

CASE REPORT



Maxillary Molar Endodontic Case Presentation

R.Bose. BDS (Manc 2010), General Dental Practitioner, Oxford/London.

Introduction

“Endodontology is concerned with the form, function and health of, injuries to and disease of the dental pulp and periradicular region, their prevention and treatment.”(1) When the pulp is subject to continued stimulation from micro-organisms, the inevitable result is its irreversible destruction and complete breakdown. Anaerobic bacteria may then exploit the enclosed environment of the pulp chamber and proliferate. Consequently, the inflammatory process may spread beyond the confines of the pulp chamber and into the periapical tissues.

The main aim of treatment is the ability to control the intra-canal infection. Root Canal Treatment is performed with the intention of thorough mechanical and chemical debridement of the entire pulp space followed by complete obturation with an inert filling material.

Success is measured in terms of clinical signs, symptoms and radiographic evidence of healing.

Case history

A 30-year-old medically fit female attended complaining of low grade dull ache localised to the UR6. After a thorough history & examination, a diagnosis of Apical Periodontitis of the UR6 was made.(TABLE SHOWING PERCUSSION/SENSIBILITY ?) Treatment options were discussed, following which treatment entailing prevention, restorative and endodontic care was undertaken.

The UR6 required a conventional Root Canal and using the “American Endodontic Case Difficulty Form” (2) it was deemed to be of minimal to moderate difficulty. Informed consent was gained explaining the benefits, risks, alternative options for procedure and treatment. The prognosis was assessed to be around 80-85% due to the radiographic evidence of a periradicular lesion. (Figure 1)

Treatment was performed in one visit (3) under rubber dam and anaesthesia which helped in managing the patient’s anxiety. The access cavity was prepared prior to placement of the rubber dam. The aim was to achieve straight-line access and to preserve tooth tissue (4). Further refinement was performed using an ultrasonic scaler and a long neck round bur to remove dentine overlying the canal orifices. Magnification(2.5% orasoptic loupes with illumination) and a DG16 probe was used

to find the MB2 canal but in this case only three canals were located.(Figure 2) Disinfection was performed using a small gauge needle (30) and 3% sodium hypochlorite (NaOCL). Coronal third shaping was then performed with copious irrigation throughout using Gates-Glidden burs. An electronic apex locator (Root ZX,J.Morita Corp) was used to determine working length (5) and canal patency was obtained using a size 10 stainless steel K-file. Apical preparation was then performed using a size 30, .06 taper Profile NiTi rotary instrument (Dentsply Maillefer) lubricated with EDTA (Glyde). A strict irrigating regime was employed throughout the cleaning and shaping phase of treatment.(Figure 3) The technique used to obturate the three canals was cold lateral condensation followed by thermo compaction of gutta percha (GP) using a gutta condenser and Sealapex(Sybron Endo). Coronal seal was then obtained using Vitrebond (3m)) to seal the GP followed by a fugi IX core (GC) and a hybrid composite (3m Z250).

A post-operative Peri-apical of the UR6 showed the final outcome was good (Figure 4) and over a period of twelve months the periradicular lesion had healed(Figure 5) and the patient was symptom free.



Figure 1

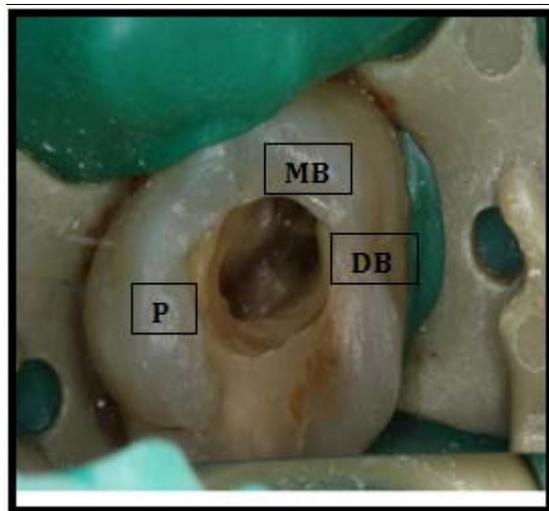


Figure 2

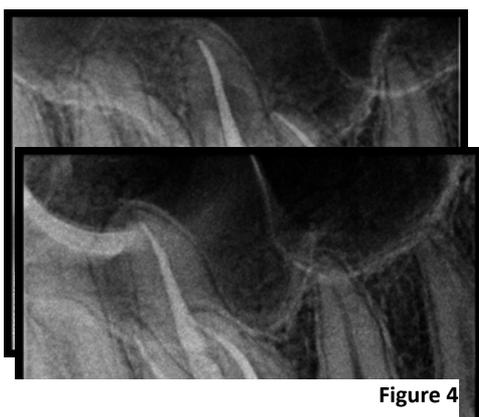


Figure 4

Figure 5

Irrigation regime

- Irrigate copiously and frequently with room temperature 3%NaOCL during mechanical preparation
- Every third irrigation , EDTA used
- After shaping complete:
- 2 minutes with NaOCl- GP cones were tried for length with NaOCl insitu. This allows for displacement of NaOCl solution into lateral canals(Mechanical activation).
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Figure 3

Discussion

The aim of the treatment provided to the patient was based on integrating the best evidence with clinical knowledge and patient preferences. The following areas warrant further discussion regarding the treatment provided:

1. Why was 3%NaOCL used rather than any other irrigant?

Evidence available suggests that NaOCl is the “gold standard” (6) irrigant to use in RCT in comparison to Chlorhexidine, Iodine and other products. (5)

When used in combination with 15-17% EDTA, both inorganic and organic substances can be removed effectively. The EDTA also enhances the antimicrobial effects of the NaOCl due to removal of the smear layer.(7)

Concentrations of 0.5%-5.25% NaOCl have been shown to have the same antibacterial effect.(8) However, NaOCl at greater concentrations dissolve vital and necrotic tissue faster but in turn carries the potential risk of extrusion from the apical foramen resulting in rapid, painful and serious inflammatory response. 3% is a good compromise and its use is also recommended by Tony Hoskinson (specialist in Endodontics).

There is also evidence to suggest that heating the NaOCl to temperatures of 45-60°C significantly increases the effectiveness of the solution.(9) However, no facility existed within the practice to heat the solution whilst performing the treatment.

2. Are apex locaters more effective than radiographs for working length measurements?

Modern apex locaters are shown to be more accurate in working length determination than a radiograph. (10, 11) They work using different frequencies, determining the ratio between the different electric potentials proportional to each impedance. These devices are not root canal length ‘calculators’, rather they are apical area locaters (foramen or constriction).

Radiography is still an important adjunct to the use of a locator. However, it has been confirmed to be less reliable than an apex locator as the foramen may not end at the radiographic apex.

Although, it may be seen as good practice to take working length/dry run radiographs, the British Endodontic Society (BES) does not state it to be mandatory. The benefits of not taking additional radiographs results in a reduced exposure of ionizing radiation.

3. What are the benefits of using Ni-Ti instruments?

The advantages of using rotary instruments are as follows

- More effective debris removal coronally
- Centered in canal- much less likely to ledge
- Predetermined taper
- Predictable shape
- Quicker

Studies show that there are fewer procedural errors and better shaping ability of the Ni-Ti instruments in comparison to stainless steel K-file. However, there are few reports to show any significant differences between the two instruments.(12)

4. Why was no extra coronal restoration provided?

Firstly, studies have shown that the quality of the coronal seal has a significant effect on the outcome of endodontic treatment.(13) Leakage can be reduced by the placement of adhesive restoration placed over the gutta-percha followed by provision of a well-sealed permanent filling.(4)

In this case, the marginal ridges of the UR6 were intact following treatment. This suggested the tooth was less liable to fracture and more likely to withstand 'wedging' forces developed during function.(14)

Evidence suggests that RCT does not change the quality of dentine, except some moisture loss (increase in brittleness), and it is thought that weakening of the tooth is more as a result of tooth tissue loss.(15) Therefore an extra-coronal restoration was not provided.

5. How is the tooth going to be monitored for success?

According to the BES (1), the RCT should be assessed at least after one year. The following findings indicate a favourable outcome:

- Absence of pain/swelling/sinus tract
- No loss of function
- Radiological evidence of normal periodontal ligament space around the tooth.

Conclusion

The case demonstrates a predictable new technique (for a newly qualified dentist) integrating best evidence with clinical knowledge and patient preference, demonstrating the ability to efficiently and effectively provide appropriate and adequate care

Upon a yearly review tooth had responded favorably to treatment and the patient had no symptoms/complaints.

Periapical taken to visualize the DB canal and assess healing (Figure 5) it shows healing of the apical radiolucency and the DB canal was filled satisfactorily.

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