

Risk of airway embarrassment during root canal therapy

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Root canal therapy (RCT) is a commonly performed dental procedure that has a good success rate.¹ There have been many advances in the field of endodontics, but the goal of therapy is the same: the removal of diseased pulpal tissue and the prevention of bacterial recolonization by means of root canal obturation. Most RCT complications are minor and include perforation, canal transportation, file separation, failure of infection or symptoms to resolve, osteitis secondary to sodium hypochlorite (NaOCl) extrusion, and violation of anatomical structures such as the inferior alveolar canal and maxillary sinus. On occasion, a severe complication can occur as a result of RCT.

There have been reports in the literature of severe complications occurring during RCT. The cause of these complications usually is a consequence of NaOCl extrusion or

ABSTRACT

Background. Root canal therapy (RCT) is a commonly performed dental procedure that has a good success rate. Complications of RCT usually are minor, but severe complications can occur.

Case Description. A 59-year-old Hispanic man with no history of coagulopathy started to hemorrhage profusely from the mesiolingual canal of the right mandibular first molar (tooth no. 30) during RCT. The general dentist practitioner briefly controlled the hemorrhaging by packing a gutta-percha point into the mesiolingual canal. Shortly afterward, the patient developed an expanding hematoma in the submandibular space. The authors extracted tooth no. 30, raised buccal and lingual flaps, and evacuated the hematoma.

Practical Implications. It is possible for clinicians to encounter significant hemorrhaging and airway compromising swelling when performing root canal therapy. Clinicians must recognize and understand how to manage such complications when they occur.

Key Words. Lingual plate hemorrhage; root canal hematoma; submandibular hematoma.

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high-speed dental handpiece use in the open endodontic site. Because of its many favorable properties, NaOCl is the most commonly used irrigant in RCT.²⁻⁵ Mehra and colleagues⁶ reported a case in which periapical NaOCl extrusion resulted in an expanding hematoma of the facial complex. Other authors have reported cases of subcutaneous emphysema,^{7,8} including a case of subcutaneous emphysema that resulted in pneumomediastinum. In our case report, we present a patient who developed an expanding hematoma secondary to RCT that resulted in an expanding hematoma of the submandibular space during RCT.

CASE REPORT

A 59-year-old Hispanic man complaining of pain in his mandibular right first molar (tooth no. 30) initially sought care at the general dental clinic at Woodhull Medical and Mental Health Center, Brooklyn, N.Y. The pain had been present for one week. It was spontaneous in onset but also was triggered by hot and cold stimuli. The tooth had a large restoration in it. The patient's medical history was significant for hypercholesterolemia and gastritis, for which he took rosuvastatin calcium and ranitidine. He reported having no drug allergies, no prior surgeries and no tobacco or drug use. He indicated that he had a glass of wine every two weeks. He had no significant family history of any disease.

When a general dental practice resident conducted a clinical examination of the patient, he found lingering sensitivity to cold, percussion and palpation in tooth no. 30, leading him to diagnose symptomatic irreversible pulpitis and symptomatic apical periodontitis of tooth no. 30. The patient agreed to undergo RCT in tooth no. 30.

At the first visit, practitioners performed a pulpotomy in which they identified three canals (Figure 1 and Figure 2). At the second visit after obtaining access to the pulp chamber, a practitioner noticed a mesiolingual wall perforation at the level of the pulpal floor. He placed mineral trioxide aggregate (ProRoot MTA, Dentsply/Tulsa Dental, Tulsa, Okla.) at the perforation in an attempt to seal the perforation. He cleaned the canals with hand files down to working length (mesiobuccal, 21 millimeters; mesiolingual, 20.5 mm; distal, 21 mm), which was obtained by means of an apex locator (Root ZX II [J. Morita USA, Tustin, Calif.]). He irrigated the canals with 2 percent NaOCl. After the canals were cleaned, the practitioner placed calcium hydroxide preparation (Multi-Cal, Pulpdent, Watertown, Mass.) into each root canal orifice



Figure 1. Panoramic radiograph demonstrating an extensive carious lesion at tooth no. 30 with apical rarefying osteitis around the root tips.



Figure 2. Periapical radiograph of tooth no. 30 before root canal therapy.

via a microtip syringe. He placed a sterile cotton pellet in the pulp chamber and sealed the preparation with a self-cured temporary sealing compound (Cavit G, 3M ESPE, St. Paul, Minn.).

The patient returned so the practitioner could complete the shaping of the canals. He reported having pain of three days' duration in tooth no. 30 before this visit. The practitioner performed instrumentation by using rotary files (ProTaper, Dentsply/Tulsa Dental). He used the F1 file as the final rotary file. He irrigated all of the root canals with a total of 2 milliliters of 2 percent NaOCl. The practitioner noted that five minutes after he finished instrumenting the canals, there was profuse hemorrhage from the mesiolingual canal. He attempted to stop the hemorrhage by packing paper points into the canals and briefly stopped the hemorrhage by packing the bleeding canal with a gutta-percha point. Shortly thereafter, the patient developed severe right submandibular swelling. The practitioner

ABBREVIATION KEY. NaOCl: Sodium hypochlorite.
RCT: Root canal therapy.

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