



ENHANCING IMPLANTOLOGY WITH AUTOGENOUS BONE BLOCK RIDGE AUGMENTATION: REPORT OF TWO CASES

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ABSTRACT Implants have significantly transformed the field of Periodontics, making implant placement a reliable option for treating both partial and complete tooth loss. However, implant placement in areas with alveolar deficiencies can result in poor angulation, increased mechanical stress, and suboptimal aesthetic outcomes. When the alveolar process does not meet the minimum dimensions required for implant placement, it becomes essential to augment the ridge and gain appropriate size. This can be accomplished through a variety of techniques and materials. In this report of two cases, we successfully performed horizontal and vertical ridge augmentation using autogenous bone blocks, achieving the desired results.

KEYWORDS :

INTRODUCTION:

The face is commonly seen as a representation of one's identity, with a smile serving as a glimpse into their character. Within this context, teeth hold significant significance in upholding a favorable self-image. Their absence can lead to substantial challenges, impacting social engagement and overall well-being.

In the past, the standard methods for addressing missing teeth included options like removable partial dentures, fixed partial dentures (bridges), and complete dentures, particularly in cases where all teeth were missing. However, the desire for replacements that closely mimic natural teeth has driven extensive research and innovation in dental implants, particularly in more developed regions.[1]

Implant placement requires adequate bone height and width, ridge deficiency compromises or hampers the implant placement procedure and outcome.

Siebert has classified residual ridge deformities into three distinct categories:

- Class I denotes a loss of tissue width along the facial-lingual dimension while maintaining normal ridge height;
- Class II signifies a reduction in ridge height while width remains unaffected; and
- Class III represents a combination of diminished dimensions in both width and height.[2]

Several surgical approaches have been developed to address significant alveolar bone defects for dental implant placement. Clinicians strive to achieve optimal outcomes efficiently by employing suitable techniques, aiming for successful results within an expedited time frame.

Ridge augmentation is one such surgical approach that varies in sensitivity, contingent upon the type of procedure and the skill level of the operator. Despite augmentation efforts, not all augmented volume translates into viable bone tissue regeneration. Implant survival is more closely associated with the quality and quantity of the remaining host bone rather than the volume of grafted bone.[3]

So, here in this case report we have done two cases: one horizontal ridge augmentation in order to achieve a sufficient ridge width for implant placement and another with vertical ridge augmentation to

cover up the vertical defect along with simultaneous implant placement.

Case report:

Case I-

A 24-year-old male visited the department of periodontology with the complaint of missing teeth in the upper front teeth region. He gave history of trauma 6 months before he visited the department. On examination, teeth # 9, #10 (Universal system) were missing, and there was depression seen with the edentulous region.

The patient was explained with all the treatment modalities for the replacement of the missing teeth such as removable partial denture, fixed partial denture and implant.

The patient opted for implant willingly, so in order to evaluate the bone CBCT was advised. On CBCT examination, it was found that there was loss of buccal cortical plate in the edentulous region, so in order to restore it, bone block augmentation was planned.

As the literature suggests, autografts stand as the pinnacle in bone grafting, revered for their status as living tissues housing their own cellular infrastructure and their unique characteristic grants them immunity from rejection, promising seamless integration within the recipient's body. And as a result, their track record for successful outcomes, particularly in terms of healing and predictive prognosis, surpasses that of alternative methods employing alloplastic or allogenic materials[4]. Autogenous bone block harvesting from the symphysis region was planned followed by implant placement after 6 months of the augmentation procedure. Patient was informed about the procedure and an informed written consent was taken.

Augmentation surgical procedure:

A full-thickness mucoperiosteal flap was reflected at the recipient site that is with #9/#10 region, debridement was done, and the defect size was measured.

Taking a submarginal incision in the mandibular anterior region, a partial thickness flap was raised followed by full thickness flap beyond the mucogingival junction in order to expose the symphysis region.

Following the rule of 5 given by Misch in 1995 [5], marking was done in order to harvest the bone block of required size. Disc bur and chisel

mallet were used to harvest the graft.

Once the graft was harvested it was then placed and at the recipient bed with the help of titanium fixation screws. Particulate xenograft was packed into the gap that was left in between the block graft and the recipient bed. Absorbable barrier membrane was placed over the graft and it was sutured using absorbable vicryl suture in order to cover the entire grafted region. Flap was completely approximated using non absorbable mersilk suture.

The donor site was also sutured using non absorbable mersilk suture. Periodic recall visits were planned in order to check for any membrane exposure.

Implant placement surgery:

After 6-7 months the patient was again advised CBCT in order to check the success of the grafting and the bone available. On 6 months post operative CBCT a ample amount of bone available was appreciated also the lost buccal plate was restored.

Now the planning for implant placement was done on CBCT and it was found that there was much bigger nasopalatine canal was present so in order to avoid invading the canal and examining the bone available , 3.5 x 10 size implant were selected.

A fullthickness mucoperiosteal flap was reflected , sequential osteotomy site preparation was done and finally implant placement was done.

As the Patient was concerned about the esthetics he wished for a temporary restoration so after placing the implants immediate temporization was done.

Prosthetic phase:

After 3 months impression was made and final prosthesis delivery was done.

Case 1 photographs:



Pre-operative Full thickness flap reflected



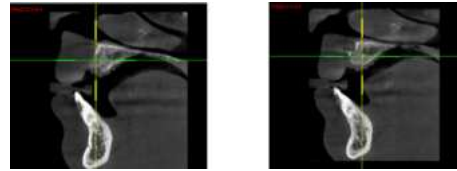
Block graft harvested using chisel and mallet Donor site suturing done



Fixation of block graft at recipient site using fixation screw Donor site suturing done



Recipient site suturing done Temporary prosthesis



Preoperative CBCT showing lost buccal cortical plate Post operative CBCT showing restored buccal cortical plate



Fixation of block graft at recipient site using fixation screw Membrane placement done

Case 2-

A 28 year male visited to the out patient department of department of periodontology and implantology with a complaint of missing teeth in lower front teeth region and wanted to get it replaced. On examination vertical ridge deficiency (siebert's class II) was appreciated. On asking patient gave history of trauma 1 year back due to which his lower front teeth got exfoliated. The patient was informed about all the possible treatment modalities such as removable partial denture, fixed partial denture and implant for the replacement of the missing teeth. The patient willingly opted for the implant placement. As the patient chose implant as treatment modality, in order to gain sufficient bone height vertical ridge augmentation was planned, harvesting the graft from symphysis region. The patient was thoroughly explained about the surgical procedure and an informed written consent was taken.

Ridge augmentation procedure:

Full thickness mucoperiosteal flap was reflected to expose the recipient site , the flap was then reflected beyond mucogingival junction to expose the donor site and using disc bur and chisel mallet bone block was harvested from the symphysis region.

The bone block was then placed at the augmentation site and in order to fix the block in place osteotomy was done followed by implant placement. The implant kept the bone block at place and acted as fixation screw. Absorbable collagen membrane was placed and suturing was done using 3-0 mersilk suture.

Prosthetic phase:

6 months after the augmentation procedure second stage surgery was performed and a well osseointegrated implant with good stability was found. After 4 weeks impression was made and prosthesis delivery was done.

Case 2 photographs :



Pre operative Marking done at donor site using disc bur



Block graft harvested and placed at recipient site Implant placement done in order to fix the block graft at recipient site



**Membrane placement done
Suturing done**



**After second stage surgery placement of the gingival former
Implant impression made**



Final prosthesis delivery done

DISCUSSION:

The survival of implants is closely linked to the quality and quantity of the remaining host bone. In patients with limited bone height and width, successfully placing dental implants becomes challenging due to the need to maintain an ideal trajectory while avoiding critical anatomical structures.[3] So reconstructing or augmenting bone is very important in order to place the implant. Vertical or horizontal ridge augmentation is a accepted treatment modality to achieve a sound bony structure. Istvan A Urban (2019) have stated that Vertical ridge augmentation is a practical and effective method for reconstructing deficient alveolar ridges.[6] Nadja Naenni (2019) have also stated that the Primary lateral bone augmentation generally results in adequate bone width, facilitating successful subsequent implant placement in most cases.[7]

Ralf Smeets (2022) have found positive outcomes for xenogeneic as well as autologous bone materials for horizontal ridge augmentation of the lower jaw.[8]

Autogenous bone graft has been stated as a gold standard in guided bone regeneration or ridge augmentation procedures. Andreas Sakkas (2017) demonstrated the reliability of using autologous bone material for alveolar ridge reconstruction prior to implant insertion, regardless of donor or recipient site, including the use of autologous bone chips for sinus elevation. And found that Given the low morbidity associated with harvesting autologous bone grafts, our clinical results affirm that autologous bone grafts continue to be the "gold standard" for alveolar ridge augmentation before oral implantation.[9]

In this report of 2 cases we have harvested the graft from the symphysis region and had got predictable outcomes with ample amount of bone available postoperatively.

CONCLUSION:

Extensive bone augmentation using autogenous bone graft results in a significant increase in horizontal or vertical bone height or width and provides with sound ridge dimensions for the placement of the implants.

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