

## Review Article

# Basal Implants : A Breakthrough For Atrophic Ridges: Review

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### ABSTRACT

Dental implants emerged as a boon in the field of dentistry and helped both -the operator and the patient for partial and complete oral rehabilitations with adequate bone height . But the prognosis in the atrophied ridges always remained questionable and unpredictable if it is associated with the ridge augmentation procedures. The augmentation procedures increase the cost, time and psychological well being of the patient and making him socially inactive. Rehabilitation of severely atrophic jaws is facilitated when basal disk implants are used. This article discusses the value of using basal implants and the differences that exist between basal implants and crestal implants in perioperative status, infection around integrated implants, load transmissions and advantages and disadvantages.

### INTRODUCTION

Implant placement in severely atrophic jaws is especially challenging because of the poor quality and quantity of the future implant bed. The crestal implants require appropriate vertical height for implant placement. Ridge augmentation procedures are often used to overcome inadequate vertical height for the placement of dental implants. Despite acceptable success rates, these approaches involve unpredictable degrees of morbidity at the donor and/or recipient sites and poor prognosis. Furthermore increase in cost, time and also the patients are reluctant for the surgical procedures.

Basal implants were developed primarily for immediate loading and where there is inadequate vertical bone height as in atrophied ridges. These basal implants are synonymously called lateral implants or disk implants. These two types of implants are not only

differentiated by the way they are inserted and also by

the way forces are transmitted.

This articles discusses the types of basal implants, drawbacks of conventional implants, advantages disadvantages and complication of basal implants.

### TYPES OF BASAL IMPLANTS

- 1- The two types BOI (Basal Osseo Integrated) (fig 1 )
- 2- BCS (Basal Cortical Screw) (fig 2)

Basal implants are specifically designed to utilize strong cortical bone of the jaw. Basal implants are designed such that they can utilize the support from more strong and infection free area that is cortical bone or basal bone. (fig 3)

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Screwable basal implants can be placed without incision and also in the immediate extraction socket.



FIG 1



FIG 2

**Draw backs with conventional root form implant**

1. Requires large amount of bone.
2. Require wider bone at crest to accommodate its neck which usually found lacking in many cases because of bone loss.
3. Mostly require bone augmentation procedures at the time or before the implant insertion which increase the cost, surgery time, no. of surgeries and treatment span.
4. Most part of the implant is placed into the poor density spongy bone which cannot be loaded immediately- may require healing time upto 3-8 months.
5. Because of vital structures such as maxillary sinus and mandibular canals in the back region of jaws, these implants may require large amount of bone augmentations (sinus augmentation, block grafting,

nerve repositioning), multiple surgical steps, higher cost and longer healing times (fig 4 and 5).

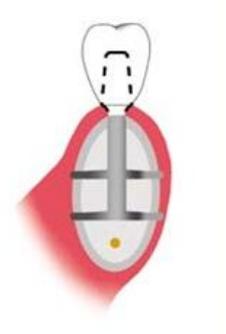


FIG 3



Fig 4 minimum bone support required for basal implants (right) compared to conventional implants

6. Has a screw connection which may lead to future screw loosening/ screw breakage problems under the prosthesis.
7. Sensitive to infection- These implants have rough surface which is prone to collect infection once exposed to oral environment or placed at the infected region. Hence these implants cannot be placed into the infected tooth socket.
8. Being rough surface, these implants are prone to peri-implantitis.
9. Crestal bone loss- maximum stress/ load comes on the bone crest which may cause crestal bone loss.

10. Wide neck diameter and rough surface of these implants require thick, keratinized and stable/non mobile gums around its neck to avoid the problems such as soft tissue.



Fig.5

### ADVANTAGES OF BASAL IMPLANTS

**1. Immediate loading-** BOI and BCS basal implants are specifically designed to utilize strong cortical bone of the jaw. Hence these implants are considered to be the best option for immediate loading and long lasting satisfaction to the patient.

**2- BOI (Lateral basal implants):-** is inserted from the lateral aspect of the jaw bone and it require minimum bone height of 3 mm and that means: **FIG 4)**

1. Virtually every patient can be treated without bone grafting.
2. Because bone grafting is avoided, also risk groups, such as smokers and diabetics, can successfully receive these implants.
3. Wide basal disk of the implant is stabilized into both facial as well as lingual strong cortices deep into the resorption and infection resistant zone (well deep from the crest) which guarantees safe load transmission and Osseo integration.

**3-BCS (Screw Basal Implant):** - is inserted like a conventional implant, but it transmits loads only into the opposing deep cortical bone . that means:

a. Strictly cortical anchorage of the implant guarantees for safe load transmission and osseointegration.

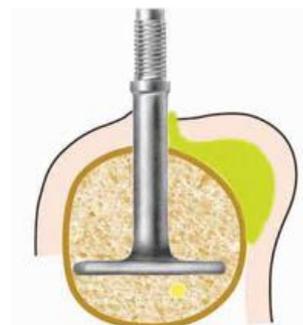


Fig. 6

b.. Minimal invasive implant placement (Mostly without any flap and suture)

c. The neck of this implant can be bended to make multiple implant heads parallel for passive seating of the prosthesis and also to seat the prosthesis in the most suitable occlusion line.

**4-Peri-implantitis incidence** – Peri-implantitis is the single most common cause for failure of conventional implants. This happens mostly because of the rough implant surface as well as the interface problems between the multiple parts of the implant. Judicious use of monobloc, smooth surface basal implants eliminate the threat of peri-implantitis by almost 98%.

**Minimally invasive, minimal surgical complications** – in most edentulous situations, the single piece screw type implants can be inserted in a minimally invasive fashion – often flapless and involving minimum bone cutting. Being minimally invasive, they are also associated with

minimum postoperative edema and healing at the procedure sites are rapid and often non-eventful.

**MONOBLOC DESIGN** Basal implants are one piece implants in which the implant and the abutment are fused into one single piece. This minimizes failure of implants due to interface problems between the connections which exist in conventional two and three piece implants.

#### **DISADVANTAGES OF BASAL IMPLANTS**

1-For **BOI** implants open flap surgery is needed. Gum incision and suturing are necessary, unlike **BCS** implants, as **BCS** implants may be inserted without a flap procedure.

2-SKILL Only a properly trained operator can accomplish the surgical procedure without any complication. If placed by inexperienced or untrained hands, problems are bound to come.

#### **COMPLICATION OF BASAL IMPLANTS**

1) Functional overload osteolysis:- The masticatory forces transmitted via the basal implants to an enossal location create local microcracks in the cortical bone. Microcracks are repaired by the formation of secondary osteons, a process called remodeling. This, however, will temporarily increase the porosity of the affected bone region and temporarily reduce the degree of mineralization additionally. If microcracks accumulate at the bone/implant interface, the reduction in mineralization can also be detected on radiographs where the osteolytic area initially exhibits only diffuse radiological borders. As long as the bone substance is not torn away from the implant and the area is not superinfected, the loss of mineralization remains diffuse but usually reversible (fig 5), Basal implants in this status have a

good chance of getting reintegrated at a high degree of mineralization, if loads are reduced to an adequate amount (fig5)

2) Infection:- It spreads submucosally. (fig 6) This may result in infected vertical parts if the implants are submerged below the mucosal level over time, eliminating the necessary gateway for suppuration as the area of penetration is closed with scar tissue. Any inflammation of this type will spread just like a submucosal abscess and is treated in the same way. It is recommended to make generous incisions to open the abscess. The mucosal area immediately adjacent to the threaded pin can be excised by electrosurgery. In rare cases, reduction osteotomies or the replacement of implants will be required if vertical bone growth becomes excessive.

#### **CONCLUSION**

Evolution of basal implants had given positive hope for the patients with atrophied ridges which can be rehabilitated not only by avoiding augmentation procedures, time, cost but also by immediately loading of the prosthesis making them more confident and socialize normally.

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