Sealing the deal in endodontics

The integrity of coronal seal is important in endodontics before, during and after treatment. Poor quality endodontic treatment coupled with a restoration that provides inadequate coronal seal is a recipe for failure; the best results are achieved with high quality foundations and restorative treatment.

A 52-year-old woman was referred for endodontic treatment of the abutment teeth of a three-unit bridge. The general practitioner had noticed a draining sinus tract and exposed a periapical radiograph with a gutta percha point inserted into the tract (Figure 1).

This is an excellent means of highlighting where pus is originating from. Pus from a periapical abscess may track along the jaw some distance before exiting through a sinus. Indeed it is not unheard of for a sinus to appear externally and resemble a persistent spot!

On presentation the patient reported that the teeth had been persistently uncomfortable following root canal treatment and placement of the bridge. She had noticed a spot on her gum and had suffered an acute flare-up.

Intra- orally, there was slight buccal swelling and a sinus tract adjacent to tooth 16. There were no abnormal periodontal probing depths around either abutment. The bridge was reasonable, but there was an open margin on the mesial surface of the distal abutment, potentially compromising coronal seal.

The pre-operative radiograph showed the gutta percha point tracking to a large periapical lesion around all the root apices of tooth 16. Three canals had been located but MB1 was under-prepared and under-filled and the MB2 was likely to have been missed.

There was a large periapical lesion associated with the mesial abutment (14). This tooth had not been root-filled and was non-vital to electric pulp testing. Pulp necrosis may occur in up to eight per cent of teeth prepared for full coverage restorations and is highest risk when burs are not cooled sufficiently – the pulp effectively being cooked in its own juice!

A diagnosis of failed root canal treatment in tooth 16 and chronic periapical periodontitis in teeth 14 and 16 was made.
Sensible treatment options in this case therefore include:

- Root canal re-treatment of tooth 16 and root treatment of tooth 14.
- Extraction of both teeth and replacement with a denture, or implant-retained prosthesis. Extraction and replacement with implants should be feasible. However, both teeth are restorable and re-treatment of the technically poor root filling should have a good prognosis.

**Non-surgical re-treatment**

After discussing all the available options and risk factors, the patient elected to undergo endodontic treatment.

One of the challenges in this case is removing the existing gutta percha to re-negotiate the canals. Working through an access cavity in a cast restoration can be difficult and as there was questionable marginal integrity it was decided that the bridge should be removed and replaced.

The lesions were large, there were two teeth being treated and a sinus tract was present, so a two-visit strategy was adopted.

After placement of local anaesthetic and an alginate impression for fabrication of an acrylic temporary, the bridge was sectioned and elevated. It had already been decided that the bridge required replacement and careful removal reduces any risk of damage to the underlying tooth substance.

With rubber dam application over both teeth, straight-line access was made to expose the gutta percha in the root canal orifices of tooth 16.

The bulk of gutta percha was removed using Gates GiIidden burs sizes 2 and 3. A few drops of chloroform were introduced into the canals so that any remaining gutta percha was softened and the working length estimated with an apex locator.

Preparation was completed and refined with Wave. One primary and large instruments, always working through a puddle of sodium hypochlorite in the access and irrigating frequently.

At this point the canals were dried with matched paper points and a small drop of chloroform introduced to ensure that all the gutta percha had been removed. Tooth 14 was prepared using Wave. One large instruments. Passive ultrasonic irrigation was used with 3% sodium hypochlorite and EDTA for smear removal. Following this, the canals were dressed with calcium hydroxide paste.

Coronal seal was provided during treatment by a double layer: Cavit in the base over the canal orifices and Fuji in the access; Temp Bond was used to cement the temporary bridge (Figure 2).

One week later the patient was symptom-free and the sinus tract had healed. At this visit the root canals were obturated using vertically compacted gutta percha. Coronal seal after treatment was provided with dual-cure composite in the access cavities.

A final radiograph showed the completed root fillings; all the canals are well sealed and lateral canals are visible in 14 and the palatal root of 16 (Figure 3).

A review at six months showed almost complete bony healing and the teeth restored with a new permanent bridge by the practitioner, providing good coronal seal, function and protection from fracture (Figure 4).

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**References**

