

Background

In clinical scenarios with inadequate bone volume, augmentation procedures are carried out to create adequate bone width. These procedures can be done either prior to implant placement or during implant placement or at times even after implant placement. Simultaneous GBR and implant placement as procedure has been carried out with a great deal of success. The following case series describes the use and outcomes of GBR using CP and Collagen membrane or titanium mesh.

Methods

Five patients with edentulous jaws requiring implant supported prosthesis for replacement of missing teeth in the maxilla were selected. The pre-operative assessment included both clinical & radiographic evaluation of the alveolar ridge. The cases were then operated as per the protocol described below and the post operative assessment of the ridge measurements were made. A total of 20 implants were placed in 5 patients and

Procedure

Full thickness flaps were elevated and depending on the ridge dimensions and the anatomy, the implants were placed either following a conventional drilling protocol, or ridge split and expansion or ridge expansion alone. After the implant placement, CP Putty was placed adjacent to the implants and in the gap between the implants in ridge split cases, whereas CP morsels were placed to make up the bulk of the tissue and the contours on the buccal and palatal sides. The sites were then covered either with collagen membrane or titanium mesh layered with collagen membrane. At 4 months post operative, 2nd stage procedure was carried out which was carried out either as punch technique or by displacing the palatal tissue buccally to provide a zone of kratinised gingiva. The Ti mesh was removed at second stage. The prosthetic steps were then carried out. All the cases , but for one were restored with Ball-On-Bar restorations opposing restorations in 3 of the cases were overdentures, where as in one patient it was a natural dentition and in the other it was a hybrid prosthesis. As on date the cases have been restored for 6-8 months.

Results

Five months post-operative, four patients received maxillary over-dentures, and one received fixed retrievable hybrid prosthesis. The ridge width was measured at the alveolar crest or at a designated point apical to the crest. Four Patients each received four implants in the maxillary anterior area, and one patient received six implants in the maxilla. Mean pre-operative ridge width was 4.40 mm. Mean Post-operative ridge width at the crest was 6.99mm. Four implants were covered with the titanium mesh and collagen membrane, while the rest were covered with a collagen membrane alone. All sites had increased bone dimensions and all the 22 implants integrated. Over the duration of the study period all the implants were well integrated. At the end of 6 months the bone levels were stable on all the implants. The patients described happiness at the outcome.

Discussion

GBR has been a very successful procedure for managing clinical scenarios where in the implants have been placed with a decent primary stability but the bone is not adequate to provide ideal hard tissue contours for long term success. Studies¹⁻⁴ have shown that bone can be successfully regenerated around dental implants simultaneous with implant placement and can be maintained over long periods. The manipulation of the bone by procedures such as bone expansion, bone split etc. has made it possible to place implants in scenarios where the ridge is very thin, but these procedures are to be augmented to achieve ideal contours and so the application of GBR becomes more so important. GBR has been carried out using bone grafts materials derived of Bovine anorganic bone, allogenic bone, Hydroxyl apatite, Autogenous bone, bioactive glasses or a combination of the above with a high degree of predictability and success.¹⁻⁴ Though the autogenous bone grafts are gold standard for grafting procedures the issues of second surgical site and patient willingness play a role in deciding the graft material. In the cases reported above CPS was used as it has shown to be osteostimulative and has shown to promote oseogenic differentiation of undifferentiated cells and thus promote bone formation.⁵⁻⁸

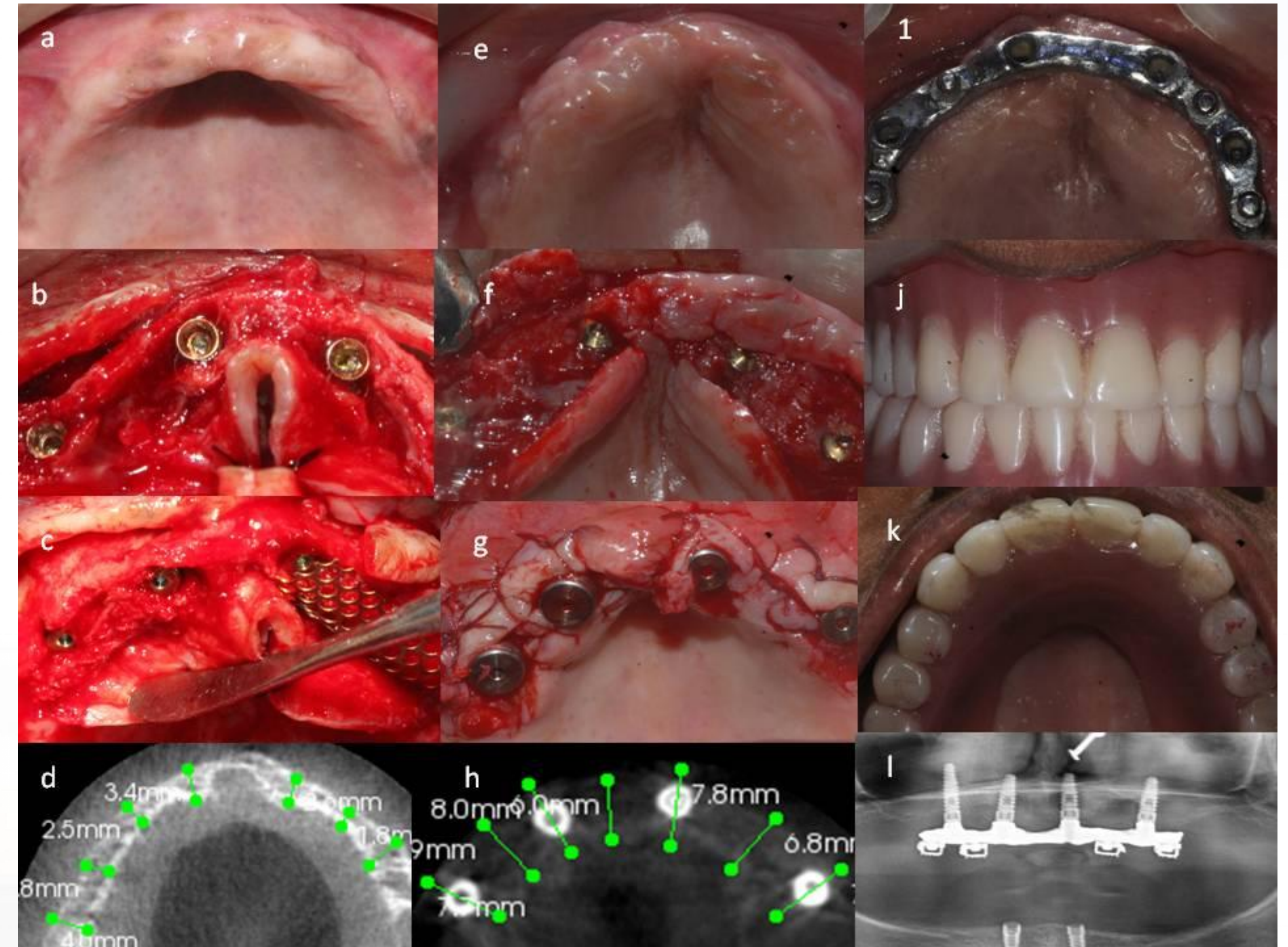
Apart from the graft material, the stability of the graft is very important for regeneration. The titanium mesh was used in one case where in the augmentation was done on the palatal side as the only a membrane would not have helped in maintaining the shape and the volume. In all the other cases, the augmentation was on the buccal and were covered with collagen membrane.^{1,2,9}

Conclusion

CP bone grafts can be successfully used in GBR procedures. GBR not only created adequate bone width around the implants but also enhanced tissue contours in our evaluation.

References

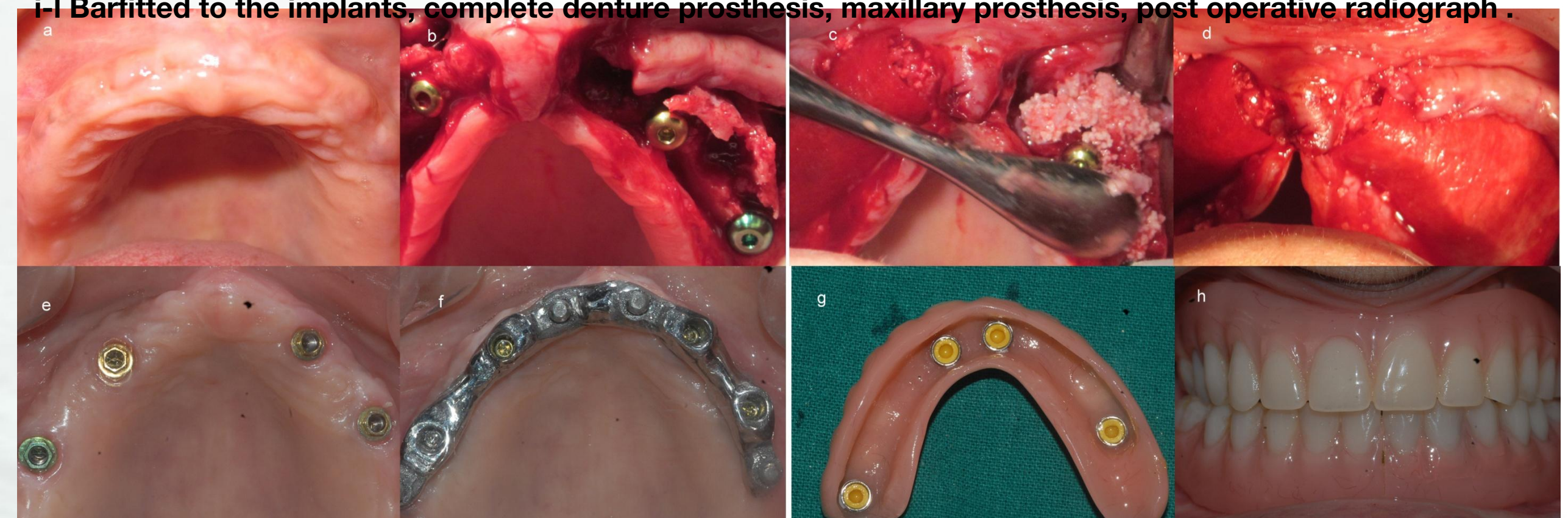
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Case 1. a-d: Pre operative, implant placement with ridge expansion, augmentation and mesh placement, pre-operative Radiograph

E-h: @ 2nd stage, mesh removal, notice th bone regenerated, gingival formers placed,, radiograph at 2nd stage,

i-l Barfitted to the implants, complete denture prosthesis, maxillary prosthesis, post operative radiograph .



Caase 2: Pre-operative, implant, placed, NCPS being placed, membrane covering the graft and the implaants, Prior to connecting the final prosthesis, bar in situ, maxillary prosthesis, final restoration