



## IMPLANT PLACEMENT IN MAXILLARY ANTERIOR REGION WITH BONE AUGMENTATION USING AUTOGENOUS BLOCK GRAFTS –A CASE REPORT

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**ABSTRACT** Implant surgeon should take advantage of advances in instrumentation and grafting biomaterials to augment the deficient ridges. Biotechnology has greatly improved our ability to predict and reconstruct osseous defects. In addition to present specific bone grafting techniques used to restore hard tissue volume defects at the sites, the volume of augmentation defines the procedure. Significant amounts of autogenous bone can be procured from symphysis or ramus region of the mandible. The cortical grafts of this area provide predictable increase in bone volume with a short healing time and yield a highly dense osseous architecture for implant placement. This review discusses the use of autogenous block grafts and bovine bone allograft for predictable bone augmentation in atrophic ridges.

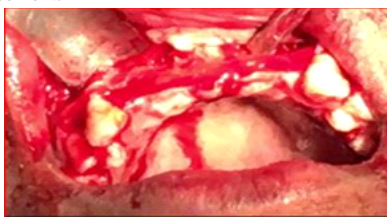
**KEYWORDS :** Allograft, autogenous graft, bone grafting, dental implants, guided bone regeneration

### INTRODUCTION

Oral rehabilitation of patients with missing teeth with oral implants has become a successful treatment for last few years. Often patients present with ridge atrophy which may become an obstacle for correct implant placement. Insufficient bone volume requires hard tissue reconstruction, autogenous block bone from oral cavity has been a gold standard which has over the years has been greatly simplified both for the surgeon and for the patient. The author routinely harvests autogenous bone grafts from the retromolar, buccal shelf, and symphysis region of the mandible, and further, it is mixed with bovine bone mineral (cerabone, botiss) to expand the volume. This bone graft is porous, hydrophilic and osteoconductive, when mixed with autogenous bone, it not only expands graft volume but also improve the working properties of the particulate graft. Corticoancellous block grafts harvested from intraoral sites offer tremendous advantages as they are biologically superior since the viable cancellous marrow cells transferred with the marrow graft contribute to the phase one bone regeneration at the recipient site. The cases discussed here are of horizontal ridge augmentation with bone blocks from intraoral sites coupled with PRF and xenograft. Clinical and radiographic evaluation further confirms the predictability of the technique.

### CASE REPORT

A 28 year-old patient reported to department of Prosthodontics with missing central and lateral incisors and was concerned with the aesthetics of his maxillary incisors. He reported a history of trauma, two years back. Architecture of soft tissue was firm. Clinical examination demonstrated buccal defect.(Fig 1) A block graft placement from midsymphysis region was decided after complete blood and other examinations. Two block graft was tighten with titanium screw in maxillary anterior region.(Fig 2) 8 months after block graft procedure a two- stage implant surgical procedure (using Adin implant) was planned with simultaneous use of bone grafting to cover any dehiscence in the labial aspect that will appear during the placement procedure. After evaluating the clinical and radiographic findings (CT scan), two implants of 11.5 mm length and 3.5 mm diameter was considered ideal for the site in 12 and 22 taking into consideration the fact that the tooth-implant distance should be greater than or equal to 3mm at the site.(Fig. 3,4,5) Study models were prepared. Occlusal guiding stents were prepared with clear acrylic resin. The prefabricated surgical stent was to be used to direct the implant placement.



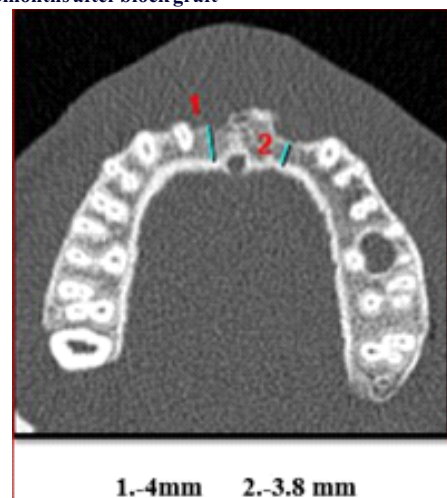
**Fig. 1- bone previous to block graft**



**Fig. 2- placement of block graft from symphysis region**



**Fig.3- 8months after block graft**



**Fig.4- CT scan**



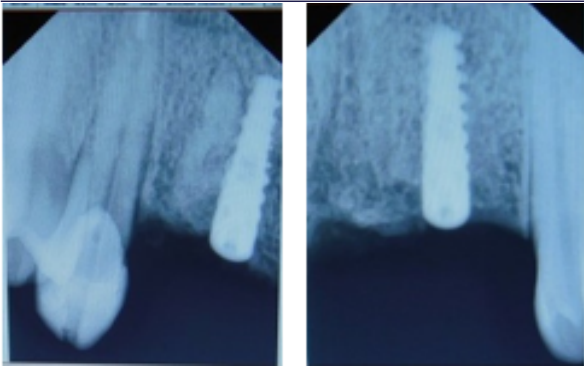


Fig. 5- Placement of implants



Fig. 6- healing abutment

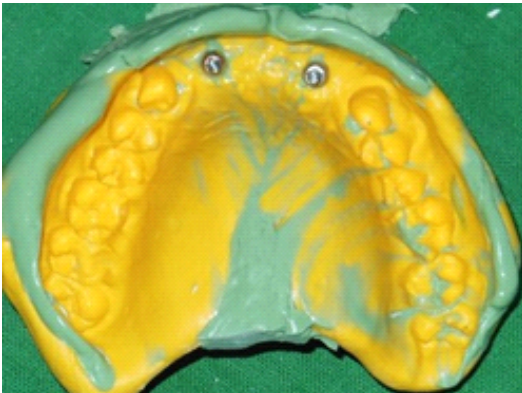


Fig.7- Open tray impression



Fig 8-Angulated abutments



Fig. 9- Final prosthesis intraoral and extra oral view

**Bone Grafting:** A buccal dehiscence defect at the most coronal aspect of the left implant exposing a few threads of the implant was noted.

After decorticating the labial bone with hand instruments, (Particulate xenograft) was mixed with PRF (platelet rich fibrin) from the recipient site and was placed over the dehiscence. Healing guide membrane was used to stabilize the graft. The flap was closed over the graft and sutured using interrupted sutures.

**After Three Months-  
Second Surgical Stage:**

After a healing period of 3 months as advised in the classical Branemark 2 stage submerged protocol (Branemark et al,1969), a tissue punch was used to uncover the implants.

Healing abutment (Fig. 6) was placed after 10 days. Open tray impression technique (Fig 7) was used for implant level impression. 20° angulated abutment (Fig 8) was placed to change the angulation of implant and temporary composite crown was placed. Final prosthesis was inserted after a week (Fig. 9).

**DISCUSSION**

The clinical report confirms the validity of a previously described surgical approach to horizontal GBR.[1,2] For the presented patients, the regenerative technique improved the morphology of the partial and complete edentulous ridge, thus allowing for a more ideal implant placement. Better positioning of the fixtures allowed for final restorations with better emergence profile, and as a result, the overall harmony of the implant-supported prosthesis in relation to the adjacent and opposing dental elements was enhanced. The adopted regenerative technique presents several advantages when compared with other surgical procedures designed to rebuild lost osseous structure,[3,4] During GBR procedures, it is crucial to create a space that is properly isolated from the surrounding soft tissues and can be maintained for an appropriate period of time to ensure osteogenesis.[5,6] In addition, speedy and adequate blood supply to the area are necessary to ensure rapid blood clot formation[7] and the accumulation of a reservoir of endogenous bone-formative elements. The necessary space is created and preserved with the aid of a specialized biologic barrier membrane interposed between the graft site and the surrounding soft tissues. In GBR studies, resorbable membranes have been shown to be as effective as non-resorbable membranes.[8,9] In addition, resorbable collagen membranes seem to be able to overcome exposure problems and possible infection by promoting rapid soft tissue healing once exposed to the oral cavity, as opposed to expanded polytetrafluoroethylene or non-collagenous resorbable membranes.[10] In addition to space maintenance, the membrane plays a role in clot stabilization while simultaneously preventing migration of non-osteogenic tissues into the area. The created space can then be occupied by proliferating vascular, osteogenic cellular, cytokinal, and hormonal components with fundamental successful GBR.[11] When the space created for GBR cannot be maintained because the membrane collapses into it, screw devices or graft/filler materials must be introduced into the space to prop up the membrane.[12,13] It has also been shown that autogenous bone used as a filler will enhance osteogenesis by inductive and conductive processes. Furthermore, placement of a collagen barrier membrane over the graft sites might exclude unwanted cells from the wound, protect the wound, and, therefore, promote bone regeneration. From the histologic and immune histochemical standpoints, no difference was found between the sites treated with or without membrane when block graft was used as the graft materials.[1,14] However, recent studies have shown using a membrane during block graft procedures actually minimizes bone resorption.[1,14] Our study did not aim to show the efficacy of placing a barrier membrane and its influence in bone resorption. However, we noted that the additional use of autogenous bone and absorbable membrane had successful outcomes for proper implant placement compared with the results in previous studies where these biomaterials were not used.[15,16]

**CONCLUSION**

Within the limitations of the present study, a combination of block graft obtained from the ramus or symphysis, particulate xenograft, and then an absorbable collagen membrane as a cover is a predictable technique in augmenting atrophic ridge deficiency.

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