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Case Report

Rehabilitation of Atrophied Anterior Mandible with Basal Implants: A Case Report

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ABSTRACT

Basal implantology also referred to as bicortical implantology is considered to be a modern implantology system which utilizes the basal cortical portion of the jaw bones for retention of the dental implants, which are uniquely designed to engage within the basal cortical bone areas. In the present case, a 44-year-old healthy male patient reported to our department with grade III mobile 32, 33. After careful examination and treatment planning cortical implants with immediate prosthetic rehabilitation was initiated. The teeth were extracted atraumatically and two smooth surface cortical implants were placed into the extraction sockets followed by prosthetic rehabilitation using metal ceramic crowns. IOPA radiographs and CBCT were taken preoperative and immediate postoperative. The patient and operator compliance after placement of implant and prosthetic rehabilitation were analysed using a 10-point patient assessment scale. Cortical implant therapy has several advantages, it allows placement in bone that is deficient in height and width, reduced treatment length, reduced number of operations, immediate loading and better patient compliance.

Keywords: Fixed Rehabilitation; Basal Implants; Atrophied Ridges

1 INTRODUCTION

Dental implants are fixtures that functions as replacements for a missing natural tooth root.Worldwide, single-tooth implants have a hit rate of nearly 95% survival at 15 years.[(1)] The conventional implants utilise the alveolar bone which tends to be lost after removal of the teeth and diminishes through life as their function reduces. The basal bone is often present throughout life; it remains strong and forms the stress bearing part of our skeleton.[(2)]

The success of the endo-osseous implant critically requires sufficient amount of bone around the implants. In the maxillary sinus region, post extraction pneumatisation and resorption reduces the bone height and thereby poses a challenge for implant placement. In the mandibular region, the compromised height of bone may lead to injury to the neurovascular bundle, during the placement of endo-osseous implant. A conventional fixed bridge can be the choice of prosthetic modality, when sufficient numbers of implants are placed in an jaw. Often, this cannot be used as an option in maxilla due to combined vertical and horizontal resorption of bone and tilted positions of the implants. In this instance, the patient ends up in using a traditional fixed bridge which would not meet the patient's demand for hygiene maintenance, esthetics, phonetics, and comfort.[(3)]

Basal implantology, also referred to as bicortical implantology is considered to be a modern implantology system which utilizes the basal cortical portion of the jaw bones for retention of the dental implants, which are uniquely designed to engage within the basal cortical bone areas.[(2)] The basal bone provides excellent quality cortical bone for retention of these unique and highly advanced implants.

Basal /cortical implants is considered as a viable option as they do not require extensive augmentation and allow for immediate loading for restoring atrophied jaws. Further, they can be combined with any implant and can be placed utilizing a flapless technique. In this article, we present a case report of rehabilitation of an atrophic anterior mandible with two immediately loaded cortical implants.

2 CASE REPORT

A 44-year-old patient reported to the Department of Periodontics and Oral Implantology, Rajarajeswari dental

college and hospital, Bangalore with a chief complaint of mobile lower anterior teeth for the last 2 years. Clinical examination revealed mandibular arch with missing 31 and grade III mobile 32, 33 (Figure 1). Radiographic investigation (CBCT) showed vertical and horizontal bone loss in lower alveolar arch (Figure 2): barely sufficient bone (width 2.5-5 mm, height >10-13 mm) according to Misch et al, 1987.[4] The patient was in good health and had no contraindications to surgical therapy with absence of mucosal disease.

Fig. 1: Baseline photograph

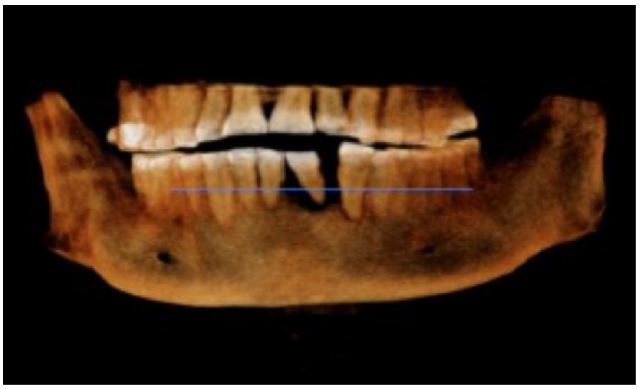

Fig. 2: Baseline CBCT

Pre surgical radiographic evaluation was carried out with CBCT and IOPA (Figure 3) for appropriate treatment planning. After measuring, the implants (MONO IMPLANTS) of size 3.5 × 14 mm and 2.7 × 12 mm were selected (Figure 4).

2.1 *Surgical treatment*

Followed by injecting 2% lignocaine hydrochloride (1:80,000 conc.), the mobile teeth were atraumatically extracted (Figure 5). After evaluating for any osseous defects, infection or granulation tissues, the sockets were then thoroughly

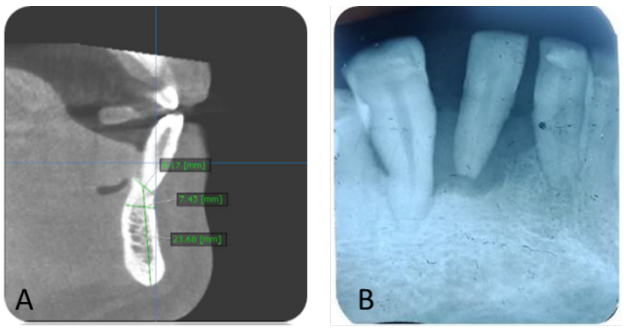

Fig. 3: a) preoperative CBCT, b) IOPAR evaluation

Fig. 4: Selected implants

debrided with saline followed by sequential drilling under copious irrigation and implant placement (Figure 6). An impression was made with putty impression material by using implant analogues and transfer copings (Figure 7). Satisfactory primary stability was achieved with all the two implants and immediate CBCT showed good parallelism as well. Impressions were sent to the laboratory for temporary provisionalization (Figure 8).

Fig. 5: Extracted tooth

Fig. 6: Implant placement

Fig. 7: Impression making

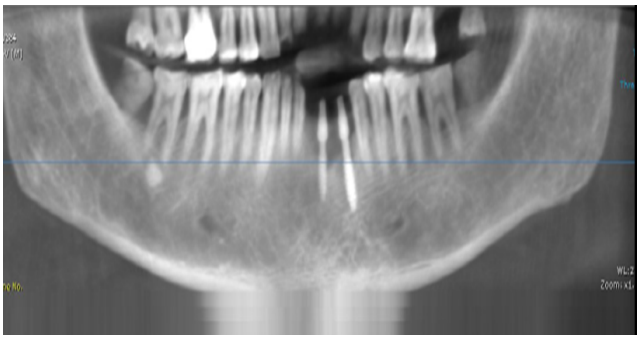

Fig. 8: Postoperative radiograph

2.2 *Postoperative Care and Evaluation*

The patient was put on an antibiotic regime consisting of amoxicillin 500 mg three times a day for 5 days along with a chlorhexidine mouth rinse. The patients were asked to abstain from brushing on the surgical area for at least one week and the operated area was evaluated for healing, infection and any signs of ulceration and necrosis. Temporary prosthesis was delivered three days from surgery (Figure 9). Patient was re-evaluated one week from surgery and after removal of sutures final metal ceramic prosthesis was delivered. Patient and operator compliance was satisfactory after prosthetic rehabilitation.

3 DISCUSSION

Basal implants are advanced dental implants that utilises the basal cortical portion of the jaws for their retention. They possess a unique and specific design aimed at the sole purpose of gaining anchorage from the basal bone and had underwent several modifications in the past decades. These

Fig. 9: Prosthetic rehabilitation

modern implants have a simple design, yet sophisticated surgical protocol and acquire a prosthetic friendly system. Several practitioners around the globe have been practicing basal implantology and so far this implant system has provided equitably successful results, due to their attractive properties.[5]

One of the common reasons that result in failure of endosseous implant is the inadequate bone width.[6] Further, long-standing edentulous situations commonly lead to ridge resorption. In this instance, basal implants can be used to support single & #8209; or multiple‑unit restorations in the upper and lower jaws with compromised bone width. Moreover, they can be implanted in the extraction sockets or even in the healed bone as the structural characteristics of these implants allow placement in deficient bone height and width. Whenever ridge augmentations come as a part of an alternative treatment plan, basal implants can be considered the devices of first choice. The concept of cortical implantology resolves all problems associated with conventional (crestal) implantology since it is a customer & #8209; oriented therapy, which meets the necessities of the patients' ideally.[7]

A case report was done by Ghalaut et al to study full mouth rehabilitation in a severe periodontally compromised patient who received 18 single piece basal implants. The study concluded that immediate loading of basal implants can be done, when they are placed in the dense cortical bone, as they attain high primary stability. Therefore, though there are high chances of crestal bone loss, they are more predictable than before. Hence, single & #8209; and multiple & #8209;unit restorations in the upper and lower jaws can be supported by cortical implants.[7]

Another study carried out by Garg et al aimed to evaluate the survival of endo-osseous immediate loading (IL) implant and basal IL implants in atrophic jaws, to compare implant survival for full mouth rehabilitation between endo-osseous IL and endo-osseous delayed loading (DL) versus basal IL implants during 3-year follow-up. The study concluded that achieving primary stability was easy for basal implants in mandible compared to endo-osseous implants as basal implant are cortical engagement, whereas in maxilla, both exhibit similar results. They also found out that basal implant placement was comparatively minimal technique sensitive and does not require minimal bone width or length.[8]

In this case report, two smooth surface straight basal implants were placed immediately after extraction of grade III mobile tooth in an atrophied anterior mandible. The implants were placed uneventfully achieving satisfactory primary stability. Temporary provisionalization was done within 72 hours to ensure immediate loading. Permanent prosthesis was delivered after one week.

4 CONCLUSION

Endosseous implants are the primary choice in normal bone conditions whereas single stage basal implants can be an option where conventional implant fails and in cases where residual bone height and width is reduced as in moderately or severely atrophied ridges. Further, long term follow-ups, larger sample and comparative studies are necessary to appraise the survival of basal implants. Basal implant therapy has numerous advantages, as it allows rehabilitation of maxilla and mandible that is deficient in height and width, decreases the treatment length, reduces the number of surgical procedures, helps in immediate loading and provides better patient compliance.

REFERENCES

1) Sakaguchi RL, Powers JM. Craig's Restorative Dental Materials;vol. 13. 2012.
2) Yadav RS, Sangur R, Mahajan T, V RA, Singh N, SIngh R. An Alternative to Conventional Dental Implants: Basal Implants. *Rama Univ J Dent Sci*. 2015;2:22–28. Available from: https://ramauniversityjournal.com/pdf_aug/22-28.pdf.
3) Qamheya AHA, Yeniyol S, Arısan V. Full Mouth Oral Rehabilitation by Maxillary Implant Supported Hybrid Denture Employing a Fiber Reinforced Material Instead of Conventional PMMA. *Case Reports in Dentistry*. 2015;2015:1–6. Available from: https://doi.org/10.1155/2015/841745.
4) Misch CE, Judy KW. Classification of partially edentulous arches for implant dentistry. *Int J Oral Implantol*. 1987;4(2):7–13. Available from: https://pubmed.ncbi.nlm.nih.gov/3269839/.
5) Stefan I. Principles of BOI- Clinical, Scientific, and Practical Guidelines to 4-D Dental Implantology. Heidelberg. Germany. 2005.
6) Agrawal D, Gupta AS, Newaskar V, Gupta AS, Garg S, Jain D. Narrow Ridge Management with Ridge Splitting with Piezotome for Implant Placement: Report of 2 Cases. *The Journal of Indian Prosthodontic Society*. 2014;14(3):305–309. Available from: https://doi.org/10.1007/s13191-012-0216-8.
7) Ghalaut P, Shekhawat H, Meena B. Full-mouth rehabilitation with immediate loading basal implants: A case report. *Natl J Maxillofac Surg*. 2019;10(1):91–95. Available from: https://doi.org/10.4103/njms.NJMS_87_18.
8) Garg R, Mishra N, Alexander M, Gupta SK. Implant survival between endo-osseous dental implants in immediate loading, delayed loading, and basal immediate loading dental implants a 3-year follow-up. *Annals of Maxillofacial Surgery*. 2017;7(2):237–244. Available from: https://doi.org/10.4103/ams.ams_87_17.