

Implants and Bone Augmentation – A Case Report

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Abstract

The use of endosseous implants provides dentistry, the solution in many problems. Someone who worked in early 90's may remember, the full arch reconstructions in periodontal teeth, the heroic attempts for endodontic treatments, root-end resections (palatal roots of molars, mandibular premolars), root resections/root separations of molars. Today no uses these approaches, because our patients after spending time, effort, and money, want solutions with proven durability, solutions that only endosseous implants can provide. In fixed prosthodontics, natural bone, late loading, good surgery, the failure rate is something like 2%. Friberg et al. conducted a study comprising of 4641 Branemark dental implants for a period of 3 years and reported a failure rate of 1.5%. My statistics in these conditions are 1%. Failure rate in immediate loading rise (9%), also in maxillary overdentures with 4 implants freestanding (15%), and when I use implants to salvage removable partial dentures (20%) (my statistics). It is believed that in the field of general dentistry the failure rate is bigger. Also, when we use removable interim rehabilitations, we have to expect high failure rates. I had a patient with a removable interim rehabilitation, and he gave me in the hand the implant after one week, (was inserted with torque 55 N-cm and closed with the gingiva).

Keywords: Dentistry; Rehabilitations; Dental implants

Introduction

On September of 2018 came K.M. for the replacement of two periodontally involved teeth (right central and lateral incisors/maxilla). Gingival crevices measured more than 10 mm, and the intraoral x-ray revealed complete absence of bone. CBCT affirmed the absence of alveolar bone but revealed bone 4-5 mm under the nose, and the disappointing periodontal condition of left central incisor [1-5]. The patient insisted in the replacement of the incisors with the use of dental implants. In the conversation about bone reconstruction of the area, I told her, that the possibilities of reconstruction with guided bone regeneration, were few. The use of a fixed bridge was more difficult, because I had to extract and the left central incisor, and use as abutments, at least right canine, left lateral incisor and left canine, and having a bridge with three pontics. A three pontic prosthesis flexes 18 times more than a two Pontiac prosthesis, whereas a two-pontic restoration flexes eight times more than a one-pontic prosthesis.

Case Study

We agree to use as graft, cerabone (Natural Bovine Bone Graft) as steak bone with PRF/platelet rich fibrin, with membrane Cytoplast Ti-250 XL (d-PTFE, reinforced with Ti), and as provisional, a Maryland bridge. Teeth of Maryland was from acrylic in order to change them easily. I did the extractions the same day (I had already the provisional) (the patient received tab Augmentin 625 mgr/8 h two days before and 6 days after, topical anaesthesia articain1/100.000). The blood collected from me, and PRF used in small pieces with the graft, and as a membrane under the d-PTFE membrane 22). Maryland was used with adhesive resin without the use of primer and adhesive liquids, in order to remove it easily. Except antibiotics, patient is given PRUFEN 400 mgr/6 days and chlorhexidine mouthwash 0.2%, twice per day for two weeks [6-10].

The result, (the flap is stretched too much, the vascularization was compromised and there was dehiscence, that's the reason for using d-PTFE membrane) In order to avoid dehiscence, we should have waited three months for the healing of the soft tissues [11-15]. Complex three-dimensional bony defects command large volumes of bony augmentation that require tension-free soft-tissue closure to maintain blood supply to the grafted area. This also prevents incision line opening, the number one complication of large alveolar bone grafts. Preliminary soft-tissue augmentation utilizes both allogeneic

tissue (freeze-dried human dermis), as well as autogenous tissue (palatal connective tissue), to prevent vestibular dehiscence, another common complication following alveolar bone grafts. Three months of healing is required prior to bone grafting (Figure 1).

Discussion

After five months, radiographically, was enough osseous regeneration (new CBCT). In opening to install the implants, portion of the graft was not resorbed, but because of the haemorrhage from the graft, I thought that was integrated, and there was no need for further waiting (Figures 2 and 3). (osseointegration of the implant does not occur until the grafted bone has become vascularized). Two implants have been used, Alpha-Bio Neo/3.2 mm, and 13 mm in length (topical

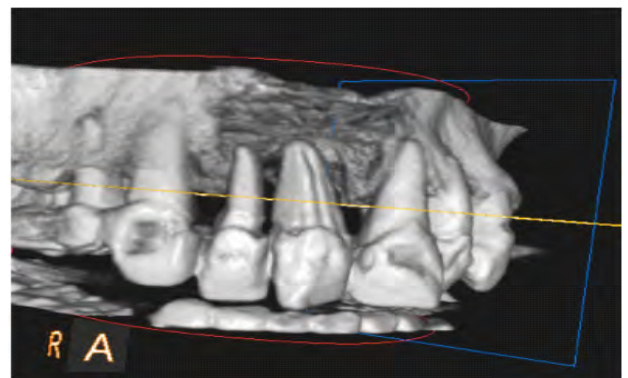


Figure 1: Initial CBCT.

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anaesthesia arctician 1/100.000). Reasons for using this implant was Primary stability, in the native bone, because of the aggressive threads.



Figure 2: Centrifusion of blood.

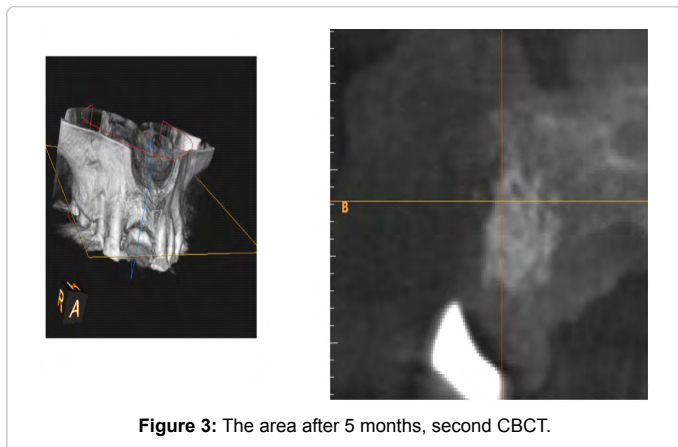


Figure 3: The area after 5 months, second CBCT.



Figure 4: Piezosurgery unit.

Small diameter, possibly I need only the pilot drill. I used piezoelectric surgery (Figures 4 and 5) for the preparation of the implants wells in order to avoid vibrations, common with the use of micromotor. As surgical guide, we used a clear copy of the Maryland. The problem was the slight mobility of the graft and the fact that the implants installed with screwing and were taking the final position not coincident with the implant osteotomy, so the distance between them, was slight less

than 3 mm [16-20]. Some implants, such as those with an aggressive thread design, may change the drilling path and angulation, and this three-dimensional change commonly occurs as the implant is being torqued in place; the implant is following the path of least resistance within the alveolus (Figures 6 and 7). But because the final torque was 40 N-cm, and I had the fear to lose the graft, implants remain in that position. Final reconstruction installed in August 2019 (after eleven months) was, splinted/screwed/zirconium crowns, with Ti bases. Because when smiling, the upper lip ascends to the middle of central incisors, the aesthetics were acceptable, and this was one reason for not using Provisionals (the other was to have the definite restoration earlier) [21-24].

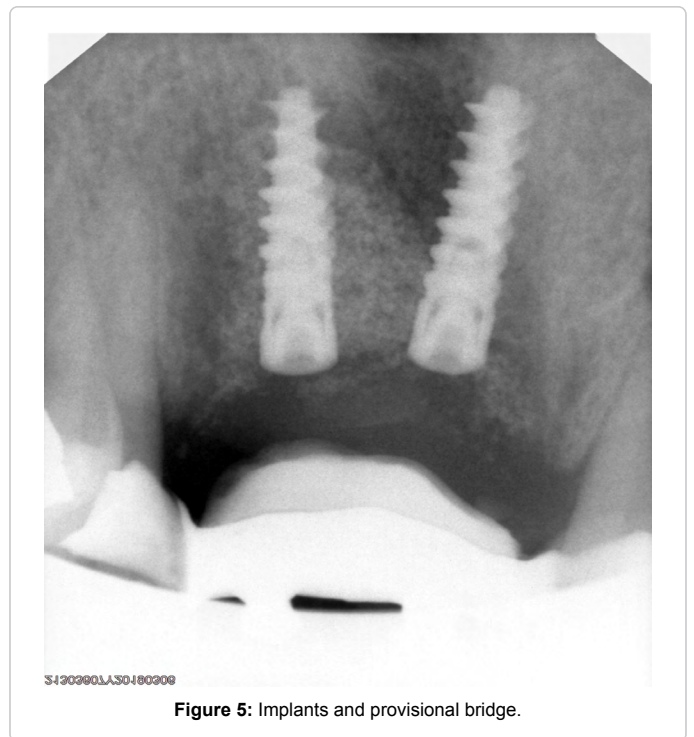


Figure 5: Implants and provisional bridge.

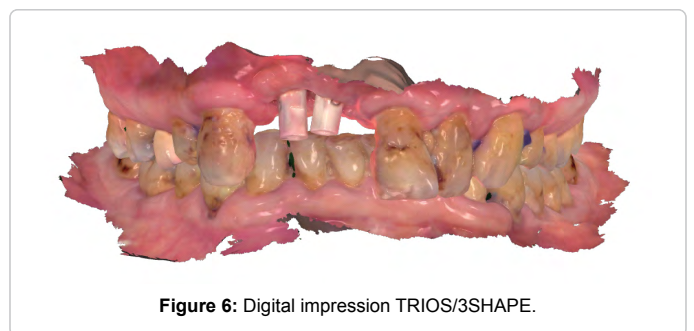


Figure 6: Digital impression TRIOS/3SHAPE.

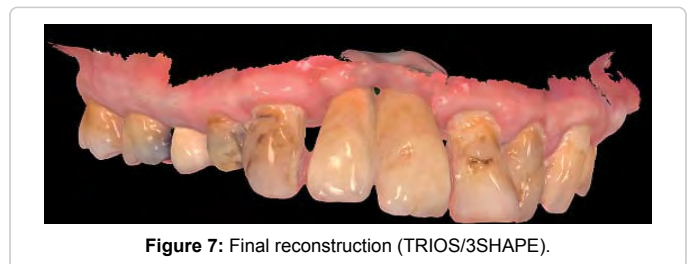


Figure 7: Final reconstruction (TRIOS/3SHAPE).

Conclusion

Simple or medium scale cases, with implants-guided bone regeneration-prosthodontics with the use of new instruments, techniques and materials (intraoral scanner, piezo surgery, d-PTFE membranes, PRF) is possible to achieve, in the area of a typical dental clinic.

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