

PROSTHETIC REHABILITATION OF TOTAL EDENTULISM WITH DENTAL IMPLANTS

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Abstract: For the aesthetic and functional solution of edentulous patients, we use dental implants in our daily dental practice. For their planning, in addition to the clinical examination, we also use paraclinical examinations using X-ray diagnostics (panoramic or CBCT).

Purpose: This paper aims to demonstrate the aesthetic and functional rehabilitation of edentulous jaws using dental implants through the presentation of two clinical cases.

Methodology: In both patients, conical implants were placed and loaded after a period of osseointegration, and a prosthetic construction was made on straight abutments.

Results: The prosthetic rehabilitation, from an aesthetic and functional aspect, was at a satisfactory level even after several months of loading on the implants.

Conclusion:

Keywords: implant, prosthetic rehabilitation, CBCT

1. INTRODUCTION

In cases where the whole tooth is missing, the root part can be replaced by the implants. Prosthetics on implants are actual both in the absence of one tooth and in full edentulism. Implants act as a support for the construction instead of the native teeth in cases where they are absent. Prosthetic-supported-implants are a treatment option commonly used for restoring partially and totally edentulous arches (Chochlidakis K. Et al. 2020 & Windael S. et al. 2018).

Many studies have documented that reconstruction by implant-supported single crowns or fixed partial bridges represents a persistent, preventive tool to rehabilitate partially edentulous patients. In totally edentulous patients, implant-supported, fixed prostheses or removable overdentures are available and present reliable solutions for rehabilitation (Velasco-Ortega E et al. 2020 & Mertens C. Et al. 2012).

Properly positioned and osseointegrated implants ensure the long-term success of implant-prosthetic rehabilitations from both functional and esthetic perspectives (Brånemark, P. 1977).

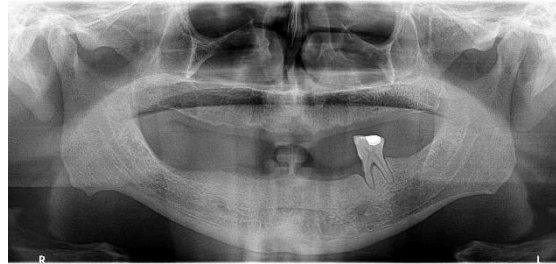
This paper aims to demonstrate the aesthetic and functional rehabilitation of jaw edentulousness using dental implants through the presentation of two clinical cases

2. MATERIALS AND METHODS

Case 1

In a 59-year-old patient, in a good health condition, after a clinical examination and a panoramic X-ray, total edentulism in the upper jaw and subtotal toothlessness in the lower jaw were diagnosed. (Figure 1)

Figure 1. Panoramix x- ray



Source: Authors research

Since the patient insisted on a fixed prosthetic construction, but had extensive resorption of the alveolar bone, there were not many options for implant restoration. After the treatment plan was made, it was decided to place 5 implants in positions where there was enough bone for their placement, namely in positions 16, 13, 11, 23, 26. In the lower jaw, it was decided to make a mobile prosthesis as a preventive solution for future implant placement. After local infiltrative anesthesia, bilateral infraorbital and tuber anesthesia, an open method of implant placement was performed. A bed was made for the implants and conical implants (Vent, Octa-TRI dental implants Titanium grade 5 ELI) were placed, namely 3 implants with a diameter of Ø3.7 mm and a height of L 10 mm and 2 implants with a diameter of 4.1 mm and a height of L 10 mm. A cover screw was placed and the wound was closed with non-absorbable suture, silk, 3-0, needle 3/8 (triangular) 19 mm. (Figures 2, 3, 4)

Figures 2, 3, 4. Implant placement procedure



Source: Authors research

The postoperative course was without major complications, except for a small postoperative swelling that lasted 4 days. The suture was removed 10 days after the intervention. After 4 months, a sulcus former was placed and left for about ten days to form a bed for an abutment. A straight abutment was placed in the formed bed, on which a fixed prosthetic construction, a bridge, was made.

Figure 5. Placed abatments



Figure 6. Prosthetic construction



Source: Authors research

After 16 months of implant loading, a control was performed, during which no changes were clinically seen intraorally around the placed implants and the bridge. An agreement was made and an intervention was scheduled for the placement of implants in the lower jaw as well. (Figures 7, 8)

Figure 7. 16 months follow up



Figure 8. 16 months follow up

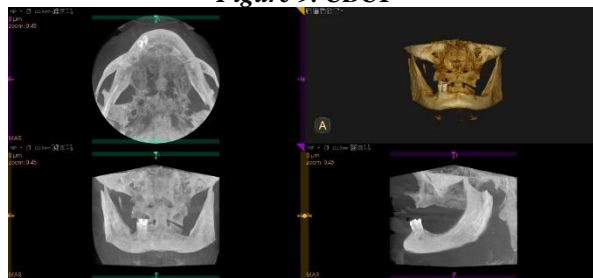


Source: Authors research

Case 2

A 67-year-old patient came with a request for an aesthetic and functional solution to his edentulism. He gave anamnestic information that he suffers from Diabetes Mellitus Type 2, and takes insulin therapy (Xultophy) 1x1 with long acting/ long-term effect, and with Daplagliflozin/Metformin tablets 2x1). Periodontal disease was treated for many years. After a clinical examination and CBCT, a treatment plan and implant placement were determined. (Figure 9)

Figure 9. CBCT



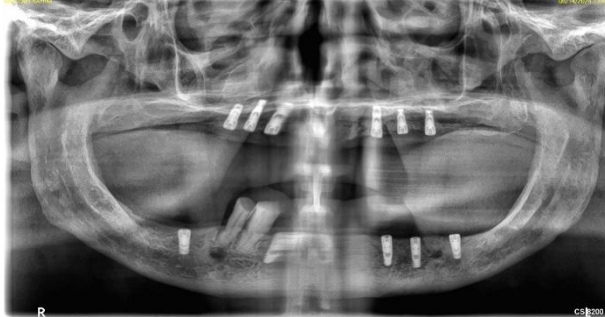
Source: Authors research

Before the start of any intervention, the patient was trained in a proper hygiene and dietary regimen that should be emphasized due to the disease he has. After explaining the risks that may occur after implantation and signing an informed consent for intervention, we approached to implant placement.

After local infiltrative anesthesia, we placed the implants (TRI dental implants, Titanium grade 5 ELI, Conical-Vent, Narrow) first in the maxilla, and then in the mandible, namely 5 implants with a diameter of 3.7mm and a height of 8mm, 3 implants with a diameter of 3.7mm and a height of 10mm, 3 implants with a diameter of 3.3mm and a height of 10mm. An open approach was used for their placement. After their placement, the wound was sutured with

non-absorbable thread, silk, 3-0, needle 3/8 (triangular) 19mm. The panoramic x- ray was made to control if the implants are in the right positions. (Figure 10) The patient was protected with antibiotic therapy Amoxiclave a 1000 mg, 12h x 1, for a duration of 10 days. The postoperative course was uneventful. The sutures were removed on the tenth day of the intervention

Figure 10. Panoramic x- ray after implant placement



Source: Authors research

After the period of osseointegration, the patient's implants were exposed and a sulcus former was placed for preparing the abutment bed. (Figures 11, 12) After the sulcus was formed (14 days after the placement of the sulcus formers), straight abutments were placed. We positioned the transfers and we took the impression with Bms silicone mass. (Figures 13, 14, 15)

Figure 11. Sulcus formers in maxilla



Figure 12. Sulcus formers in mandible



Source: Authors research

Figure 13. Formed sulcus



Figure 14. Placed abutments



Source: Authors research

Figure 15. Transfers



Source: Authors research

A prosthetic device was made in a dental laboratory that is retained on the placed implants and has both dental and gingival transmission of chewing pressure, to ease the loading of the implants. The aesthetic and functional effect of the therapy was maintained even after 10 months of wearing the prosthetic device. (Figure 16)

Figure 16. 10 months follow up



Source: Authors research

3. RESULTS AND DISCUSSION

Prosthetic rehabilitation of completely edentulous patients, in addition to the conventional method, can also be solved by using more modern therapies such as the placement of dental implants. For their placement, it is necessary to make a good treatment plan through clinical examination and X-ray diagnostics.

Digital tools can be employed to program the insertion of intraosseous implants, ensuring that the implant-prosthetic rehabilitation achieves optimal esthetic and functional outcomes. This process, known as computer-aided implant surgery (CAIS), can be executed using either a fully digital or partially digital workflow. In our second case we used CBCT for treatment planning (Tahmaseb, A et al. 2014 & Tahmaseb, A. et al. 2018).

In the retrospective study of Chaushu et al. 2020, the lack of long-term differences in implant survival, crestal bone loss and gingival health around implants after one- or two-stage implant placement procedures promoted a significant change over a period of 18 years, increasing the prevalence of one stage-surgery as an evidence-based preferential protocol when there are no specific contraindications. In our case we did the two- stage implant placement.

Velasco- Ortega et al. 2020 showed in their study a long term treatment outcomes of implant prosthesis in partially and totally edentulism. They selected only patients with a good quality and quantity of bone to be part of the study and they didn't use any grafting materials or barrier membranes. Contrary to them Malpartida-Carrillo et al. 2019 in their case report previously made onlay autogenous chin bone graft followed by the placement of dental implants and rehabilitated with an implant-supported fixed partial prosthesis with a prosthetic gingival restoration.^{9,10} In our cases we didn't use any grafting materials or barrier membranes.

In order to preserve the alveolar ridge from resorption, some authors recommend immediate implantation with immediate loading of the implants. In our cases, the implants were loaded after 6 months in the first case and after 4 months in the second case (Arora H. and Ivanovski S. 2018 & Hari Rijal et al. 2023).

4. CONCLUSION

The prosthetic rehabilitation, from an aesthetic and functional aspect, was at a satisfactory level even after several months of loading the implants. Implants are the recommended treatment for total edentulism of the jaws.

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