

Autogenous Mandibular Symphysis Graft for Horizontal Ridge Augmentation Prior to Dental Implantation: A Case Report

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ABSTRACT

Background: Endosseous dental implants are commonly used in the present day to replace missing teeth. However, ridge resorption can complicate the placement of implants due to inadequacy in width and height of the ridge. Autografts, being the gold standard in alveolar reconstruction can be utilized to treat large ridge defects prior to implant placement. This can be done prior to or at the time of implant placement to ensure good long term prognosis. This article presents a case with a horizontal ridge deficiency treated using autogenous bone harvested from the mandibular symphysis and the placement of an endosseous dental implant six months following augmentation procedure.

Keywords: Bone graft, Ridge augmentation, dental implant.

INTRODUCTION

Residual ridge resorption is a phenomenon that always follows tooth extraction. Around 60% of ridge height is lost in one year following extraction of which the majority occurs in the first three months¹. Considering the time interval between tooth extraction and replacement and the increasing popularity of dental implants, not all the sites will be amenable for the placement of a dental implant. Therefore the clinician faces the difficult situation of a resorbed ridge which will not adequately support the placement of implant supported prosthesis. Hence, ridge augmentation procedures have gained clinical importance over the years and newer surgical techniques and materials have been proposed to augment the deficient ridge. They include guided bone regeneration, bone grafting, distraction osteogenesis, and autogenous block bone grafting using intra oral or extra oral bone¹. All these procedures have their own specific indications and contraindications which will dictate their use in a given clinical situation. The gold standard of bone

grafting however remains autogenous bone which can be obtained either from intra oral or extra oral sites. The advantages offered by selecting an intra oral site for harvesting bone are single surgical site, lesser intra and post operative morbidity for patients, ease of access, and reduced surgical time. The mandibular symphysis and ramus buccal shelf are the most used intra oral sites for harvesting block bone grafts for ridge augmentation procedures. The selection of the donor site depends on the volume of graft required, the location of the recipient site and the type of graft needed for augmentation. Among the advantages offered by the symphysis as a donor site is the graft volume which is 50% larger than what can be obtained from the ramus². Another important advantage is its inherent cortico-cancellous nature which favours vascularisation and in-growth of blood vessels following graft stabilization³. This article presents a case of horizontal ridge deficiency treated with a block bone graft from the mandibular symphyseal region and dental implant placement six months following augmentation procedure.

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CASE REPORT**Pre-Operative Assessment and Preparation**

A 17 year old Female patient reported to a OPD, Department of oral & maxillofacial surgery, Mahatma Gandhi dental college & Hospital, Sitapura, Jaipur, Rajasthan, India presenting with a deficient alveolar ridge in the maxillary anterior region (Fig-1). History and examination revealed loss of right & left maxillary central and maxillary left lateral incisor due to traumatic injury leading to a horizontal ridge defect which was confirmed by taking radiographs. Following routine blood and biochemical investigations to ascertain the medical status of the patient, informed written consent taken, a two stage treatment plan was formulated. The first stage involved augmenting the deficient ridge with a block graft from the mandibular symphysis and the second stage involved the placement of a dental implant.

Stage- 1

The vestibular approach was used to access the symphysis. Vestibular degloving incisions were placed and a full thickness muco-periosteal flap was elevated upto the lower border of the mandible (Fig-2). The mental foramen was identified and isolated so as to avoid trauma to the mental nerve and vessels. The ridge defect was measured and the width of the ridge was found to be 2mm near the crest. The recipient site was decorticated using round burs to induce bleeding. A block bone graft measuring 10mm by 6mm and a thickness of 5mm was harvested from the symphyseal region. Initial holes were made with round burs to mark the extent of the block graft and the graft was procured (Fig - 3) and placed in a bowl containing sterile saline. Hemostasis of the donor site was achieved using Platelet rich fibrin (5ml gel form) which was subsequently followed by suturing the flap (Fig-6). The graft was then trimmed to remove sharp margins and stabilized in the recipient site. Fixation of the graft was achieved using a titanium screw (Fig-4). Anorganic bovine bone mineral with PRF was placed around the block graft (Fig-5). Both the block bone and bone graft particles were covered by an absorbable collagen membrane. The flap was then approximated with interrupted sutures using 3-0 braided black silk sutures (Fig-7). Care was taken to close the flap without tension. An extraoral

pressure bandage was also placed over the symphyseal region to prevent post operative oedema. Post-operative instructions and medications (Amoxycilling 500mg T.D.S, Ibu profen 400mg T.D.S) were prescribed. Sutures were removed after 10 days. Regular recall visits were scheduled to evaluate wound healing and appearance of complications such as wound dehiscence, membrane exposure, or loss of graft.

Stage-2

6 months following the augmentation, a computerized tomogram scan was taken to evaluate the outcome of augmentation procedure. It revealed width of 7mm in the edentulous region (Fig-9). Based on these findings, it was decided to place two endosseous dental implant of diameter 3.5mm, length 11.5mm & diameter 4.0mm, length 10mm each in the region of upper right central incisor and left lateral incisor. A crestal incision was placed and a full thickness muco-periosteal flap was reflected. After flap reflection, the bone graft was found to be completely integrated with the recipient site and the width of the implant site was 7 mm which indicated a gain of 5mm. Prior to implant placement, titanium cortical screw was removed from the healed block graft through a stab incision, using a screw driver.

The implant was placed following sequential drilling and good primary stability was obtained (Fig-8). Following implant placement, the cover screw was placed and the flaps were approximated with interrupted sutures using 3-0 braided black silk sutures. Care was taken to close the flap without tension. A post-operative radiograph (Fig-10) revealed proper placement of the implant. Patient was prescribed the same medication as during the bone augmentation visit. Regular recall visits were scheduled to evaluate any complications following implant placement.

DISCUSSION

The clinical indication for performing ridge augmentation procedure is the lack of satisfactory quantity and quality of alveolar bone. Currently there are numerous materials and techniques to perform such a procedure. Autogenous bone grafts

however, remain the gold standard for bone regeneration and this becomes exemplified when a large ridge defect is present⁶. The 2 stage approach is used when extensive ridge resorption has occurred wherein block bone grafts maybe used prior to the placement of dental implants. There are numerous advantages of this technique includes lesser probability of membrane exposure, wound dehiscence, and loss of graft⁷. This case was treated using such a method where a symphyseal graft was harvested and a dental implant was placed 6 months later. The bone formation was excellent at the time of re-entry and the additional placement of graft particles and a membrane also helps in graft stability which will reduce resorption⁶. This becomes more pronounced if the membrane remains in place throughout the healing period⁸.

An important advantage of using an intraoral site for graft harvesting, especially the symphyseal region is the lesser resorption of the graft when compared with extra oral sites⁹. The CT scan showed adequate bone at six months with no complications evident clinically. There were no residual graft particles at the time of re-entry with complete integration of the graft seen. This will ensure proper placement of the implant which will facilitate prosthetic rehabilitation with optimum aesthetics and function.

CONCLUSION

The result obtained in this case demonstrates the success of ridge augmentation using autogenous block bone grafts obtained from the mandibular symphysis. Re-entry at the time of implant placement showed adequate bone regeneration at six months. Considering the necessity of such procedures, their success will only encourage dental professionals to perform augmentation of the ridge prior to implant placement. It is an excellent and predictable procedure for ridge augmentation in horizontal deficiency



Fig 1: Preoperative :Missing maxillary right & left central and left lateral incisor.



Fig 2: Donor site exposed.



Fig 3: Bone Harvest area marked.

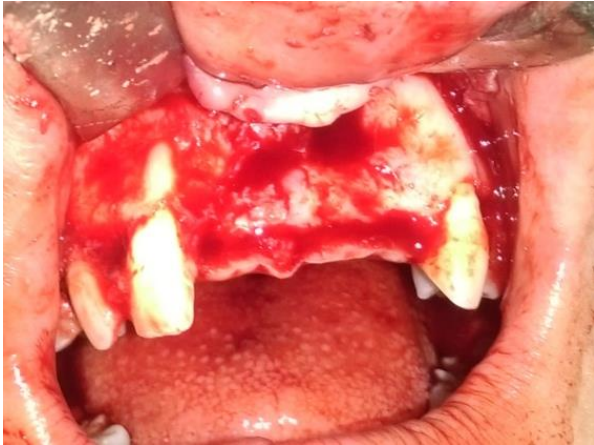


Fig 4: Recipient site prepared.

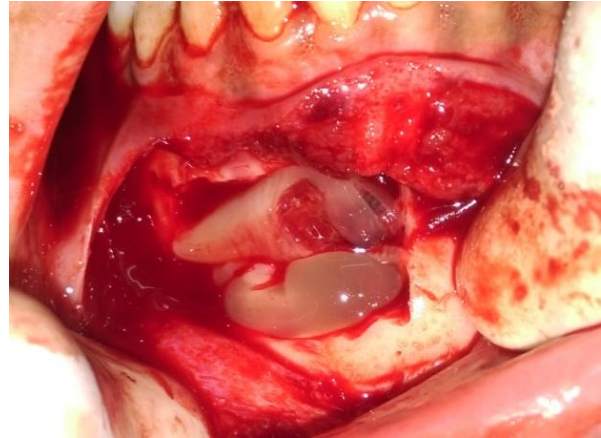


Fig 6: Platelet rich fibrin placed in Donor area



Fig 4: Harvested Mandibular Chin Bone.



Fig 7: Donor area sutured.



Fig 5: Onlay bone graft fixed with titanium screw.



Fig 8: Dental implant place in grafted site after 6 months.



Fig 9: OPG showing grafted bone fixed with titanium screw.



Fig 10: OPG showing dental implants after placement.

CONFLICT OF INTEREST

No potential conflict of interest relevant to this article was reported.

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