

BDA pushes for real reform amid announced contract changes



The British Dental Association (BDA) has said government must press ahead on fundamental reform of NHS dentistry, following plans announced on 19 July ‘that will do little to arrest the exodus of dentists from the service, or address the crisis in patient access’.

The current target-based system funds care for little over half the population and sets perverse incentives to dentists, rewarding them the same for doing one filling as ten. The unsuitability of this model during the pandemic has accelerated the drift of dentists away from the NHS into a full-on exodus. Thousands of dentists have left the NHS in England since lockdown, with almost half reporting having significantly reduced their NHS commitment.

The plans – elements of which will require secondary legislation so cannot take force until after summer recess – include:

- A minimum UDA value. The Unit of Dental Activity will now be set at a minimum of £23.00. The BDA has noted that only around 3% of practices will benefit, stressing that any increase will not reverse a decade of savage cuts in the service, which can leave practices providing NHS care at a financial loss, particularly to high-needs patients
- A higher reward for treating three or more teeth. Dentists will now receive five UDAs for treating three or more teeth, an increase on the current level of three UDAs, which applied to care delivered to any number of teeth. The BDA stress that given patients are now presenting requiring as many as 20 fillings, perversity will remain baked into the system, with less complex work still rewarded at the same rate as treatments that take hours
- A new payment rate for complex treatment. Root canal treatment on molar teeth will now be rewarded with seven UDAs, as opposed to the current three, as a result of BDA lobbying. However, the BDA stress the move is unlikely to be a game changer, given the nature of the challenging and time-consuming treatments – which can take up to three hours on a single tooth
- A greater role for dental therapists, who will soon be able to accept patients for NHS treatments, providing fillings, sealants and preventive care for adults and children. The BDA say that

there is no hard evidence of a workforce waiting in the wings for the chance to work under the failed NHS contract.

The BDA is taking a neutral position on the new package of changes, neither endorsing nor rejecting what it characterises as modest and marginal fixes to the widely discredited NHS dental contract. It remains focused on wholesale change to the broken system, where formal negotiations with NHS England have yet to begin. It has expressed some concern that the government has offered no guarantees that pledges of fundamental reform will be honoured, stressing this package cannot form a final destination for the service.

The BDA has stressed that these changes – which come with no new investment – show the limits of what can be achieved for patients without greater commitment from the Treasury. The BDA estimate it would take an extra £880 million simply to restore funding to levels seen in 2010.

Shawn Charlwood, BDA’s General Dental Practice Committee, said: ‘These are modest, marginal changes that will not fix the rotten foundations this service is built on.’

‘Our patients need Ministers to do more than paper over the cracks. These tweaks will do precious little to keep dentists in the NHS or ensure millions get the care they urgently need.’

‘The simple fact is not a penny of new investment has been pledged, and government targets will still come before patient care.’

‘Today is little more than a small step on the road to real reform. If government considers this a final destination then it will mean the death of NHS dentistry in England.’

CGDent welcome any change

Responding to the announced changes to the NHS England dental contract, Abhi Pal, President of the College of General Dentistry (CGDent), said: ‘While the NHS dental contract in England still needs wider and more fundamental reform, we welcome these changes – the first in 16 years – as positive and significant improvements.’

‘In particular, we have previously called for the removal of unnecessary restrictions on the roles played by members of the wider dental team, and are pleased to see that steps will soon be taken in this direction. The College believes that greater recognition and use within NHS dentistry of the full range of skills of all team members will benefit patients, enable the delivery of more preventative care, and support professional satisfaction and staff retention.’

‘We have also said that while truly universal access to NHS dentistry can only be achieved with greater funding, access can still be improved through better allocation of existing resources. We therefore welcome the direction of more resource to the treatment of patients with greater needs, as well as the potential for practices to deliver additional care so that all funding allocated to dentistry is used for its intended purpose.’



Top tips for identifying endodontic case complexity: part 1

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Abstract

There are no universally accepted guidelines for general dental practitioners regarding when endodontic referral to a specialist service may be indicated. UK NHS specialist endodontic services do not have national standardised criteria for which patient cases will be accepted for specialist care, and it is therefore important that more complex cases can be identified by general practitioners and referred accordingly, decreasing the likelihood of avoidable iatrogenic errors occurring, which reduce treatment outcome.

There have been a number of indices developed to help ascertain the complexity of endodontic cases. Part 2 discusses tips for identifying endodontic case complexity and examines indices available to guide clinicians as to when referral to an endodontic specialist service may be warranted.

Introduction

Increased tooth retention in an ageing population¹ poses challenges for specialist endodontic services. Older adults may have more complex medical histories which impact on dental care, such as frailty, dementia, and multi-morbidity (two or more chronic conditions including respiratory or coronary heart disease, and type 2 diabetes).² Due to the coexistence of multiple long-term conditions, patients increasingly experience polypharmacy, with 44% of patients over 65 taking five or more medications.³ In addition, tooth-related challenges in an ageing population can present difficulties: treating the increased prevalence of root caries increases the risk of pulpal exposure;⁴ secondary and tertiary dentine deposits can make root canals more tortuous to negotiate;⁴ and restorative cycles result in multiple pulpal insults, reducing the pulp's regenerative capacity.⁵

Today, it is desirable to retain one's natural dentition in a comfortable, functional and aesthetically acceptable state to allow engagement in normal, everyday activities.⁶ This demands clinicians provide more complex endodontic treatment, frequently including dismantling indirect restorations, root canal retreatment and periradicular surgery.

This article discusses tips for identifying more complex cases and discusses tools available to guide assessment and identification of complex cases which may benefit from referral.

Referral of endodontic cases

There is variation between UK health boards on what is considered suitable for specialist services and/or secondary care, complicating the issue of when to treat or refer. Thorough, structured dental assessment allows clinicians and patients to make decisions about teeth regarding benefits, risks, predictability and cost-effectiveness of treatment, and whether referral is warranted and beneficial to achieve a predictable

outcome, minimising treatment risk and harm. The outcome of endodontic treatment is known to be influenced by the dentist's skill⁷ and thus pre-treatment identification of endodontic case complexity is essential. Difficult endodontic cases pose increased risk of iatrogenic error, which can directly reduce treatment success.⁸

Assessing endodontic case complexity: patient factors

Patient factors can affect tooth prognosis. For example, cases with restricted mouth opening, patients who cannot lie supine or who have a tremor tend to increase the complexity of care. Individuals who cannot or will not tolerate dental dam make endodontic treatment an impossibility due to safety risks such as inhalation or ingestion of irrigants or files. Reduced endodontic outcomes are associated with microbial contamination of the root canal system from saliva if a dental dam is not used. In addition, some studies suggest medical conditions, such as diabetes, may reduce

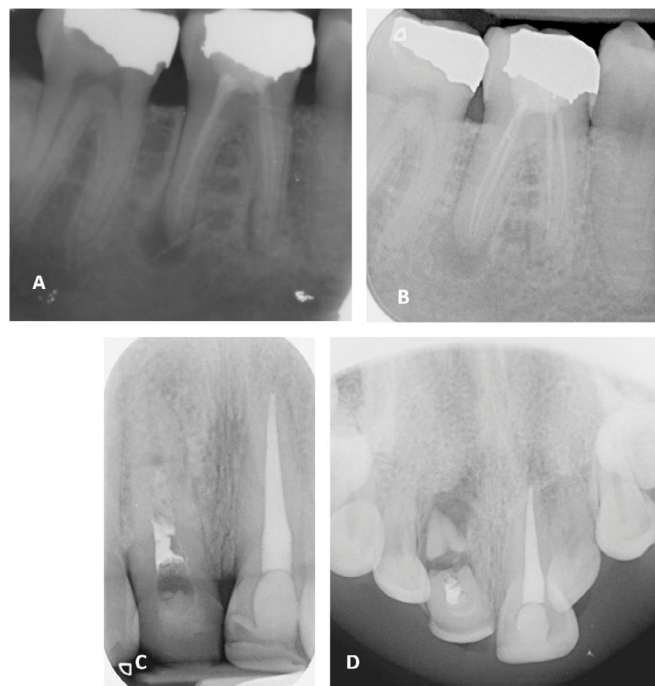


Fig. 1 Image A and B show an example of horizontal parallax shift during assessment of a patient referred with pain from previously root canal treated tooth 46. The x-ray tube head is more mesially positioned in image B which reveals there are four previously obturated canals, not the three suggested in image A. Image C is of tooth 11 referred by the patient's GDP stating a perforation and internal root resorption in tooth 11 was identified when root canal treatment was commenced. The patient relates a history of trauma and describes a lateral luxation of tooth 11. A maxillary occlusal radiograph (Image D) sheds light on a different diagnosis: an unhealed mid-third horizontal root fracture and periradicular changes are seen. This is an example of a vertical parallax shift which shows the horizontal root fracture more clearly than the periapical image (C), clarifying the diagnosis and steering treatment planning

Table 1 Relevant radiographic features for endodontic treatment planning (cont. on page 178)


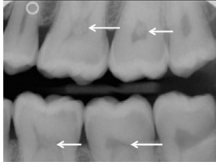
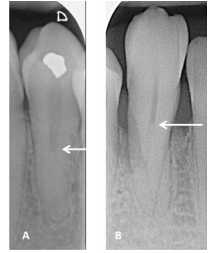
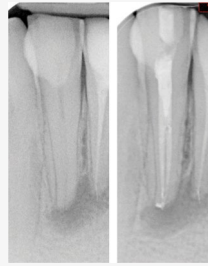
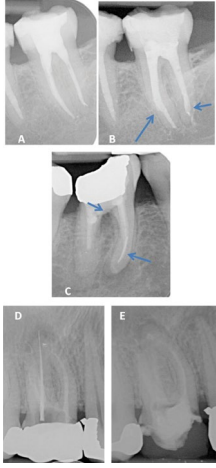
Feature	Treatment
Caries and coronal restoration(s)	 <p>Caries, if present, should be removed to allow assessment of tooth restorability and facilitate placement of a good-quality coronal seal for the duration of endodontic treatment. For predictable restorability, a tooth requires 1.5–2 mm supragingival height supragingivally and 1 mm width of dentine.¹⁶</p> <p>Providing endodontic treatment through existing restorations can help retain the rubber dam clamp, but may hinder visibility and decrease restoration retention.¹⁶ Furthermore, access through crowns can cause the operator to lose orientation (as shown in Figure 2), increasing risk of iatrogenic error. The possibility of detecting caries, cracks or marginal breakdown is reportedly enhanced with restoration removal.¹⁷</p> <p>Fig. 2 Radiograph of a referred case where access to the root canal system through an existing metal-ceramic crown was attempted but the root canal system not found. The radiograph demonstrates loss of orientation when searching for the root canal system and associated significant dentine removal.</p>
Pulp stones	 <p>Figure 3 shows calcifications known as pulp stones, often seen radiographically, which vary in size and can be attached, embedded or free in the pulp.¹⁸ Endodontic management can be more complex if canal orifices are concealed or blocked by pulp stones.¹⁹ Loose pulp stones can be inadvertently displaced into root canals, blocking access and increasing treatment complexity</p> <p>Fig. 3 A bitewing radiograph shows evidence of calcific change and pulp stones in several teeth.</p>
Canal calcification/pulpal obliteration	<p>Root canal size reduces with ageing,²⁰ and pulpal obliteration (clinically, manifesting with a yellowing of the clinical crown) is a known complication of dental trauma luxation injuries.²¹</p> <p>Root canal systems hard to discern radiographically, because of significant size reduction, will generally be harder to locate and prepare clinically, increasing risks of iatrogenic errors and therefore increasing treatment complexity.</p>
Root canal morphology and tooth position	 <p>A good working knowledge of the expected number of canals for each tooth type is advisable.^{18,22} Radiographic 'fast-breaks' (Fig. 4) indicate division of the canal. Canal division increases endodontic case complexity because of the technical challenges successfully navigating bends, divisions and merges in root canals.¹⁸</p> <p>Fig. 4 Two examples of radiographic 'fast breaks' are shown. This is where the root canal system is clearly visible for some of the way along the root length and then abruptly becomes harder to discern. This appearance indicates division of the main root canal into two or more branches. Image A: a premolar tooth where one canal splits into two. Image B: a less commonly seen case of a mandibular canine with two separate roots, each with one canal.</p>  <p>There are several common anatomical variations, many increasing complexity; these include additional canals, 'c' or 's' shaped canals, and dens invaginatus.²³ Individual teeth have variable morphology; for example, Figure 5 shows two canals in a mandibular incisor. Carrotte²² (2004) highlights 58% of mandibular central and lateral incisors have one canal, whilst 42% have two canals.</p> <p>Fig. 5 A fast break is seen in tooth 42. The referring dentist located the root canal system but encountered a 'blockage' a few millimetres into the root canal. This 'blockage' was the point of canal bifurcation. Precurving small stainless steel hand files is of help in successfully negotiating such anatomy.</p>
	 <p>Pre-operative radiographs allow an opportunity to identify canal morphology and measure estimated working lengths. Particularly long roots are more challenging to prepare and fill, and therefore may require referral. In addition, radiographs may highlight excessively angled or rotated teeth, sometimes disguised clinically by extra-coronal restorations. Such teeth have a higher chance of iatrogenic error, particularly perforations, when cutting access into the root canal system.</p> <p>Root canal re-treatments are generally accepted as being more complex than primary cases, although the standard of previous treatment and presence of iatrogenic errors will influence this. Various iatrogenic errors can be identified radiographically as shown in Figure 6.</p> <p>Fig. 6 Iatrogenic errors identifiable radiographically.</p> <p>A: A patient with low-grade symptoms and no overt periradicular pathology opts to embark on root canal re-treatment.</p> <p>B: Root canal re-treatment of the case in image A results in ledging and failure to reach working length in the distal canal (arrowed). A mesial canal is transported and ledged (arrowed). Symptoms are unchanged and the likelihood of treatment success now reduced.</p> <p>C: A compromised tooth with evidence of a furcal perforation, associated intraradicular radiolucency (arrowed) and a separated file fragment in the mid-apical third of a mesial canal (arrowed). The distal canal is short of the radiographic apex by >2 mm. This tooth has a very poor, if not hopeless, outlook.</p> <p>D and E: tooth 16 has a 16 mm length separated rotary file in the palatal canal. This iatrogenic error was correctable (E).</p>

Table 1 Relevant radiographic features for endodontic treatment planning (cont. from page 177)


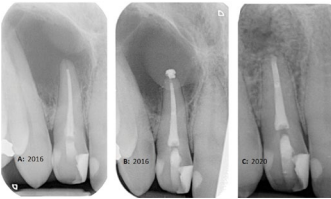
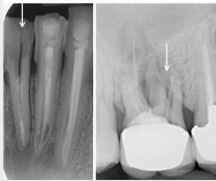

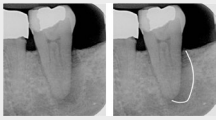

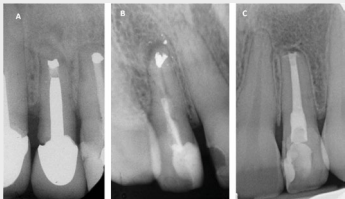
Feature	Treatment
Severity of canal curvature(s)	 <p>Generally, the more severe the canal curvature, the more challenging root canal treatment will be because iatrogenic errors, such as blockages, ledges and potentially perforations, are more likely to occur. 'S' or 'C' shaped curves (Fig. 7) particularly complicate endodontic treatment. Curvatures are not always visible radiographically depending on their direction and because of superimposition, although taking parallax views may help identify these. When identified pre-treatment, the technical challenge these present for successful instrumentation and obturation should be noted and onward referral considered for particularly severe curvatures, if necessary.¹⁸</p> <p>Fig. 7 Extreme canal curvatures increase the likelihood of ledging, perforation and file separation. Tooth 15 was referred because full working length could not be reached. This is an extremely complex case and would have benefitted from referral to a specialist in the first instance because ledging of the canal was very likely, and indeed occurred prior to referral. The patient opted to extract the tooth.</p>
Radiographic root end/apex	<p>The anatomical apex (ie 'true' working length) is often 1–2 mm from the radiographic apex.¹³ Open apices are more challenging to endodontically manage and referral for specialist input encouraged.</p> <p>The shape of the radiographic apex/root end may be affected by root end resorption, for example stemming from chronic inflammation or orthodontic tooth movement, which can result in blunting of the apex.²⁴ If a significant length of root end has been lost, a pseudo open apex may be present, increasing endodontic complexity and if sizeable, may need managed as an open apex case. Generally, if a file or gutta percha tip of a size 50 does not bind (friction fit) at the working length, the case can be considered as an open apex and obturation using a mineral trioxide-based material is preferable. This may necessitate referral for placement of such material under magnification.</p>
Periradicular radiolucencies:	 <p>The inflammatory response following pulp necrosis takes time to show radiographically and is ultimately seen as a widened periodontal ligament and apical radiolucency.²⁵ It is notoriously difficult to determine the histopathology of a lesion from its radiographic appearance; however, the larger a radiolucency is, the more likely it is to be cystic. This increases the complexity of cases and therefore radiolucencies approaching, or in excess of 1 cm diameter, should be considered for referral to a specialist in the first instance. Figure 8 illustrates such a case. Cysts can be associated with resorption and displacement of roots, and those showing these factors are less likely to be a radicular cyst.²⁵</p> <p>Fig. 8 Particularly large periradicular radiolucencies are more likely to be cystic. If a radicular cyst is suspected, extraction or non-surgical endodontic management is indicated in the first instance. Those cases not showing a resolution in signs or symptoms, or reduction in periradicular pathology within 6–12 months of root canal treatment completion, may need to be tackled surgically.</p> <p>A: Radiograph from 2016 sent with referral because of ongoing symptoms from root canal treated tooth.¹² B: Completion of root canal re-treatment (sealer overfill) in first instance. Symptoms did not resolve during multi-visit root canal re-treatment, therefore periradicular microsurgery was planned and undertaken in 2016. C: Four-year review following periradicular microsurgery shows significant resolution of lesion and no clinical signs or symptoms are present. The lesion removed during endodontic surgery was sent for processing and histopathology confirmed a benign odontogenic cyst.</p>
Root fractures	 <p>Vertical root fractures are generally only seen radiographically when the tooth root has split, as illustrated in Figure 9. Horizontal root fractures can often be diagnosed with the use of a periapical and occlusal film, but these too can be challenging to visualise. Cone Beam CT scans are helpful if it is essential to clarify if a fracture is present.</p> <p>Fig. 9 Vertical root fractures are not often seen on radiographs until the tooth has split. A lower central incisor has split (arrowed), as has the mesio-buccal root of the maxillary right first molar (arrowed). Both bases had associated periodontal pocketing clinically and tooth fragments could be seen without magnification moving independently. Each has a hopeless outlook.</p>  <p>Radiographic features of root fractures vary and include: widening of the periodontal ligament, separation of root fragments, presence of a 'radiographic halo' on each side of the root (Fig. 10), 'J' shaped radiolucency (Fig. 11) and bifurcation radiolucency.²⁶</p> <p>Fig. 10 A patient with symptoms from tooth 11 relates a history of trauma over 20 years ago. The periapical radiograph shows alveolar changes at each side of the root suggesting a crack may be present. A maxillary occlusal film confirms a horizontal root fracture.</p>  <p>Fig. 11 Tooth 37 is a functional molar with an extensive multi-surface restoration <i>in situ</i>. The shape of the radiolucency, loss of the mesial-marginal ridge and functional demands on this tooth highlight it as a tooth which could fracture irretrievably. Root canal treatment was started and after several visits, with no reduction in symptoms, referred. Magnification revealed a crack distally. A 'J shaped' radiolucency can be indicative of a longitudinal root crack.</p>
Resorption	<p>Several types of root resorption may be seen radiographically. Only some impact on endodontic treatment planning by increasing treatment complexity. Those which can increase complexity are:</p> <ul style="list-style-type: none"> • Resorption related to pulpal degeneration or necrosis (external and internal infection-related resorption) • Cervical root resorption • Those which create a pseudo open apex due to loss of the apical constriction in a tooth which is non-vital • Replacement resorption, most often as a consequence of significant periodontal ligament damage, for example following avulsion or intrusion dental trauma injuries.

Table 1 Relevant radiographic features for endodontic treatment planning (cont. from page 178)

Feature	Treatment
Anomalies	<p>Various anomalies affecting root canal treatment can occur. For example:</p>
	<div style="display: flex; align-items: flex-start;">  <div style="flex-grow: 1;"> <p>Dens invaginatus</p> <p>This developmental malformation, an example of which is shown in Figure 12, is a folding of enamel into dentine most commonly affecting maxillary lateral incisors and affects 0.3% to 10% of the population.²⁷</p> <p>Where this anomaly is identified, it is advisable to check the contralateral tooth. Treating such teeth endodontically is more complex and as such referral is advocated.</p> <p>Clinically: The crown may appear normal or be dilated, peg²⁸ or barrel-shaped, or have a deep foramen coecum.</p> <p>Radiographically: A pear-shaped invagination of enamel and dentine is seen.</p> </div> </div> <p style="text-align: center;">Fig. 12 Dens in dente affecting tooth 12.</p>
	<p>Taurodont teeth</p> <p>Clinically: Taurodont teeth are associated with syndromes such as Down's, Klinefelter's syndromes and ectodermal dysplasia.²⁸ Teeth have large pulp chambers, a long 'trunk' (cervical area) with the root bifurcation or trifurcation placed apically.</p> <p>Radiographically: An extended length cervical area is seen and as root canal orifices are more apically placed, this complicates identification and instrumentation for root canal treatment.</p> <p>Additional cusps or projections; for example, talon cusps</p> <p>Clinically: Talon cusps protrude from the tooth with enamel covering a dentine core that usually contains pulp tissue and a slender pulp horn.²⁸</p> <p>Radiographically: A pulp horn is seen.²⁸</p> <p>For endodontic treatment, it is important that the pulp tissue present in the additional cusp or projection is accessed and removed.</p>
Previous endodontic management: non-surgical	<p>Endodontic re-treatment outcome is influenced by the presence of a pre-operative periapical lesion, apical extent of root filling and quality of coronal seal.²⁹</p> <p>Iatrogenic errors, although not always identified radiographically, are known to decrease treatment outcome.^{9,30} Errors which may be identified radiographically are:</p> <ul style="list-style-type: none"> • Short root fillings may be the result of a blocked canal (when dentine and pulp debris are packed into the canals apical third, resulting in loss of working length). Blockages can be avoided using copious irrigation and recapitulation with small files³¹ • Excessive overfills of obturation materials tend to be problematic if the material is an irritant to the periradicular tissues; if microbes/biofilm is carried on the material(s) from within the root canal system into the extraradicular tissues or if the overfilled material affects an adjacent structure, such as a neurovascular bundle. In each of these cases, various signs and symptoms can ensue and if symptomatic, further treatment is likely to be required. This treatment will be of a more complex nature and referral is recommended • Ledging may be avoided by pre-curving instruments, avoiding forcing instruments into the canal, using nickel titanium files or, if using stainless steel hand files, using a step-back preparation technique³¹ • Perforations can result from ledges or transportation of a canal when, for example a large, stiff file is used in a curved canal, causing zipping. Incorrect orientation of the access cavity can also result in perforation³¹ • Instrument separation/fracture within the canal or beyond the canal confines can be avoided by using appropriate techniques such as establishing a guide path using a size 10 stainless steel hand file in the canal prior to entering it with rotary files, always using files in a wet canal, examining files prior to and during treatment to insure each is intact and using magnification.³²
Previous endodontic management: surgical	<div style="display: flex; align-items: flex-start;">  <div style="flex-grow: 1;"> <p>Previous periradicular surgery identified clinically or radiographically will have an impact on treatment planning if the tooth is symptomatic and requires further treatment to retain it.</p> <p>Modern materials and techniques for periradicular microsurgery are associated with high success rates.³³ The different surgical techniques used can impact on endodontic treatment planning and any tooth to have had surgery in the past is more complex to manage and referral to a specialist for surgical revision using microsurgical techniques prudent</p> <p>The radiographic appearance of a tooth to have been surgically managed using modern techniques is usually different from that done as a traditional 'apicectomy' (Fig. 13). Identifying this difference is relevant for endodontic treatment planning because symptomatic cases treated using traditional techniques (associated with low success rates) may be re-treatable using modern, microsurgical methods and therefore referral may be of benefit. Cases previously treated using modern microsurgical techniques and materials can also have surgical re-treatment/revision if needed, but success rates are lower than that for 'first time' root-end microsurgery.</p> </div> </div> <p>Fig. 13 Radiographs highlighting differences between traditional and modern techniques and materials associated with periradicular surgery.</p> <p>A: Tooth 12 has an amalgam root end filling <i>in situ</i>. Approximately 2 mm of root length remains apical to the root end filling. This suggests that the root end may not have been entirely resected, or that a large bevel has been prepared on the root surface during surgery. The adjacent tooth (partially seen) shows an amalgam root end filling which has been placed into a cavity created by a round bur.</p> <p>B: An amalgam root end filling has been placed and amalgam particles are seen in the periradicular tissues. It is unclear if the root end filling is in the canal. The root length continues apical to the root end filling, again suggesting insufficient root resection or creation of bevel.</p> <p>C: Tooth 22 has been treated using modern, microsurgical techniques and materials. The root end is entirely resected with minimal or no bevel. A root end cavity preparation to a depth of 3 mm in the long axis/within the root canal has been prepared and filled to a depth of 3 mm using mineral trioxide aggregate.</p>

◀ endodontic treatment success,⁹ thought due to the alterations in immune functions and gingival crevicular fluid.¹⁰

Furthermore, the use of medications such as bisphosphonates, antiplatelet or anticoagulants or a pre-existing bleeding condition may influence the decision on whether to try retaining a tooth in order to avoid risking development of medication-related osteonecrosis of the jaw (MRONJ) or risk of post-operative bleeding following extraction.¹¹ It is noteworthy that the placement of subgingival rubber dam clamps are considered invasive dental procedures for those patient cases at risk of infective endocarditis.¹²

Assessing endodontic case complexity: radiographic interpretation

An up-to-date, appropriate radiograph is an essential part of the pre-operative endodontic assessment. The gold standard view for diagnosing and treatment planning endodontic cases is a paralleling periapical.^{2,13} This should clearly show the radiographic apex of the root(s) and at least 2–3 mm of surrounding periradicular tissues, allowing analysis of pathology and root morphology.¹⁴ This is the image of choice due to high sensitivity identifying periradicular pathology (being almost twice that of panoramic radiographs) and specificity is similarly high, indicating a high probability of a true negative rate.¹⁵

Two-dimensional imaging allows visualisation in a mesiodistal plane only and diagnostic yield may be improved by taking two periapical views of the same tooth, at different angles (using parallax shift).¹³ Both horizontal and vertical parallax shifts can be useful. Using this, the more distant object appears to move in the same direction as the tube shift, while the closer object appears to move in the opposite direction. Figure 1 shows examples of the benefit of using horizontal and vertical parallax shifts in assessing endodontic cases. Table 1 summarises key features usually identifiable from paralleling periapical views which impact endodontic case complexity and therefore treatment planning.

Cone-beam computed tomography systems (CBCT)

In recent years, advantages of CBCT for endodontic treatment planning have emerged, for example, in cases of possible non-odontogenic pain when conventional radiography has been insufficient in identifying pathology, which could account for symptoms. However, the radiation dose is generally higher with CBCT than conventional radiography,³⁴ although the advent of limited volume (where the field of view is limited to the area of interest), high-resolution CBCT reduces the effective dose of radiation to the patient.³⁴

Limited volume CBCT can be of use in the assessment of dental trauma, complex root canal morphology, resorption, endodontic complications and planning for surgical endodontic management.³⁴ However, significant radiographic artefacts from metallic restorations and even gutta-percha can compromise the detail gained.¹³

Conclusion

Several patient-related, clinical and radiographic factors impact on endodontic treatment planning and case complexity. In the next part, the assessment tools available and their benefits and limitations for guiding endodontic case complexity will be considered. ■

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