

Rehabilitation of severely atrophic alveolar ridges using autogenous bone block grafts as cortical tenting (case series)

Mohseni Salehimonfared, Seyedhossein Mina Taheri

Department of Periodontology, Tehran University of Medical Sciences, Tehran, Iran

salehimo@tums.ac.ir

Introduction: Dental implants reveal highly predictable results for replacing missing teeth (1). Frequently, after tooth extraction, resorption of the alveolar ridge occurs which is sometimes so severe that precludes implant placement. This necessitates extensive bone augmentation procedures, which are usually performed in a staged protocol before implant insertion (2). Autogenous bone blocks and guided bone regeneration using bone substitutes and membranes are successful methods to provide adequate bone volume enabling implant insertion in a prosthetically driven location. This report presents few cases reconstructed using this method.

Methods: Augmentation of alveolar ridges was performed using autogenous bone blocks in combination with bone graft materials and membranes in 12 cases with full or partial edentulism suffering from severe bone resorption. Bone blocks were harvested from intra-oral sources (chin or ramus), and fixated with screws. Particulate allogenic or xenogeneic bone substitutes were placed above and in between the bone blocks. The blocks created space to contain bone graft materials, indeed. The autogenous and non-autogenous bone grafts were covered with resorbable collagen membrane, which was fixated using tacks if needed. Three different cases are presented in here, showing horizontal and vertical augmentation, and also a novel approach using the block bone in the socket to reinforce the buccal bone.

Results: The outcome of the bone graft procedure was successful in all cases. After a healing period of 4 to 6 months, depending on the defect size and the source type of the used bone substitute, the width and/ or height of the alveolar ridge was significantly increased, facilitating implant insertion. Four to six months after implant placement, prostheses were fabricated. Soft and hard tissue around the implants were healthy and maintainable.

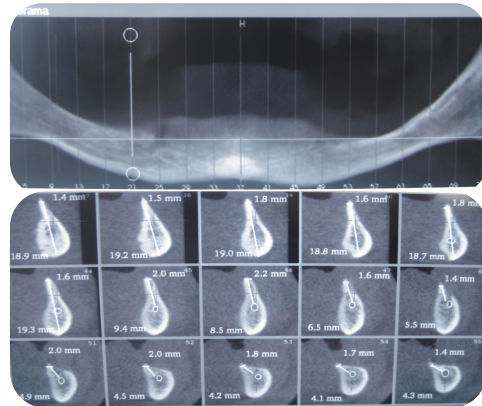
Conclusion: Due to their osteogenic properties combined with the ability to maintain the space, autogenous bone blocks have special advantages to reconstruct severely resorbed alveolar ridges. They can also be used to augment the bone in small single-tooth spaces.

References:

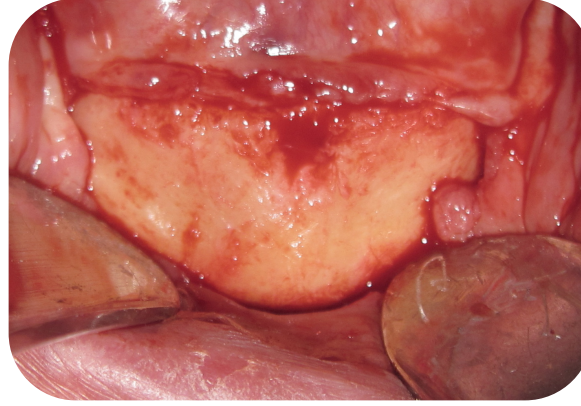
1. Moraschini V, Poubel LA, Ferreira VF, Barboza Edos S. Evaluation of survival and success rates of dental implants reported in longitudinal studies with a follow-up period of at least 10 years: a systematic review. *Int J Oral Maxillofac Surg.* 2015 Mar;44(3):377-88.
2. Naenni N, Lim HC, Papageorgiou SN, Hämmerle CHF. Efficacy of lateral bone augmentation prior to implant placement: A systematic review and meta-analysis. *J Clin Periodontol.* 2019 Jun; 46(21):287-306.



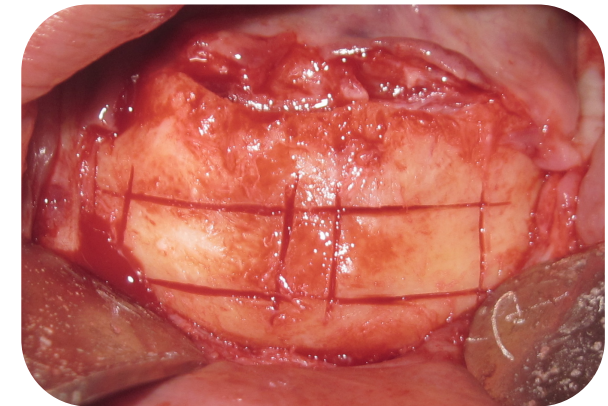
Clinical view of the atrophic ridge



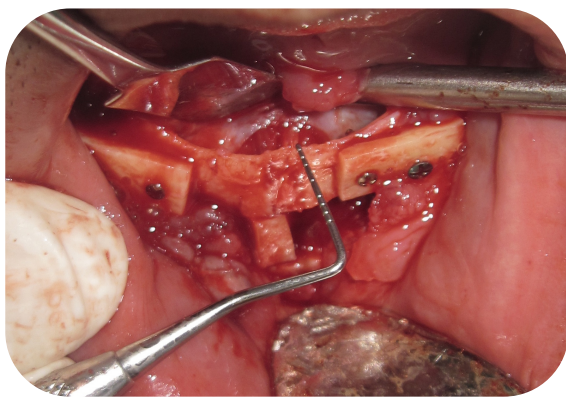
CBCT showing severely resorbed mandibular ridge



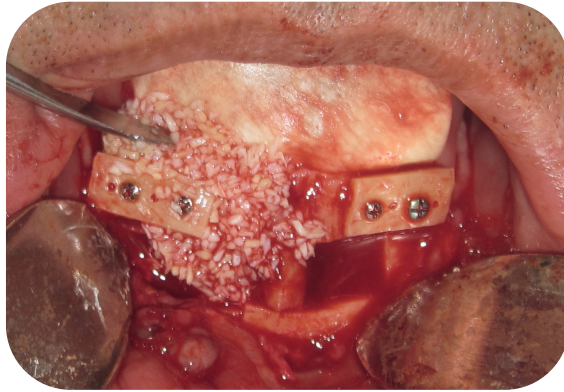
Alveolar ridge after flap reflection



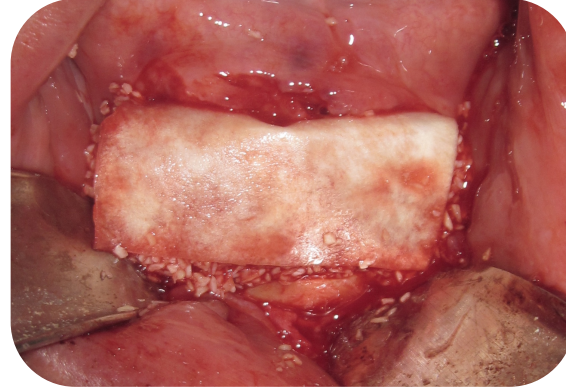
Outline of the bone blocks to be harvested



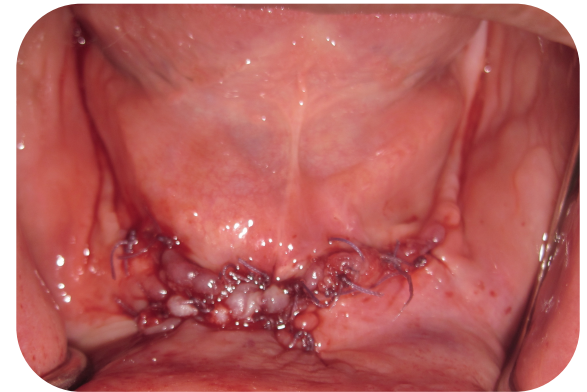
Two autogenous bone blocks
fixated by screws on the right
and left sides



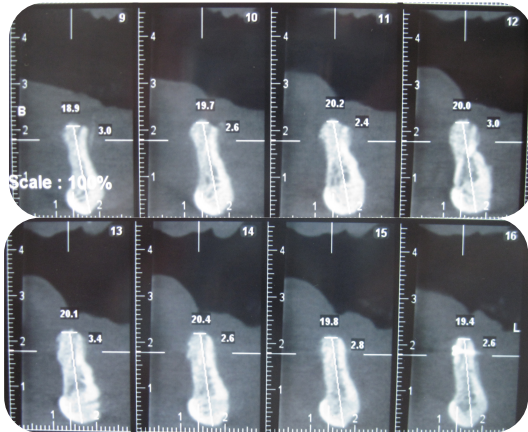
Particle allograft and xenograft
placed between the bone blocks



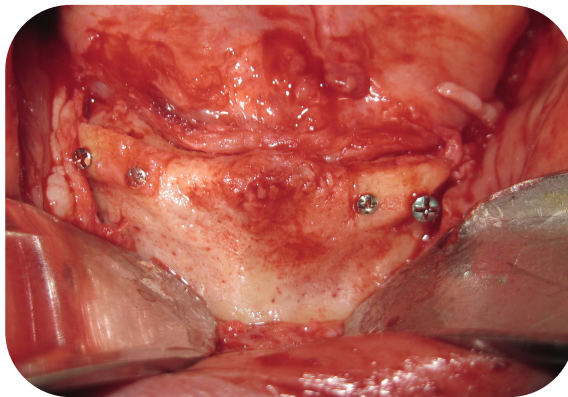
Resorbable membrane placed
over the bone graft materials



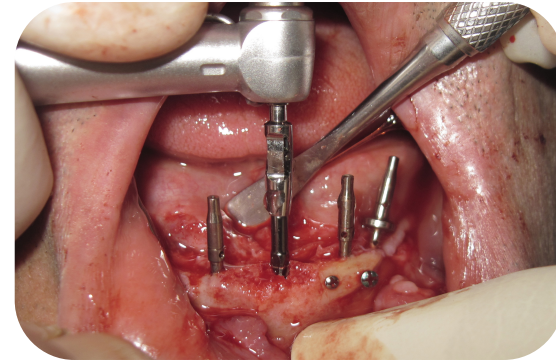
Flaps are sutured



Clinical view 6 months after
augmentation



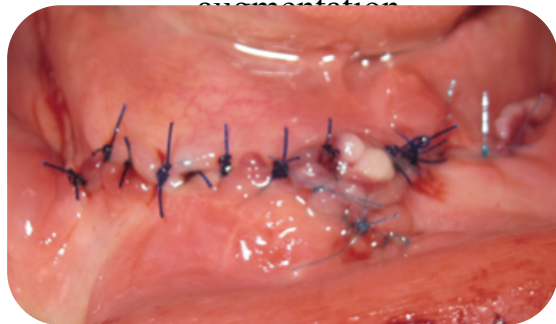
Clinical view of the reconstructed
ridge. The ridge width has
significantly increased



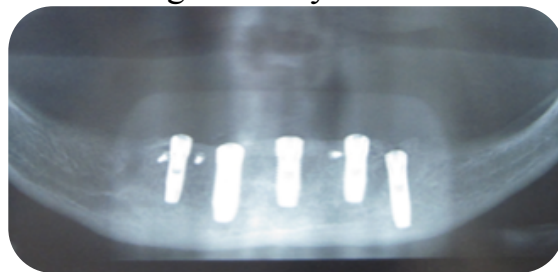
Drilling for implant placement;
parallel guide pins



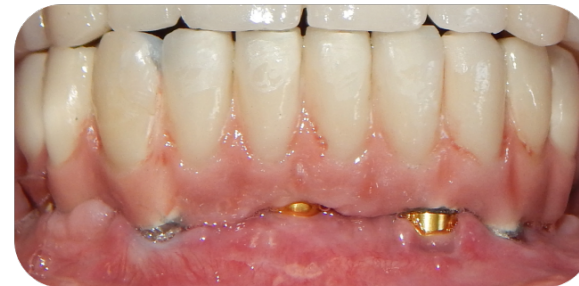
The buccal bone is reinforce by
particulate bone grafts around all
implants



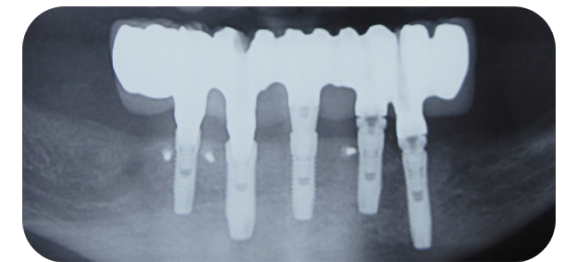
Flaps are sutured



Panoramic radiograph; five implants
are placed



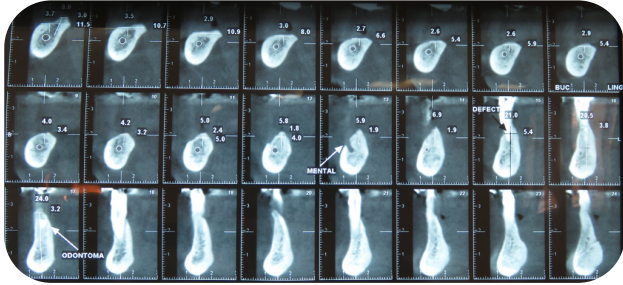
Clinical view of final
prostheses



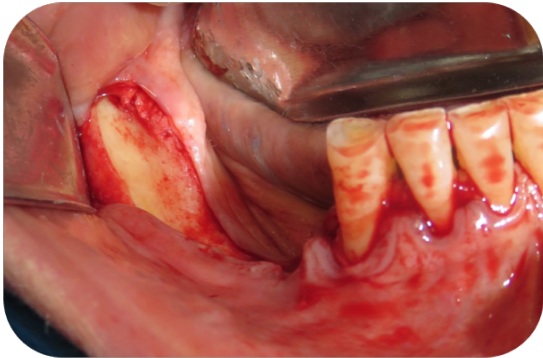
Final panoramic radiograph



Clinical view showing extreme vertical deficiency



CBCT view; significant vertical deficiency



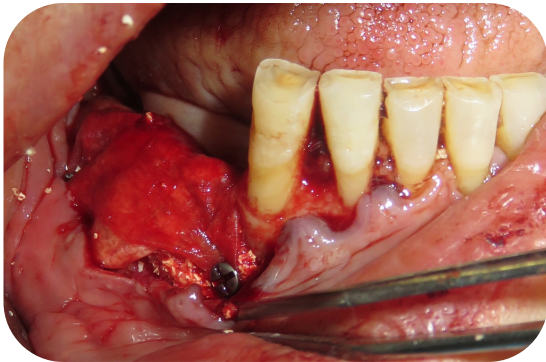
Clinical view after flap reflection



Bone blocks are fixated using screws over the vertically resorbed alveolar ridge



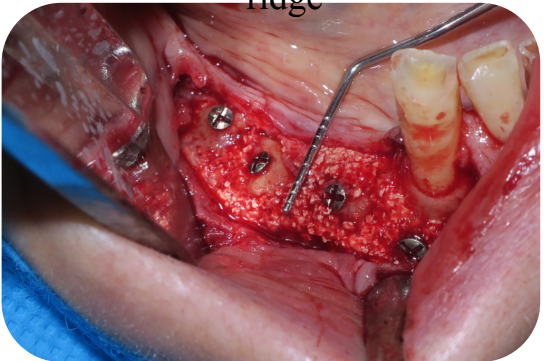
Xenograft material filling the areas between the bone blocks



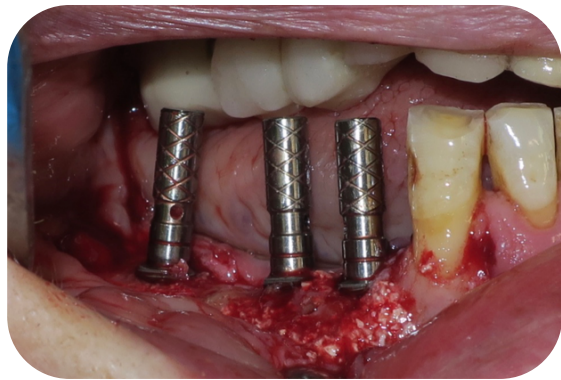
Fixed resorbable membrane using tacks



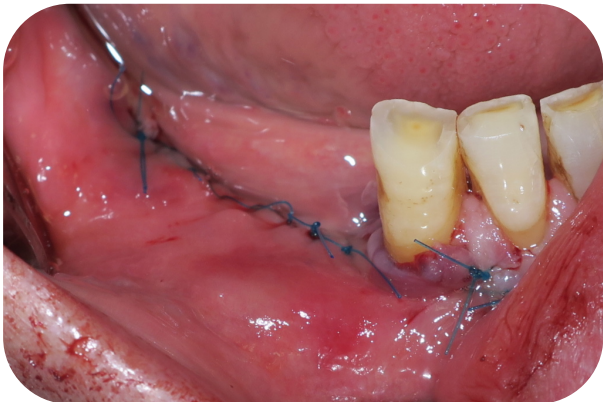
Advanced flap suture over the bone graft



Increased width and height of the ridge after 5 months



Three implants placed



Flaps sutured over the area



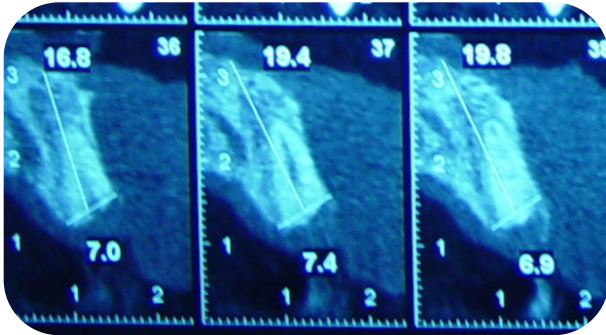
Clinical view of the final restoration



Final radiograph; stable bone around the implants



Pretreatment clinical view; left central incisor has been fractured



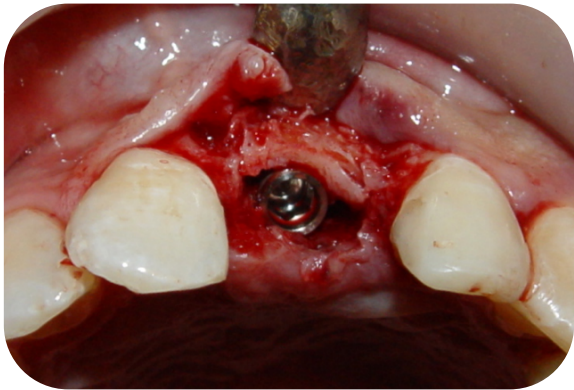
CBCT showing the remained root in the area



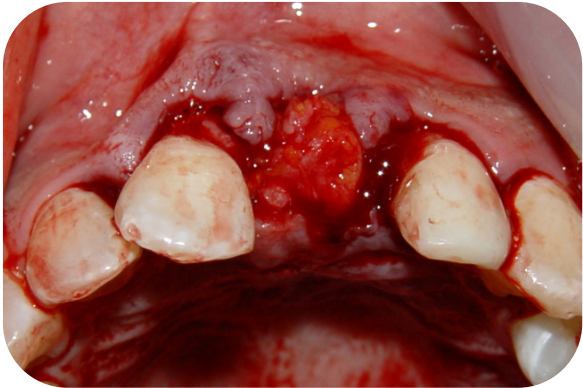
Clinical view after root extraction



Semilunar bone block harvested



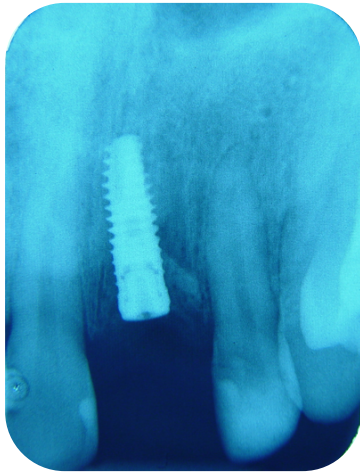
Prosthetically driven position of the implant.



Connective tissue graft placed over the bone graft



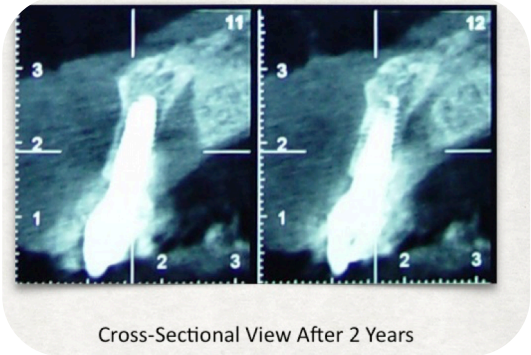
Healed area after 3 months



Periapical radiograph of the implant in place



Final prosthesis



Cross-Sectional View After 2 Years

CBCT 2 years after placement of the implant