Assessing previous endodontic treatment radiographically: making clinical decisions

The clinical case pictured in Figure 1 referred to me for diagnosis and treatment. The endodontic treatment pictured was completed two years before presenting in my office. The patient described the treatment as extremely painful at the time the canals were filled, which was reported at the time of the procedure.

After the initial treatment, the patient’s symptoms went away and had returned approximately a week before her presentation into my office. When examining the patient, the teeth were extremely sensitive to chewing. At the time of my examination, the tooth, No. 5, was extremely sensitive to percussion, moderate sensitive to palpation, mobility was slight, and the tooth had probing depths no greater than 6. The patient attributed the pain to the sealer and requested treatment.

The radiograph revealed the following features:
1) There were three large sealer puffs present apically as well as obvious tracks of sealer leading to two of the puffs. It was unknown which type of sealer was used in the previous treatment.
2) The master cone obturating the mesial buccal root canal filling appeared to be extended approximately to the radiographic apex with a sealer puff that leads to the largest extraneous extrusion of sealer apparently in the sinus above the tooth. There is evidence of a second, unprepared canal in that there is visible canal at the mesial of the existing MB root canal filling. The MB canal preparation did not have a continuous taper. Radiographically, the middle third of the root has a greater taper than the coronal third. This violates one of the principles of canal preparation (i.e., to create a tapering funnel with narrowing cross-sectional diameters).
3) Reading the radiograph to interpret the palatal canal is challenging, but it appears that the core material extends to the radiographic apex or slightly beyond and that there is a minor sealer puff above the tooth. To the mesial of the obturation of the palatal root, there is a slight deviation of the core material, which could be a post or canal eccentricity (which was reflected in the obturation). The obturation in the coronal third of the palatal root appears slightly serrated, giving evidence that this sealer puff: mechanism of this iatrogenic event

It is noteworthy that the radiographic image was taken two years after the initial treatment and that the extrusion of sealer was in all likelihood greater than that present radiographically when examined by me.

It is unknown how the sealer puffs were created, but it is likely that one of two mechanisms were involved:
1) An excess amount of sealer was placed into the canals initially, and this sealer was extruded by repeated placement of the master cones (i.e., pumping the sealer out the end of the root by repeatedly placing new sealer in the canal and refilling the master cones).

2) The clinician injected sealer with a syringe without focus being placed on the location of the needle tip. Apical over enlargement and/or a very thin needle used incorrectly with a syringe could also explain such a gross extrusion of sealer. Incorrect in this context means that the needle was beyond or locked at the apical foramen and the clinician did not realise either how much sealer had been extruded or where the needle tip was during extrusion. It is also possible that this excessive sealer was extruded from a syringe and positioned into the root end with a single cone obturation technique.

A coronal seal was not placed at the time of obturation. The patient was able to stay patent at all stages of the treatment process from the time of sealing the perforation immediately eliminates the possibility that the patient will walk away, never receive a coronal seal and predispose the case to failure. Placing the coronal buildup at the time of treatment gives some relative level of assurance that the tooth will be retained even if the patient does not immediately get a crown.

Clinically, this patient was presented with all the options — extraction and an implant or a bridge, or retreatment and a crown. Due to finacial concerns, the patient refused treatment. It is unknown what was done to resolve this clinical situation. This clinical case underscores the importance of an adequate length control, control of sealer, cone fit with tugback and down packing with the control over the master cone using a technique like SystemB delivered via the Elements Obturation Unit (SybronEndo, Orange, Calif.), and after the core was removed or where the smear layer is present.

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Length control is vital at all stages of canal preparation. While the patient was able to stay patent at all stages of the treatment process of canal enlargement (a desirable outcome), it is likely that the constriction of the apical foramen of each of these canals was violated in the canal preparation. Making extrusion much more likely given the appearance of the obturation in the apical third. Figure 2 shows a case where the canal preparation comes to a definite stop, and while the canal is patent (and there is a sealer puff) it is clear that the minor constriction of the apical foramen has not been violated.

Whatever sealer application technique was used, it is a ringed technique or sealer placed onto a master cone, it was an excessive amount relative to the final prepared canal space that needed obturation. Irrespective of the method used, the amount of sealer should be a minimum to coat all of the walls circumferentially around the canal and no more. I place sealer with the Skini syringe (Ultradent, South Jordan, Utah) and an appropriate amount that has been extruded or where the sealer crown is bonded obturation system (SybronEndo, Orange, Calif.). The smear layer is cleared with a liquid EDTA solution (SmearClear, SybronEndo, Orange, Calif.), and after the sealer layer is removed the canal can be bonded with the materials above.

Ideally, coronal seal is placed after the root canal treatment. There should be no delay in the placement of coronal seal. With the rubber dam on and under the SOM, the tooth can be etched and sealed with a flowable composite at the time of obturation. What is ironic in this clinical case is that even with the flaws in treatment, the tooth was able to be sealed at the time of obturation the probabilities of a clinical success would have been much higher. Instead, having left the tissue around the coronal microleakage, the clinical failure was virtually assured, especially with the perforation. Perforations should be repaired and sealed immediately to optimise the chances for clinical success. Once exposed to leakage, especially over the two-year period from the time that the perforation occurred to the patient’s visit in my office, there was no other

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