CASE REPORT

Clinical response to a vacant post space

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Abstract

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Aim To report a case demonstrating a radiolucency developing adjacent to an unfilled post space.

Summary A mandibular left first molar was root filled before post-space preparation. The tooth was restored coronally but the post space was left empty, and 14 months later, pain and furcal radiolucency developed. Cleaning, shaping, medicating and filling the post space resulted in the resolution of symptoms and healing of the radiolucency.

Key learning points

- Post space should be prepared under conditions of asepsis.
- A post space must not be allowed to remain empty when a tooth is restored.

Keywords: post space, radiolucency, unfilled.

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Introduction

The consensus of investigators performing leakage studies is that restorative materials, cements and canal filling materials leak (White *et al*. 1995, Siqueira *et al*. 1999). Dyes and bacteria have been shown to penetrate root-filled teeth through the apical foramen and coronal opening in as little as 24 h (Gish *et al*. 1994), and while the clinical relevance of such studies may be in doubt (Wu & Wesselink 1993), most practitioners strive to improve the prognosis of their endodontic cases by working to minimize both coronal and apical leakage (Ray & Trope 1995). Most studies advise retreatment after 3 months of saliva contact with gutta-percha (Magura *et al*. 1991).

The creation of a post space decreases the amount of filling material in the root canal. Some investigators feel that this may leave the apical seal susceptible to leakage (Metzger *et al*. 2000), and researchers have also speculated on the threat of leakage around posts (Metzger *et al*. 2000).

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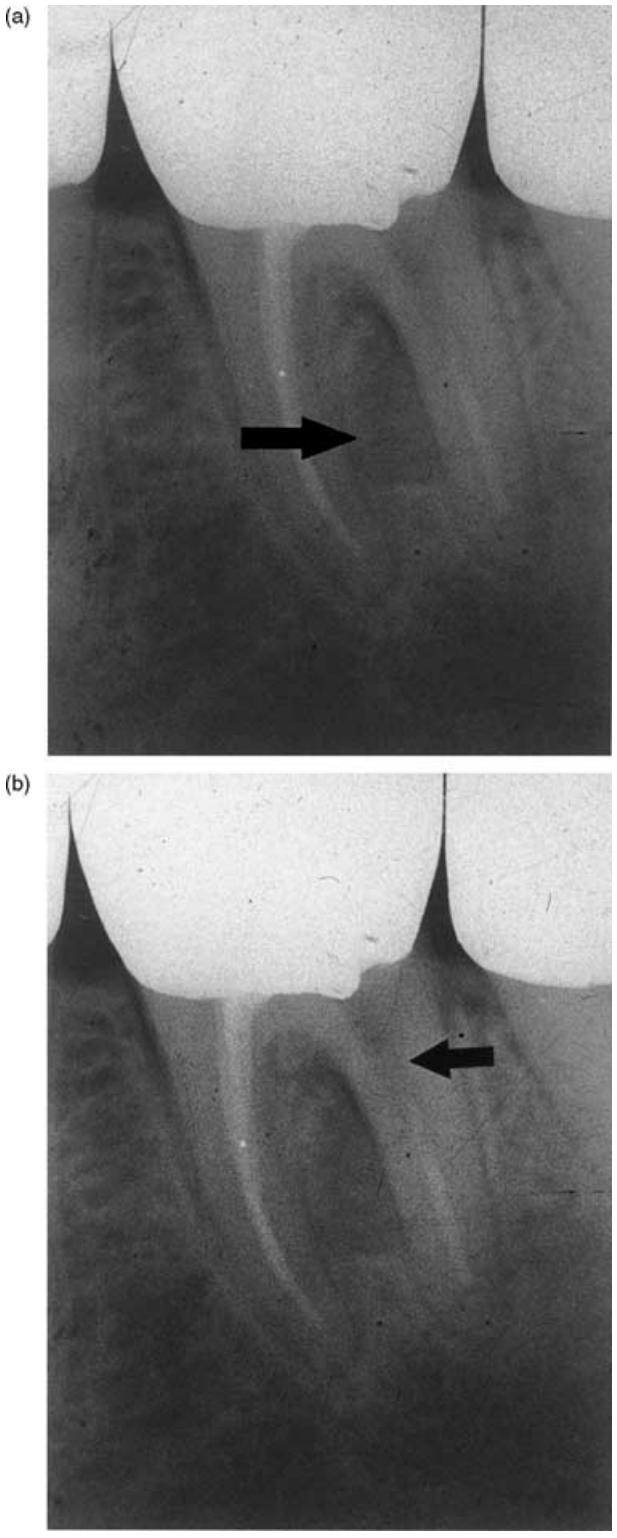

Figure 1 (a) A periapical radiograph arrowed to indicate a furcal radiolucency. (b) A periapical radiograph arrowed to indicate a vacant post space.

The case presented in this manuscript illustrates signs and symptoms associated with a vacant post-space preparation, where new infection or reactivation of residual microorganisms led to the development of a lesion. The report serves to reinforce the message that root canals should be densely filled after preparation and that vacant space may lead to clinical failure.

Report

A female patient, aged 34 years, was seen in an Endodontic office for evaluation of pain and swelling associated with a mandibular left first molar. Discomfort began 10 days before, when the tooth became uncomfortable on chewing. Tenderness progressively became worse to touch, and the pain increased to a severe level. The patient relayed that root canal treatment had been performed 14 months before and a crown was placed soon after the completion of root filling.

A periapical radiograph revealed a furcal radiolucency (Fig. 1a) adjacent to an unfilled post space (Fig. 1b); the apices of the tooth exhibited an intact periodontal ligament space. Clinically, the tooth was tender to percussion and palpation in the midroot area, not the apical area. There was no significant pocketing or communication to the radiolucent area through the sulcus.

A rubber dam was applied, and an access opening was made through the crown. No anaesthetic had been administered. Cement was removed from the chamber with a spoon excavator, and an empty distal post space was irrigated with 5.25% sodium hypochlorite solution (CVS Woonsocket, RI, USA) and instrumented with Hedstrom files (Dentsply Maillefer, Tulsa, OK, USA). As soon as the post space was irrigated, the patient reported the

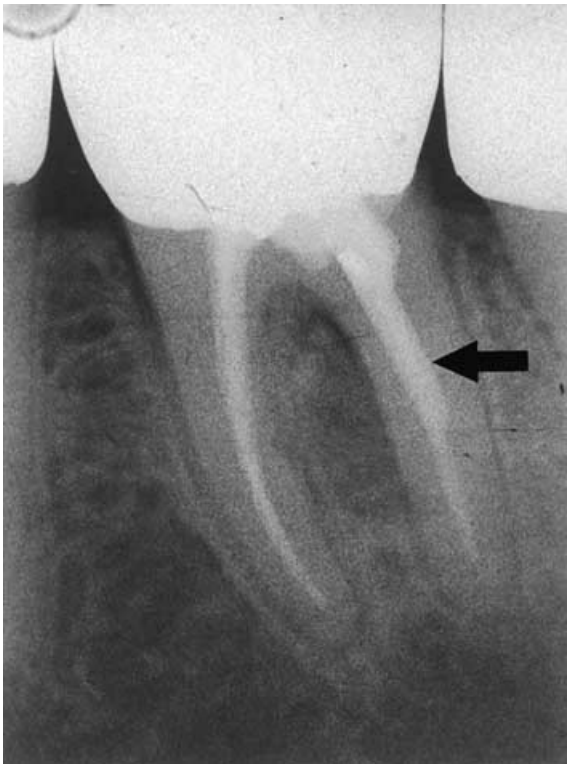

Figure 2 A periapical radiograph arrowed to indicate the obturated post space.

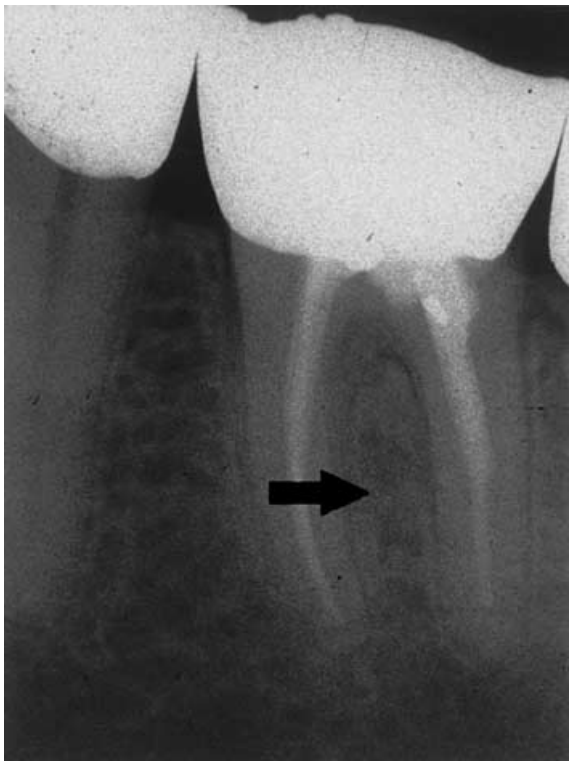

Figure 3 A periapical radiograph arrowed to indicate bone filling in the furcal area.

immediate relief of all symptoms. The canal was dried with paper points (Dentsply Tulsa, Tulsa, OK, USA) and calcium hydroxide (Sultan, Englewood, NJ, USA) mixed with sterile water was placed in the chamber with a plastic instrument (Union Broach, York, PA, USA), before packing it into the post space with a Luks Plugger (Union Broach). The crown was temporized with Cavit (ESPE America Inc., Norristown, PA, USA).

Seven days later, the post space was re-instrumented and filled with gutta-percha (Dentsply Maillefer) and sealer (Roth Root Canal Cement, Roth Co., Chicago, IL, USA), by a combination of cold lateral and warm vertical compaction (Fig. 2) with a heated no. 3 Luks plugger. IRM (Dentsply Caulk, Millford, DE, USA) was used to fill the chamber, and the patient referred back to her general dentist for a new crown.

At 9-month recall (Fig. 3), the tooth was asymptomatic and there was no communication from the sulcus into the furcation. The bone had filled in between the roots, and the apical areas appeared to have remained normal (Fig. 4).

Discussion

This case demonstrates that complications may arise from an unfilled post space. Leakage of saliva along crown margins may have resulted in accumulation or reactivation of microorganisms in the post space. Alternatively, post-space preparation may have been undertaken without proper isolation, allowing the pooling of saliva in the empty channel. Although a lateral canal was not demonstrated, it is likely that seepage of irritants to the furca resulted in the development of pathosis. Emergency treatment resulted in immediate alleviation of clinical symptoms. The patient was advised that as coronal leakage was likely, the entire root canal system should be re-treated, but in the absence of symptoms after the

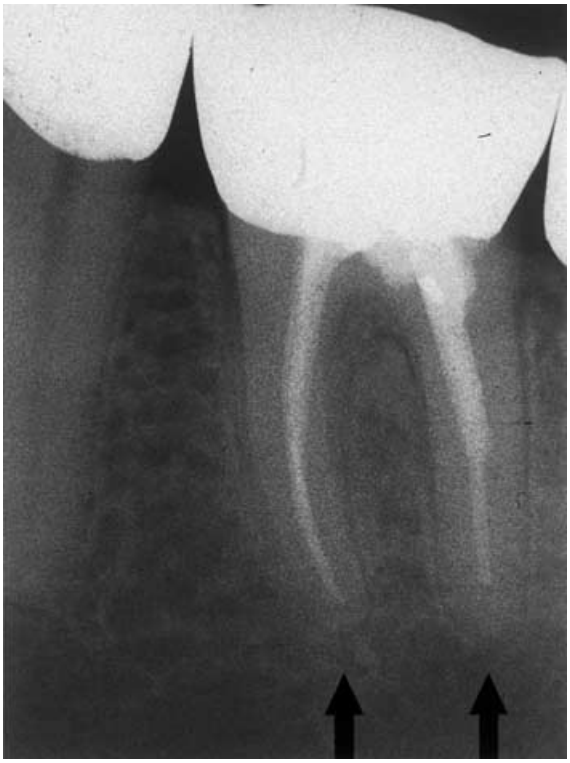

Figure 4 A periapical radiograph arrowed to indicate normal periapical bone.

emergency visit and apparently healthy apical tissues, the patient and the referring dentist requested that the root canal not be re-treated. After filling of the post space, a recommendation for a new crown was made. Cement was placed in the chamber to seal the gutta-percha from future leakage.

The interesting question that we must ask is: why did the apical regions of the tooth remain healthy in the apparent presence of prolonged contact between microorganisms and gutta-percha more coronally? Are current methods of assessing the leakage of root fillings appropriate and valid (Wu & Wesselink 1993)?

The conclusions of Ricucci *et al.* (2000) suggest that the problem of coronal leakage may not be of such great clinical importance as implicated by numerous *in vitro* studies, provided instrumentation and root fillings are performed carefully. The history of the case suggests that careful treatment should include preparing post channels under conditions of asepsis and not leaving them empty as potential reservoirs for infection.

Conclusion

A vacant post space, unfilled for a prolonged period of time, may allow the accumulation of bacteria sufficient in numbers to cause pathology to develop in the adjacent bone.

Post channels should be prepared under conditions of asepsis and should not be left empty.

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Disclaimer

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