Prevention and management of oral surgery complications in general dental practice

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In recent decades advances in dentistry have enabled more patients to keep their teeth for longer. However, when the time does come to extract these teeth it can be far from straightforward. This article, and the associated session at the 2014 British Dental Conference & Exhibition, describes the assessment of teeth for extraction and highlights potential problem areas and how to deal with them. Tips and techniques for dealing with failed or stubborn extractions are also discussed, as well as how to manage some of the more common complications of dental extractions.

Richard Oliver currently works as a specialist in oral surgery at numerous practices throughout England and Wales. He qualified in 1993 from the University of Manchester and after completing his PhD in Glasgow undertook academic oral and maxillofacial surgery training to become a senior lecturer and honorary consultant in oral surgery in Manchester (until 2010). He is currently on the Specialist Advisory Board for Oral Surgery for the Royal College of Surgeons of Edinburgh and the Board for the Tricollegiate Membership Exam in Oral Surgery and is an examiner for all three UK colleges. At present, he holds an honorary senior lecturership at the University of Cardiff.

INTRODUCTION

Advances in techniques and materials have resulted in patients keeping many teeth for longer. However, when these teeth eventually fail they can be more challenging to extract. Additionally, patients may opt to have these missing teeth replaced by dental implants so preservation of as much bone as possible when extracting teeth should be one of the objectives.

Careful assessment, correct choice of instruments and knowledge of techniques to achieve successful removal of teeth and roots are essential. Secondary and tertiary specialist referral services are under great pressure and thus can result in a delay for patients getting treated. So, successful removal of teeth by the general dental practitioner (GDP) in a timely manner is going to be preferable. Reserving the use of the specialist providers for the more complex treatment or severely medically compromised patients is more efficient and beneficial to all. However, remember the consent process for such patients begins with the referring practitioner, so knowledge of the risks and potential complications by the GDP is essential.

None of the information provided here relies on advanced techniques or materials unlike much dentistry today. It is not rocket science more a back-to-basics approach.

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ASSESSMENT

A complete assessment of a patient including clinical and radiographic examination does not take long but really is the key to successful exodontia and anticipating difficulties and potential complications. Clinically, teeth requiring removal will range from having completely intact crowns to just retained roots so the initial approach to removing these teeth will vary. Patients with limited mouth opening may pose a challenge especially for the removal of posterior teeth. Adjacent teeth that are heavily restored must be noted and the greatest care must be taken not to cause iatrogenic damage during the procedure.

Although some have argued that a preoperative radiograph is not essential before all dental extractions, such a simple investigation with low radiation exposure may readily alert the dentist to potential difficulties or complications. Common examples of these are listed in Table 1. Even mobile periodontally involved teeth can be a challenge, especially in the mandible.

INSTRUMENTS

Having appropriate instruments for the procedure and knowing how to use them correctly will greatly facilitate a successful extraction. The most useful instruments are without doubt the luxators; equally, they can be one of the most dangerous if not used correctly with appropriate precautions. The luxator does exactly as its name implies and luxates the tooth or root from within the socket. It requires careful application following the long axis of the root in the periodontal ligament space between the alveolar bone and root. Controlled force is applied in an apical direction and rotational movements applied to dilate the socket and move the root coronally. The operators index finger should always be placed close to the tip

Table 1 Radiographic signs of potential problems with extraction

Root morphology – divergence, excessive curvature, presence of a root filling, bulbous/hypercementosis, additional root(s)
Anatomy – proximity of the maxillary sinus and inferior dental nerve
Adjacent teeth – precarious restorations for example, post crowns, large restorations

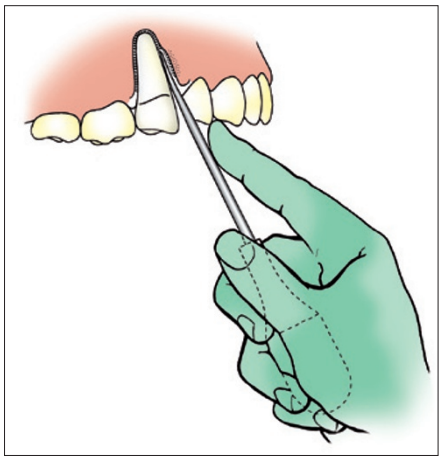

Fig. 1 Illustrating the application of a luxator in relation to the long axis of the tooth. Note the position of the index finger close to the working end of the luxator blade to prevent deep penetration into adjacent tissues if the instrument slips off the tooth. Image courtesy of Directa AB, Sweden

of the instrument in case it slips (Fig. 1); this is a sharp instrument which when combined with force will be capable of causing significant soft tissue damage.

A selection of forceps that can be used for varying tooth/root morphologies is essential. A surgical handpiece is another essential instrument used for division of teeth or roots of multi-rooted teeth to facilitate the removal of each root separately.

TECHNIQUES

Whether an implant is being considered or not, preservation of bone should always be one of the objectives whenever possible. To that end, priority should be given to removing tooth substance and not bone, especially the buccal/labial and lingual plates.

Always remember the successful removal is going to require breakage of the periodontal ligament and dilation of the socket. Some would advocate the use of periotomes only to remove teeth before implant placement, which is more achievable for anterior single rooted teeth than it is for posterior multi-rooted teeth.

Forceps should be applied and used as appropriate for the tooth/root being removed. Rotational forces can be applied to any tooth and should always be slow and sustained to allow dilatation of the bone.

When the crown crumbles or fractures off a multi-rooted tooth, look on this as an opportunity rather than a threat. Knowing the root morphology (which would be confirmed after viewing the preoperative radiograph), the remainder of the tooth can be drilled to separate the roots (Fig. 2) which can generally be elevated with relative ease as if each was a single rooted tooth more often than not with a rounded profile.

COMMON PITFALLS AND POTENTIAL COMPLICATIONS

The following list is not exhaustive but in the author's experience these are areas where extra vigilance should be exercised:

1. **Proximity to the maxillary sinus**: The greatest care must be taken when using elevators or luxators on individual roots in the molar area so that they are not displaced into the sinus. Also, be mindful of generating an oroantral communication
2. **Lone-standing posterior maxillary teeth and upper third molars**: In both of these instances beware of non-functional teeth that may have become ankylosed. Such teeth which are anchored to the bone may cause fractures of the tuberosity
3. **Lower third molars**: The mandibular bone in this region where the body meets the ramus is dense and relatively inelastic, and so frequently the usual forces and techniques for tooth removal will not work here. The path of withdrawal of the tooth will often be difficult and impacted by bone or the second molar. The root morphology is extremely variable and the proximity of the inferior dental nerve should always be fully assessed. Generally, lower third molars should only be attempted by those with sufficient experience and competence
4. **Retained deciduous molars**: Especially when infra-occluded, they are often ankylosed.

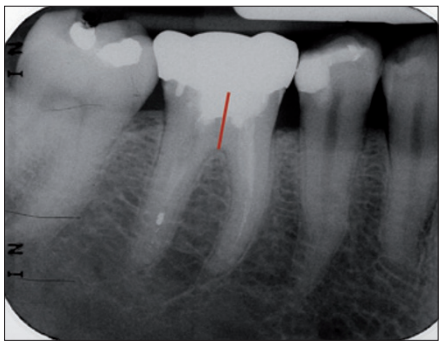

Fig. 2 A periapical radiograph of a lower right first molar that was to be extracted. The tooth is root filled and the coronal portion heavily restored. One would anticipate the crown would readily fracture off during attempted removal. Sectioning the two roots as indicated by the red line will facilitate removal of the roots separately

CONCLUSION

With careful assessment, being equipped with appropriate instruments and knowing how to use them, most teeth can be successfully removed in the general practice setting.

Richard Oliver will be presenting on this subject on Friday 11 April 2014 at 5 pm at the 2014 British Dental Association Conference and Exhibition in Manchester. Richard will also be providing a suturing masterclass at the conference on the same Friday at 11:45 am. Register online at: www.bda.org/conference. Three-day VIP conference passes are free to Extra and Expert BDA members.