

## Facial Plate Augmentation Using an Ossifying Scaffold - A Case Report

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Rehabilitation with dental implants is a treatment that has high success rate in rehabilitation of partially or totally edentulous patients. Periodontal diseases, systemic diseases, trauma, tumours, and tooth loss can lead to decrease bone volume and these bone defects limit the correct positioning of implant. Soft tissue augmentation at implant site improves peri implant health, esthetics and marginal bone level stability. The present case was done to evaluate results of dental implant placement in edentulous ridges treated with a collagen membrane having ossifying properties for horizontal augmentation of the ridge volume.

**Keywords:** Dental Implant; Bone Volume; Bone Defects; Guided Bone Regeneration; Ossifying Scaffold**Introduction**

Use of dental implant to rehabilitate patient with missing teeth or non-restorable teeth have become common practice, but for rehabilitating the missing teeth in anterior region by implant, the esthetic appearance of the implant is considered very important.

The rehabilitation process however, can be made complicated by deficiency of hard and soft tissues of alveolar ridges. This can have major limitation for successful implant placement specially in anterior maxillary region.

Hard and soft palate deficiencies or resorption of alveolar ridges follow, physiological or pathologic process as a result of tooth extraction, periodontal disease or trauma, use of continuous removable appliances, dehiscence and fenestration defects, developmental defects or cyst and trauma etc.

In most cases, the alveolar ridge augmentation may be necessary as adequate bone support is important for stability and survival of implant as well as for esthetic outcome.

Due to the resorption patterns of edentulous jaws, the ideal position of implants required varying amounts of bone augmentation [1]. Reconstructive surgery to restore the hard and soft tissues of a deficient ridge is more often demanded in anterior sites for esthetic reasons but is equally important in posterior areas for functional support. Soft tissue augmentation procedures are indicated when one tooth (or more) is missing between existing teeth. An esthetic outcome of an implant-supported prosthesis means complete integration with the neighboring adjacent teeth but without ignoring function [2]. Augmentation of deficient alveolar ridge can be done by different methods, like using bone grafting materials, guided bone regeneration, ridge expansion techniques etc., or block grafts combined with barriers to re-generate the lost bone support.

**Materials and Methods****The scaffold- Ossix Volumax**

Ossix Volumax™, a resorbable collagen membrane, is based on sugar cross-linking of collagen using Glymatrix technology. It is a

biodegradable and biocompatible collagen membrane intended for use during the process of guided tissue regeneration and guided bone regeneration. It is produced by standardized and controlled manufacturing procedures.

The collagen is extracted from porcine tendons subjected to veterinarian inspection and is purified to prevent hypersensitivity reactions.

Ossix Volumax™ has been demonstrated to be biocompatible. Animal and human clinical testing show a low potential to induce hyper sensitivity. It has a porous structure, the size of the pores is small enough to occlude gingival cells, but large enough to allow passage of fluids, nutrients and plasma proteins, which are necessary to support healing. The clinical applications of Ossix Volumax™ are guided bone regeneration and guided tissue regeneration, having the potential to augment thin tissue, esthetic deficiencies and residual dehiscence's.

### Case Report

A 32-year-old male patient reported to the clinic with chief complaint of missing teeth in anterior maxillary region.

There was a history of accident six months ago which resulted in trauma to upper front teeth.

Radiographic examination of the site showed deficient bone support for implant placement due to trauma from accident.

All the available possible prosthetic treatment options were explained to the patient, and after detailed discussion of risk, benefits and cost, the patient gave consent for implant placement. A complete radiographic evaluation was done and medical history was taken.

Maxillary and mandibular diagnostic impressions were made for diagnostic examination and for fabrication of provisional prosthesis.

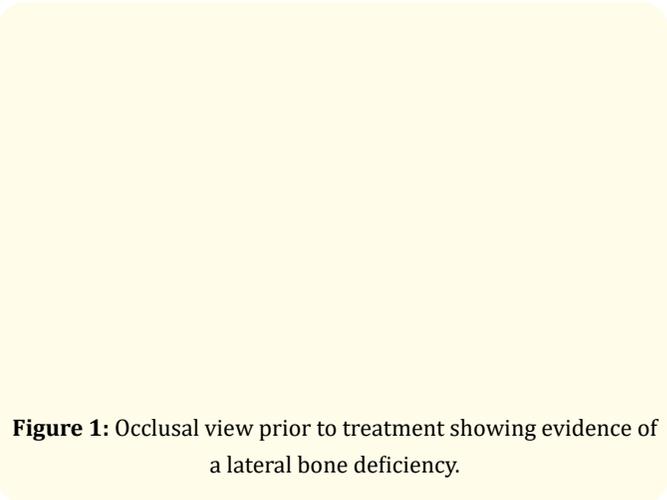
The patient was prepared for surgery and two stage implant surgical procedure using MIS Seven (Dentsply) implant system was planned along with ridge augmentation to correct the alveolar ridge deficiency.

Under local anesthesia, implant size of 3.75 mm diameter and 11.5mm length was inserted.

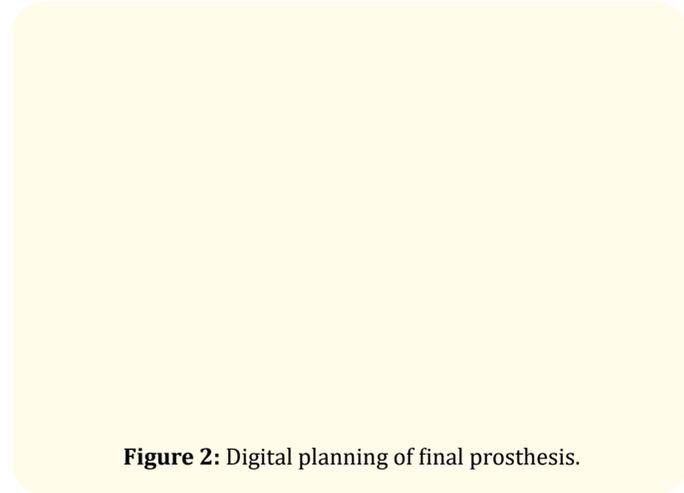
After insertion of implant the bone defect was corrected using Ossix Volumax™, and then sutured with 3-0 Vicryl sutures. An Essix retainer was given as a provisional restoration.

After a healing period of 5 months, the patient was recalled and provisional prosthesis was removed and implant site was incised again under local anesthesia infiltration. Flap was raised to check the bone augmentation process and exposure of the alveolar ridge showed augmented bone with great stability and good blood supply.

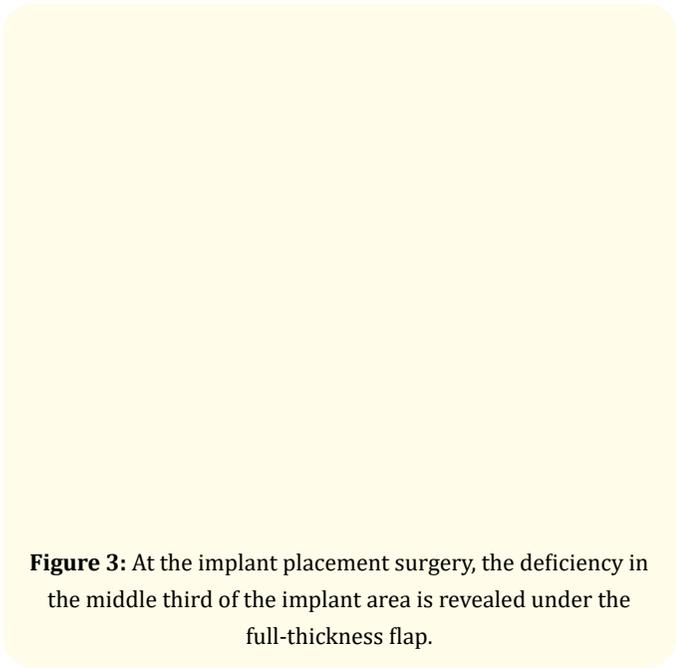
Cover screw was then removed and healing abutment placed to enable the gingival margin to form properly around the implant site and insure a good emergence profile. After 2 weeks impressions were recorded and PFM (Porcelain Fused Metal) crowns were delivered with a very satisfactory result.



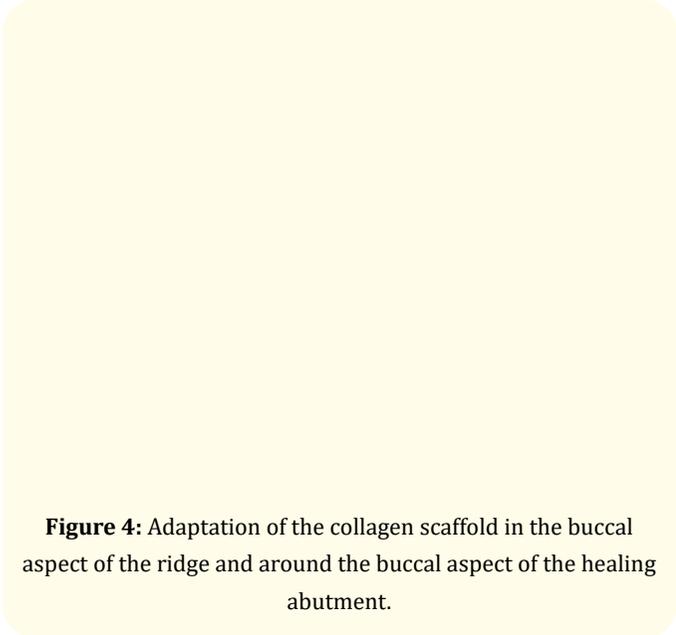
**Figure 1:** Occlusal view prior to treatment showing evidence of a lateral bone deficiency.



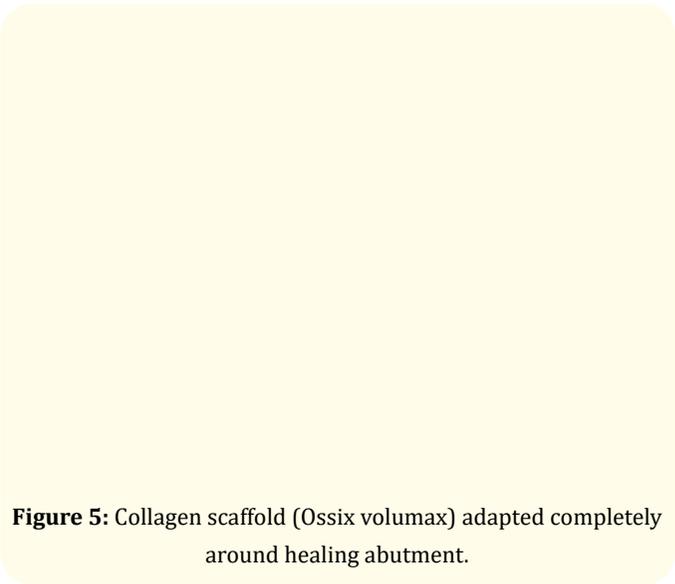
**Figure 2:** Digital planning of final prosthesis.



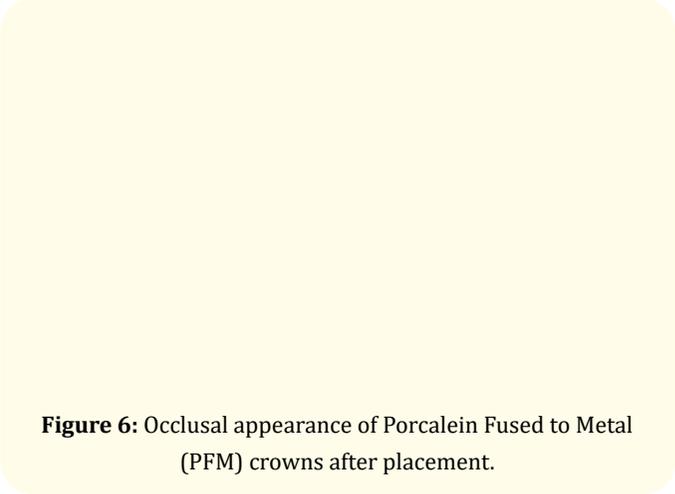
**Figure 3:** At the implant placement surgery, the deficiency in the middle third of the implant area is revealed under the full-thickness flap.



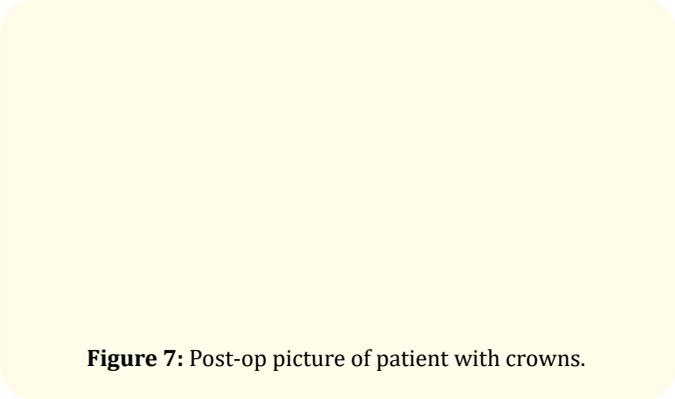
**Figure 4:** Adaptation of the collagen scaffold in the buccal aspect of the ridge and around the buccal aspect of the healing abutment.



**Figure 5:** Collagen scaffold (Ossix volumax) adapted completely around healing abutment.



**Figure 6:** Occlusal appearance of Porcelain Fused to Metal (PFM) crowns after placement.



**Figure 7:** Post-op picture of patient with crowns.

## Discussion and Conclusion

Dental implants have been used successfully to rehabilitate missing teeth or non-restorable teeth in patients, but for implant treatment to be successful, a proper evaluation should be done and implant placed in appropriate manner should support the prosthesis. Lack of adequate bone around implant, especially in maxillary anterior teeth, which are the esthetic zones of the mouth, leads to results which may be unsatisfactory for both the patient and clinician. In horizontal ridge augmentations, the best documented grafting protocol includes an intraorally harvested autogenous bone block alone or in combination with demineralized bovine bone mineral and with or without coverage of a barrier membrane [4]. But bone grafting materials with collagen placed in the jumping gap did have significant advantages on the thickness of the buccal bone and the esthetic outcomes [3]. This may often lead to soft tissue recession and more bone loss in the long run and eventually implant failure. Hence, bone augmentation is necessary especially in anterior maxillary region for long term implant success as well as esthetics.

## Conflict of Interest

No conflicts of interest.

No financial support was provided.

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