Case Report

Basal Implants: An Alternative Treatment Modality for Geriatric Patients- A Case Report

Manu Rathee, Sanju Malik✉, Prachi Jain, Smriti Kaushik

ABSTRACT

Basal implants rehabilitate the edentulous maxillary and mandibular arches when conventional implants cannot solve the purpose especially in moderate to severely atrophic maxillary and mandibular edentulous arches without any extensive ridge augmentation procedures. Modern basal implant has been modified into a comparatively simple design, easy to follow surgical protocol and is a prosthetic friendly system. The present case report highlights the treatment of severely atrophic maxillary and mandibular completely edentulous ridges with basal implants.

Keywords: Basal implant, Flapless Surgery, Immediate loading, Pterygoid implants.

Introduction

Implant-supported prosthesis has become a widely accepted treatment option for the rehabilitation of partially or completely edentulous patients.[1] Seldom patients opt for a removable form of oral rehabilitation.[2] Conventional Branemark's delayed loading protocol is often not acceptable to patients nowadays. With digitalization, recent advances in medical sciences, imaging modalities and the introduction of new implant systems, a variety of treatment options are available for the patients.

Today, most of the edentulous patients are opting for fixed implant therapy instead of removable dentures. However, residual ridge resorption after the loss of teeth often leaves the patient with severely atrophied maxilla and mandible. Basal bone generally left after resorption is often challenging for the placement of conventional implants.[2,3] Ridge augmentation procedures have their own risks, increases the treatment cost, require multiple numbers of surgeries and are psychologically not motivating enough for the patients.

Rationale of the Treatment

Basal bone is a highly dense, bicorticated, strong bone that forms the stress-bearing part and provides excellent support to implant.[4] Basal implants or bicortical

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Received: 26 November 2019

Accepted: 30 May 2020

Published online: 01 July 2020

Citation: Rathee M, Malik S, Jain P, Kaushik S. Basal implants: an alternative treatment modality for geriatric patients - a case report. J West Bengal Univ Health Sci. 2020; 1(1):85-89

implants were developed specifically to be used in atrophied jaw bone, which engages the infection and resorption free basal bone. As it is having load-bearing tolerance these implants can be immediately loaded.[5,6]

Basal implants confines the masticatory load to the cortical bone structures and horizontal implant segments. On the other hand, screw basal implants transmit load into the bone usually onto the opposing cortical bone.[7]

Case Report

A 55-year-old female reported to the Department of Prosthodontics, Crown, and Bridge and Oral Implantology with the chief complain of inability to chew food with the ill-fitting dentures for 3 months. The patient had been using the denture for the last two years and never felt comfortable chewing with them. Intraoral examination revealed severely resorbed maxillary and mandibular completely edentulous ridges (Fig.1). There was no significant medical history.

Radiographic examination revealed 2-3 mm of bone width with respect to maxillary edentulous arch with a height of less than 3 mm in the maxillary sinus area bilaterally. Mandibular edentulous ridge had a width of 3-4 mm overall and a height of 6 mm over the inferior alveolar canal (Fig.2).

Various treatment options including a conventional implant-supported fixed prosthesis along with ridge augmentation, an implant-supported overdenture or a basal implant-supported fixed partial

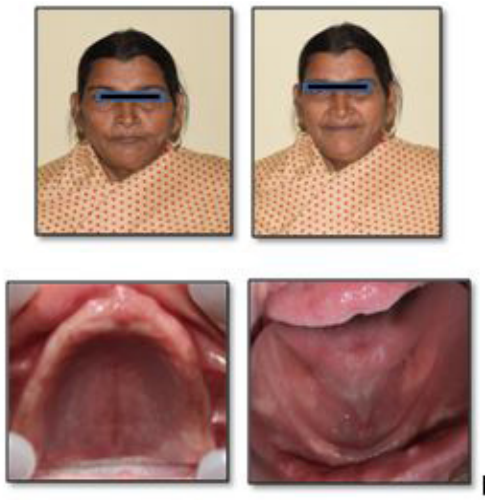

Fig. 1: Pre-Rehabilitation Extraoral and Intraoral View of the Patient

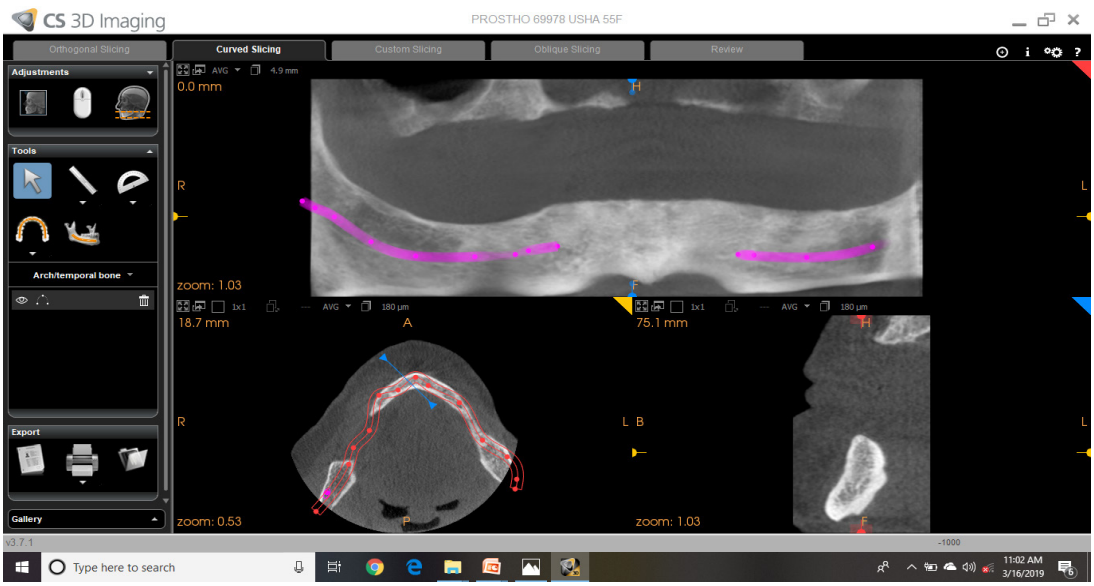

Fig 2: CBCT showing atrophic mandibular ridge

denture were discussed with the patient. Considering the minimum treatment duration, least traumatic, basal implant-supported fixed partial denture was chosen for the patient. This case report highlights the treatment of severely atrophic maxillary and mandibular ridges with basal implants and lateral pterygoid implants.

Routine blood examination was done for the patient and results were found to be within normal limits. Patient preparation was done according to the standard protocol. Posterior superior alveolar, infraorbital, nasopalatine and greater palatine nerve blocks were administered for the maxillary arch. Eight screw basal implants were placed using a flapless immediate procedure. Bilateral single pterygoid implants were placed engaging the lateral pterygoid plates.

Local infiltrations were administered for the mandibular ridge; no blocks were administered for the mandibular ridge. Blocks were not given in order to check the nerve response while doing the nerve bypass during the placement of implants in the first molar region. Eight implants were placed for the mandibular arch using the flapless surgical procedure (Fig 3).

Fig. 3: Surgical flapless implant placement

Post-surgical radiographical examination revealed proper orientation of the basal implant placed. For evaluation of implants placed by nerve bypass CBCT was which revealed the implants engaging the buccal cortical plate successfully bypassing the mandibular canal (Fig.4).

Maxillary and mandibular full-arch impressions were made using irreversible hydrocolloid impression material in the same appointment. Tentative jaw- relation was estimated using the old dentures. On the second day, all implants were functionally loaded with temporary heat cure acrylic resin crowns. On the 10th day of follow-up after the placement of the temporary fixed partial denture, the patient was able to chew both hard and soft food well and was very comfortable with the outcome of the treatment. (Fig 5.)

After 4 months of use of resin-based fixed partial denture, impressions were made again using addition silicone impression material for both maxillary and mandibular arch. The metal framework was fabricated and corrected in the patient's mouth. Only after the successful metal try-in, definitive intermaxillary records were made using a triple tray and jet bite. Final cement-retained metal-ceramic fixed partial denture was given to the patient in the balanced occlusion.

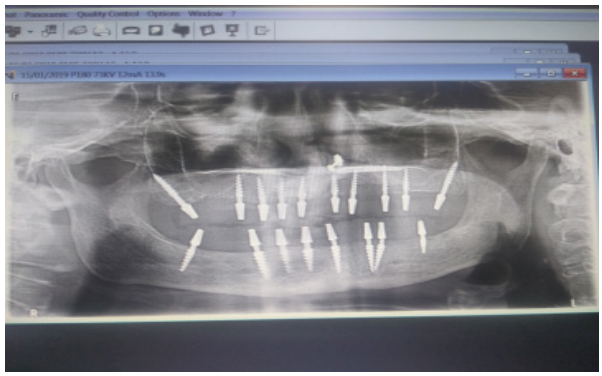

Fig. 4: Post-surgical Orthopantograph (OPG)

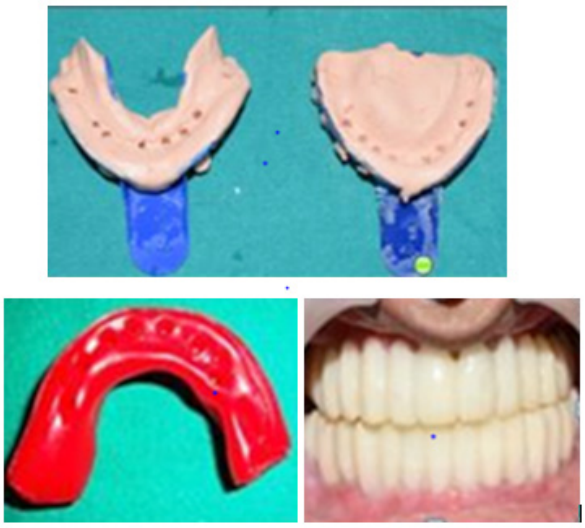

Fig 5: Prosthetic phase

Discussion

Basal implants are single piece implants that reduce the failure risk due to abutment-fixture interface related problems that exist in the conventional two-piece systems. This implant system works well in patients with controlled diabetes, chronic smokers, patient who had or have been suffering from chronic periodontitis.[8,9]

Moreover, basal implants are suited in patients with compromised bone and eliminate the need for morbidity increasing bone augmentation procedure. Incidence of peri-implantitis has been reduced to almost 98%.[9]

In the present case, 10 implants were placed in the maxilla and 8 implants were placed in mandible. Bone height was not sufficient in both the maxillary and mandibular posterior region bilaterally. In maxilla, pterygoid implants were placed bilaterally for the posterior support.[10] In the mandible, basal cortical implants were placed engaging the lingual cortical bone, bypassing the mandibular canal. Bone remodeling starts within 72 hours after the implant placement and weakens the peri-implant structure. Rigid splinting of placed implants helps to distribute the masticatory forces to the surrounding cortical bone.[11] So, splinting should be done as soon as possible.

Conclusion

Basal implants can be used for both extraction sockets and also in the healed bone. These can be used in the bone deficient cases. It solves the problem connected with conventional implantology and ideally meet the demands of the patient. Many dentists are still hesitant to use this form of the implant system in India, however, it provides good results and better treatment outcomes in the indicated cases.

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