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Cortical Implants for Immediate Functional Loading to Rehabilitating Missing Teeth: A Series of Case Reports

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Abstract:
Background: *Dental implants have significantly advanced oral rehabilitation protocol since Dr. Branemark discovered osseointegration. However, limitations such as prolonged healing, bone loss, and certain medical conditions can hinder the success of traditional implant procedures. Basal implants, placed in dense cortical bone at a strategic location, offer a viable alternative for challenging cases. With a history dating back to the 1970s, these implants have evolved into a treatment option that allows for immediate function and is suitable for situations where conventional implant placement is not a feasible choice. This article explores the indications for basal implants and presents some case reports to their clinical application.*
Conclusion: *Cortical implants are viable options for immediate functional masticatory loading, however, it requires careful treatment planning, while considering various anatomical and systemic factors.*
Key Word:*Cortical implantology, Immediate Loading, osseointegration*

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I. Introduction

Implant therapy in dentistry is now considered a predictable treatment choice for dental rehab. Branemark conceptualised the concept of unique "osseointegration" of implants into alveolar bone, the success of implant[1]therapy has become more rewarding and widespread throughout the globe.But there are a lot of limitations whichinvolve prolonged healing of 4-6 months, atrophied jaws, caudal expansion of maxillary sinus, few medical[1,2]conditions like uncontrolled diabetes, smokers which are not indicated for this Branemark protocol.

Such situation's require special attention for validation so that implants can be successfully placed. Of late, cortical implants consists of special designs with specific characteristics and can be used as a substitute for such conditions. These implants can be inserted into the basal and cortical bone with greater stability for immediate functional loading. Basal implants were first developed and used by Dr. Jean-Marc Julliet in 1972, as a single-piece implant.

Later, French dentist, Dr Scortecci, in 1980 invented improved basal implant system completed with matching[2,3,4]cutting tools.

In recent times, treatment of missing teeth can be considered very challenging as prosthesis do not mimic the ideal dentulous anatomy. To overcome such challenge, dental implants with a proper prosthetic design and biocompatible materials are used. To achieve a successful implant, macro and micro design of implant is selected properly, as wellas proper selection of the quality (thickness), and quantity of bone.[2] When insertion of the implant is done, the resistance reflected by bone can help determine the nature of bone. Generally basal bone implants are inserted in poorly atrophied bone areas which requires a stable cortex for engagement, example includes anterior nasal spine, nasal floor, pterygoid areas in case of maxilla and lingual cortex, mandibular symphysis in case of mandible.[4] Such implants can be used to place single and multiple unit prosthesis. Basal implants has a good clinical success due toitsspecific approach of meeting patient

demands, it can serve as a good solution to problems faced with conventional implants. This article discusses cases where basal implants were placed.

II. Case Report

This clinical study was carried out on patients of Department of Periodontics and Implantology at Hazaribag College of Dental Sciences and Hospital, Hazaribagh, Jharkhand.

CASE 1

Missing left lateral incisor (22) was rehabilitated by using (3.5/17mm) corticobasal implant. All the surgical protocol were followed while placing an implant. Suitable prosthesis was given next day and balanced occlusion was established. Overjet and overbite were checked while keeping the aesthetic as topmost priority.

Figure 1-Preoperative clinical picture (A) along with radiographic image (B). Post operative implant (3.5/17) mm (C) along with post operative radiographic image(D) was shown. Loading of implant with suitable prosthesis (E).

CASE 2

Missing left central by using (3.5/17mm)incisor (21) was rehabilitated corticobasal implant. All thesurgical protocol werefollowed while placing an implant. Suitable prosthesis was given next day and balanced occlusion was established. Overjet and overbite were checked while keeping the aesthetic as topmost priority.

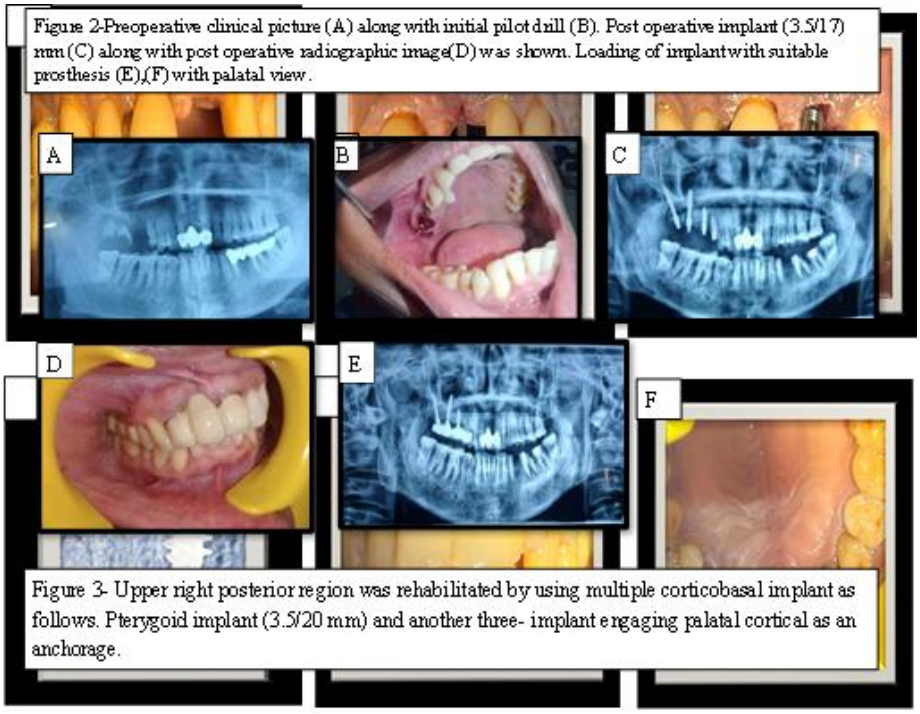

Figure 2-Preoperative clinical picture (A) along with initial pilot drill (B). Post operative implant (3.5/17) mm (C) along with post operative radiographic image(D) was shown. Loading of implant with suitable prosthesis (E),(F) with palatal view.

Figure 3- Upper right posterior region was rehabilitated by using multiple corticobasal implant as follows. Pterygoid implant (3.5/20 mm) and another three- implant engaging palatal cortical as an anchorage.

Upper right posterior regionwas rehabilitated by using multiple cortico-basal implant as follows. Pterygoid implant (3.5/20 mm) and another three-implant engaging palatal cortical as an anchorage in a strategic area.

CASE 4

Missing upper anterior central incisor (11,21) and lateral incisor (12) was rehabilitated by using (3.5/17mm) cortico-basal implant. All the surgical protocol were followed while placing an implants stable cortical i.e., nasal floor were engaged. Suitable prosthesis was given next day and balanced occlusion was established. Overjet and overbite were checked while keeping the aesthetic as topmost priority

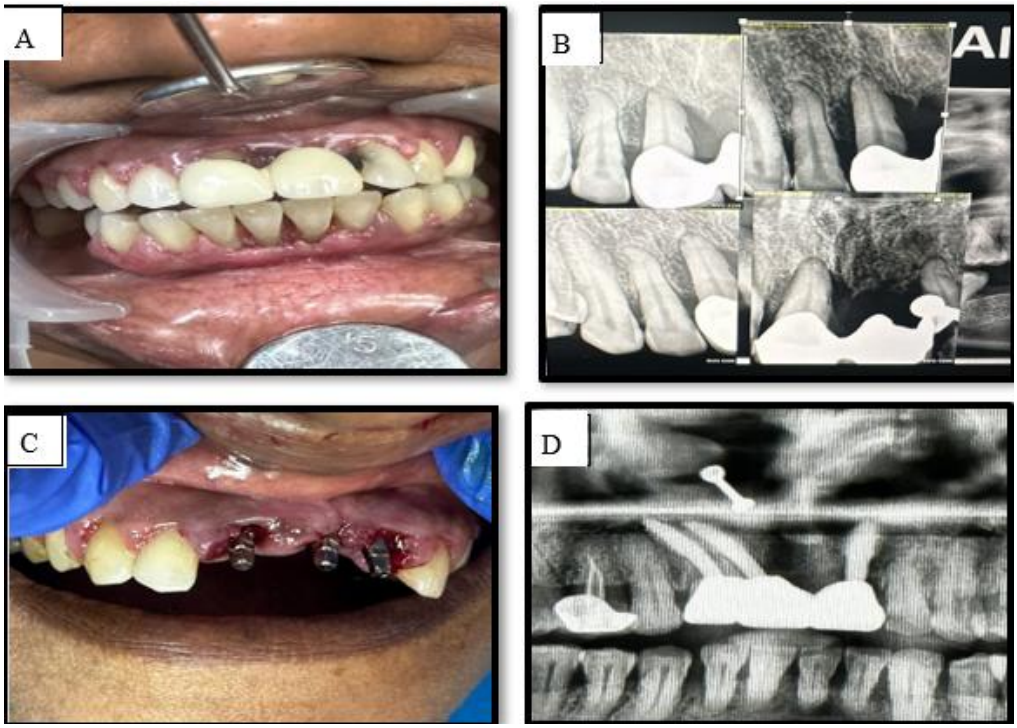

Figure 4- (A)Clinical picture of Upper anterior region, (B) Clinical picture of Upper anterior region radiographic image, (C)Post-operative clinical picture after implant placement ,(D) Post- operative clinical picture after implant placement and radiographic image ,(E) Clinical picture after prosthetic loading of implants

III. Discussion

The available option for r e m o v a b l e o r f i x e d prosthesis, choices include conventional and cortical's which, the cortical implants appreciable outcomes.[3] cases didn't show sufficient conventional implant There was a need for such additional cost and expense. require sufficient alveolarrehabilitating missing teeth is prosthesis [1,2] . I n f i x e d bridge or implants. In Implants, are feasible options. Out of have been chosen here and had Through OPG & IOPA, these alveolar bone for placing the without bone augmentation [5]. adjunct surgery which incurs

[6] Since cortical implant doesn't bone in terms of its height andwidth, the fixation ofimplants was successfully made with basal bone by engaging implants in strategic locations.[7] For the upper central and lateral incisors position, the cortical implants having smooth surface was engaged. Here in all upper incisors cases 3.5X17 or 3.5X 20 mm wasengaged in stable cortical apical to nasal floor. In prosthesis wing had been incorporated in both the sides to add anti rotational features. In posterior rehabilitation the tuberopterygoid region is the choice for anchorage as per anatomical advantages.[8] Cortical implants of 3.5X23 mm had cross the tuberosity and postero-superiorly-medially movement allowed to engage pterygoid fossa. Its blind procedure but still tactile perception plays guiding factor. The assessment of discrepancy between implant abutment and margin of the gingiva, necessitates the creation of gingival prosthesis. The transmission of occlusal load through these implants will be on stable cortical.[9] The soft tissue over the alveolar bone will shrink and shift apically with concomitant resorption of alveolar bone in the long run, hence space maybe present between alveolar bone and the prosthesis. This gap is taken care through later changing prosthesis if required.

IV. Conclusion

The above mentioned four cases have been done for rehabilitation of missing teeth by cortical implantology for immediate functional loading. The real challenge is to maintain the patient's aesthetics and keep the prosthesis in a position where the occlusion is not hindered. Subsequently, impressions were made of both arches, and trials were done on consecutive days. The prosthesis was placed following proper guidelines. The results obtained were satisfactory, and the prosthesis was placed to obtain a balanced occlusion without interferences. The success of these implant supported prosthesis mainly depends on occlusion, beside other factors and need a long term follow-up to validate its success.

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