

Advantages of basal cortical implant over crestal implant in esthetic area of the jaw: a case report

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Abstract

The aim of this article was to present a case report for the advantages of basal cortical implant over crestal implant in esthetic area of the jaw in a patient with atrophic ridge in which five basal cortical implants were placed in a two stage surgery with immediate non-functional loading. The results obtained were exquisite, with outstanding primary implant stability. They are considered as the first choice of treatment for atrophic ridges particularly as patient oriented implantology system.

Keywords: Basal Implants, Crestal Implants, Immediate Non-functional loading,

Introduction

Basal Implantology Begins Where Conventional Form Of Implantology surrenders, providing the opportunity to the Implantologists in treating cases which are not possible to be treated with the conventional implant systems.

Basal implants are single piece implants (fused implant & abutment).Dental implant placement in the basal bone, are advantageous in immediate teeth loading, due to the

strong & unresorbing nature of this bone, acting as a stress-bearing part of our skeleton.^[4] Implant placement into the fresh extraction socket is beneficial rather than placement after few months, as the cortical walls around the extraction socket are stable during extraction.^[5]

Single piece implants can be inserted in a minimally invasive fashion-flapless (“keyhole implants”) & minimal bone cutting. Further, surgical complications as post-operative edema are eliminated adding to it as cost saving and rapid healing. They utilize the available bone in the best possible manner avoiding bone augmentation adapting to suit the patient’s own bone-with respect to quality & quantity, whereas for conventional implants, the available bone is modified to suit the implants.

The conventional crestal implants are indicated only when an adequate vertical and horizontal bone is available. Ridge augmentation procedures tend to increase the risk of poor prognosis, cost, number of operations. Crestal implants being the first choice in atrophied jaw bone paradoxically receiving no treatment.^[7] It is a standard practice to insert implants of at least 10-13mm in length in the mandibular anterior segment usually presenting sufficient vertical bone.

This case report highlights the advantages of basal cortical implant over crestal implant in the esthetic area of maxillary jaw bone. All the implants were followed for a period of one year.

History of Basal Implantology

Dr. Jean-Mark Julliet in 1972 developed & used a single piece implant necessitating no need of any homologous cutting instrument for its placement.

A French dentist in mid-1980’s invented an improved basal implant system with matching cutting tools- disk implants.

Since mid-1990’s efforts have been made in developing more appropriate tools and new implant types giving rise to modern basal implantology.

Conventional Crestal Implantology

Traditional crestal implants use the alveolar bone as a support, which is lost after tooth extraction & continues to decrease throughout the life due to functional loss. For a successful implant placement there is need for sufficient bone availability (at least 13-15mm length, 5-7mm width).^[1,9] Not fulfilling this criteria necessitate additional treatment planning which includes inlay or onlay alveolar grafts, nerve repositioning, sinus lift, nasal lift.^[10]

Basal Implantology

Basal implantology utilizes bicortical implant system. It is a single-piece implantology eliminating abutment-implant interface. This modern implant system utilizes the basal cortical bone lying underneath the alveolar bone for the support, functional load transmission & retention. There are many advantages of bicortical implant system- it is not prone to peri-implantitis due to their thin mucosal penetration diameter & polished surface, better distribution of masticatory forces, can be used in compromised bone areas, minimally invasive (flapless) placement possible, immediate functional loading possible, they transmit masticatory load/forces deep into the opposite cortical bone.

Case Report

A 20-years old female having normal gait & stature reported to the Department of Oral & Maxillofacial Surgery, Himachal Institute of Dental Sciences Paonta Sahib with the chief complaint of missing upper anterior teeth, as she met with an accident 6 months back & has sustained injuries which includes grade 3 mobile 11, avulsed upper front teeth (12,14,21,22,23) with parasymphysis fracture, which was healed and was of no

concern to us when she reported to our department [Figure 1 and 2].

A routine blood examination was done for the patient, and the results were found to be within normal range. There was no significant medical injury, & the patient needed bone grafting, to which she refused due to additional cost. We have used alternative to the crestal implants, which is BCS implants for atrophic ridges. Patient was advised full mouth scaling followed by placement with 5 BCS implants using handgrip instruments, she also had impacted canine in maxillary right quadrant.

Implant placement with delayed functional loading in 2 stage surgery was carried out. In the first stage surgery two basal implants were placed in the 21, 23 tooth region, with immediate non-functional loading [Figure 3]. After around 43 days grade 3 mobile 11 was extracted with disimpaction of 23. Implant placement in second stage surgery [figure 4] was proceeded (11,13,14 tooth region) after 3 months with immediate non-functional loading. Bridge(7 units permanent crowns) were given after 6 months [Figure 5].



Figure 1: Preoperative Radiographic View



Figure 2: Preoperative Intraoral View



Figure 3: Postoperative First Stage Surgery Intraoral View



Figure 4: Postoperative Second Stage Surgery Intraoral View

Discussion

Rehabilitation of partially & completely edentulous patients with implant supported prosthesis has become a widely accepted treatment option in day to day practice.^[1,2,3] For a successful implant placement there is need for sufficient bone availability (at least 13-15mm length, 5-7mm width)^[1,9], not fulfilling this criteria necessitate additional treatment planning which includes inlay or onlay alveolar grafts, nerve repositioning, sinus lift, nasal lift^[10], in order to avoid these procedures to

successful, sophisticated yet simply unique implant designs & protocols have been demonstrated in the past, which are Mini Implant & Basal Implants (synonymously called lateral implants/disk implants/orthopedic implant).^[10,11,12] The traditional Branemark system involve implant loading after 4-6 months post implant placement, which obviously leave the patient with no teeth at all or with temporary removable prosthesis, leaving the patients in dilemma to choose implant as a replacement option for their missing teeth.

In the present scenario there are 2 different approaches for immediate loading of implants. Firstly, depending on the principle of compression screws; secondly, on the cortical anchorage of thin screw implants (BCS).^[6]

The BCS implants have smooth surface with aggressive threads. Excellent primary stability can be achieved with no need of corticalization adding to its advantage of immediate loading and immediate placement.^[1] They can also be placed via flap or flapless techniques. In maxilla pterygoid plate can also be engaged as an anchorage. Besides, the angulation of abutment can be adjusted with regards to patients case scenario for up to 15 degrees corresponding to implant axis.



Figure 5: Prosthesis in Situ



Figure 6: Postoperative Radiographic View

Acting not less than a patient oriented implant system basal cortical implant system has been the first choice of interest with respect to accepted principle “*primum nihil nocere*” i.e, limiting treatment.^[11] Indications and contraindications of basal cortical implants are listed in Table 1.

Table 1: Indications & Contraindications Of Basal Cortical Implants

Indications	Contraindications
When bone grafting has failed(2 stage surgery)	Patient on drug therapy- Cancer drugs, anti-blood clotting drugs(warfarin) & bisphosphonates (a class of drugs used in the treatment of osteoporosis)
In atrophic jaw bone <ul style="list-style-type: none"> • Insufficient bone height • Insufficient bone width 	Systemic Conditions- Recent MI (heart attack), immunosuppression, cerebrovascular accidents (stroke)
When several teeth are missing, complete edentulous mouth, numerous teeth are to be extracted.	Cases where bilateral equal mastication is not possible (when muscles of mastication or their innervations are partially missing)
Can be placed in already infected sockets.	

Advantages of Basal Cortical Implantology

Immediate loading

Single piece implant system

Basal bone support

Minimally invasive, minimal surgical complications

Advance option for atrophic ridges

Eliminate the threat of peri-implantitis (98%)

Medically compromised patients (controlled diabetics, smokers, periodontitis)

Cost effective

It avoids the phenomenon of stress shielding (as both bone & implant are visco-elastic)

Disadvantages of Basal Cortical Implantology

Technique sensitive procedure

Should not be placed in load bearing areas of the jaw

Conclusion

Development of basal cortical implant system has provided enormous amount of expectations for patients with atrophic ridges, adding to its advantages of positive results with cost efficient procedure, reduced time span, immediate loading of prosthesis for esthetically concern patients, with needless of going through augmentation procedures.

Declaration of Patient Consent

The authors certify that they have obtained all the appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their/images and other clinical information to be reported in the journal. The patient(s) understand that their name and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be granted.

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