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Original Research Paper

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IMPLANT SUPPORTED MAXILLARY OVER-DENTURE WITH FRENECTOMY: A CASE REPORT

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ABSTRACT Modern implant dentistry has changed the course of treatment for edentulous patients. One such example is full mouth rehabilitation with the help of implants. Implants satisfy the patient's expectations, improve their quality of life, have a good long-term serviceability and presents with predictable outcomes. This paper describes a case report in which a partially edentulous patient was rehabilitated with an implant supported overdenture in maxilla and a 4-implant supported mandibular fixed bridge along with a frenectomy.

KEYWORDS : Implants, Implant supported dentures, fixed partial denture, Cone beam CT scan, Frenectomy, Overdentures

INTRODUCTION

Transition of a dentulous arch to an edentulous arch goes through various phases such as bone remodeling, tissue modifications etc. During the time of rehabilitation these changes poses different challenges to the clinician. Removable prostheses need continuous adjustments and long-term use leads to bone resorption. Implant supported bridges are an effective alternative as they have many beneficial effects like bone preservation, increased retention, stability, function, proprioception and patient comfort.

Bone remodeling is one of the most important factors to be considered for an implant placement, normal x-rays fails to provide good quality image, bone density, bone width etc. So, the best option for a bone diagnosis is a Cone Beam CT scan (CBCT). This scan provides detailed 3-dimensional picture of the whole arch including size and density of bone.

Tissue modification is another important factor to be considered before any full mouth rehabilitation. Tissue modification includes Pre-prosthetic surgeries. These modifications are usually done before or along with the implant surgery. They usually include frenectomy, alveolo-plasty, tori removal, undercut removal etc.

Labial Frenectomy is usually done on patients who have large frenulum's which is attached on lip at one end and between the two central incisors leading to a diastema as well as gingival recession. During the fabrication of a denture, it is advisable to relieve the frenum with the help of frenectomy or will require a frenum relieve in denture leading to decreased retention of denture.

Case Report

A 60 years old patient presented with multiple missing teeth, multiple root stumps and multiple mobile teeth with severe periodontal disease. Patient did not have any previous fixed or removable prosthesis. Patient was screened according to a protocol that considered his general health and oral health for treatment planning. The screening included x-rays, CBCT scan, blood tests.

Patients general health was good with no major or minor health condition. In the mandible, mandibular ridge presented with multiple decayed, some periodontally weaken teeth and some edentulous areas. The ridge size appeared good, making the patient a good candidate for implants.

In the maxilla, the situation was similar to mandible. Some missing, mobile and decayed tooth. But the posterior maxilla appeared to have gone under massive resorption. The resorption in posterior maxilla made it a poor candidate for implant. Anterior maxilla still has some teeth present, which represents the good alveolar sockets and can provide support for implant.

Figure 1. Patient's Initial Oral Condition

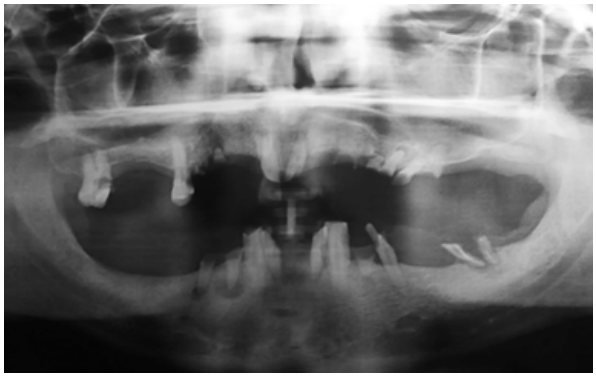

Figure 2. Pre-operative Panoramic Radiograph Of Patient

As per the Panoramic radiograph, the maxillary sinus pneumatization can be seen in the posterior maxilla and the remaining teeth were indicated for extraction. Bone in mandible and anterior maxilla appeared good. There were some periapical pathologies which needed immediate attention.

For a full mouth implant case, one needs more than just the height of the bone and conditions of teeth. Exact bone width, height as well as the bone density are required for a precise diagnosis. Along with these, the size and shape of the implants that could be placed in the specific areas were vital for a full mouth rehabilitation. For these kinds of requirements,

a full mouth Cone Beam CT scan with implant visualization is a good diagnostic technique.

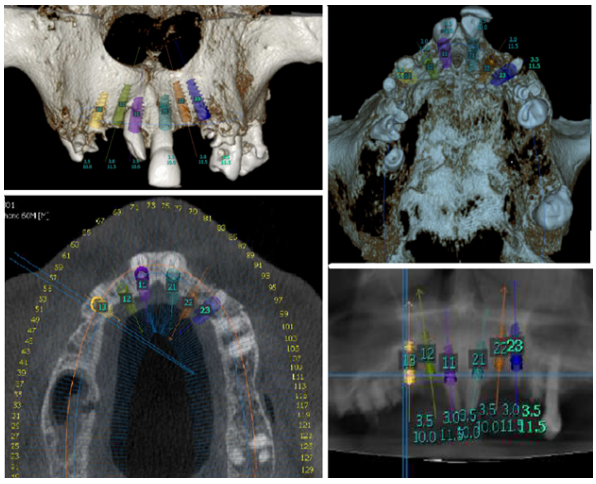

Figure 3. CBCT Scan Of Maxilla With Implant Visualization

As predicted, the posterior maxillary CBCT presented with advance residual ridge resorption. The anterior maxillary CBCT presented with moderate D3 type bone. Pneumatization of maxillary sinuses is noted extending till canines on both sides. Anterior maxilla was presented with multiple implant placement options. The best location for implant placement was provided as canine areas on both sides with a size of 11.5 mm Length of implant and 3.5 mm occlusal diameter.

Implant placement on maxillary anterior teeth was a difficult decision, as the option was to whether go for 4 implants on which a fixed bridge can be made or to go with 2 implants with overdenture. We can achieve a fixed prosthesis on 4 implants up to 1st premolar on both sides. With 2 implant supported overdenture it was possible to provide complete dentition with satisfactory results. So, the decision was made, that we will proceed with maxillary 2 implant supported overdenture. Implant supported maxillary overdentures are not a common procedure and there was very little research available.

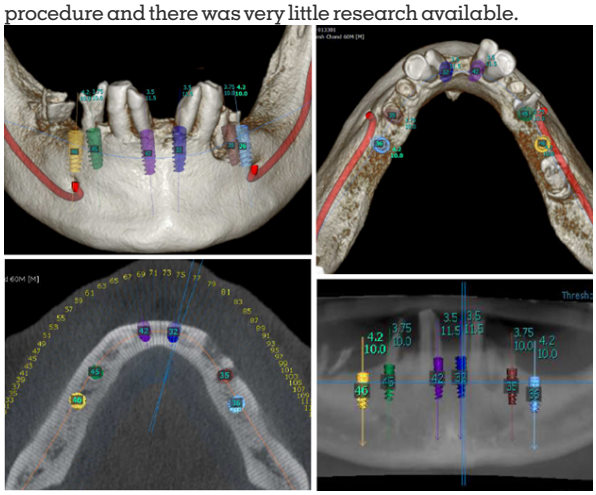

Figure 4. CBCT Scan Of Mandible With Implant Visualization

The mandibular CBCT scan presented with a good bone quality and width. Height of ridge on posterior side was less that what we expected but there was still good bone, enough for a 4-implants supported fixed bridge. The treatment plan for mandible remained same as previously decided. The plan was to place 4 implants, 2 on canine and 2 on molar areas. The length and diameter of the implants were presented with the CBCT scan which were 10 mm length with 4.2 mm diameter for molar implants on both sides and 11.5 mm length with 3.5 mm diameter for canine implants.

Phase 1 – Surgical Phase

Initial treatment plan included the maxillary implants, as there were only 2 implants to be placed it was considered into a single surgery with just 2 extractions and placement of 2 implants in the same sockets. The second surgery was to place mandibular 4 implants and removal of all the root stumps and mobile teeth in 1 surgery.

After placing all the implants, the third surgery was planned for extracting remaining maxillary teeth, frenectomy and alveoloplasty. So, the first phase was completed with placement of all implants, removal of all teeth, frenectomy and alveoloplasty. Cover screw were placed over all the implants and patient was scheduled for regular weekly follow ups.

Figure 5. Panoramic Radiograph After Placing All Implants Before The Third Surgery.

Figure 6. Maxillary Full Arch Extraction And Location Of Frenum.

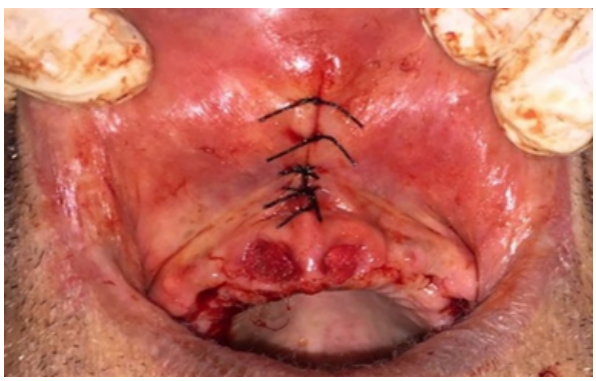

Figure 7. Frenectomy

Phase 2 – 2nd Surgery With Healing Abutments

After 6 months, patient was scheduled for 2nd surgery and placement of healing abutments. During this appointment the impressions were also taken for the fabrication of maxillary denture.

Phase 3 – Prosthetic Phase

After 4 weeks of healing, patient was scheduled for a follow up exam. After the exam and a post-op panoramic radiograph, the prosthetic work was started. Impressions for implants as well as final impression for maxillary overdentures. On these impressions the try-in for both arches were fabricated. After completing the try-in, the try-ins were sent back to lab for processing.

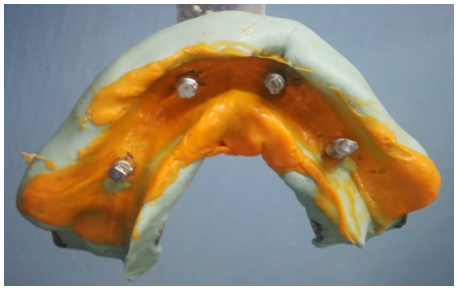

Figure 8. Implant Impression With Impression Coping

Figure 9. Try-in

Phase 4 – Delivery And Follow Up.

After fabrication of the final bridge and denture, the patient was called back. The delivery of the denture included checking for suction in the maxillary denture as well as adapting the locators on the denture and cementing the final bridge in mandibular arch.

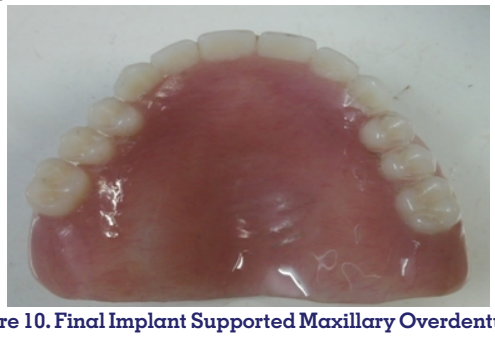

Figure 10. Final Implant Supported Maxillary Overdenture

Figure 11. Final Full Mandibular Arch PFM Bridge.

Figure 12. Final Insertion (before And After Treatment)

DISCUSSION

The "All-on-Four" treatment concept is an attempt to achieve the goals by offering a relatively straightforward, predictable treatment option for edentulous patients with a high quality of life outcome [1].

In contrast to the mandibular implant supported dentures, prospective clinical and radiological baseline studies presenting the number of implants needed to support a maxillary overdenture are currently infrequent with a suitable sampling frame, adequate sample size and sampling method.

In contrast to the excellent long-term success rates for implant-supported mandibular overdentures [3,6,7]. A number of studies described a higher number of implant failures and prosthodontic complications in implant-supported maxillary overdentures[2,4,5,6].Poor bone quality, low bone size, short diameter implant length and poor initial stability are problems observed in edentulous cases of maxillae and may adhere to the increased risk of implant loss and maxillary overdenture loss[5].

CONCLUSION

The successful management of a patient with edentulous arches can be done with implants as well as implant supported overdentures. In this case an unconventional technique has been used where a 2-implant supported overdenture was placed on maxillary arch instead of mandibular. The patient was followed up for 4 years on a 4 month recall in 1st year and 6 months recall from 2nd year to 4th year. The results of the case were found to be more successful than expected. There were minor bony changes in mandibular arch. In maxillary arch the bone remodeling was seen in the posterior region where only denture was present and the 2 implants in canine region were found normal with minimum to no bone loss. The maxillary denture used most of the support from denture suction instead of implants leading to less stress on implants. The patient presented with a healthy oral mucosa with no signs of inflammation around any implant and a good masticatory result was reported. The patient does complaint of difficulty in biting from the anterior teeth, the posterior biting was normal but except for that there were no major concerns.

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