PETER RAFTERY

Getting to the root of apicectomy

APPROXIMATELY half of all cases referred to oral surgeons from endodontics departments at district general hospitals and teaching dental hospitals for surgical endodontics are rejected at the envelope-opening stage because they do not meet widely agreed criteria for surgical endodontics.1 Such instances where the referral criteria have been ignored or overlooked can result in wasted time for hospital staff and patients alike.

Frustration from any barrier to accessing surgical endodontics is justified. Until now, more than ever before, because it is exactly this discipline within endodontics where recent technological advances – the addition of microsurgical techniques – have delivered significant improvement in success rates.

When discussing surgical endodontics by “traditional methods”, patients in the not too distant past, a disappointing range of success rates (44-95 per cent) were the norm.2 The same procedure performed with contemporary microsurgical techniques returns a greater, more consistently high rate of successes (88-96 per cent).3,4

With this in mind, I would now argue that undergraduate instruction needs to be enhanced and equipped practitioners to receive apicectomy referrals, and that referrals directed elsewhere are inappropriate.

What?

A definition of apicectomy is surprisingly hard to find. The American Association of Endodontists produced, in 2001, a 51-page Glossary of Endodontic terms,6 which found space to define argyra but not apicectomy. That same year, the Royal College of Surgeons of England’s Faculty of Dental Surgery (FDS RCS Eng) published an update to its 2001 Guidelines for Surgical Endodontics,3 which were later condensed into a British Dental Journal article.7 In these guidelines, the term “surgical endodontics” is taken to mean the “procedure combining root-end resection, periapical periodontitis, usually for failed root treatments. Although recently there has been debate over the terminology applied to treatment of the root-end most common way to judge treatment remains classification into “success”, “failure” or “uncertain”. Correctly identifying failed root canals is crucial, as this becomes a vital part of apicectomy planning.

The decision to label a treatment as “failed” requires a clinical examination, knowledge of the treatment chronology and, ideally, access to relevant radiographs over this period. For example, a root filled tooth may present today with a draining sinus; a patient who presented as a periapical radiolucency, but ought not to be considered a failure should it transpire that the root filling was completed only yesterday.

For guidance on assessing the outcome of endodontic treatment, we can again turn to the ESE quality guidelines,5 which state that root canal treatment should be assessed at least one year after the procedure and again, subsequently, as required.

Where?

As was mentioned earlier, it is my opinion that endodontists are best placed to perform apicectomies. A telling strand of evidence to support this view comes from the only study that directly compared endodontists and oral surgeons from a 2001 Eastman Dental Hospital study. The apicectomy success rates between clinicians from the oral surgery and endodontic departments, compared at four years post-op, found that the “rate of complete healing for patients treated in the endodontic unit was significantly higher than that for patients treated in the oral surgery unit”.

Considering that endodontists spend their days sealing canals and controlling intra-canal infection, this result does not surprise me. This study also confirms a finding that I see outside of the teaching hospital environment; oral surgeons will manage the surgical access beautifully, but will not always place a retrograde filling – even if this is a crucial step in the apicectomy process.1

Whilst diamond-tipped, contra-angled, piezo-electric, ultrasonic tips may not be the go-to tools for apicectomy, I think it is my experience that only they tend to have this necessary kit – another reason I believe that endodontists are better placed than dental surgeons to perform apicectomies. Endodontists, after all, are familiar with, and have access to, the materials and equipment necessary for modern microsurgical apicectomy. For example, I have made use of a dental microscope, piezoelectric ultrasonics, biocement and methylene blue dye – all employed routinely during non-surgical endodontics (for orifice location, post placement/irrigant agitation, perforation repair, staining for coronal cracks) – are also vital during apicectomy for surgical field magnification, retroprep, retrofill and sinus location.

How?

Approach

The 2012 RCS guidelines advise against the use of semilunar flaps in apicectomy.4 Pre-operatively, it is not entirely possible to predict the size of the osteotomy necessary for full curettage of the lesion, and this flap design does not easily allow for an increase in surgical exposure should the extent of lesion exceed it. Also, the suturing for a semi-lunar flap tends to site the wound edges over the osteotomy rather than on nearby sound bone. Furthermore, the incision of the semi-lunar flap does not allow access to the surrounding soft tissues and is associated with a lot of bleeding and more scarring than other designs.8

I would advocate use of a piezo-calcium silicates (such as biocement) instead, as does the RCS.4

However, with apicectomy success rates in cases where the retro-preps were placed compared to the MTA group, no significant difference was noted (although the MTA group did contain more cases classified as “completely healed”9). Though this finding might initially seem unexpected, it is probably intuitive that the choice of material for the retrofill – in a study where experienced specialist endodontists, with access to microscopes, expertly performed each step in the surgical procedure – would influence the success rate only minimally when the expertise of the operators meant the overall expectation of success was already very high.

Conclusions

Apicectomies performed with modern techniques on correctly selected cases offer a predictably high chance of a successful outcome to both the clinician and patient.

Over the course of this article, I have reviewed why apicectomy is suitable only when conventional, non-surgical endodontics is not possible.8,10 A number of novel techniques have been described by endodontists that facilitate non-surgical retreatment in cases where the pre-operative “blockage” would otherwise have consigned such teeth to surgical endodontics or extraction. Consequently, the treatment planning of apicectomy is a decision best made by an endodontist for when cases are deemed suitable for conventional retreatment. Endodontists are best placed to perform this restorative dental treatment too.

References are available on request.

About the author

Peter spends most of his clinical time at The Wessex Dental Practice in Fareham, Hants.