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Implants and bone augmentation: 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 (1), 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 one uses these approaches, because our patients after spending time, effort, and money, want solutions with proven durability, solutions that only endosseous implants can provide (2, 3). In fixed prostodontics, 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%(4).] 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). (5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18). It is believed that in the field of general dentistry the failure rate is bigger (6, 7). Also when we use removable interim rehabilitations we have to expect high failure rates.

Keywords: augmentation, endosseous, Implants, bone

Introduction
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 10mm, 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 [31], and the disappointing periodontal condition of left central incisor [28].

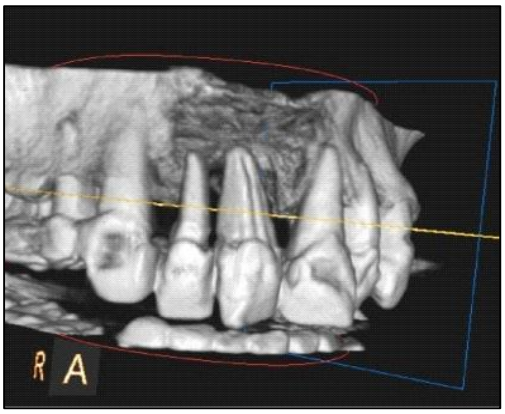

Fig 1: Initial CBCT

The patient insisted in the replacement of the insisors 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. [She refused taking grafts from the symphysis or ramus] [33]. 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 tree pontics. [A three pontic prosthesis flexes 18 times more than a two pontic prosthesis, whereas a two-pontic restoration flexes eight times more than a one-pontic prosthesis] [19].

Method, materials

We agree to use as graft, cerabone (NATURAL BOVINE BONE GRAFT] as steak bone with PRF/platelet rich fibrin [21], with membrane CYTOPLAST Ti-250 XL [23] [d-PTFE, reinforced with Ti], and as provisional, a Mairyland bridge. Teeth of Mairyland was from acrylic in order to change them easily. I did the extractions the same day (I had already the provisional) [the patient received tabl Augmentin 625mgr/8h two days before and 6 days after, topical anesthesia articain1/100.000]. The blood collected from me, and PRF [20, 21] used in small pieces with the graft, and as a membrane under the d-PTFE membrane [20]. Mairyland was used with adhesive resin without the use of primer amd adhesive liquids, in order to remove it easily. Except antibiotics, patient is given PRUFEN 400mgr,/ 6 days and chlorfexidine mouyhwash 0,2%, twice per day for two weeks.

Fig 2: Centrifusion of blood

The result, (the flap is stretched too much, the vascularization was compromised and there was dehiscence, thats 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. [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.] [30, 32].

After five months, radiographically, was enough osseous regeneration. [new CBCT]. (Figure 3). In opening to install the implants, no portion of the graft was resorbed, and because of the haemorrhage from the graft, I thought that was integrated, and there was no need for further waiting. (osseointegration of the implant does not occur until the grafted bone has become vascularized [29])

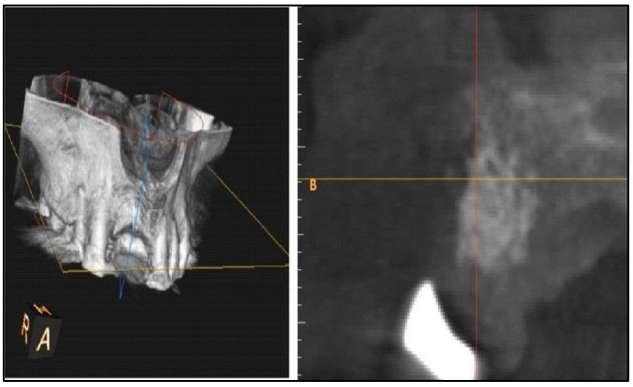

Fig 3: The area after 5 months, second CBCT

Two implants have been used, Alpha-Bio Neo/3,2mm, and 13 mm in length (topical anesthesia articain 1/100.000). Reasons for using this implant was A. Primary stability, in the native bone, because of the aggressive threads. B. small diameter, possibly I need only the pilot dril. I used piezoelectric surgery (Figure 4) for the preparation of the implants wells [25], in order to avoid vibrations, common wiith the use of micromotor. As surgical guide, we used a clear copy of the Mairyland. 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 3mm. [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, [24] but because the final torque was 40 N*cm, and I had the fear to loose the graft, implants remain in that position.

Fig 4: Piezosurgery unit

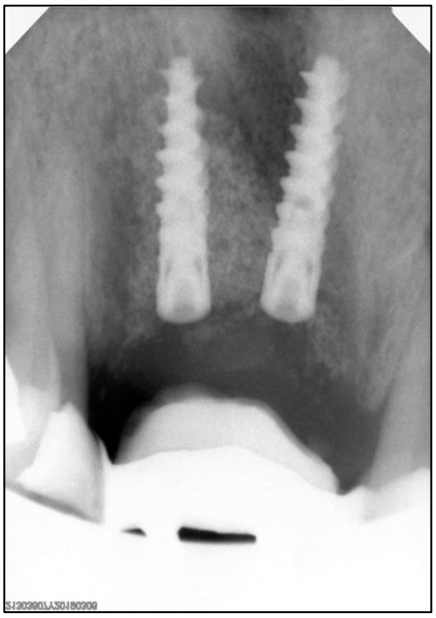

Fig 5: Implants and provisional bridge

Prosthetic rehabilitation [1, 19, 26]

Final reconstruction installed in August 2019 [after eleven months] was, splinted/ screwed /zirconium crowns, with Ti bases.

Fig 6: Digital impression TRIOS/3SHAPE (27)

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

Because when smiling, the upper lip ascends to the middle of central incisors, the aeshetics were acceptable, and this was one reason for not using provisionals (the other was to have the definite restoration earlier).

Conclusion

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

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