Bone regeneration in sockets grafted with Shefabone® SCPC immediately following extractions

Dr RANDA ALFOTAWI, Oral and Maxillofacial dept.King Saud University

Introduction

Extraction socket is characterized by fast rate of resorption of the alveolar bone at the extraction site.This produces a decrease in ridge volume, deformations of ridge contours, and thus, difficulties in delayed placement of root-form implants in an ideal position

Hypothesis

The present study was clinically evaluated bone response to bioactive silica-calcium phosphate composite (Shefabone® SCPC), grafted in the extraction socket.

Project Overview

A total 25 extraction sockets were included, Atraumatic extraction was performed, after irrigation with normal saline, the extraction sockets were filled with SCPC bone graft granules. Cone Beam Computed Tomography (CBCT), plain X-ray/digital radiography and histology of bone biopsy were performed to check the quality and quantity of the regenerated bone after 3 and or 6 months thereafter. In Twenty DM patient Extraction sockets without grafting in the same patients served as control.

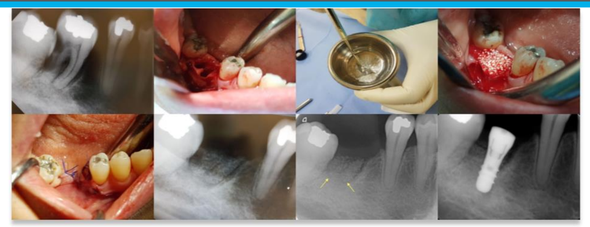
Three patients seeking Endo-ossues implants were placed in some of the reported cases. During implant bed preparation, it was felt hard to drill after 3 month of grafting and, initial stability was achieved.

In one case, bone grafting was performed after removal of

Case 1

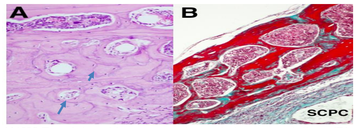
- A 44-years-old female was referred to Oral and Maxillofacial Surgery for extraction of un-restorable lower right and left first molar teeth #36, #46 and seeking implant afterward. Patient medical history revealed, she has osteoporosis and has repaired congenital heart defect.The extraction socket for #36 was filled with ShefaBone® SCPC (Silica-calcium phosphate composite) granules (Shefabone, Inc., NC, USA). The SCPC granules were slightly overfilled in the socket then covered with a resorbable membrane (BioMend, Zimmer, Swaziland) for guided bone regeneration

Case 1



The SCPC granules mixed with normal saline and became ready for use for socket preservation followed by implant insertion,

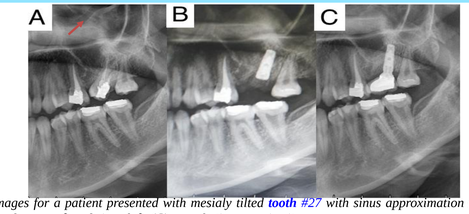
CBCT radiographAxial section through the grafted socket



(A)H&E staining, blue arrows denoted the reversal line, (B) shows Masson trichrome staining showing regenerated woven bone tissue , presence of marrow spaces and bone start to form Haversian system around marrow spaces .

Case 2

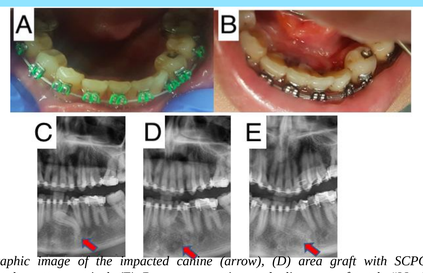
A 28-years- old Lady referred for extraction of tooth # 27 un-resorbable. The patient asked for immediate implant replacement. The treatment plan was to perform atraumatic surgical extraction checking for ora-antral communication, then simultaneously perform external sinus lifting, and socket preservation



*(A) Radiographic images for a patient presented with mesialy tilted **tooth #27** with sinus approximation (red arrow), (B) Implant is inserted 3 month after bone graft and sinus left, (C), prosthetic crown in situ.*

Case 3

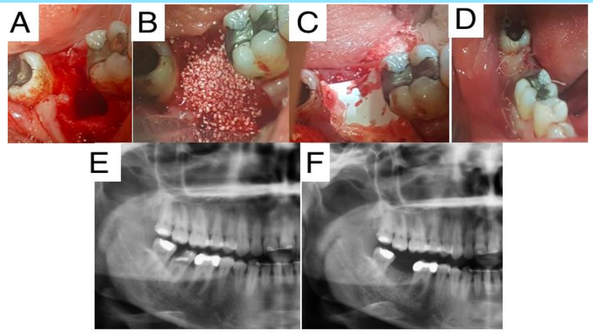
- 42 year patient presented to our clinic to extract his deeply impacted lower left canine tooth to unable the orthodontic treatment and achieved rotation on his lower left lateral incisor tooth to achieve optimum teeth alignment in lower arch . The impacted tooth was removed surgically, ShefaBone® SCPC was used to graft the defect area and allow fast alignment of the adjacent lateral incisor tooth



Radiographic image of the impacted canine (arrow), (D) area graft with SCPC immediately post-operatively,(E) Bone regeneration and alignment of tooth #32; 2 month postoperative.

Case 4

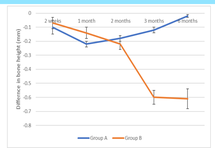
- A 33- years- female presented to implant clinic to remove her lower right molar that was badly broken and un-restorable. Patient ask for implant rehabilitation afterward . The extraction socket for #47 was filled with ShefaBone® SCPC granules. The SCPC granules were slightly overfilled in the socket then covered with a resorbable membrane (BioMend, Zimmer, Swaziland) for guided bone regeneration. At 6 month Patient was reviewed in implant clinic, and x ray film OPT was taken to assess the bone height and volume.



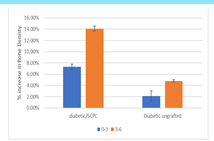
Shows surgical steps for case 4, A immediately after extraction, B ShefaBone® SCPC in situ, C membrane (BioMend, Zimmer) for guided bone regeneration is inserted D, water tight suture are placed. E; radiograph shows tooth 47 badly decayed

Case 5

Twenty-males-diabetic patients presented with badly decayed unrestorable lower molars, The tooth was extracted with a forceps, and care was taken to avoid trauma to the alveolar bone. SCPC granules were gently packed into the socket in a step wise manner until the entire socket was filled to the level the alveolar crest . Bone height and density measurements showed a steady increase in bone level for the SCPC-grafted diabetic group up to 6 month indicating alveolar ridge preservation. On the other hand, in diabetic ungrafted group, bone height continues to decrease over the 6 months period



Change in bone height in SCPC-grafted (group A) and control ungrafted.(group B)extraction sockets in diabetic patients after 6 months.



Percent increase in bone density in extraction sockets of diabetic patients grafted with SCPC or control ungrafted after 3 and 6 months

Conclusion

- The bioactivity properties of SCPC promoted new bone formation in osteoporotic and diabetic patients. Taken all together, SCPC grafting in extraction sockets of multirooted tooth expedited bone regeneration and alveolar ridge preservation for implant placement .

Works Cited