

CASE STUDY 01

A female patient aged 34 came for an extraction of the right lower first molar due to endodontic treatment failure. Extraction was done with forceps. After the extraction, scaffolds were placed horizontally in the extraction site engaging the buccal and lingual walls. Subsequently, the buccal and lingual flaps were sutured using vicryl suture. X-ray was taken at one week follow up and sutures were removed. Healing was good with no complain and patient was advised for the next follow up in two months.

Two months and three months follow up showed normal tissue contour at the extracted site with no scarring effect or tissue defect (Fig. 01).

Patient came back after five months for implant placement at the healed site. At five months, the same site showed good bony contour with well maintained height and width with no bony defects (Fig. 02 and Fig. 03).



Fig. 01 Good soft tissue healing.



Fig. 02 Good bony socket width after 5 months.

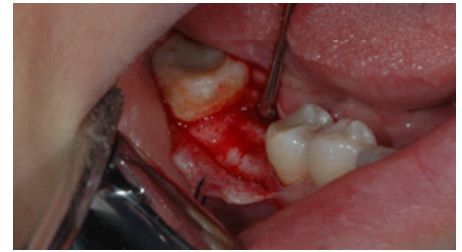


Fig. 03 Good alveolar height preservation.

To assess the bone quality of the healed socket site, a sample of bone was trephine out from the healed socket area for histopathological examination and micro CT (Fig. 04).

The histopathological slides were made in the histopathology lab, faculty of Dentistry, NUH, Singapore and the report was given by A/P Yeo Jin Fei, Head of the OMS Department, NUH, Singapore (Fig. 05). The histopathological report shows cortico-cancellous bone with many interconnecting trabeculae of new bone formed in association with small fragments of PLGA scaffold materials while undergoing varying stages of degradation and being replaced by new bone associated with previous cancellous bone. Section shows almost no or few inflammatory cells within the marrow space.

The micro CT of the trephine bone (Fig. 06) shows normal healthy bony structure similar to that of the normal bone (Fig. 07).

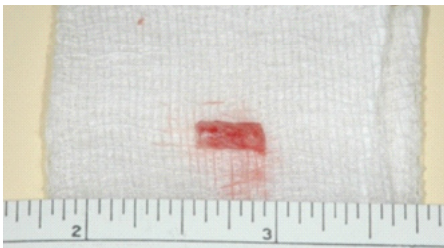


Fig. 04 Extracted bone piece (ruler in mm).

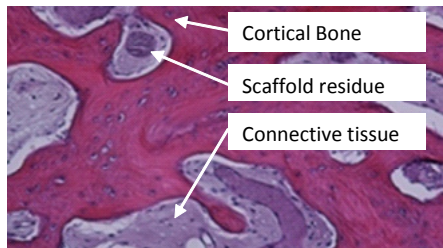


Fig. 05 Histopathological picture of the trephined bone.

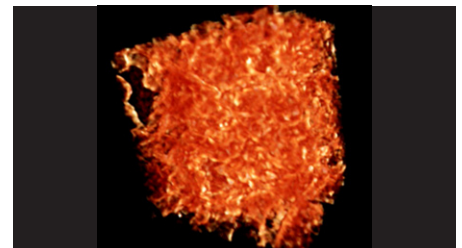


Fig. 06 Micro CT of trephine bone.

After trephine out of the bone piece, an implant (Fig. 08) was placed at the same prepared site with good initial stability.

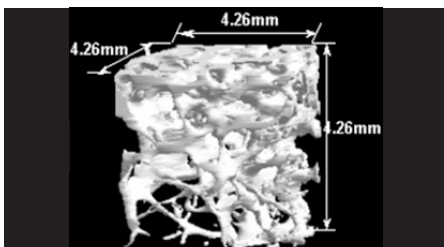


Fig. 07 Micro CT of normal bone.

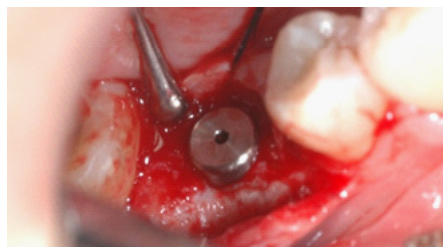


Fig. 08 Implant.

Conclusion: Usage of scaffolds in the socket after extraction helps to have good initial healing. The scaffolds also showed to have preserved the height and width of the alveolar ridge after 5 months with very little residue of scaffold material at the site. The quality of bone also showed to be very good and healthy at the post socket site after 5 months.

CASE STUDY 02

A male patient of age 38 had a fractured 11 which was root canal treated and restored with a post crown. The tooth is fractured transversely and subgingivally. Fractured post crown and remaining tooth was beyond salvage (Fig. 01). There is an existing apical lesion from the failed root canal treatment and can be seen in the OPG. Patient oral hygiene was bad with lots of plaques and calculus.

An OPG was taken before extraction clearly showing the apical lesion (Fig. 02).

Extraction was done and the coronal portion was removed first. The root was extracted atraumatically with periostomes (Fig. 03).



Fig. 01 Picture before extraction showing bad oral hygiene.

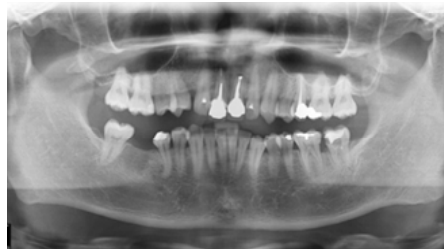


Fig. 02 OPG showing root canal treated 11 with apical lesion.



Fig. 03 Dislodged crown was taken out first.

Socket was cleaned of all infected debris (Fig. 04) and scaffold was placed horizontally at the crestal level (Fig. 05). Healing was good after a week and suture was removed. There was no complain or complicity from the patient.

Patient came back again after 10 month for a follow up visit as he is planning to have implant for his missing 11. While the patient's oral hygiene continues to be bad, it was however clear that the extracted socket showed minimal height loss as seen in the picture (Fig. 06). Width loss was observed to be insignificant and is likely to be due to the patient's early apical infections and bad periodontal condition.



Fig. 04 Socket cleaned of all infected debris.

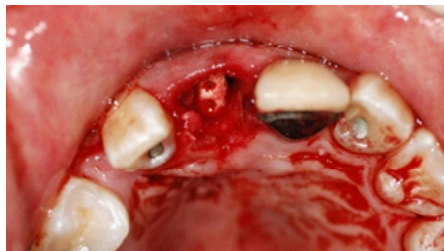


Fig. 05 Scaffold placed horizontally at crest level.



Fig. 06 10 month follow up shows well tissue contour. Socket height is preserved.

Due to financial situation, patient is still waiting for a suitable time for his implant restoration. So implant placement picture will be included once done.

Conclusion: Scaffolding of this extracted 11 preserved the height of the socket and also prevented severe collapse of width of the socket despite having an apical infection and periodontal conditions.

CASE STUDY 03

A female patient of age 59yrs came to the clinic with periodontically involved two upper central incisor and the teeth were beyond salvation (Fig. 01). An OPG was taken before extraction clearly showing the condition of the teeth and surrounding bone which is already not so good (Fig. 02). The bone height is already far below the cervical margin and only half or so socket was remaining. So to preserve the remaining socket bone, socket preservation was done with Alvelac™. An atraumatic extraction was done with periostomes and 21 was removed first followed by 11 (Fig. 03 & Fig. 04).



Fig. 01 Before extraction showing two upper central incisors.



Fig. 02 OPG showing periodontically involved 11 and 21 with severe bone resorption.



Fig. 03 Atraumatic extraction of 21 done.

Socket was cleaned of all infected debris and scaffold was placed horizontally at the crestal level (Fig. 05). Two 3.5×4.0mm scaffold was used which resembles the width of the socket at crest level (Fig. 06).

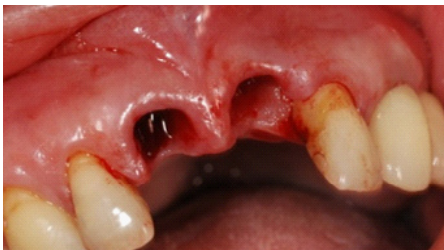


Fig. 04 Atraumatic extraction of 11 and 21.

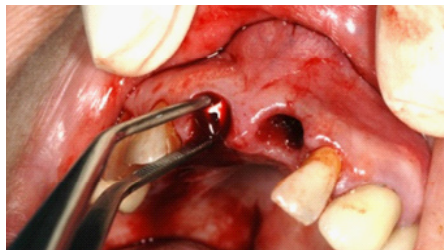


Fig. 05 Scaffold placed horizontally at crest level.

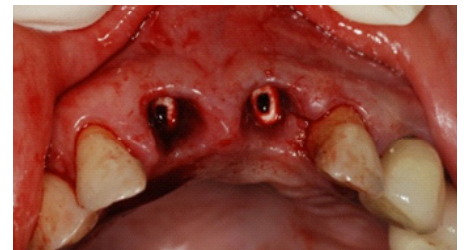


Fig. 06 Scaffold placed at crest level which is far below the cervical margin.

Healing was good after a week and suture was removed. There was no complain or complicity from the patient. Patient came back again after 7 month for a follow up visit (Fig. 07) as she is planning to have implant for her missing 11 and 21. At 7 month re-entry, the alveolar ridge height is almost at the same level as the time of extraction though there is a bit of height loss at the 21 site (Fig. 08). The thickness of the ridge was already compromised at the time of extraction and now it is just ok for a 4×11mm implant (Fig. 09).



Fig. 07 Seven month follow up shows well tissue contour.

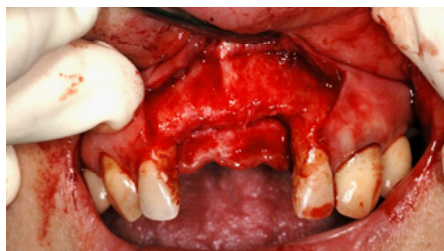


Fig. 08 Socket height is preserved at almost the same level as after extraction.

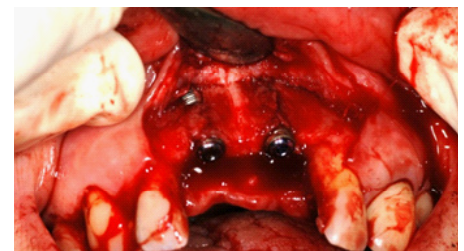


Fig. 09 Two 4×11mm Osstem implant is placed in site.

As the thickness of the ridge was already compromised, there was labial exposure of implant threads and needed a bone grafting. Xenograft was used for grafting and was covered with a resorbable membrane (Fig. 10). Mucoperiosteal flap was replaced and sutured with 3.0 vicryl. An immediate denture was given to restore the aesthetic look of the patient (Fig. 11).

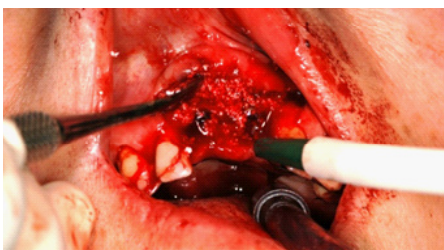


Fig. 10 Labial defect was grafted with xenograft.



Fig. 11 An immediate denture is given to the patient for aesthetic purpose.

Conclusion: Scaffolding of extracted 11 and 21 preserved the height of the socket and also prevented severe collapse of width of the socket despite having a very bad periodontal condition and bone resorption.