surgery plus hydroxyapatite vs access flap surgery plus xenograft and collagen membrane; xenograft plus native collagen membrane vs xenograft plus cross-linked collagen membrane. For each study, clinical and radiographic parameters were analyzed and divided into primary outcomes and secondary outcomes. The change of the marginal Bone Level (BL) (evaluated by intra-oral radiographs with parallel ray technique) is considered the primary outcome; the change of the Pocket Depth (PD) (measured from the gingival margin to the bottom of the pocket), Clinical Attachment Level (CAL) (measured from the neck of the implant to the bottom of the pocket), Bleeding On Probing (BoP), Probing Suppuration (PuS), Plaque Index (Pi), Full Mouth Plaque Score (FMPS), Full Mouth Bleeding Score (FMBS), Marginal Gingival Recession (ReC) (measured from the implant neck to the gingival margin) and Implant Loss are considered the secondary outcomes. Concerning the primary radiographic outcomes (BL change, BL gain, % defect fill) a bone level gain and a greater percentage of bone filling was observed in BDX treatment (mean bone level gain: 1.1 mm) and in patients treated with EMD (0.09 mm of bone level change) and PTGs (mean radiografic defect fill: 3.6 mm) compared to surgical procedures only of OFD (-0.1 mm and 1.0 mm of bone level change). The secondary outcomes (clinical parameters) shows better results in the BDX group, while the addition of EMD and PTGs does not confer any clinical advantage compared surgical procedures only. The heterogeneity of the treatments analyzed in these studies did not allow a meta-analysis. However, the individual studies seem to indicate the superiority of regenerative techniques over the only OFD for short observation periods.
Conclusions: The data provided by the studies do not allow us to give indications regarding the effectiveness of the various procedures. Regenerative surgical techniques bring improvements both in clinical and radiological measurements compared to the only surgical procedures, but despite the positive results obtained, we are not able to demonstrate that guided bone regeneration determines new osseointegration. Further studies with good methodology, long follow-up periods, and standardized assessment of the outcomes are therefore necessary.

Virtual implant-prosthetic procedure: 3D CAD/CAM technique in full arch implant-supported rehabilitations

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Aim: Digital technologies are very common in medicine and dentistry. In the last few years the use of technologies for diagnosis and therapy in dentistry was improved, in combination with Cone Beam Computer Tomography (CBCT), Intra Oral Scanners (IOS) and lab scans. In surgery and prosthetic fields, thanks to the development of dental softwares it is possible to match the stages allowing the final implant-prosthetic rehabilitation. The aim of this study was to evaluate the success of 3D CAD/CAM technique in full arch implant-supported rehabilitations.
Methods: Study participants included 15 adult patients, with edentulous mandible or maxilla, without systemic disease. All diagnoses were made clinically and radiographically, with a OPT and a CBCT before surgery. The Full Arch Implant Supported Virtual Protocol was applied, followed by immediate loading fixed rehabilitation (only if the implant placement was at least at 35 Ncm) and after 6 months, the definitive prostheses were made by a CAD/CAM procedures.
Results: At the 6-moth of follow-up, no implants were lost. Patients found smile design previsualization effective, guided surgery and immediate loading

and temporary rehabilitation effective. Radiographic evaluation showed no significant loss of perimplant crestal bone in the maxilla and in the inferior jaw. No paresthesia and no prosthetic complications were registered.
Conclusions: The fully digital approach, surgical and prosthetic phase, was effective. Today it is possible to use a specific software to obtain the design of the new smile starting with a 2D plan and becoming a 3D work. The computed guided implant surgery was effective, especially to decrease the pain and discomfort in the immediate post-operative period. Another advantage of this technique is the immediate loading that provides good aesthetics and functionality. This study describes a successful protocol for the treatment of edentulous patients, offering the clinician the possibility to use fully digital, minimally invasive technique by means of a software able to guide the implant placement and help previsualization of the prosthesis.

Digital dentistry: how technology can influence the therapeutic choices of the practioner and the patient. A case report

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Aim: Nowadays new technologies allow to look into a new and completely revolutionary world. Also the field of dentistry has undergone a remarkable evolution and the investment in high-performance and technological machinery, that has been increasingly developed over the last few years, has allowed a change in the approach and in the care of patients. One of the new frontiers in dentistry is represented by the use of digital technology for the design of treatment plans and the subsequent creation of prosthetic products, customized for each patient and inclined to meet their needs that are inevitably changed over time, requiring functionality, excellent aesthetics, reduced working times and above all no discomfort. Another important factor to consider is the age of the patients who address the dentist for rehabilitation. Life expectancy in developed countries has grown, increasing the average life span of each individual. This leads to an increasing demand from the patient, emphasizing the importance of achieving a high quality standard in relation to patients with advanced age.
Methods: A 72-year old woman with odontophobia, came to the department of dentistry of the San Raffaele hospital seeking rehabilitation. The radiographic examination (OPT) presented teeth of the upper arch no longer recoverable, with reference to the first quadrant, from tooth 1.1 to 1.6. The treatment plan included the extraction of the aforementioned teeth and the restoration of functionality and aesthetics with a implant-prosthodontic rehabilitation, in particular with the insertion of three implants in the region of 1.2, 1.4 and 1.6, the operation and the creation of a prosthetic artifact (CAM) after optical scanning of abutments and arches.
Results: The case was terminated relatively quickly, with excellent clinical results and positive feedback from the patient, without the use of conventional impression techniques, not tolerated by the patient.
Conclusions: The case shows that with the help of digital devices and good compliance on the part of the patient it is possible to achieve excellent clinical results and satisfaction of the patient, bringing planned therapies to success and implementing the development of new techniques that are more and more precise and effective for the benefit of the clinician and the patient.

Microsurgical treatment of an inferior alveolar nerve injury caused by compression of an implant

Zizza Agostino

Private practice in Milan, Italy

Aim: The case of a 52-year old woman is presented, who had undergone implant treatment of the left second mandibular premolar with compression of inferior alveolar nerve due to the fracture of the mandibular canal.
Methods: The patient presented at clinic reporting thar she had been submitted to immediate implant placement in the fresh socket of the left second mandibular premolar by her dentist, who removed the implant after 24 hours, because the patient referred an altered sensation and anesthesia, and also prescribed steroid treatment. In the 3rd day post-op, our examination showed persistent total anesthesia of the lower lip and chin. Ortopantomohraphy and CBCT highlighted that the implant site preparation involved MC, the fracture of MC roof and two fragments of bone into the MC near the mental foramen. The surgeon decided to explore the site in agreement with the patient. A conscious sedation and local anesthesia were administered. A mucoperiosteal flap was elevated with an intrasulcular incision and a mesial release flap. Under

surgical microscope the mental nerve was isolated and a bone lid was performed, cranial to the mental foramen, with piezoeletric device. The nerve appeared undamaged and pieces of bone were removed. The nerve was irrigated with sterile saline solution and 8 mg Betametasone. A non-resorbable monofilament suture was applied. Antibiotic therapy, antalgic treatment, and nicetile were prescribed after surgery.
Results: After 7 days the anesthesia was still present. After 3 months, the anesthesia disappeared, but a persistent sensation, called numb chin, remained on the lower lip and chin.
Conclusions: In the literature, iatrogenic injury in oral surgery is the most frequent case of sensory disturbance of the inferior alveolar and mental nerve. INA damage can occur during third molar extraction, implant placement, orthognathic surgery, preprosthetic surgery, salivary gland surgery, local anesthetic injections or during the resection of benign and malignant tumors. The sensory disturbance, which could follow a damage of the INA, could be hypoesthesia, dysesthesia, hyperesthesia and anesthesia. These complications can be treated in two different ways: through observation or with the surgical decompression of the involved nerve. In this case report the surgeon decided to intervene immediately, because the CBCT showed that the fragments of bone were involving the MC and compressing the nerve.

Maxillary atrophy rehabilitation with trans-sinus implant: a case report

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Aim: Pneumatization of the maxillary sinus reduce, in many cases, the available bone in both width and height for the placement of dental implants in the edentulous posterior maxilla. In this area the quality bone is often less dense and more medullar than in the jaw. The purpose of the present study is describe the method of trans-sinus dental implant, solving the problem of the reduced height of the alveolar bone in the sub-antral region and reducing operating injury without using sinus lift and bone graft techniques.
Methods: A 68-years-old patient with partially edentulous maxilla attended the department of oral surgery of the University Vita-Salute San Raffaele. Clinical and radiological examinations showed presence of inadequate implant-supported prosthetic rehabilitations at the right upper maxilla and reduced residual bone in the sub-antral area. The treatment plan was proposed, consisting of distal implants removal and placement of trans-sinus tilted implants. Surgery started with antrostomy of the maxillary sinus and continued with the sinus membrane distal displacement. The implant was placed through the maxillary sinus cavity with an inclined position; the main objective was researching stabilization of the implant by engaging the residual alveolar ridge in second premolar and the cortical area of the anterior maxillary sinus recess. The implant site was gradually expanded and, where needed, the operator tried to improve inclination, deforming the anterior wall of the sinus, in order to allow the use of an extreme abutment for screwed prosthesis. We preferred to place a cylindrical dental implant with conical tip (3.8x25mm) engaging the nasal cortical bone with an angulation up to 45°. The emergence in molar position did not require cantilever. After an healing period of 6 months, the case was finalized by means of an acrylic prosthesis. The post finalization follow-up was at 12 months. Patient was included in a strict oral hygiene protocol.
Results: The low density bone was confirmed by intraoperative clinical assessment, performed during implant osteotomy preparation. The occurrence of early post-operative complications was limited to swelling and pain. Implant was not lost during the healing and follow-up period. Clinical follow-up at two years shows optimal tissues healing. Radiographic examination did not show any substantial changes in the periimplant bone volume in accordance with success rate parameters.
Conclusions: Trans-sinus dental implant can be considered a viable alternative for rehabilitation in severe posterior maxillary atrophy. This technique allows to optimize the inclination of the implant, condensing the surrounding basal bone and increasing primary implant stability. Significant improvement for the patient are also to be considered, namely reduced rehabilitation period and absence of risks associated with sinus lift and bone graft.

Incisional biopsy examination to diagnose oral potentially malignant disorders and oral squamous cell carcinoma: report of 100 cases

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Aim: Oral squamous cell carcinoma (OSCC) is the most

common oral and maxillofacial malignancy. If detected at an early stage, survival from oral cancer is higher than 90% at 5 years. OSCC is very often preceded by oral "potentially malignant disorders"; in 2005, the World Health Organization recommended the use of the term oral "potentially malignant disorders" (PMDs) instead of precancerous lesions, having greater potential for malignant transformation than other oral lesions. In these cases, often, patients presented widespread disorders in different sites of the oral cavity and for this they obviously arequire n incisional biopsy. Indeed, currently, the "gold standard" for the diagnosis o PMDs or OSCC involves three initial steps: a visual recognition of macroscopic features, selection of the most representative sites for biopsy, and histomorphology examination. So the limitations are: the choice of the site, the tendency of PMDs towards field cancerization, artifacts or insufficient tissue, intra- and interobserver variability. Also, patients should be followed-up at regular intervals. Currently, follow-up intervals are not evidence-based and are entirely based on clinicians' subjective assessment of clinical appearance and reported dysplasia in the specimens. The aim of this retrospective study was to determine the accuracy of incisional biopsy examination to diagnose PMDs or OSCC, also during follow-up.

Methods: This retrospective review included a sample 100 patients referred to the Department of Surgery, of Dentistry, Paediatric and Gynecology, University of Verona, during the period from 2007 to 2017, who presented the following oral lesions: leukoplakia (idiopathic or due to smoking), erythroplakia, oral lichen planus, and who also were subjected to incisional biopsy. All data as demographics, habits (smoking and alcohol) and clinical features of the lesions (site, clinical features, morphology and color) were collected in a dataset. For each patient the clinical diagnosis formulated during the first visit was also recorded. The photographic records were collected in order to record not only the clinical features of the lesion, but also for the purpose of recording the site in which biopsy sampling was performed. Simple visual examination is accompanied with adjunctive techniques as toluidine blue for subjective interpretation of dysplastic changes.

Results: Considering the period from 2007 to 2017, 100 patients involved in the study were: 57 females and 43 males; their age range was 27-86 years. The majority of the lesions (n=31) appeared clinically as plaque, 23 were erosive lesions, 30 were papular/reticular, 8 were mixed plaque and erosive lesions, and 8 were ulcerative lesions. The pathological diagnosis identified the presence of 51 cases of Oral Lichen planus, 31 cases of oral leukoplakia, 10 cases of Proliferative verrucous leukoplakia and 8 cases of erythroleukoplakia. No cases were found with insufficient tissue provided in the biopsy specimen or sampling error. Also, during follow-up period, 21 patients were subjected to incisional biopsy (also with toluidine blue); so, 9 cases of OSCC were diagnosed: in 5 cases patients' fist diagnosis were oral lichen planus, in 4 cases were erythroleukoplakia.

Conclusions: The data collected indicated a diagnostic concordance with final pathologic results of incisional oral biopsy. The clinical knowledge (in association with the use of adjunctive techniques as toluidine blue), the quality of the samples sent to the pathologists and the communications between oral surgeon and pathologist are important for a correct and timely diagnosis of PMDs or OSCC.

Influence of sub-crestal implant positioning on marginal bone maintenance: a 9-year cross-sectional study

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Aim: To the best of our knowledge, whether subcrestal implant positioning might be deleterious for the maintainance of peri-implant health is still a matter of debate and research efforts are currently under way to shed light on this important topic for every-day clinical practice. Indeed, it has been widely recognized that during bone remodeling some crestal bone height is lost and this process seems to vary among brands and implant designs. At the same time, although conclusive evidence concerning the influence of implant-abutment interface upon peri-implant bone loss is currently lacking, it might be considered a strategic area both for biological and technical complications. The main outcome of the present cross-sectional study was the medium-long term evaluation of subcrestally-placed dental implants with internal connection and platform shifting. Hence, marginal bone loss, peri-implant probing depth and bleeding on probing were considered as surrogate outcomes.

Methods: In the present cross-sectional study 93 patients requiring implant-supported or implant-retained dental prostheses between 2008 and 2018 were considered. Patients were selected from high-care setting private dental offices after signing a specifically designed consent form for scientific purposes. On the contrary, patients presenting with uncertain or incomplete documentation were excluded. Only Megagen dental implants, namely, AnyRidge, AnyOne, EZ or Exfeel were taken into account. On the whole 438 dental implants were considered in the statistical analysis. The implant

lenght varied between 7 and 15 mm while the implant diameter varied between 3.3 and 6.5 mm. Overall, 234 implants were placed in the upper arch, whereas 195 dental implants were placed in the lower arch. The whole observational period ranged between 2 and 8 years from prosthetic loading. Most patients were in good general health at the time of implant positioning. On the other hand, 4 patients suffered from diabetes while 15 patients reported to smoke more than 15 cigarettes a day. All implants underwent intraoral radiographs in order to evaluate peri-implant marginal bone loss over time. Such measurements were performed by means of the ImageJ software (National Institute of Health) via the evaluation of the distance between the implant shoulder and the bone peak both measially and distally.

Results: Through the evaluation of 438 dental implants a 100% cumulative implant survival rate is reported after a mean follow-up of 5 years. The mean marginal bone loss at baseline amounted to 0.05±0.03 mm. Otherwise, concerning peri-implant probing pocket depth a mean value of 2.7±1.3 mm is reported in the present study. Additionally, based on our findings, 14 out of 438 (3.2%) examined dental implants suffered from peri-implant mucositis while no implant was diagnosed with peri-implantitis.

Conclusion: Subcrestally-placed dental implants with internal connection and platform shifting seem to be a reliable solution at the medium term follow-up. On the basis of the current knowledge, further well-conducted long-term studies with adequate sample size and follow-up are required to address the clinical validity of subcrestally placed dental implants.

Surgical management of patients under antithrombotic treatment

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Aim: Surgical management of patients under antithrombotic treatment needs special care to reduce the risk of perioperative bleeding, which is three times greater than in healthy population. The aim of this paper is to provide surgical technique indications for tooth extractions and to indicate the correct post-operative management of the clot, in order to minimize the risk of bleeding complications.

Methods: First of all, in order to manage any post-operative complications, surgeries should be performed in the morning or early in the afternoon, and within the first days of the week, to avoid that complications occur when the dental clinic is closed. Moreover, in the event of multiple extractions, it is advisable to divide surgical treatment into several sessions, to expose a less extensive vascular bed and to perform sessions of shorter duration. The use of anaesthetics containing vasoconstrictor is not contraindicated, as they offer the advantage of both a bloodless surgical field and a hemostatic effect. Nevertheless, the surgeon should consider the risk of adrenaline-rebound effect. It is therefore advisable to monitor the patient for at least half an hour after surgery if an adrenaline-containing anaesthetic has been used. It is also useful to minimize surgical trauma both on hard and soft tissues. Flap incisions should be avoided and, if they are really necessary, flap-elevation should not exceed the mucogingival line on the buccal side and should be avoided on the lingual side of the mandible, especially in the molar region, to avoid blood spreading in the deep anatomical spaces, where there are greater chances of diffusion, and the surgeon would have greater difficulties of both inspection and access. If bone removal is needed, for surgical access or bone margin remodelling, the smallest quantity of bone tissue should be removed. Accurate curettage and rinsing of the surgical field are also advisable to avoid both the presence of residual bone chips from drilling and bleeding due to the residual granulation tissue. Local haemostatics are also useful to improve hemostasis, and a criss-cross horizontal mattress suture is advisable to press and stabilize gingival margins. In case of surgeries involving masticatory areas, clot stabilization can be improved by using pre-operatively manufactured customized protective plates or immediate prostheses, which also avoid that residual opposing teeth may exert any post-operative trauma on the surgical wound. Finally, in the postoperative period, the patient should maintain good oral hygiene and, if analgesic drugs are needed, those which do not have a synergistic effect with the antithrombotic drug should be chosen.

Evaluation of the efficacy of lornoxicam and flurbiprofen on postsurgical management of pain and perioperative sequelae following third molar surgery: a randomized, controlled, clinical trial

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Aim: The aim of this study was to evaluate the efficacy of Lornoxicam versus a commonly used anti-inflammatory drug (flurbiprofen) and a placebo in the management of postoperative discomfort after the surgical removal of mandibular third molars. The null hypothesis was that there would be no difference

between the three protocols analysed.
Methods: Ninety-one patients who needed surgical extraction of an impacted mandibular third molar were selected for the study. The study was performed according to the CONSORT (Consolidated Standards of Reporting Trials) guidelines. The sample size calculation was performed taking into account the identification of the three groups, with an effect size of 0.40, alpha= 0.050, and with a power level of 0.80 for pain, which represented the primary variable selected for the analysis. The primary variable pain presented a difference between groups of 0.62 (mean) and a standard deviation (SD) of 0.73. The assignment of each patient to a study group was determined by means of a randomization technique using sealed and numbered envelopes; details of the sequence were concealed. An operator not involved in the subsequent experimentation generated a random allocation sequence, in a 1:1:1 ratio, for the distribution of the patients to one of the three study groups, performed with a permuted block design using a computer generator. All subjects were randomly allocated to receive one of the following treatments twice a day for 5 days after surgery: placebo (n = 29), flurbiprofen (n = 31), or lornoxicam (n = 31). The primary outcome was postoperative pain, evaluated using the visual analogue scale (VAS) score at 30 min, 2, 6, 12, 24, 48 h, 7 and 10 days following surgery. The secondary outcomes chosen were changes in postoperative swelling and maximum mouth opening values compared to preoperative ones, obtained at each follow-up session (i.e. at 24, 72 hours, 5, 7 and 10 days), of the different measurements. The Kruskal–Wallis test was applied to compare pain scores, facial distances, and maximum mouth opening among the three groups at each observation time point. The Mann–Whitney test was applied for two-by-two comparisons. The Friedman test was applied for the comparison of the measurements at the different observation time points within each group. The Wilcoxon test was used to perform two-by-two comparisons between time observations, for each follow-up session. For each treatment, the area under the curve (AUC) was calculated with a relative 95% confidence interval (CI) and significance. The significance of the P-value was set at 0.05.
Results: Compared to placebo, treatment with flurbiprofen and lornoxicam was characterized by an improvement in the primary outcome. Moreover, the treatment with lornoxicam presented significantly lower median pain scores at 2h ($p<0.001$) and at 6h ($p=0.016$) compared to flurbiprofen and at 2h ($p<0.001$), 6h ($p=0.01$), and at 24h ($p=0.018$) after surgery compared with placebo. Swelling and maximum mouth opening values were not significantly different between the groups at each follow-up session. Regarding the AUC, for the placebo, an AUC=0.475, $p=0.208$ and for Flurbiprofen an AUC=0.501, $p=0.937$ was obtained, which were not significant; for Lornoxicam, a higher AUC=0.614 with a p-value<0.001 was recorde.
Conclusions: This trial demonstrated that treatment with lornoxicam showed a decrease in the incidence and severity of pain in the first postoperative phase following third molar surgery compared to flurbiprofen and placebo.

Therapeutic solutions in the second mandibular molar's eruption anomalies

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Aim: With regard to the prevalence and incidence of eruptive problems in the second mandibular molars, the literature provides quite variable results, with percentages that are still relatively low. However, at the same time, many authors believe that this pathological condition is underestimated because it is frequently not reported, being rarely associated with a particular symptomatology. The aim of this work is to analyze the emerging aspects concerning the therapeutic procedures of a problem that is often underestimated from an epidemiological point of view and, above all, from the clinical perspective, such as the inclusion of the second mandibular molars.
Methods: 7 patients were included in the study: 4 patients were treated with surgical-orthodontic technique through the application of TAD (Temporary Anchorage Devices), 1 case was treated with conservative surgical technique with germectomy of the adjacent third molar and orthodontic banding of the arch; 1 case was treated with conservative surgery through a prior alignment associated with the use of a brass wire. Finally the last patient underwent radical surgery and then extraction of the second mandibular molar.
Results: Patients treated with surgical-orthodontic techniques through the use of a temporary anchor, in our case the miniscrews, have obtained excellent results: in one year the tooth was subjected to uprighting, thus reaching the arch and obtaining the result we wanted. On the other hand, with the three-dimensional orthodontic adjustments, it has been possible to obtain a functional position of occlusion, except for the patient number 1 as fixed orthodontic therapy is still being perfected. For the patient treated with germectomy of the third molar, the removal of the obstacle to the eruption was decisive for the repositioning of the tooth,

which (thanks to orthodontic adjustments) reached a functional position of occlusion. In the case of the patient treated with the preventive alignment, it was possible to obtain the space for the normal completion of the eruption, removing the obstacle represented by the undercuts of the mesial tooth and giving a better axis of eruptionf. Finally, for the patient treated with the radical surgery technique, that is the extraction of the second mandibular molar included, we do not have the definitive results: space was obtained for the eruption of the adjacent third molar, but it is not possible to predict what the actual result will be.

Conclusions: In conclusion it is possible to state that the inclusion of the second mandibular molars, although not with frequent occurrence, cannot be underestimated under the clinical aspect. When facing this pathological condition, it is important to approach it in the best possible way, without excluding the possibility to recover the tooth. The therapeutic solutions currently available are of medium complexity and the use of orthodontic mini-screws to obtain uprighting does not require special knowledge nor does it present excessive difficulties. This type of approach seems to be the most indicated one when the included tooth is impacted against the adjacent molar, especially when the inclination of the tooth is such as to suggest the impossibility of a spontaneous eruption along the normal axis.

Cystectomy: evaluation of bone healing through CBCT and fractal analysis

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Aim: Surgical treatment of bone jaw cysts has been the subject of discussion in the literature for a long time, but in substance the most widely applied approach consists in the total enucleation of the cyst or cystectomy, with or without the use of grafts to fill the residual bone cavity. The purpose of this study is to find an answer to the question of whether or not there is the possibility of accelerating bone healing, using appropriate aids, and if it were possible to obtain a greater level of bone regeneration in a reasonable time, especially in view of further interventions, such as dental implant rehabilitation, in the region affected by the cyst.

Methods: The spontaneous healing process, starting from the clot, was compared with other therapeutic possibilities. PRF, a platelet concentrate that should lead to faster and more effective healing; already several authors in the past have shown how the PRF, used following cystectomy, allows to accelerate the regeneration time and to reach a complete recovery in six months. The third biomaterial included in the comparison is a gelatin sponge; such materials are frequently used in clinical practice, as they are easy to find, and have good biological potential: clot stabilization, infection prevention and haemostasis control. In the past, authors observed a 20% higher bone regeneration in the residual cavities of the cyst than the sites where they had not been used, exposing a sort of collagen stimulating effect. Once the 17 patients examined were recruited, it was expected 1 year from the surgery to proceed with the evaluation of the healing, conducted solely on the basis of numerical data obtained through the fractal analysis of the radiographic images obtained with Cone-Beam CT. The use of a computerized analysis method represents a good compromise between reliability of evaluation and cost, both biological and economic. The importance of this analysis was confirmed in an in vitro study that investigated the accuracy of fractal analysis in measuring bone quality on CBCT images, supporting the ability of this method to detect changes in the mineral density of bone tissue, contrariwise to the evaluation of HU units. For each patient the cyst area was analyzed from the pre and post operative Cone Beam CT scan, performed 1 year apart; an adjacent healthy bone area was used as a reference site for bone density. The parameters considered are the fractal dimension, the numerical equivalent of microarchitecture, the irregularity, the roughness of the bone, and the lacunarity: a scale of measurement dependent on the heterogeneity of the bone surface texture. The data were examined using the ANOVA statistical analysis; the null hypothesis provides that the differences observed between the groups are due only to chance.

Results: The average data obtained from the fractal analysis of the pre- and post-operative radiographs, and of the control site are: 0.934, 0.972, 1.006 for the PRF group; 0.921, 0.978, 1.04 for the clot group; 0.934, 0.981, 1.088 for the haemostatic sponges group. The mean values of the lacunarity in the pre, post-operative and control stages are: 0.165, 0.159 and 0.148 in the PRF group; 0.424, 0.242 and 0.185 in the clot group; 0.368, 0.341 and 0.154 in the haemostatic sponges group.

Conclusions: Finally, the statistical analysis of the collected values leads towards a result consistent with what has already been stated in the literature: the clot is actually the best filler and allows to have the best desirable healing; however, we do not feel able to totally cancel the biological value of biomaterials such as PRF and gelatin sponges. The results we have reported, in fact, must be observed taking into account the limits of this research, such as the small sample size and the wide variability in it,

both in terms of type, size and location of the lesions examined and of the demographic variety of the subjects, which could have negatively affected the results. Our future goal is therefore to increase the number of patients included in the study, and to be able to define a more detailed case series by dividing the samples into groups based on different types of grafts to fill the residual bone cavity.

Healing of a post-extraction socket in a patient underwent bisphosphonates therapy: a histological study

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Aim: Although anti-resorptive drugs, among others bisphosphonates, have largely been associated with development of osteonecrosis of the jaws and impairment of osseous healing, it has been reported that they may inhibit bone resorption and enhance bone regeneration, preventing loss of both vertical and horizontal height of residual alveolar ridge after tooth extraction. Therefore, the aim of the present study was to clinically and histologically assess the healing pattern of a post-extractive socket after 4 months in a patient undergoing oral biphosphonates therapy.
Methods: A 82-year-old female osteoporotic patient in treatment with oral nitrogen-containing bisphosphonates for 4 years who needed tooth extractions and subsequent dental implant rehabilitation, was enrolled in the present study. The subject referred no history of cancer or radiotherapy and no co-morbidities. The patient underwent drug-holydays 3 months before tooth extractions. Four months after healing, during implant sites preparation, 2 bone biopsies were harvested using a 3 mm diameter trephine bur; the first sample was harvested from the healed post-extraction site (Test), the second one from the contiguous edentulous bone ridge (Control). The specimens were processed for histological analysis and observed under light microscopy. Then, histomorphometric analysis was performed.
Results: The healing was uneventful, and no signs of inflammation were observed. The histological analysis revealed in both specimens vital bone with no evidence of empty lacunae or morphological alterations of osteocytes. No signs of inflammatory infiltration and/or bacterial infection were detected. Lamellar bone was observed in most areas of both samples, however, small foci of woven bone could be appreciated. Histomorphometric analysis showed a greater amount of trabecular bone in the test (640.17%) than control (59±0.15%) site, although no statistically significant difference was observed.
Conclusions: Within the limitation of the present study, it could be concluded that the anti-resorptive drugs therapy seemed not to alter the healing pattern of a post-extraction site after 4 months of healing. Nevertheless, the risk of osteonecrosis can not be excluded in the medium and long-term, especially in case of implant-supported prosthesis rehabilitations. Therefore, further studies with a larger sample size and a longer follow-up period should be prospectively conducted in order to support the results obtained in the present preliminary study. Moreover, a pre-operative careful case history and the observance of international guidelines in treating patients taking anti-resorptive drugs are mandatory.

Complications associated with the clinical use of orthodontic miniscrew implants: A systematic review

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Aim: To evaluate the complications associated with the clinical use of orthodontic miniscrews by systematically reviewing the best available scientific evidence.
Methods: A survey of articles published up to June 2019 investigating the complications associated with miniscrews insertion, in both maxillary and mandibular jaws, was performed using 6 electronic databases (MEDLINE, Cochrane, Web of Science, LILACS, BBO, and ClinicalTrials.gov) without restrictions relating to publication status or language of publication. Hand search of reference lists of selected articles will be also performed. Clinical studies on humans or case reports or case series reporting complications associated with the use of orthodontic miniscrew implants were included. Two authors performed independently study selection, data extraction, and risk of bias assessment.
Results: 24 articles were included and an individual analysis of the selected articles was undertaken. The risk of bias assessment revealed low methodological quality for all the studies included. The included studies were designed as case report (11), case series (1), retrospective study (8), prospective study (3), preliminary study (1). The most frequent complication reported was root injury (5 studies, 127 screws) after

inter-radicular miniscrews placement with associated periradicular lesion (4 studies, 4 screws), vitality loss (7 studies, 7 screws), pink discoloration of the tooth and transitory loss of pulp sensitivity (1 study, 1 screw). Chronic inflammation of soft tissue surrounding the miniscrew, both in alveolar and extra-alveolar region, with formation of granulation tissue or mucosa overgrowth (6 cases, 15 screws) was also reported in some studies. Other complications reported were alveolar bone exostosis (1 case, 2 screws), lesion of buccal mucosa at the insertion site (44 cases, 98 screws), necrotic mucosa (2 cases, 2 screws) traumatic lesion of the upper inter-incisal frenulum (1 case, 1 screw), protrusion of the miniscrew in the maxillary sinus (4 cases, 60 screws), Complications were also found immediately after miniscrew removal such as perforation of nasal floor (3 cases, 3 screws), secondary bleeding (7 cases, 7 screws) and miniscrew fracture (3 cases, 3 screws).

Conclusions: Despite the low level of evidence from the studies included in this systematic review, the documented complications would suggest that a preliminary evaluation of the patient-related risk factors for miniscrews insertion is clinically advisable.

Pediatric odontogenic tumors and keratocysts: bone regeneration and implant rehabilitation protocol

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Aim: Latest literature reports that 12,7% of all odontogenic tumors and keratocysts affect pediatric patients, regardless they are in primary (0-5 years), mixed (6-12 years) or permanent (13-17 years) dentition. The most common odontogenic lesions in pediatric patients are ameloblastoma (10-15%), keratocysts (often sign of Gorlin's syndrome), adenomatoid odontogenic tumor (which has 69% of cases between 10 and 19 years), odontoma (that has maximum incidence in the first two decades of life) and odontogenic mixoma (8.5-11.6% of pediatric odontogenic tumors). They often can be associated to one or more impacted teeth. Because of locally invasive behavior of some of these lesions, the surgical excision is often associated to the extraction of the nearby healthy or impacted teeth, resulting in both bone and teeth loss that can be treated only in adult age and after a long period of follow-up without recurrence. This study reports bone regeneration and implant rehabilitation protocol in 7 patients treated for odontogenic tumors and keratocysts in pediatric age at the Complex Operating Unit of Odontostomatology of "Aldo Moro" University of Bari, between 1998 and 2017.

Methods: During their childhood, 7 patients (4 males and 3 females) underwent: clinical examination, panoramic radiograph and computed tomography to evaluate the real extension of the lesions. Standard blood tests and electrocardiogram were performed to prepare patients to surgery. Primary diagnosis was performed through histological exam of specimens collected with fine needle aspiration biopsy. Surgical excision was conservative for all cases. Bone regeneration, contextual to excision, was performed with a hyaluronic acid and amino acids – based gel. The whole lesions and all teeth extracted underwent histological exam, in order to obtain the conclusive diagnosis. Patients underwent monthly clinical follow up and panoramic radiographic check-up every year. Once the skeleton completed growth, patients underwent cone-beam computed tomography with dental scan and the implant replacement of the extracted teeth.

Results: The 7 patients described in this study underwent surgical excision of lesions at the mean age of 12 years; 4 patients had 12 odontogenic keratocysts of the jaws (later diagnosed as Gorlin's Syndrome), 2 had dentinogenic ghost cell tumors and 1 had odontogenic myxoma. All lesions healed without local recurrence during the follow-up (mean = 5 years). The bone regeneration was performed without adverse effects, and patients successfully received implants. All implants showed a good survival at the mean follow-up of 2 years.

Conclusions: Even though surgical excision of odontogenic tumors and keratocysts can result in premature teeth-loss, our data suggest that a successful bone regeneration can be performed in these patients, providing a good bone level for implant rehabilitation. Further studies, especially randomized controlled trial or wide multicentre observational studies could focus on this kind of patients, in order to provide conclusive evidence about this rehabilitation protocol.

Peri-implant medication-related osteonecrosis of the jaw (MRONJ) in patients taking antiresorptive drugs: a observational study

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Aim: Medication-related osteonecrosis of the jaw (MRONJ) is a severe side effect of antiresorptive and antiangiogenic drugs used for bone metastases of oncologic diseases and osteoporosis. Peri-implant MRONJ can be classified as

surgery-triggered and not-surgery triggered. A further classification considers the bone destruction pattern of necrosis: "peri-implantitis like", characterized by progressive loss of the surface bone-implant, and "en block type", which keeps the bone-implant bind but affects the basal bone resulting in bone sequestration. The aim of this study is to report cases of MRONJ associated to dental implants referred to the Complex Operating Unit of Odontostomatology of "Aldo Moro" University of Bari from 2006 to 2019.

Methods: Authors analysed a database comprehending 283 patients affected by 366 lesions histologically diagnosed as MRONJ. Peri-implant MRONJ affected 72 patients, resulting in 93 lesions. All patients were treated according to our diagnostic and therapeutic management for MRONJ. They underwent panoramic radiograph and computed tomography to evaluate the real extension of necrotic areas and according to the "Dimensional Staging System" of MRONJ. Then, the surgical resection of necrotic bone was performed, after an interruption period of both antiresorptive and antiangiogenic therapy of 3-6 months, and after almost 3 cycles of antibiotic therapy (ceftriaxone 1g daily i.m. and metronidazole 250mg twice a day per os). During surgical treatment all dental implants and all involved teeth were removed. Histological exam was performed to all bone specimens. Patients underwent monthly clinical follow up and panoramic radiographic check-up every three months for a mean time of 3 years.

Results: From 2006 to 2017, 72 patients with peri-implant MRONJ were treated in our unit, 63 of them were women and 9 were men (M/F ratio = 1:7). The mean age was of 72.10 $\pm$ 13.72 years. 51 patients received antiresorptive drugs because of osteoporosis while the other 21 were oncologic patients (12 with mammary gland carcinoma and 9 with prostatic carcinoma); 34 patients received oral Alendronate, 12 received intravenous Zoledronate, 8 oral Risedronate, 12 subcutaneous Denosumab and 6 received off-label co-administration therapy. The patients developed 93 lesions, 9 surgery-triggered and 84 not surgery-triggered, involving 161 implants among 210. According to the "Dimensional Staging System", 8 lesions were at stage I, 31 at II and 54 at III. 59 peri-implant MRONJ affected the mandible (42 in posterior regions, 17 in anterior region) and 34 affected the maxilla (26 in posterior regions, 8 in anterior region). Bone destruction pattern was peri-implantitis-like in 30 lesions, while was en block type in the other 63. All treated MRONJ healed without recurrence or complications.

Conclusions: Caution is required in planning the implant rehabilitation in patients with clinical history of intake of antiresorptive drugs, stratifying the risk of MRONJ for each patient considering individual risk factors, and avoiding implant placement in areas with documented high failure rate of osseointegration. Furthermore, the high incidence of en block type of peri-implant MRONJ suggests that the basal bone that hosts the implant is unable to correctly respond to mechanical stimulation, which could cause the necrosis in this kind of patients.

Coronectomy vs Extraction of impacted mandibular third molar. A split-mouth evaluation on four cases with symmetrical condition except for the relationship between the roots and the inferior alveolar nerve

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Aim: Coronectomy of the lower third molar consists in the intentional partial removal of the tooth, leaving in situ the portion of the roots still vital in strict relation to the alveolar inferior nerve. It represents an alternative to surgical extraction with high risk of neurological injury. The purpose of this work is the split-mouth comparison between coronectomy and the extraction of the impacted lower third molars to verify, with more evidence, the reliability of this procedure.

Methods: During the last 2 years, 4 patients (all female) underwent coronectomy of the third lower molar and surgical extraction on the other side. The option of coronectomy was chosen after an X-ray assessment on OPT and CBCT of intraoperative NAI injury risk. In one case, the surgery was performed in the same time on both sides in general anesthesia. In all cases, a complete closure of the soft tissue was obtained. All patients were clinically assessed at 1 week, 1, 3, 6, 12 months and annually thereafter. A periapical X-ray was taken at 1, 3, 6, 12 months. The average follow-up was 21.2 months.

Results: No patients reported complications and no differences were noted between the two sides, with a good healing of soft tissues without any dehiscence. The distal periodontal probing, performed 3 months after operation, was <4 mm distally to the second molar. No differences in bone healing were noted radiographically, with a coronal migration of the roots and a complete bone impaction in all cases of coronectomy. No differences were detected in the level of bone distally to the second molar in respect to

the enamel-cementum junction.
Conclusions: No other reports in literature verified with such evidenced metodology the effectiveness of coronectomy as an alternative to extraction in risky situations. More cases and longer follow ups with this format of investigation will definitively confim the usefulness of this procedure in deleting the neurological problems associated to the mandibular third molar management.

Soft tissue healing in patients undergoing antiplatelet and anticoagulant therapy in oral surgery: a controlled clinical study

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Aim: Anticoagulant and antiplatelet agents are prescribed for patients who are at high risk of thromboembolic events. These include patients who have experienced deep-vein thrombosis or pulmonary embolism or who have non valvular atrial fibrillation. Anticoagulants include vitamin K-antagonist warfarin and the newer direct oral agents, including the direct thrombin inhibitor dabigatran and the factor Xa-inhibitors apixaban, rivaroxaban, and edoxaban. Antiplatelet agents include clopidogrel, ticlopidine, prasugrel, ticagrelor, and/or aspirin. The currently available literature identifies a low hemorrhagic risk in these patients during simple dental extractions. The purpose of the study is to compare post-extraction healing in patients undergoing anticoagulant and antiplatelet therapy with respect to healthy patients.
Methods: Thirty patients who visited the Department of Oral Surgery of the University Federico II of Naples, (Italy) were enrolled in this controlled study.Patients of both sexes were recruited, from 18 to 95 years old, able to sign the informed consent form. Patients undergoing anticoagulant or antiplatelet therapy who underwent extractions of single-root teeth were included. The exclusion criteria were: pregnancy or lactating, patients with concomitant diseases that compromise the healing processes of the post-extraction alveolus (diabetes, use of bisphosphonates,), immunosuppressed patients or in therapy with corticosteroids, patients undergoing radiation therapy and/or chemotherapy or with HBV, HCV, HIV. Patients that did not comply all the clinical checks were excluded during the follow up. Patients were divided in three groups (10 subjects for each group): the first one consisted of patients undergoing anticoagulant therapy, the second group consisted of patients undergoing antiplatelet therapy and the third group of healthy patients (control). The extractions were made as atraumatically as possible. All sites were closed with resorbable suture. Photographs were obtained before and immediately after surgery and patients were followed after 3-7 (coinciding with removal of the sutures) -14 and 28 days. The photographic images were provided to a dentist not included in the study, who was asked to evaluate the healing, giving a score from 1 to 5 (very poor, poor, good, very good, excellent), based on the index of Landry et al, which includes the evaluation of: tissue color, presence of granulation tissue, incision margin (epithelialization and exposition of connective tissue), presence of suppuration or not. A comparison between the groups was performed using the paired t-test. A P-value <0.05 was considered to indicate a statistically significant difference.
Results: For all patients the post-operative recovery was uneventful without any kind of post-extractive complications. On the third and seventh day the antiplatelet group showed a higher level of healing compared to the other two groups, but there were no statistically significant differences between groups ($p> 0.05$) at each timepoint considered.
Conclusions: The higher scores in the group of the patients treated with antiplatelet indicates that therapy with this kind of drugs could positively affect healing process after dental extractions. With a greater number of cases, if these trends are confirmed, the use of antiplatelet agents could be used in patients with metabolic difficulties and healing delays (such as diabetes) or in patients with reduced osteomucous metabolism (patients with previous chemotherapy, bisphosphonates). A larger sample of patients is necessary to confirm this result.

The application of thermography in dentistry. Validation of a new imaging technique for the evaluation of dental anxiety: experimental clinical study

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Aim: The purpose of this study was to determine if dental anxiety could be measured objectively using Thermal Infrared Imaging, a pioneering, alternative, fast, contactless, non invasive and favourable method for detecting stress as well as anxiety. Thermal Infrared

imaging is a technique capable to record the natural emitted body's thermal radiation in the infrared part of the electromagnetic spectrum and convert it to a visible thermal image, that are coloured thermal images of temperature distribution of the target where every single pixel is a temperature measurement. It is an ideal tool to monitor emotional status; for example stress and anxiety activate the Autonomic Nervous System due to the "Fight or Flight" response that, in turn, affects blood flow, muscular contraction and variations of cutaneous temperature detectable by a thermal camera.

Methods: Thanks to a thermal camera connected to a PC where a GUI Matlab was developed, two thermal measurements of the face of patients were acquired: during the first measurement at baseline the patient was sitting on the dentist's chair and no stimuli were given. Subsequently a second thermal registration called "visita" was done, during which the dentist carried out the medical examination. On this thermal registration five ROI (Region of Interest) at the level of the nose, hear, cheek, head and chin were considered. The difference of temperature assessed between the ROI at baseline and the ROI of "visita" were correlated to the score of the patient of the Italian version of the MDAS questionnaire for assessing Dental Anxiety, using the Pearson Correlation Coefficient referred to a P-value <0.05 on a sample size of 30 patients.

Results: The Index of Pearson of 0.78 referred to a P-value < 0.05 identified a statistically linear significant correlation between the thermal imaging measurements and the scores of MDAS questionnaire.

Conclusions: The instrument has good capability of objectively identify and quantify the presence of Dental Anxiety. In the future it could be proposed as a new method of diagnosis and management of Dental Anxiety resetting up the GUI Matlab and customizing it on patient's need. It could find many fields of application, for example to understand what exactly causes stress during a dental procedure, to monitor the increase of anxiety in patients at risk, to compare dental procedures in terms of stress and discomfort for the patient and also to evaluate the anxiety of the operator during dental procedure to improve technical support to the dentist.

Complication rates associated with third molar extraction procedures: a systematic review

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Aim: Over the last two decades, the incidence of major and minor complications associated with oral surgical procedures has drastically declined. The purpose of this review was to report complication rates of third molar extraction procedures.

Methods: We performed an electronic search to identify relevant literature indexed from April 1985 to March 2018 using several online databases (Pubmed, MEDLINE, and the Cochrane Library). Only observational and international studies published in English and investigating the incidence of third-molar-extraction complications were included in this analysis.

Results: A total of 1158 studies were identified. Among them, 13 articles met the inclusion criteria. Overall, 8333 extractions had been performed in 3760 patients. The main complications were: alveolitis in 543 cases (12.3% of extractions, 14.4% of patients); hypoesthesia or paresthesiaof inferior alveolar nerve in 61 cases (1.4% of extractions, 1.6% of patients); postoperative infections in 37 cases (0.8% of extractions, 1% of patients); hypoesthesia or paresthesia of lingual nerve in 12 cases (0.3% of extractions, 0.4% of patients). Older age, position of wisdom teeth and presence of systemic comorbidities as diabetes were consistently associated with a higher incidence of peri- and post-procedural complications. Conflicting data still exist with regard to the best antibiotic regimen associated with lower infectious complication rates.

Conclusions: Incidence of third-molar-extraction complications is relatively low, with a declining trend over the last decades. Elderly patients, as well as those with other medical conditions appear to be more prone to complications.

Moreover, there is conflicting evidence with regards to antibiotic prophilaxis. Further research is necessary to identify the risk factors predisposing to complications, as well as provide definitive conclusions regarding the best surgical technique.

Anti-oedematous and anti-inflammatory protocol in surgery of lower third molars: preliminary results of a prospective randomized double blind study

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Aim: The aim of this clinical study is to evaluate and compare the relative efficacy of two different dosages of

dexamethasone, i.e. 2 and 4 mg injected submucosally to reduce postoperative discomfort, e.g. trismus and oedema after mandibular third molar surgery.
Methods: A prospective randomized double blind study is still being conducted on 150 patients requiring surgical removal of an impacted third molar. Selected patients are divided randomly into three groups of 50 patients each: group I (literature's gold standard) patients received one regimen single dose of 4 mg dexamethasone submucosally, group II (test) received one regimen single dose of 2 mg dexamethasone submucosally, and group III (control group), no dexamethasone was given but only received injection of normal saline submucosally. The drug was administered after the wound closure through silk sutures. Baseline measures were done pre-operatively as inter-incisal mouth opening width and three linear measurements for facial swelling. Each patient was instructed to assume 1 gr paracetamol exclusively. For pain assessing patients were required to take note on a survey form through an VAS scale and the paracetamol capsules amount. The postoperative sequelae were assessed using the same linear measurements on the second and seventh postoperative day. The sutures were removed on the seventh day post-surgery.
Results: As compared to group III, group I showed statistically significant reduction in trismus and swelling whereas no statistically significant difference were found between the group II and group III. The statistical analysis showed that the dexamethasone treatment is more effective on the male gender.
Conclusions: It can be concluded that dexamethasone is effective in curtailing the postoperative oedema and trismus of lower third molar surgery but have negligible analgesic effect, though keeping in mind that is still a work in progress because the sample size is yet to be reached. As no statistically significant di-erence is found between both the group II (2 mg) and control group, so within the confines of our study, it may be concluded that 4 mg dexamethasone can be given safely to reduce the postoperative edema after the third molar surgery. Due to the gender pattern that has emerged from our statistical analysis, further high-quality study are needed to confirm this findings.

Anatomical and functional study of the retromolar neuro-vascular bundle: surgical implications

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Aim: Retromolar canal is an anatomical structure of the mandible that branches from the mandibular canal behind the third molar and extending to the retromolar foramen in the retromolar fossa. This canal might conduct accessory innervation to the mandibular molars or contain an aberrant buccal nerve. The identification of the retromolar canal has become an issue for the oral surgeons because of its clinical implications during several kind of surgeries such as third molar extraction, mandible branch withdrawal, cystic surgical approach, infrabony neoformations and defects. Aaim of this study was to calculate, through a radiological and statistical analysis, the prevalence of the retromolar canal in Caucasian subjects and to assess the main aspects previously studied in literature, such as type, shape, mono/bilaterality, angulation, height, diameter and distance from the third molar distal surface. Furthermore, histological content of the neurovascular bundle of the retromolar canal was evaluated.
Methods: Two hundred radiographic images obtained through CBCT (NewTom® VGi EVO®, Verona, Italy) were analyzed. The inclusion criteria included only Caucasian patients, with no distinction of sex and age that referred to the Radiology Department of San Raffaele Hospital for radiographic exams concerning the craniofacial district in which the mandibular bone structure was undamaged. Moreover, we reviewed the literature including all the previous studies concerning the radiographic analysis of the retromolar canal made from 2011 to 2019. The images were analyzed by only one operator, using 3Diagnosys® software (3DIEMME®, Cantù, Italy).
Results: Statistical analysis, accomplished through the classical inferential statistics, showed that the retromolar canal was present in 71% of the cases; 40% of those were only on one of the mandibular branches, while in the remaining 31% the retromolar canal was present on both sides. Only 29% of the radiographic images did not show any retromolar canal.
Conclusions: The results suggest that the frequency of the retromolar canal is significant, with a possible relevance in the surgical approach of the mandibular retromolar area. The presence of this canal, properly studied with CBCT, may warn the clinicians about the possibility of an inadequate pre-surgical anesthesia, in addition to a local intra-operative bleeding and post-operative alterations of the symptomatology of the patient in the third molar area.