

CASE REPORTS

Persistent Pain Related to Root Canal Filling and Apical Fenestration: A Case Report

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Endodontic treatments may give rise to persistent pain whose origin is sometimes difficult to determine. Although it is unusual, pain may occur due to apical fenestrations following endodontic treatment. If this occurs, the solution is surgical intervention. This surgical procedure consists of raising a flap to expose the fenestration, followed by curettage of any overextended canal filling materials that may be potentially irritating to the underlying mucosa, remodeling of the apex, and its repositioning below the level of the cortical bone. A case is described that illustrates this clinical situation. The case also demonstrates information that can be obtained from tomodontometric films.

Endodontic treatments may result in postoperative pain of diverse origins. The most frequent causes are related to diagnostic errors that led to inappropriate treatment, inflammatory reactions related to infection or to the materials used for filling the canal, the development or persistence of a periapical area of infection, or root fractures. Some of these pains may disappear rapidly, with or without intervention, whereas others may persist even though subsequent examinations such as radiographs may not reveal any apparent cause. This is the case, for example, with pain originating from a cracked tooth or from phantom tooth pain (1). In this article, we describe a clinical case where pain was related to apical fenestration, a far less frequent cause of persistent pain following root canal treatment. Apical fenestrations are localized defects of the cortical bone covering the teeth. They are usually symptom-free but can elicit persistent pains after root-filling treatment.

CLINICAL CASE

A 45-yr-old woman presented for consultation because of pain localized in the maxillary left molar region. The patient was in good health (ASA 1) and upon interrogation said that the pain appeared after endodontic treatment of tooth 14, which was treated

in preparation for a crown. The patient experienced pain upon mastication and upon digital palpation of the apical area. As a result of these complaints, a temporary crown was remade by her dentist with no noticeable improvement. The definitive crown was not inserted and the patient had experienced 4 months of pain when she presented for consultation in our service.

Extraoral examination did not reveal the presence of any anomalies or of muscular sensitivity to palpation. Intraoral examination revealed no occlusal problems. A temporary crown was in place on teeth 14 and 15, which were devitalized. Upon palpation, the vestibular area in the region of the distobuccal root of 14 was sensitive. The mucosa in the apical area was slightly more red than the neighboring areas, and a slight discoloration that suggested the presence of gutta-percha was seen. Examination revealed no evident periodontal involvement. Palatal palpation revealed a small, hard area in the region of tooth 14, which suggested a palatal exostosis.

Radiographic examination (Fig. 1) showed root canal therapy with an extension of filling material beyond the apex but with little obvious additional pathosis. A slight round radiopacity was also visible on the radiograph in the area of the distal root that represented the palatal exostosis. The discovery of the exostosis greatly alarmed the patient who immediately thought of a malignant tu-

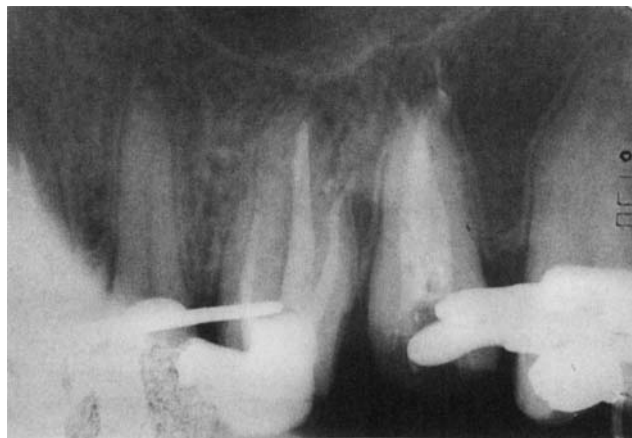


FIG 1. Radiographic examination of tooth 14 shows some material beyond the apical limit, but an otherwise satisfactory file.

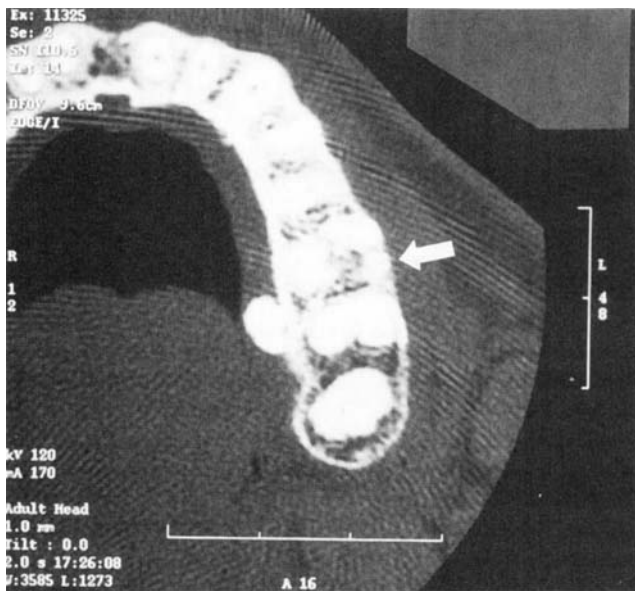


FIG 2. Horizontal tomodensitometric view of the apical region of tooth 14. The fenestration is clearly visible. Note the presence of an exostosis on the palatal side.

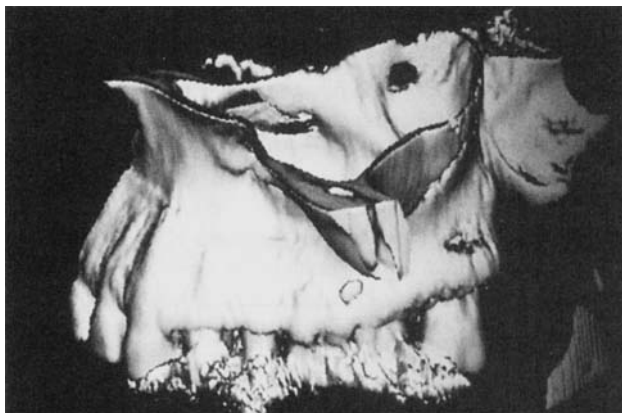


FIG 3. Tomodensitometric three-dimensional reconstruction of the maxillae indicating the apical fenestration of the bone at the apex of the distobuccal root of tooth 14.

mor, despite our reassurances and explanations. She focused on this problem, believing that it was the cause of her pain.

A tomodensitometric picture was thus ordered (Figs. 2 and 3) both to reassure and calm the patient and to confirm our diagnosis. The images showed a fenestration of the distobuccal root of tooth 14 and an exostosis located in the palatal region.

A diagnosis of pain related to apical fenestration was established, and the proposed treatment plan consisted of apical resection and returning the root to within the bony limit of the cortex.

A full-thickness flap was raised and the root was exposed. A fenestration was shown to be present, and the gutta-percha canal filling material was visible. The apex was resected and the root was reduced so that it was within the limits of the bony cortex. A small zone of fibrous tissue in the mucosa facing the fenestration was eliminated, and the flap was repositioned and sutured. A prescription for paracetamol (1 g three times a day for 2 days, than as necessary) was given.

At the follow-up visit 1 wk later, the patient complained of widespread sensitivity in the area which differed, however, from



FIG 4. Radiographic examination after 1 yr. The pain has never reappeared since the intervention. The palatal exostosis is visible as a round radiopacity near the distobuccal root of tooth 14.

the pain described before surgical intervention. The following week, the pain had diminished and the sutures were removed. One month later, the patient was free of pain, and 1 yr later (Fig. 4), the pain had not reappeared.

DISCUSSION

Defects in osseous coverage of the dental roots, resulting in coverage by the periosteum and gingiva only, may be either localized defects (fenestrations) or extensive defects (dehiscences). The frequency of these defects is between 7.5 to 20%, according to various studies (2-7), and varies according to the type of tooth considered. They occur almost exclusively on the buccal surfaces of the alveolar bone. Mandibular teeth are more often affected than maxillary teeth, and anterior teeth are more frequently involved than posterior teeth. Nevertheless, if only fenestrations are considered, maxillary teeth appear to be more frequently affected than mandibular teeth, because the dehiscences affect predominantly the mandibular incisors.

These defects occur bilaterally, and certain factors such as age and tooth malpositions may predispose the patient to fenestrations. Strong occlusal forces may also be an aggravating factor, as are certain anatomical configurations of the teeth that facilitate the contact of the apex with the cortical bone. The fenestrations are most often seen on the mesiobuccal root of the maxillary first molar and the canines (2-7).

Although they are usually symptom-free if left alone, these fenestration may give rise to pain when a root canal treatment is done on a tooth that already has this type of bone defect. This phenomenon was first described by Spasser and Wendt (8). Studies by Patterson (9) and Weine and Bustamante (10) also mention this possible source of pain. It is not the bony defect itself that causes the pain, because teeth that have not undergone root canal treatment, although not covered by bone, are asymptomatic. However, once the endodontic treatment is done, the pain may appear. This leads us to think that, whenever there is a slight projection of excess filling material past the apex, any mobility of the tooth will cause further irritation to the mucosa over the apex. The tooth is rarely spontaneously sensitive, and pain is perceived primarily during masticatory movements or palpation. Patients may frequently aggravate the problem by rubbing the annoying irritated area with their fingers. Clinical treatment consists of raising a flap

(which permits confirmation of the diagnosis), trimming the excess filling, and remodeling of the root in such a way as to reposition it in the bony housing. The bone may then repair itself, and the pain will disappear.

In the case presented herein, utilization of tomodensitometry proved to be useful for confirmation of the diagnosis (11, 12). However, its use is not indispensable and may be contraindicated due to its cost and the irradiation to which the patient is subjected. Clinical examination and conventional radiography are sufficient to determine the origin of pain.

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It is often tempting to maintain that a "scientific research result," which runs counter to "common sense," must be wrong. An example of such might be a recent study (*Diabetes Care* 20:244) that found that injecting insulin directly through clothing was as effective as, and had no greater number of adverse results than, injecting into clean, bare skin. The finding is not trivial for diabetics, who may have difficulty in locating a suitable private room to do their injecting.

What happened to all those germs my mother was always warning me about?

Louis Koch