PROPROSTHETIC INTERVENTIONS IN THE POSTERIOR MAXILLARY IMPLANT THERAPY

Norina Consuela Forna
University of Medicine and Pharmacy "Grigore T. Popa" - Iasi
Faculty of Dental Medicine

PROPROSTHETIC INTERVENTIONS IN THE POSTERIOR MAXILLARY IMPLANT THERAPY (Abstract): Aim: The purpose of this study is to evaluate the necessary number of pro-prosthetic interventions in view of the implanto-prosthetic rehabilitation of the defective prosthetic fields. Materials and methods: We investigated a lot that included 230 patients aged between 18 and 82 who benefited from implant-prosthetic rehabilitation, the type of graft used, the types of membranes selected as well as the various remodeling and elevation techniques at the maxillary level dictated by the particularity of the clinical case. Results and discussions: The edentulous posterior maxillary region presents in implantology a more difficult situation than any other region of the maxillary. The absence of teeth often triggers a progressive reduction of the alveolar process volume, a reduction that aims particularly at the bony vertical dimension, namely the region between the top of the alveolar ridge and the floor of the maxillary sinus, called the sub-sinus Misch vertical dimension. The presence of the maxillary sinus, combined with the reduction of height of available bone in the terminal maxillary region poses serious problems for implant insertion. Conclusions: The success of the implant therapy depends on the absence of radio-transparent areas, while the per-implant bone resorption must be limited to the cervical region and should not involve the implant threads or its osteointegrated area. The implant should also be fix, pain free, with no local infection. Keywords: IMPLANTS, PREIMPLANT SURGERY, AUGMENTATION, ORAL REHABILITATION.

The main success factors of the implant therapy are related to the preimplant augmentation surgery, The three-dimensional optimum and precise positioning of the implant, The Management of peri-implant soft tissues, Implant axis compatible with prosthetic options, The quality of prosthetic restorations (1).

Pre-implant surgery of augmentation is absolutely necessary to ensure a good osteo-integration, as well as a good stability over time of the implant (2).

The purpose of this study is to evaluate the necessary number of pro-prosthetic interventions in view of the implanto-prosthetic rehabilitation of the defective prosthetic fields.

MATERIAL AND METHODS
We investigated a lot that included 230 patients aged between 18 and 82 who benefited from implant-prosthetic rehabilitation, the type of graft used, the types of membranes selected as well as the various re-
modeling and elevation techniques at the maxillary level dictated by the particularity of the clinical case.

RESULTS AND DISCUSSION

The edentulous posterior maxillary region presents in implantology a more difficult situation than any other region of the maxillary. The absence of teeth often triggers a progressive reduction of the alveolar process volume, a reduction that aims particularly at the bony vertical dimension, namely the region between the top of the alveolar ridge and the floor of the maxillary sinus, called the sub-sinus Misch vertical dimension. The presence of the maxillary sinus, combined with the reduction of height of available bone in the terminal maxillary region poses serious problems for implant insertion (3).

The bone structure of the sinus walls is mainly composed of compact tissue. However, in certain areas there is a spongy tissue that fills in the gaps between the corticals, especially at the level of inferior areas (the floor of the sinus maxillary) (4).

According to Misch’s bone density, it can be argued that in most cases the bone tissue in this area is mainly of D2-D3 class and, especially in the distal areas of the edentulous alveolar processes, D4 class (4).

Howell and Cawood’s experimental studies showed that in the presence of teeth there is a centrifugal type circulation: the blood comes mostly from the arteries inside the bone tissue and partly from the blood vessels from the periosteum.

The edentulous alveolar process suffers from an ongoing resorption and its circulatory pattern becomes centripetal; most of the blood comes from the periosteum, while the intrinsic vascular component is greatly reduced. In agreement with the theory of Moss’ oro-functional conformations, the loss of maxillary volume that follows the tooth loss is attributed to the following factors:

- the reduction of the centrifugal blood contribution through the atrophy of the vessels of the superior dental plexus;
- the pneumatization of the maxillary sinus towards the alveolar process, which is no longer hindered by the functional bone remodeling of mastication;
- the reduction of the centripetal blood contribution caused by the sufferance of the soft tissue in the case of removable dentures carriers.

The mucous membrane of the maxillary sinus is similar to that of paramaxillary sinuses, but less vascularized.

The thickness of the membrane is variable, generally ranging between 0.3 - 0.8m.

The maxillary sinus is linked to the nasal fossa through the ostium, infundibulum and middle meatus. These structures are called the osteomeatal complex. Of a particular importance is the fact that this opening is situated in the upper part of the maxillary sinus.

The adequate reflection and lifting of the sinus membrane and the insertion of the bone graft is possible without affecting the sinus drainage and improve the quality of life (5).

Until the first half or 1970, the maxillary sinus was considered an inviolable anatomic limit in implantology. With the rapid development of implantology, the need for surgical techniques to allow the augmentation of the atrophied alveolar process emerged, especially in the distal region of the upper alveolar maxillary arch. For exemplification, we show patient A.C, 43 years old, who had the following condition (fig.1).
After removing the existent implants, the case was evaluated again and the fix implant therapy was decided as a therapeutic solution, thus recreating the integrity and functionality of the stomatognathic system. Because the prosthetic field was defective from the odonto-periodontal and mucous-bone point of view, surgical interventions were necessary to readjust the two supports, in order to ensure the viability of the solution (fig. 2).

Thus, in a first stage, the regularization of the edentulous ridge in quadrant I was necessary, as well as the proposthetic preparation in view of the implant (fig. 3 a,b). The regularization of the alveolar ridge involved the realization of a mucous-periostal flap, the evidencing of the bone support and the removal of bone irregularities with the bone drill, followed by the suture of the alveolar ridge.

Fig. 1. Paraclinic OPT examination

Fig. 2 (a,b,c). Removal of existent implants
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In a next stage the implants sites were created and the implants of the teeth corresponding to spaces 13, 15, 12. At the level of second premolar 13 a tuareg swell implant was chosen, with the following dimensions: 3.3x10 (fig. 4 a,b,c,d).

Fig. 3 (a,b). Regularization of the edentulous ridge

Fig. 4(a,b,c,d). Tuareg swell implant
For 15a tuareg sp implant was selected 4,2x11 (Fig. 5 a,b,c,d,e)

Tooth 12 was substituted by means of a tuareg s implant 3,5x10 (Fig. 6 a,b,c,d)

Because the bone support was deficient, we opted for a bone addition of Bio-Oss, as well as for the placement of a membrane, augmentation materials which will remedy the deficit of hard bone, contributing to a primary and secondary stability of the implants (Fig. 7 a,b,c,d,e, f,g).

The pro-prosthetic treatment included the apical resection at level 11.

Fig. 5 (a,b,c,d,e). Tuareg sp implant 4,2x11
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Fig. 6 (a,b,c,d). Tuareg’s implant 3.5x10
The prosthetic treatment aimed at an aggregate metallo-ceramic reconstitution at the level of implants 13, 12, 15 (Fig. 8 a,b,c,d,e).

*Fig. 7 (a,b,c,d,e,f,g).* Bio-Oss addition, as well as placement of a membrane.
Another case is that of a 36 years old patient, for whom the final prosthetic solution was the implant (Fig. 9).

At level 24 we opted for the placement of a Bio Com Wide implant 4,70X13, as well as for the reinforcement of the bone support with Bio Oss and Mesh Titan (Fig. 10 a,b,c,d,e).

The prosthesis aimed at recreating the integrity of the edentulous arch by means of a fix metallo-ceramic denture Fig. 11 (a,b,c,d,e) placed at the level of molar 2 as well as of the two premolars from quadrant II (Fig. 12 a,b,c).
Fig. 10 (a,b,c,d,e). Bio Com Wide implant 4,70X13, as well as reinforcement of the bone support with Bio Oss and Mesh Titan
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**Fig. 11 (a,b,c,d,e).** The realization of the metallo-ceramic crowns

**Fig. 12 (a,b,c).** The final aspect of implanto-prosthetic rehabilitation
CONCLUSIONS
The success of the implant therapy depends on the absence of radio-transparent areas, while the per-implant bone resorption must be limited to the cervical region and should not involve the implant threads or its osteo-integrated area. The implant should also be fix, pain free, with no local infection.

REFERENCES