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Precision of implant positioning in computer guided surgery designed on data acquired with digital methods in totally edentulous patients

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Background: Several publications focus on the accuracy of guided surgery (GS). In order to be able to perform GS in a total edentulous, it is necessary to overlap the patient's prosthesis to his CT scan. The "double scanning" technique is one of the procedures used for this purpose. Some radiopaque markers are applied on patient's prosthesis and two CT scans, one of patient wearing the prosthesis and one of the prosthesis alone, are performed. If the prosthesis was not congruent, the clinician would be forced to manufacture a new prosthesis before evaluating the case with a new TC. **Aim:** The accuracy of computer guided implant surgery designed and performed with digital methods is evaluated.

Materials and methods: 10 patients with total edentulism signed informed consent and underwent computer guided implant planning with CoDiagnostix, (Dental Wings). Patients' prosthesis was relined and some optically detectable radiopaque markers were installed on its surface. The overlap between template and CT was performed using the radiopaque features. The master cast alone was scanned and the image obtained was superimposed on the model+prosthesis scan using a series of holes created into the cast. Implant definitive position was decided on the basis of more than one project without patient excessive

radiographic exposure.

Results: 54 implants were analyzed. The linear difference (mm) between in vivo implants position and surgical designed implants position in the three planes of space were calculated coronally (0.74mm [0.38; 1.1]) and apically (0.90mm [0.52; 1.28]). The difference (degrees) between the computer designed planning and the effective angle obtained was also calculated (2.66 [4.06; 1.26]).

Discussion and conclusions: A recent systematic review reports an average coronal inaccuracy of 1.3mm (1.09; 1.56), average apical inaccuracy of 1.5mm (1.29; 1.62) and an average angular imprecision of 3.3 degrees (2.71; 3.88). The present study show encouraging figures compared to the average reported in the literature. The DICOM / STL technique has a double advantage. First of all, the surgical template can be create directly on digitized master model. This could result in a more precise surgical guide could result. Secondly, the production of the diagnostic wax-up after the CT scan can reduce both the technical and chair side time required to make a classic radiographic template. The possibility to create lots of different projects reduces patients' rx exposure.

Immediate versus delayed loading of post-extraction implants in the aesthetic zone: a prospective longitudinal study with 2-year follow-up

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Aim: The aim of this study was to assess implant survival in immediate loaded post- extraction implants in the

pre-surgical evaluation of mandibular third molars, oral surgeon must consider that the inclination of the third molar is biased by a not avoidable distortion, and that this distortion can give rise to a wrong assessment of the degree of difficulty of the surgery.

Histological analysis of bone healing following alveolar preservation technique by deproteinised bovine bone covered by a xenogenic collagen matrix

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Introduction: The aim of the present study was to histologically evaluate the new bone formation and the dimensional changes in tissues following two different healing protocols (16 weeks and 32 weeks) using deproteinized bovine bone mineral (DBBM) covered with a collagen matrix (CM) for alveolar ridge preservation in the aesthetic area frontal before implant placement.

Materials and methods: Sixteen patients (mean age 48.2 years), requiring the extraction of a single mono-radiculated tooth in the frontal area were recruited for the study. The surgical protocol was performed with great care to preserve the buccal plate and surrounding soft tissues. Each selected tooth was extracted using a minimally invasive technique. Subsequently, in each patient, the alveolus was filled with DBBM with 10% collagen (Bio-Oss® Collagen; Geistlich Pharma AG, Switzerland). A xenogenic reabsorbable CM (Mucograft®, Geistlich Pharma AG, Switzerland) was subsequently adapted to marginal soft tissues and positioned to cover the DBBM in order to promote primary tissue healing. A resorbable suture was placed on the wound to stabilize the CM and to allow a flap closure without tension. Following the tooth extraction, the vertical distance from the center of the buccal and palatal/lingual alveolar crest (AC) and the cemento-enamel junction (CEJ) of the adjacent teeth that was recorded using a periodontal probe. The buccal-palatal/lingual alveolar width and thickness was measured at the center of both buccal and lingual walls using a caliper. After the surgical procedure was completed, each patient was randomized for evaluation of short-term (16 weeks) or long-term (32 weeks) healing group protocol for subsequent implant placement. Moreover, after the elevation of the flap, a biopsy was obtained useful for histological analysis; therefore, a 4.0 mm diameter implant was placed into the surgical site. A Student

t-test was performed for the analysis of dimensional ridge changes and in changes of the histological parameters between the two groups. A value of $p < 0.05$ was set as statistically significant.

Results: Regarding the dimensional alveolar ridge variations, no significant difference were found, between groups, in the thickness of the buccal plate (short term 1.09 ± 0.26 mm vs long term 1.15 ± 0.31 mm) and in the CEJ-AC buccal distance change (short term 2.38 ± 0.22 mm vs long term 2.49 ± 0.26 mm) and in the palatal/lingual CEJ-AC distance (short term 2.41 ± 0.31 mm vs long term 2.37 ± 0.24 mm), respectively. Furthermore, there was no significant difference between groups in the buccolingual alveolar thickness ($P = 0.12$). However, the 32-week protocol resulted in a better new bone formation and fewer tissue dimensional changes ($P = 0.01$) compared to the 16-week protocol. The 16-week group presented a vital bone percentage of 35.58% compared to 47.76% of the 32-week group. Regarding the percentage of residual graft, there was no significant difference between groups (short-term= 34.23%, long-term= 25.43%).

Conclusions: This study indicates that there was significantly greater new vital bone formation by a xenograft protocol for the alveolar socket preservation with DBBM plus CM at 32 weeks compared to 16 weeks before dental implant placement.

Conservative surgical treatment of medication-related osteonecrosis of the jaws with Leukocyte-Platelet Rich Fibrin: preliminary results at nine months

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Background: The optimal treatment of Medication related osteonecrosis of the jaw (MRONJ) remains controversial; leading goals of the surgical treatments are to control the infection and the pain and to slow the progression of the disease and, when it is achievable, to remove all the necrotic bone promoting the complete tissues healing. In the latest years, conservative surgical treatments of MRONJ have been proposed and applied also in advanced stage of the disease. Recently, autologous platelet concentrates, such as Leukocyte-Platelet Rich Fibrin (L-PRF), are increasingly applied as a new approach to regenerate tissues in oral surgery as they release high quantities of growth factors, promoting angiogenesis and bone