IMPROVING THE RECONSTRUCTION OF DENTAL OCCLUSION USING IMPLANTS IN ELDERLY PATIENTS

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Abstract:

Immediate function has become an accepted treatment modality for fixed restorations in completely edentulous jaws. Guided implant surgery is considered as a safe and minimally invasive flapless procedures. A total of 26 patients (10 males and 16 females, mean age 50.0+/- 15.5 years) were enrolled in the present retrospective clinical study, 265 implants post-extractive were installed, immediately loaded by means of a provisional fixed full arch. In our present study, a total of 265 SKY classic fast @ fix implants from Bredent were used for the reconstruction in 3 cases of both jaws, for the reconstruction of a single jaw in 5 cases, for the reconstruction of the maxilla in 6 cases and for the reconstruction of the mandible in 5 cases.

Within the limits of this study, complete-arch fixed reconstruction by means of guided surgery and immediate loading of implant placed in fresh extraction sockets appears to be a reliable and successful procedure. Further long-term prospective studies on a larger sample of patients are needed to confirm these positive outcomes.

Keywords: dental implants, immediate implant placement, immediate loading, complete-arch reconstruction, survival, success.

INTRODUCTION

Generally, in specialized medical literature, the oral cavity was described as being a mirror that reflects the health of the whole body [1]. The oral health is a major factor for a good quality of life for everyone [2]. Nowadays, the pathology of the oral cavity,edentation (especially complete edentulism), represents a global major public health problem [3].Edentation is

considered a pathological entity that, through evolution and complications, causes serious imbalances in the stomatognathic system [4]. Available data collected worldwide report a wide variation of the prevalence of edentulism, equating up to 70% in population groups age 60 years old or over [5,6]. Some epidemiological studies highlight a decrease in prevalence in developed countries due to preventive oral health measures [6,7]. The diverses strategies of health education are an essential tool in the promotion and prevention of oral disorders [8]. A correct diagnosis, elimination of the causes and reduction of modifiable risk factors are paramount for successful prevention and treatment of oral disesses [6,9]. The increase in life expectancy seems to balance this tendency and promote the need for treatment [6,10].

In the context of society development, in the last decades have been recorded theoretical and practical interest of reserchers, clinicians, manufacturers, to improve the success of implant treatment outcomes through evolution in implant design, materials and clinical procedures [11]. Nowadays, the use of dental implants is considered a revolution in dental medicine, osseointegrated dental implants representing a breakthrough in clinical practice for replacing missing teeth and supporting prosthetic reconstructions in edentulous areas [12].

An implant-supported full-arch rehabilitation, either fixed or removable, represents a highly predictable treatment for edentulous patients to recover masticatory function, aesthetics and psychological well-being [6,13]. Patient-related outcome measures evaluated through oral health-related quality of life parameters, patient satisfaction and patient preference, serve to confirm these prosthodontic needs [6,14,15]. Several prospective studies and recently randomized clinical trials and systematic review after evaluation at the implant and prosthesis levels have described high survival and success rates associated with these types of rehabilitations either in immediate early or conventional loading protocols [6,16].

The immediate functional loading of implant-supported fixed full-arch prostheses can today represent a predictable solution for the rehabilitation of edentulous patients even in the case of implant placement in fresh post-extraction socket [17-19]. Such procedures as immediate prosthetic loading and immediate placement of implants in fresh extraction sockets are highly appreciated by patients because they reduce the invasiveness and the numbet of surgical and prosthetic session as well as the length of time needed for treatment [19,20].

However, the immediate placement of implants in post-extractional sockets and their immediate functionalization in a complete-arch reconstruction represent a serious challenge for clinicians [18,19,21]. Surgically, in fact, clinicians must be able mentally visualize the future prosthetic rehabilitation and consequently the ideal position and axis of implant insertion, in a rather large field such as that of the edentulous maxilla or mandible, this can be particularly complex. Furthermore, it may be difficult to obtain adequate primary stability when placing implants in post-extraction sockets. These mental and clinical difficulties may result in a non-optimal placement of the implants [17-19,22].

This non-optimal positioning, even if it does not lead to the violation of anatomical risk structures (such as the inferior alveolar nerve and the maxillary sinus) can have serious aesthetic consequence and may force the prosthodontist to seek compromise rehabilitation solutions that might not be appreciated by the patient [19,23,24]. In fact, it is known from literature how the aesthetics survival and long-term success of implant-supported restoration depend not solely on the volume of bone and mucosal tissues available, but also on other parameters, including the implant insertion axis [19,25,26].

Modern digital technologies in particular guided implant surgery, now offer a solution to these problems [19,27,28]. Conceived in the mid-nineties, guided implant surgery has rapidly frown in popularity and is now widely used all over the word. Current imaging techniques have an important role [29]. The introduction of cone-beam computer tomography (CBCT) allowed the acquisition of the three-dimensional (3D) bone volume of the jaws in a simple way and with a considerable reduction in the dose of radiation absorbed by the patient, compared to that of conventional computerized tomography [28,30,31]. The information on the patient's bone anatomy, captured by CBCT, may be imported as digital imaging and communication in medicine (DICOM) files into specific software for implant surgery planning and combined with the wax-up of the ideal prosthetic restoration. In this software, the surgeon can plan the implant insertion, based on the anatomy of the residual bone and the ideal prosthetic project. According to the planning a surgical guide is drawn produced with additive techniques and used during the implantation for the guided placement of the fixtures [19,28,32].

In 2002, the concept of guided implant planning linked to immediate functional loading was first introduced in Leuven, Belgium. The first treatments were limited to the edentulous jaws and required full-thickness flaps, as the surgical templates were bone-supported [19,28,32].

However, in most clinical studies in the literature, full arch restorations are represented by Toronto Bridges, also known as ,,all-on-four,, and ,,all-on-six,, dentures, i.e hybrid fixed prostheses characterized by the presence of a bar connecting the implants and more importantly, artificial gum (either in porcelain or in resin, depending by the restorative treatment chosen) [33,34]. There is no doubt that even in this context, guided implant surgery offers advantages such as more precise implant placement, especially with respect to the screw holes and the availability pre-fabricate a milled provisional for same- or next- day delivery [19,28,30,33].

MATERIAL AND METHODS

A retrospective evaluation was conducted on the customized records of patients that were treated with guided implant surgery during period from January 2022 to December 2022 in a private dental clinic. The subjects included in this study were complete edentulous or had teeth with hopeless prognosis. Prognosis for the non-extracted teeth was good to fair. Periodontal treatments, included surgical and non-surgical were done on these teeth. The patients with a hopeless prognosis and bad oral hygiene went through a gross oral debridement one week before the surgery to

avoid a possible contamination during surgery. Subject's teeth with hopeless prognosis were extracted at the day of the surgery and immediate implant placement was done on these patients. Exclusion criteria were active infection at the intended sites of implant placement, chemotherapy or radiotherapy within 12 months before surgery, uncontrolled diabetes or hematologic disease.

The analyzed record included patient-related information (gender, age at surgery, systemic health, smoking habit) details about the inserted implants (type, position, length an diameter) at the prosthetic rehabilitation (single crown, fixed partial prosthesis, fixed full arch) including the dates of delivery. In addition, the analyzed data included all information about any implant failure or complication that occurred during the intervention, after surgery and each follow-up visit. A necessary condition for enrollment in this present study was also the patient's willingness to present him/himself at a final control visit. All patients were fully informed on the nature of this study, read an signed a written consent form for inclusion. A total of 265 SKY classic fast @ fix implants from Bredent were used for the reconstruction in 3 cases of both jaws, for the reconstruction of a single jaw in 5 cases, for the reconstruction of the maxilla in 6 cases and for the reconstruction of the mandible in 5 cases.

The rationale for patient selection was to include all patients who received a full-arch reconstruction during a specific time interval at the clinic. This time interval was chosen so as to include the very first patient who received this treatment and all consecutive patients treated in the same way up to a given date which allowed for the collection of a least 24 months of follow-up data for the orthopantomography (OPG) evaluation. The patients treated were in need of full-arch rehabilitation and presented a bone situation amenable to the placement of at least four implants, The minimum bone width and height were required at least 4 mm and 8 mm in each patient, respectively.

A complete clinical, photographic and radiographic dataset was acquired for each patient. In particular, photographs of the initial situation were taken accompanied by two-dimensional (panoramic) radiographs, periodontal probing and three-dimensional radiographs (CBCT of both arches). General impression were taken and stone casts were obtained for the study of the case. Starting from the photographic data, a digital smile-design software was used for a first evaluation of the length and width of the teeth. The information taken from this analysis was used for the preparation of a diagnostic wax-up on the stone cast models.

In a guided surgery software, the STL files with the ideal teeth morphology derived from the scan of the diagnostic wax-up, were imported and superimposed on the bone anatomy obtained from the CBCT. Then, the surgeon and the dental technician were able to plan the placement of the implants in the correct position, depth and inclination, guided by the prosthetic wax-up in a prosthetically-driven manner. Care was taken to try to engage the fixtures as much as possible in the residual bone, exceeding the apex of fresh extraction sockets at least 3-4 mm, by choosing appropriate implant length. At the same time, care was taken to position the implants in the palatal portion of the sockets, ideally at a distance 2-3 mm from the residual buccal bone walls and a

proper inclination. Ideally the axis of the implants had to be in the center of the teeth, to achive a perfect prosthetic plan. The same procedure was repeated in both maxilla and mandible. After the planning was successfully completed and carefully controlled, the models of the situation were 3D printed in the laboratory with a desktop with a desktop printer and the implant analogues were inserted in these models.

These models not only included the correct position of the planned implants, but also the mucosa and the residual teeth, which had not been removed in the planning, in order to facilitate the superimposition in the guided surgery software and to stabilize the surgical guide during the intervention (these hopeless teeth had to be removed at the end of the intervention). Based on the virtual planning. Surgical guides were then printed and the sleeves were manually inserted in. In the lower jaw, since the sleeves of the central incisors touched each other, two different guides were 3D printed. Finally, before surgery, provisional full-arch restoration were prepared for immediate loading and aesthetic. A burn-out framework based on the prosthetic project and virtual implant position was milled. This led to a metal structure on which resin composite was manually stratified, in order to obtain a highly aesthetic temporary full-arch prostheses for immediate loading. This prosthesis had to be seated on temporary abutments after implant placement.

The implants used in this study (the SKY classic implant from Bredent) is ideally suited for flapless implant placement as the long-machined neck allows a semi-transgingival implant position without any problems. As a result, milling and levelling of the bone is avoided for narrow and uneven ridges. By supracrestal positioning, the 8mm implant we used as a „short“ implant. The macro-grooves in the neck area allow bone preservation at a high level SKY classic which we used very well in conjunction with augmentations. In the coronal portion, microgrooving is present, whereas in the intermendiate portion, the fixture present a double lead thread to facilitate insertion and to increase primary stability in soft bone. In the apical portion, these implants are endowed with apical threading which is particularly indicated to stabilize in post-extraction sockets in the case of immediate placement after extraction (a rounded apex protects such anatomical structures as the maxillary sinus membrane and inferior alveolar nerve). The presence of one connection for all implant diameters facilitates the prosthetic treatment by offering a large range of tissue-shaping possibilities. The fixtures used in this study were available in different lengths (8,10,12,14) and diameters (3.5, 4.0, 4.5, 5.0).

The surgical procedures were performed under local anesthesia which comprised articaine hydrochloride and epinephrine (0.012 mg, Safoni-Aventis Deutschland GmbH, Germany). Antibiotics (Augmentin 1g) was given twice daily before surgery on the day before surgery and then daily 7 days. Anti-inflammatory medication (Ibuprofen, 400 mg) was given 3 days postoperatively starting on the day of surgery. Flapless surgery start with atarumatic extraction of all hopeless teeth (with exception of the ones used to stabilize the guide, those teeth had to be removed after the removal of the guide). During extraction care was taken not to damage the alveoli and particularly the delicate

maxillary buccal bone wall. All sockets were debrided before implant placement. Implant placement was assisted by a specially designed sugical guide to facilitate correct implants tilting and accurate positioning of the implants in relation to each other. Screw-retain abutments (torqued to 25-30 Ncm) were palced in relation to opposite jaw. The implants were placed according to standard procedure except that under-preparation was used when needed to get a final torque of at least 30 Ncm. Countersinking was used only when needed to create a space for the head of titled implants. A bone profiler was then used to create a space for multiunit implants, especially for the tilted implants. The shortes axial and tilted implants measured 4 and 10 mm, respectively (tabel 1).

The diametre of the implants in the anterior or posterior region was determined according to the width of the alveolar crest. The function of the prosthesis has been reported that it was not dependent the numbar of implant inserted and it has been shown by the others that a total of four implants in each jaw in the total edentulous patients resulted in a good survival rate for a long time. The majory of jaws received four and six implants with one exception case with 8 implants. When one of the implants in each jaw did not reach the 30 Ncm primary stability, an extra implant was placed. The alveolar bone width and height determined the implant size. The shortes implant used in this study was 4 mm. The tilted posterior implants angulation was corrected with 30^0 multiunit abutments. In the anterior area, the implants were introduced with either 0 or 17^0 multi-unit abutments (torqued 30 Ncm).

Healing caps were placed over the screw-retained abutiments. The mucosa was then sutured with 4.0 absorbable sutures. Provisional full-arch acrylic prostheses were delivered on the day of surgery. A small volume of bite registration silicone was placed on a previously made full-arch denture. This prosthesis was then seated on the healing caps to estimate implant positions in the oral cavity. After making holes in the provisional prosthesis, the healing caps were removed and temporary titanium copings were placed on the abutments. The holes in the acrylic provisional prosthesis were filled self-curing acrylic. The patient was asked to close their mounth in centric relation. The provisonal prosthesis was removed from patient's mounth, trimmed and polished. No later than 3h after surgery, an crylic provisional with 10 teeth was delivered. Occlusal screws were torqued to 10 Ncm. After 6 months of healing, an impression was taken from all jaws. The definitive prostheses were fabricate using CAD-CAM or laser sintering in some cases and made from metalo-ceramic materials. The final prosthesis usually comprised 12 teeth.

Implant Lengths	4mm	10mm	12mm	14mm
Implants # (Maxilar)	12	20	30	78
Implants #	6	30	19	70

(Mandible)				
Total#	18	50	49	148

Table 1. Number of implants inserted and their lengths

RESULTS

Patients poulation, implants and prostheses

A total of 26 patients (10 males and 16 females, mean age 50.0+/- 15.5 years) were enrolled in the present retrospective clinical study, 265 implants post-extractive were installed, immediately loaded by means of a provisional fixed full arch (table 2).

Both Jaws	11
Single Jaw	21
Maxilla	24
Mandible	19
Total	265

Table 2. Distribution maxila and or mandible and the number of treated jaws

One of the patients included in the study is a 63-year-old man, with no hereditary-collateral antecedents, who presented himself in the office complaining of physiognomic, swallowing disorders and foul breath as a result of improperly adapted prosthetic bridges, root remnants and periodontal disease as well as existing dental gaps as a result of multiple extractions due to untreated caries (fig.1,2).

During the clinical and radiological examination, the following were observed: improperly adapted prosthetic bridges, large deposits of supra- and sub-gingival tartar, gingival bleeding on index probing calculation, 14 root remnants, tooth migration towards the existing gaps as a result of the disappearance of the occlusal stops, chronic marginal periodontitis grade III towards IV, periapical cysts (11,21,25),32,41-dental caries (fig.1,2). Mesial and distal peri-implant marginal bone level was measured using CBCT after surgery using Romexis software. All taken measurements were evaluated based on the actual implant lenght. Once we had accomplished a correct measurement, we were measure all bone loss (fig.3a,b).

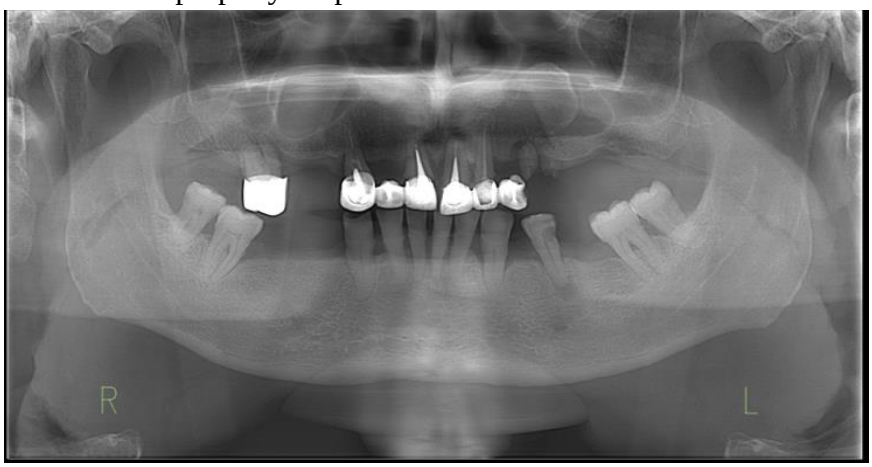

Fig.1. Preoperative intraoral OPG showed the need the reconstruction of both maxillary and mandibular arches

Fig.2. Clinical magines of a 63-year old man receiving a reconstruction of both maxillary and mandibular arches

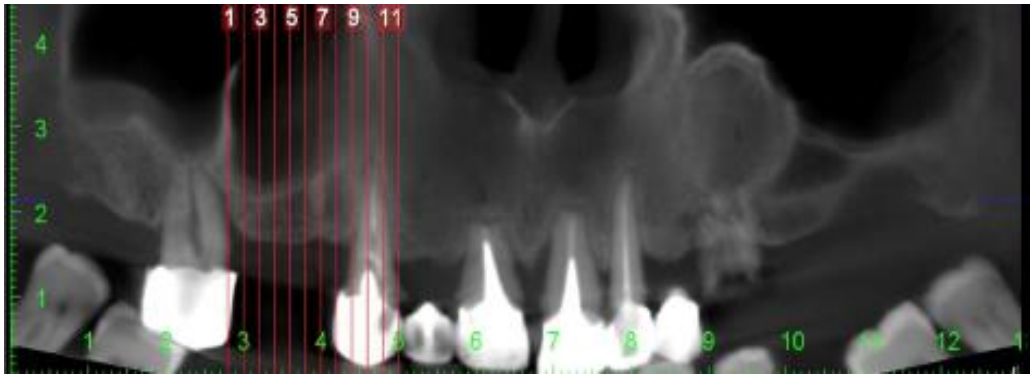

Fig.3a) Tomographic analysis of the edentulous maxilla

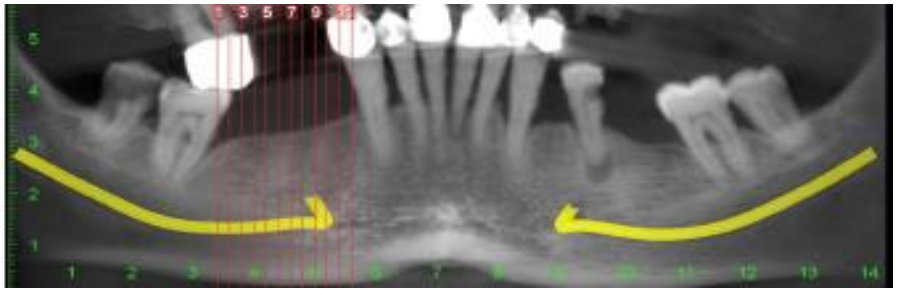

Fig.3b) Tomographic analysis of the edentulous mandible

Local infiltrative anesthesia with mepivacaine hydrochloride was applied before the extraction of useless teeth and implant placement. The surgical procedure was initiated with an intraoral crestal incision. A full-thickness mucoperiosteal flap was elevated both bucally and lingually to expose the bone. All remaining soft tissues that would make contact with the surgical guide were removed from the bone surface. Based on the drilling sequence, surgical guides were designed as a series with steel cylinders in graduaded diameters to accomodate the specified diameters of each drill. The guide was held down in the midlle or on each of the 2 ends to prevent it from tilting or shifting. The guide's position was remained on the bone during the

drilling process. Once drilling for the implants was finished the position and direction of the implant sites were clinically assessed before proceeding with the next guide (fig.4,5,6). Seven titanium implants from SKY classic fast@fixed were placed in the mandible. After the implants were placed, the mucoperiosteal flaps were repositioned and sutured in place (fig.7,8).

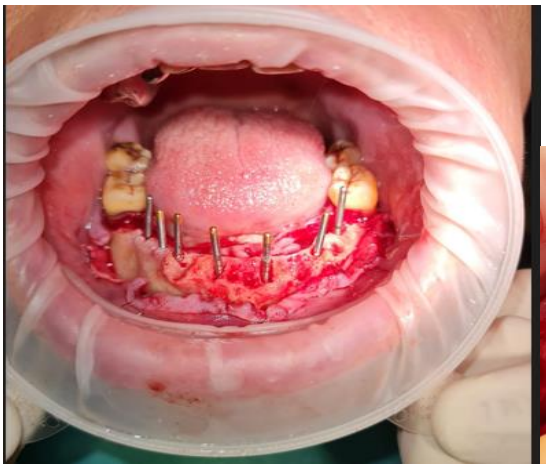

Fig.4. parallelism pins

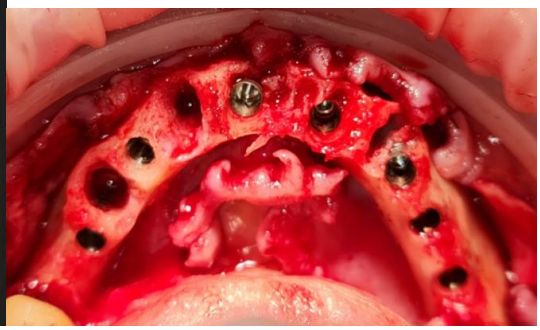

Fig.5. implants in position, occlusal view

Fig.6. multiunits and rods from the transfer **Fig.7.** solidarity transfer stubs abutments for checking parallelism

Fig.8. gingival conformers on multiunits **Fig.9**. frontal view of definitive mandibulary prosthesis

One month later, eight titanium implants from SKY classic fast@fixed were placed in the maxilla. A panoramic radiograph was taken to examine the implant positions in both jaws (fig. 10).

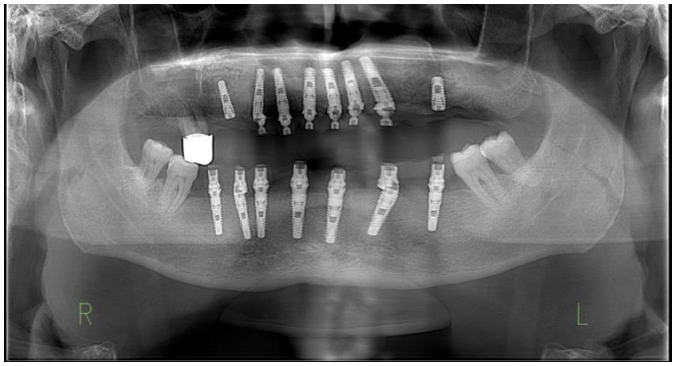

Fig.10. panoramic radiography after implant placement

In the first stage, compromised teeth were extracted, 11, 21 with a periapical cyst, as well as 25 with a super-infected periapical cyst in the maxillary sinus (between the anterior wall of the sinus and the sinus septum), keeping on the arch 17 in order to maintain the vertical dimension of occlusion, its extraction being carried out later (fig.11).

At level 25, curettage of the alveolus was performed, then bone addition was performed Gen-Os (OsteoBiol) by Tecnoss and Apatos (OsteoBiol) by Tecnoss. In the same session, a left side lift was performed with a lateral approach to the vestibular cortex, using the same additional materials. At the level of the left sinus, it was septated and a sinus lift was performed with the elevation of the sinus membrane, addition of bone in the same compartment between the anterior wall and the septum. I carried out the loading with implants 6 months after this intervention. The post sinus lift implantation area was avoided, the implants being positioned distally due to the lack of bone and because there is no primary stability due to the lack of bone reserve. Thus, in the first stage, 6 implants were inserted, then after 6 months, the other two were loaded. Thus, in the first stage, 6 implants were inserted, then after 6 months, the other two were loaded.

Fig.11. final prosthetic mandibular bridge

DISCUSSION

Restorative dental treatment of edentulous patients should be based on through understanding of the chief complaint. For a successful dental treatment, a delicate, supportive, professional, sympathetic, calm approach should be followed, when working especially with patients suffering from dental anxiety [35].The specialist dentist must listen carefully to the patient's expectation, combine this information with the clinical examination and formulate a treatment plan [36-38]. Most edentulous patients prefer a fixed restoration instead of a removable denture. The clinical and technological algorithm for prosthetic rehabilitation targets non-metallic biomaterials associated with non-invasive and minimally invasive techniques[39,42-44].

According to data obtained from extraoral, intraoral and radiologic examination and patient history, if bone and soft tissue deficiencies cannot be compensated by a fixed restoration, a removable reconstruction in the most desirable alternative solution [40,**41,37**]. Must be mentioned that the bone is an extremely dynamic biological system, comprising a series of tightly regulated and synergistic anabolic and catabolic processes that lead to a metabolic homeostasis corresponding to skeletal structures [41].

Facial parameters such as facial support, lip support, smile line and upper length should be clinically examined. If soft tissue support is needed, this can be achieved mainly by the buccal flage of a removable restoration. Any need for extraoral soft tissue support should be evaluated with the patient facing forward and in profile [37,42,43]. In the maxilla, an evaluation of the smile line should be performed without the denture in place. If the alveolar ridge is displayed during smiling, the use of a buccal flange in a removable prosthesis may be advisable to prevent esthetic problems [37,44,45]. Because the upper lip length affects the position of maxillary anterior teeth, it should be assessed during the examination. In patients with a short upper lip, the maxillary anterior dentition will normally be exposed. In patients with a longer upper lip, incisors will usually covered [37,42,46]. In the present case, facial parameters such as soft tissue support, smile line and upper lip length were assessed and the patient was deemed as candidate for fixed restoration.

Intraorally, vertical dimension, quality and quantity of the mucosa and quantity and the contour of the underlying bone should be evaluated. This principles and rules of complete denture prosthesis rehabilitation can be applied while detecting the vertical dimension. Sufficient mucosal thickness help to hide the abutment margin and facilitate correct emergence profil of the clinical crown. In a situation with advanced underlying bone resorption, making fixed restoration would cause long and buccally flared teeth with large interproximal spaces or visible abutments

entering the mucosa. Because facial support cannot be accomplished adequately, speech may be disturbed and aesthetics compromised [37,42,47]. In present case, the interarch space was assessed by preparing the diagnostic setup. Based on intraoral examination, it was decided that the patient could have fixed restoration.

For precise estimation of the available bone, which affects implant position, angulation and length, a CT scan with a radiographic template is highly recommended. The case-planning software in this study used high-quality CT imagines for the preoperative planning of dental implants to satisfy the patient's needs for esthetics, phonetic function and acceptable occlusal function [37,48,49].

Although guided surgery has become increasingly popular widespread, there are currently only a few studies in the literature that present the results obtained with the guided flapless placement of implants in post-extraction sockets and their immediate functional loading by means of complete fixed-arch reconstructions [19,50,51]. Most of the studies in the literature, in fact, refer to the immediate loading of hybrid prostheses (such ,,all-on-four,, and ,,all-on-six,, dentures), characterized by the presence of a bar connecting the implants and more relevant, artificial gum [33,52,53].

In a recent clinical and radiographic study on implants placed in post-extractive and healed sites, inserted using flapless guided surgery and immediately loaded, Ciabatoni et al have reported successful clinical results [50,54,55]. In that study, 285 implants were installed in 32 patients with a double-guide template technique, in detail, 197 were inserted in fresh extraction sockets (137 maxilla, 60 mandible) and 88 in healed sites (58 maxilla, 30 mandible). All implants were immediately loaded by means of fixed full-arch restorations and followed for a period of 3 years [50]. The outcome variables were implants survival, prosthesis survival and marginal bone levels [50]. At the end of this study, a high implant survival rate (95,7%) was reported, with only 7 fixtures failed (3 in fresh extraction sockets of the maxilla, 2 in fresh extraction sockets in the mandible) and 2 in maxillary healed sites. All fixed full arches-maintained stability and good functionality during the entire follow up. Finally, the marginal bone loss accounted to 1,32 mm (+/- 041) at the 3-year follow-up control. The authors concluded that flapless guided implant surgery with double-guide template technique is a predictable treatment procedure, capable of guaranteeing predictable outcomes while decreasing length of treatment time and patient discomfort [50].

Polizzi et al investigated the clinical and radiographic outcomes in immediate fixed restorations on maxillary implants, inserted in fresh extraction and healed sites by using the Nobel Guide system [56]. Twenty-seven patients were included in the study and were treated with flapless guided implant surgery and immediate full-arch or partial reconstructions. The patients were followed for a period of up to 5 years and the clinical outcomes were implant survival, marginal bone remodeling, soft-tissue parameters and complications [50]. Among the 160 implants assessed, only four failures were reported, for a cumulative survival rate of 97,3%. At the end of the study, all prostheses were functioning. The marginal bone resorption from insertion to 2 years amounted to 0,85 mm(+/-1,28), from insertion to the last radiographic control

was 0,64 mm (+/- 1,66). Finally, the soft-tissue response was excellent and only a few minor complications were reported [50].

In 2013, Meloni et al, reported on a guided implant surgery protocol for the immediate delivery and functional loading of a screw-retained provisional metal-acrylic full-arch prostheses. In total 60 implants were placed in 10 patients, among these implants, 22 were inserted in fresh extraction sockets. The final prostheses were delivered after 6 to 12 months. All patients were followed for a period of at least 1 year [57,58]. The outcome measures of this study were implant survival, patient satisfaction and marginal bone loss. At the end of thi study, no implants were lost, for a survival rate of 100%, in addition, no complications (either biological or prosthetic) were reported [58]. All patient felt comfortable with the treatment procedures and were fully satisfied with the final functional and aesthetic result. Finally, the mean marginal bone loss amounted to 1,4 mm (+/- 0,3), the mean marginal bone loss amounted to 1,4 mm (+/- 0,3).

Finally, the present study has certain limits such as the limited number of patients enrolled and the short follow-up time.

CONCLUSIONS

In our present study, a total of 265 SKY classic fast @ fix implants from Bredent were used for the reconstruction in 3 cases of both jaws, for the reconstruction of a single jaw in 5 cases, for the reconstruction of the maxilla in 6 cases and for the reconstruction of the mandible in 5 cases. A total of 26 patients (10 males and 16 females, mean age 50.0+/- 15.5 years) were enrolled in the present retrospective clinical study, 265 implants post-extractive were installed, immediately loaded by means of a provisional fixed full arch.

Our present surgical and prosthetic approach present several advantages. First, only one surgical session is required for tooth extraction, implantation and application of provisional prosthesis. For the patients social life, thsi concept allows a reduction of disconfort and facilite their return to professional life. For the dental rehabilitation, provisonal restoration guides thye soft-tissue healing for an optimal aesthetic result.

Within the limitation of this study, combining a CBCT-derived surgical guide to an immediate implant placement in post-extraction sockets together with immediate provisonalization and loading seems to be a safe and predictable therapy with high survival rates and excellent aesthetic results, when applied in indicated cases. Further studies on larges samples of patients and with longer follow-up controls are needed to draw more specific conclusions about the long-term results with present technique.

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