

Horizontal and Vertical Ridge Augmentation Utilize Allogeneic Bone Block Graft in Anterior and Premolar Area Prior To Implant Placement Follow Up 2 Years

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1. Abstract

Allografts, derived from donor tissue, are widely utilized in various medical fields, including orthopedics, reconstructive surgery, and organ transplantation. These biological materials provide an alternative to autografts, reducing donor-site morbidity and surgical time while preserving structural and biological integrity. Recent advancements in processing techniques, such as decellularization and sterilization, have enhanced the safety and efficacy of allografts by minimizing immunogenicity and the risk of disease transmission. This review highlights the clinical applications, benefits, limitations, and emerging innovations in allograft technology.

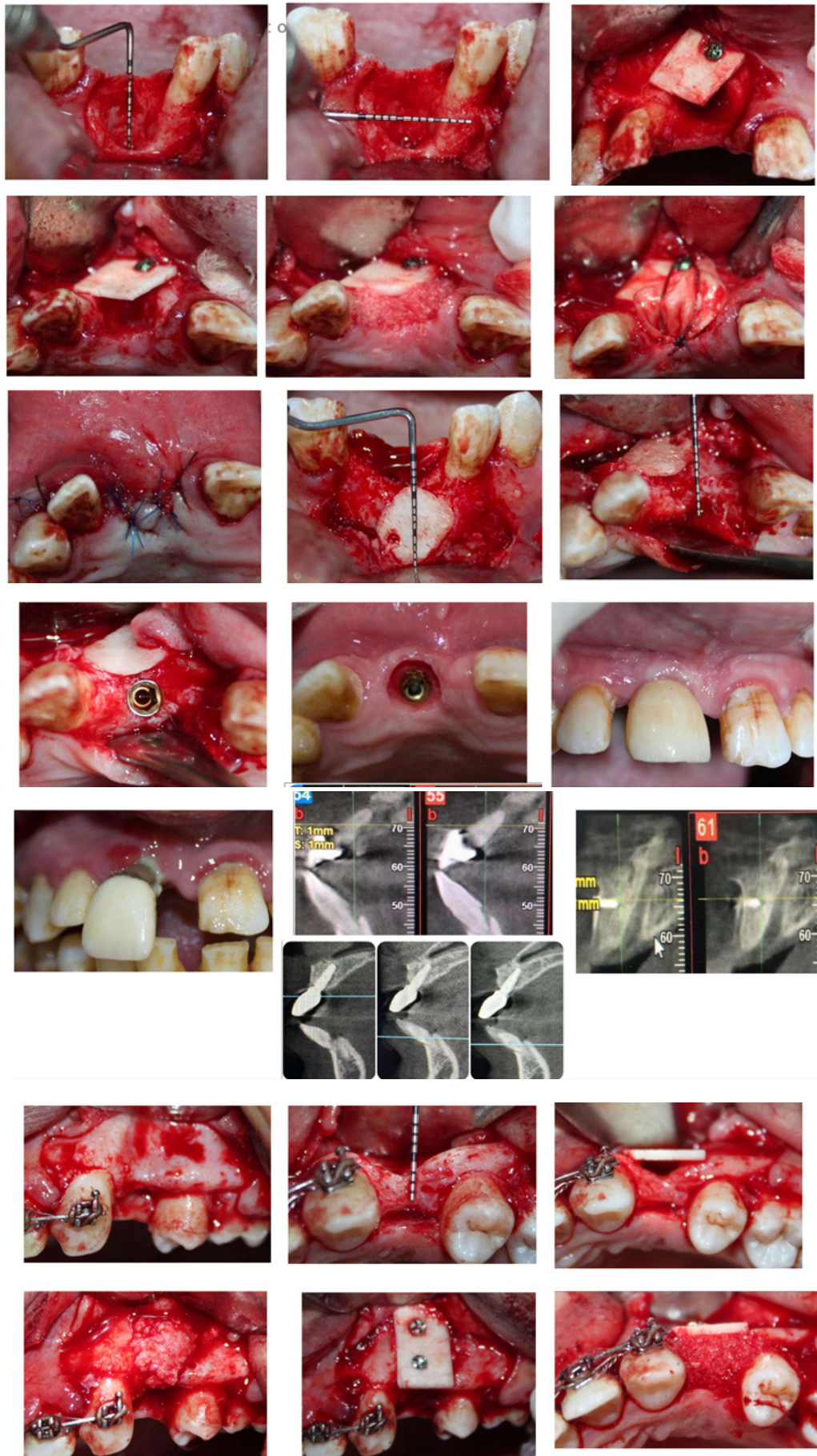
2. Introduction

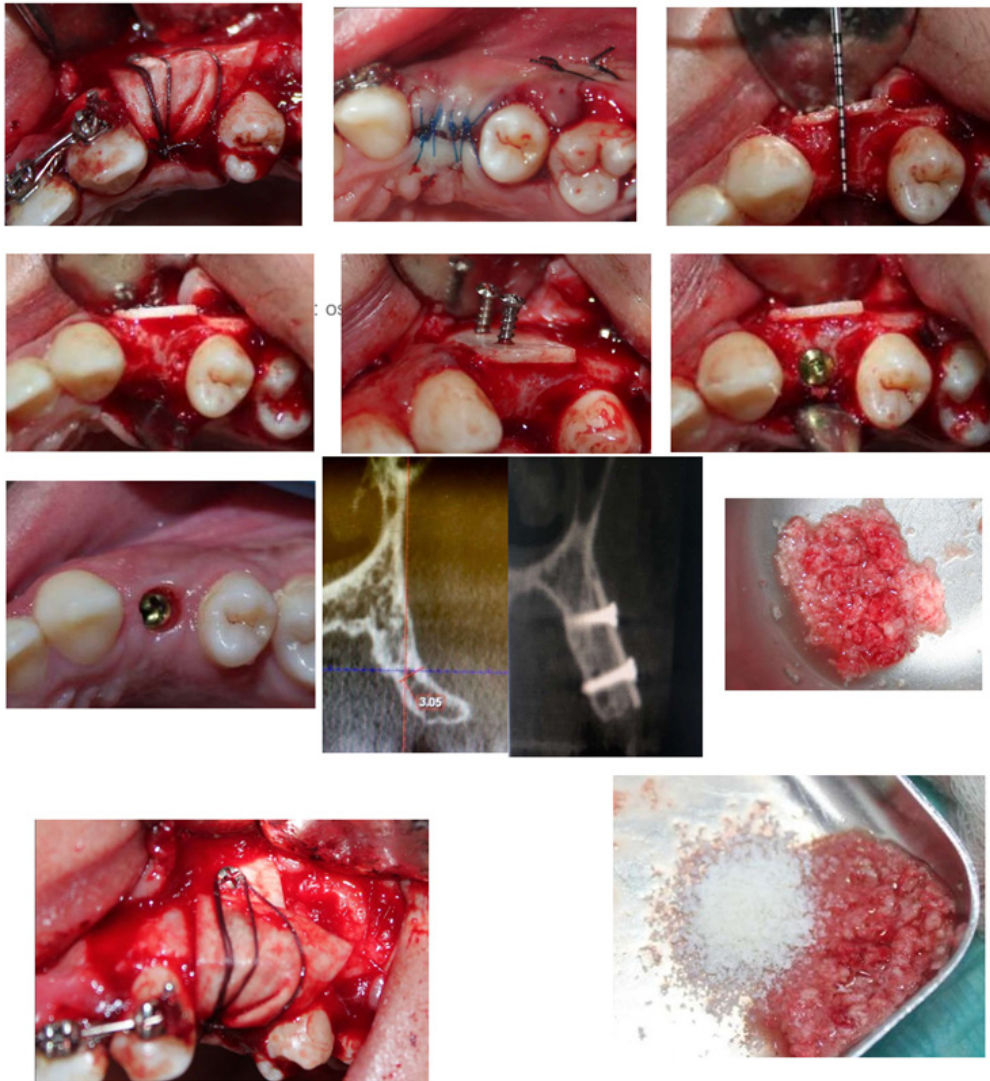
The anterior maxilla and mandible are critical regions in dental rehabilitation due to their impact on both functional and esthetic outcomes. However, atrophic conditions in these areas—whether due to tooth loss, trauma, or periodontal disease—can result in significant vertical and horizontal bone defects, making dental implant placement challenging. The loss of bone volume in these regions can compromise implant stability, functional outcomes, and aesthetic restoration, particularly in the anterior zone where optimal soft tissue contour and esthetics are of paramount importance.

3. Material and Method

Cases of vertical 10mm, horizontal crestal 7 mm and mesiodistal 10 mm, bone defect and tissue inflammation around the infected tooth 11 decision for extraction and curettage of infected

socket remove all infected tissue and granulation accumulation and utilize allograft bone block using one screw for fixation of the plate and filled the gap with mixed allograft particles and autogenous bone chips harvested from external oblique ridge then covered the filled gap by collagen resorbable membrane stabilization by resorbable suture hanging it with the screw that's fixing the plate, tissue flap closer done by doing apical releasing incision for detached the apical muscles and tissue to get passive and stable wound closer done by using polypropylene suture 0.4 flap design for both case was trapezoidal in first case gum around the 21 keep it without reflection to avoid gum recession. Follow up for the wound show stable situation and tissue complete healing, reopening after 4 months reveal perfect bone plate integration and angiogenesis formation at the buccal side of the plate and complete bone reconstruction of vertical and horizontal defect. Implant placement 3.8x10.5mm tapered implant Biohorizons then wait for 3 months and loading the final crown. Second case with the same protocol CBCT reveal horizontal bone defect 3mm thickness of the alveolar ridge utilize allograft bone plate fixed with 2 screws and filled the gap with mixture of allograft and autogenous bone chips from the same zone of first case covered it up collagen membrane and technique of tissue releasing apically for insurance stable wound postoperative. Reopening after same period 4 months and the same results show complete bone healed osseointegration bone plate with host bone and mixture of bone particles, implant placement 3.8x12mm and loading after 3 months.





4. Results

Post operative reopening on the grafted sites after 4 months reveal completely bone integration of the plate with particles and with host bone give full length regain of vertical and horizontal bone defect angiogenesis formation on the plate and on the CBCT show perfect bone formation and stable graft on time of following up, implant placement of both cases show successful integration in the site of the gap was filled by autogenous bone and allograft particles even after 2 years of recall situation is free of inflammation on soft tissue even getting more thickness over time and creeping on the zirconia crown compared by first day loading. Interesting point of first case of central incisor neighboring lateral incisor was have bone loss at the mesial side and

grade II mobility result of periodontal infection after grafting show bone growth on the root again and decrease of root mobility.

5. Conclusion

allograft bone reconstruction is a safe and effective option for vertical and horizontal maxillary defects, especially when combined with strong means of fixation. However, long-term studies and clinical trials are necessary to refine protocols, optimize outcomes, and address limitations such as graft resorption and variability in regenerative response. The integration of tissue engineering and biomaterials may further enhance the reliability and predictability of allograft-based treatments in the future.