

# Tooth removal and tissue management in implant dentistry



BY DR JOHN GIBLIN

**T**he need to remove compromised, non-functional teeth is increasing. Over the last 50 years, with the advent of the high speed drill, dentists have done well to save and restore teeth, reconstruct functional dentitions and provide good oral health for their patients.

Today more than ever, patients' expectations of superlative results are high and careful case planning is imperative to maximise aesthetic and functional treatment outcomes. Dentists need to be both confident and competent with the options and skills offered to their patients in order to maximise treatment outcomes.

The concept of Planned Extraction Therapy (PET) is not new, but provides a variety of choices to be offered to the patient, before tooth removal. Options following extraction include:

- Do nothing and leave a vacant site;
- Provide a denture;
- Graft the extraction site in preparation for a bridge pontic site, or a future implant;
- Immediate bridge preparations (allowing several months for tissue remodelling); or
- Immediate implant placement.

Such advice and recommendations should be discussed with patients prior to tooth removal.

Current literature lists figures ranging

from 30-60% alveolar bone loss following tooth extraction, within the first year, particularly in the anterior, maxillary aesthetic zone where the buccal alveolar plate is thin or compromised. Loss of this bony architecture is disappointing and much time, effort and expense are needed to hopefully restore the hard and soft tissues to their former profiles for either a denture, bridge or implant placement.<sup>1</sup>

The concept of preservation of the extraction socket dates back to 1974 with the development by Dr Arthur Ashman of "HTR" (Hard Tissue Replacement) (Kerr) - a calcium hydroxide coated methyl methacrylate polymer (alloplast). On contact with bleeding bone marrow, the calcium hydroxide component of HTR becomes calcium carbonate apatite, which encourages bone growth and provides a graft or 'scaffold' for new bone formation following tooth removal. Often it may be necessary to perforate the bony walls of the socket to stimulate marrow bleeding, as minimal bleeding may give minimal bone.<sup>2</sup> Examples of reconstructed sites are shown in Figures 1-3.

Following discussion of PET with the patient and the decision having been made to preserve the valuable post-extraction architecture, the dentist needs to decide on the most conservative method to remove the tooth and apply the appropriate graft

material. With tooth removal, a traditional range of instruments has been used, namely periostomes, elevators and forceps.

However, a new root extraction instrument is available - BENEX (available from Dental Implant Dynamics) which can remove a difficult tooth root in seconds. The BENEX is remarkable in its action and is extremely conservative of the adjacent hard and soft tissues, particularly with the interseptal bone of adjacent extracted teeth. It is almost atraumatic in use and effective for most teeth, except molars with splayed roots. It may be used as an alternative to elevators and forceps provided that the anterior teeth to be removed are decoronated and that posterior, multi-rooted teeth are sectioned prior to removal. Illustrations of the atraumatic results of the BENEX (and grafting) are shown in Figures 4-6.

If a decision has been made at the time of the PET discussion to place an immediate implant or otherwise, then the final decision to either place an implant or to graft the socket (and the grafting material used) is made following extraction. This decision becomes a function of the remaining volume of surrounding bone, adjacent teeth, bone and soft tissue morphology, location in the mouth, smile line/aesthetic concerns and gingival margin levels.

Further to this, functional occlusal



Figure 1. 6 weeks post grafting.



Figure 2. 6 months post grafting.



Figure 3. 6 months post grafting.



Figure 4. Extraction socket.



Figure 5. Socket/root after BENEX.



Figure 6. Grafted sockets post-extraction.



Figure 7. Pre-treatment radiograph.



Figure 8. Pre-treatment photograph.



Figure 9. Application of BENEX.



Figure 10. Post-extraction sockets.



Figure 11. 1:5 with HTR graft.



Figure 12. 1:4 implant placement.



Figure 13. 1:4 implant/peri-implant graft.



Figure 14. Post-treatment radiograph.



Figure 15. Temporary bridge.

requirements, ability to achieve adequate primary implant stability, proximity of implant to adjacent roots or other important structures and the ability to adequately temporise the residual extraction space are also items of concern. These issues need to be addressed after tooth removal, although they should be discussed with the patient at the previous PET appointment.

This treatment protocol assumes that the patient is in good health, suitable for implant treatment, is prepared to undergo such treatment, is aware of the possible outcomes, time-lines, failure rates and costs associated with these procedures before treatment is commenced. Surprises should be minimised! An overall risk assessment considering the aspects noted above should be carefully made with respect to the decision to immediately implant, graft, or achieve a combination of both, in view of the final functional and aesthetic result. Current literature claims a 95% success rate for implants placed immediately post-extraction. The author of this article has had similar experience with implants placed over nine years.

If a decision is made to graft the socket following tooth extraction, then the choice of grafting material is important and should be discussed at the PET phase of treatment planning. Choices of graft mate-

rials should be explained to patients as:

- Autograft - patient's own bone;
- Allograft - same species, or someone else's cadaveric bone or products;
- Xenograft - different species, or animal bone or products; and
- Alloplast - artificial or plastic-type, manufactured products.

The specific material selected for each grafting situation is important and varies with different extraction sites and the size of the residual, post-extraction defect, along with the patient's personal views on type of material; whether it be own, other human, animal or 'plastic' graft material. Compliance with product certification and product availability varies from country to country and a good knowledge of available materials is helpful with patient discussions prior to planned treatment for tooth removal and site preservation, when required. However, it is beyond the scope of this article to elaborate further on relevant bone grafting materials and applications.

Figures 7-15 illustrate a case in which, following PET discussions, several modalities were used in treatment. The teeth 14 and 15 were removed with the BENEX (in three minutes), the 16 trimmed for a future crown and an eventual 3-unit, semi-fixed bridge. Following extraction, the 15 site was grafted with an alloplast (HTR), the 14

site received an immediate implant (Biolok) along with a peri-implant graft of Bio-Oss/Collagen (Henry Schein Halas) and Perioglas (Pacific Medical). A temporary resin Luxatemp (Gunz) bridge was placed during the healing phase of 5 months.

Time spent in patient consultation and discussion of PET will result in greater patient awareness and acceptance of possibilities available for their dental wellbeing. Patient confidence and a preoperative agreement between dentist and patient as to the likely desirable outcomes of treatment, prior to tooth removal, are essential for successful and rewarding treatment results for both patients and dentists. It is important to "measure twice; cut once!"

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