



REHABILITATION OF ATROPHIC MAXILLA WITH IMMEDIATE LOADING OF BASAL IMPLANTS USING CBCT STENT: A CASE REPORT

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ARTICLE INFO

Article History:

Received 4th October, 2021

Received in revised form 25th

November, 2021

Accepted 18th December, 2021

Published online 28th January, 2022

Key words:

Basal implant, Flapless Surgery, Immediate loading, Pterygoid implants, CBCT stent.

ABSTRACT

The main aim of this article was to study a case report of the placement of 8 single piece basal implants (BCS-Basal cortical screw) in an atrophic maxillary area with flapless technique using CBCT guided stent. All the Basal implants were immediately loaded. Basal implants rehabilitate the edentulous maxillary and mandibular arches when conventional implants cannot solve the purpose, especially in moderate to severely atrophic maxillary and edentulous mandibular arches without any extensive ridge augmentation procedures. In the upper and lower jaws, basal implants are used to support single and multiple-unit restorations. They can be inserted into extraction sockets as well as healed bone. The modern basal implant has been modified into a comparatively simple design, easy to follow surgical protocol, and is a prosthetic-friendly system. Their structural features enable them to be placed in bone that is deficient in both height and width. Basal implantology overcomes all of the issues that come with conventional (crestal) implantology.

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INTRODUCTION

Implant-supported prosthesis have become a widely accepted treatment option for partially and completely edentulous patients.^{1,2} The conventional Branemark approach includes loading the implants 4–6 months after they have been placed. This obvious disadvantage of the procedure leaves the patient with no teeth or with a removable temporary prosthesis, and hence, many patients, at times, do not choose this option at all.³ Basal implant is a better option for immediate loading when compared to the conventional implant, which requires a long duration for osseointegration. Esthetically emerging profiles can also be achieved using basal implants for single and multiple teeth replacements immediately after the extraction.⁴ Today, most 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 the severely atrophied maxilla and mandible. Basal bone generally left after resorption is often challenging for the placement of conventional implants.⁵

Dental implants can be immediately loaded with teeth after being placed in the basal bone, which is very strong, never resorbs throughout life, and serves as the stress-bearing part of our skeleton.³ Ridge augmentation procedures tend to increase the risks, costs, and a number of operations required for dental implant therapy. Patients with significantly atrophied jawbones, on the other hand, receive little or no treatment if

crestal implants are considered the first-line treatment.⁶ 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.⁷ Techniques such as early placement, immediate, delayed placement, and immediate placement were developed.⁸

Basal implantology

Basal implantology is also known as bicortical implantology or just cortical implantology. It is a modern implantology system that uses the basal cortical section of the jawbones to hold dental implants that are specifically designed to fit in the basal cortical bone regions. The basal bone is always present throughout life and provides excellent quality cortical bone for the retention of these unique and advanced implants. It is very strong and forms the stress-bearing part of our skeleton.⁶ These basal implants are also called lateral implants or disk implants.⁹

The rationale of the Treatment

Basal bone is a highly dense, bicortical, strong bone that forms the stress-bearing part and provides excellent support to the implant.¹⁰ Basal implants or bicortical implants were developed specifically to be used in the atrophied jaw bone, which engages the infection and resorption-free basal bone. As it has load-bearing tolerance, these implants can be immediately loaded.^{3,6} Basal implants confine the masticatory load to the cortical bone structures and horizontal implant

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segments. On the other hand, screw basal implants transmit load into the bone, usually onto the opposing cortical bone.¹¹

Indications and Contraindications of Basal Implants

Indications

1. All kinds of situations when several teeth are missing or have to be extracted.
2. When the procedure of two-stage implant placement or bone augmentation has failed
3. All kinds of bone atrophy i.e., in case of very thin ridges, insufficient buccolingual thickness, insufficient bone height

Contraindications

1. **Medical conditions:** There are a number of medical conditions that preclude the placement of dental implants. Some of these conditions include recent myocardial infarction (heart attack) or cerebrovascular accident (stroke), immunosuppression (a reduction in the efficacy of the immune system)
2. **Medicines:** Drugs of concern are those utilized in the treatment of cancer, drugs that inhibit blood clotting and bisphosphonates (a class of drugs used in the treatment of osteoporosis)

CASE REPORT

A 48-year-old female is having normal gait and stature reported to the Department of Oro-Maxillofacial Prosthodontics, Crown and Bridge, and Oral Implantology with the chief complaint of inability to chew food with the ill-fitting maxillary removable partial denture for three months. The patient had been using the denture [maxillary – removable partial denture & mandibular – 2 implants supported overdenture placed in B and D position] for the last one year and never felt comfortable chewing with a maxillary removable partial denture. Intraoral examination revealed that the patient had seven teeth present, which were periodontally compromised. On clinical examination, all of the teeth were found to be periodontally compromised (Grade III mobile). There was no significant medical history.

Various treatment options were explained to the patient like complete removable denture after total extraction, a conventional implant-supported fixed prosthesis (after augmentation procedures), a conventional implant-supported overdenture (after augmentation procedures), or a basal implant-supported fixed partial denture. The patient chose the least traumatic and fixed choice for his treatment in order to complete it in the shortest amount of time possible. As a result, we decided to rehabilitate the patient's mouth with a fixed come removable partial denture supported by a basal implant. This case report highlights the use of single-piece immediate implants (8 BCS) (Bioline) in a full-mouth rehabilitation patient. The patient underwent a routine blood investigation, and the findings were deemed to be within normal limits. Local infiltration (Biocaine 21.3 mg lignocaine, India), infraorbital, nasopalatine, posterior superior alveolar, and greater palatine nerve block were given.

Preoperative photographs were made (Figure-1&2).



Fig 1 Pre-operative Intraoral image

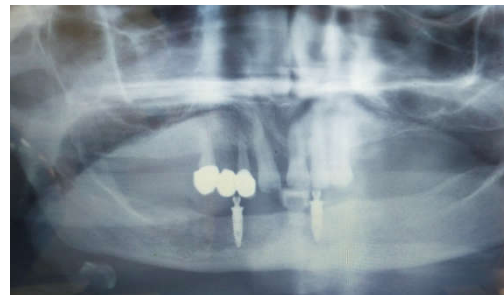


Fig 2 preoperative OPG



The remaining teeth were extracted atraumatically [Figure – 3], and curettage was done, followed by copious irrigation with povidone-iodine.



Fig 3 Atraumatic extraction was done

Then, the CBCT guided. A flapless surgical stent was positioned in the maxillary arch [Figure – 4], which was stabilized by three guiding pins. Then, the implants were placed using a flapless immediate procedure [Figure-5].

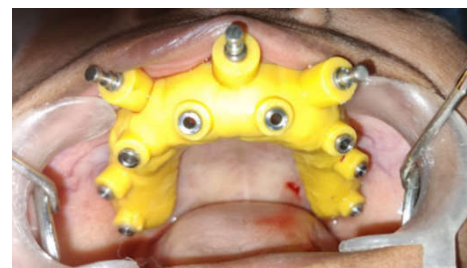


Fig 4 CBCT Flapless Surgical Stent



Fig 5 Implants placed



Fig 10 metal framework try-in

Later post operative radiographic image was made [Figure-6]

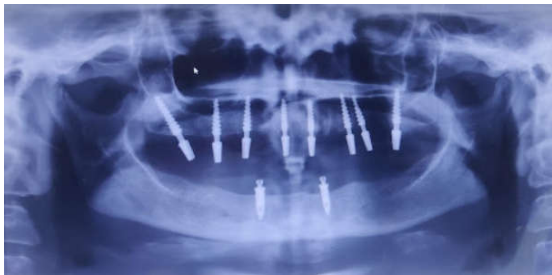


Fig 6 Post operative OPG

Then, plastic transfer copings were placed [Figure-7] and Maxillary and mandibular impressions were made using additional silicone impression material [Figure-8].

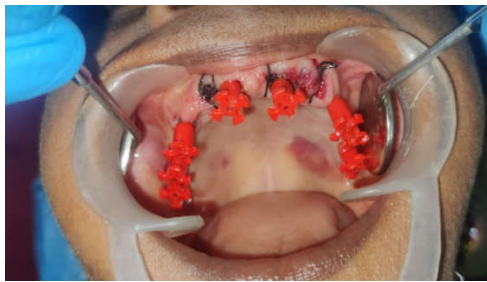


Fig 7 plastic transfer copings were placed



Fig 8 Impressions were made

Then, tentative jaw relations were recorded using modelling wax [Figure-9]. After that, metal framework try-in was done [Figure-10]



Fig 9 jaw relations were recorded

Then, the denture teeth were tried in. [Figure-11]. Finally, insertion was done [Figure-12].



Fig-11 try-in Fig-12 final insertion

DISCUSSION

Basal implants are single-piece implants that reduce the risk of failure associated with abutment-fixture interface problems that surround conventional two-piece systems. Patients with controlled diabetes, chronic smokers, and patients who have or

have had chronic periodontitis benefit from this implant system.^{12,13} Furthermore, basal implants are appropriate for individuals with weakened bone, as they avoid the need for a morbidity-inducing bone augmentation treatment. Peri-implantitis has been reduced to nearly 98 %.¹³

When basal implants are placed in dense cortical bone, they attain greater primary stability and can be loaded immediately. As a result, they are more predictable than before, but crestal bone loss is a distinct possibility. Because bone remodeling starts within 72 hours and weakens peri-implant bone structures, rigid splinting of the metal framework should be performed as soon as feasible. Masticatory forces are distributed from the bone around the implants to other cortical areas through splinting.⁶

In the present case, eight implants were placed flaplessly in the maxillary jaw engaging the basal bone. Four BCS implants were placed bilaterally in the tubero-pterygoid region of the maxillary arch, four in the maxillary anterior region engaging the nasal floor, and four in the tubero-pterygoid region of the maxillary arch, as these were the recently extracted infected sockets. This portion of the maxillary region provides more stability than any other part of the maxillary region. If BCS implants are used in conjunction with an acceptable immediate load protocol, a success rate of around 100% can be achieved. BCS implants feature a smooth surface and aggressive threads, allowing them to be placed in infected sockets. We don't need to corticalize BCS implants to achieve excellent primary stability along their vertical surfaces. As a result, they may be used for both immediate placement and immediate loading.¹⁴

CONCLUSION

Both extraction sockets and the healed bone can benefit from basal implants. In cases of bone deficiency, they might be used. It solves the problem with conventional implantology and fulfills the patient's needs well. Many dentists in India are still hesitant to employ this type of implant system, yet it provides excellent results and improved treatment outcomes in the indicated cases.

References

1. Creugers NH, Kreulen CM, Snoek PA, de Kanter RJ. A systematic review of single-tooth restorations supported by implants. *J Dent* 2000;28:209-17.
2. Wang RE, Lang NP. Ridge preservation after tooth extraction. *Clin Oral Implants Res* 2012; 23 Suppl 6:147-56.

3. Yadav RS, Sangur R, Mahajan T, Rajanikant AV, Singh N, Singh R. An alternative to conventional dental implants: Basal implants. *Rama Univ J Dent Sci* 2015; 2:22-8.
4. Creugers NH, Kreulen CM, Snoek PA, de Kanter RJ. A systematic review of single-tooth restorations supported by implants. *J Dent* 2000;28:209-17.
5. Guillaume O, Carl ME, Itzak B, Gerard S. Fixed rehabilitation of severely atrophic jaws using immediately loaded basal disc implants after in situ bone activation. *J Oral Implantol*. 2012;38:611-16.
6. Ghalaut P, Shekhawat H, Meena B. Full-mouth rehabilitation with immediate loading basal implants: A case report. *Natl J Maxill of acSurg* 2019;10:91-4.
7. 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
8. Arshad M, Maria TA, Rajendran J, Shreedhana, Mathew SS. Esthetic single tooth replacement using basal implant. *International Journal of Contemporary Medical Research* 2021;8(5):1-3.
9. PriyankaT, ShwetaB, NidhiB, Shobhit A. "Rehabilitation of atrophicmaxilla with basal implant: A case report", *International Journal of Current Research*, 2014;8(03): 28601-28604.
10. Gupta AD, Verma A, Dubey T, Thakur S. Basal osseointegrated implants: classification and review. *Int J Contemp Med Res* 2017; 4(11):2329-35.
11. Gupta A, Madan B, Bakshi M, Garg M. Full mouth rehabilitation with immediate loading basal implants. *Int J Prev Clin Dent Res* 2017;4(2):159-161.
12. Nair C, Bharathi S, Jawade R, Jain M. Basal implants- a panacea for atrophic ridges. *Journal of Dental Sciences & Oral rehabilitation*.2013;34(4):1-4.
13. Reddy S, Dharmodaran T, Nagraj V, Sudeesha S. Basal osseointegrated implant is a viable immediate solution in cases of failed implants in atrophic posterior maxillary region: A case report. *Adv Dent & Oral Health* 2018; 7(5): 555-722.
14. Shah S, Ihde A, Ihde S, Gaur V, Konstantinovic VS. The usage of the distal maxillary bone and the sphenoid bone for dental implant anchorage. *CMF Implant Dir* 2013; 8:3-12.

How to cite this article:

Santhi B *et al* (2022) 'Rehabilitation of atrophic maxilla with immediate Loadingofbasal Implants Using CBCT Stent: A Case Report', *International Journal of Current Advanced Research*, 11(01), pp. 83-86.
DOI: <http://dx.doi.org/10.24327/ijcar.2022.86.0018>
