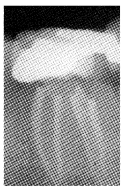

CASE REPORT

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Referred pain: a confusing case of differential diagnosis between two teeth presenting with endo-perio problems

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Abstract

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Aim A case of a patient with a confusing referred pain is reported that emphasizes the importance of providing a differential diagnosis in order to avoid inappropriate treatment.
Summary This article describes the management of a patient presenting with a combined endo-perio problem that was apparently treated adequately. After a short period of time, the reappearance of mild pain was misdiagnosed. The situation was more complicated when multiple diagnostic procedures were attempted and inadequate therapies were tried consecutively. When the true differential diagnosis was established and appropriate treatment provided, the symptoms disappeared and normal function returned. Diagnosis of teeth with necrotic pulps may be difficult to establish with possible reasons including inconclusive and poorly localized symptoms and signs. The situation can be further complicated if other teeth developing endodontic or combined endo-perio problems occur simultaneously as this may lead to misdiagnosis and treatment of the wrong tooth.

Key learning points:

- Diagnosis of teeth with necrotic pulps can be difficult to establish.
- The entire dentition should be examined for possible causes of pain before commencing treatment.
- Some periodontal lesions of endodontic origin can heal following root canal treatment alone.

Keywords: differential diagnosis, endo-perio lesions, referred pain, root canal treatment.

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Introduction

Establishing an accurate diagnosis is the first step to success in endodontic therapy. When a patient is referred in pain, it is essential to proceed carefully with investigations before carrying out treatment that could be inappropriate. In many cases, the diagnosis is easy to establish, but there are certain cases where the situation becomes more complicated, especially when a number of teeth could be the cause of pain, or when periodontal or other disease is superimposed to create uncertainty.

This article describes a patient presenting with a combined endo-perio problem that was apparently treated adequately. After a short period of time, the emergence of mild pain was misjudged. The situation was more complicated when multiple diagnostic procedures were undertaken and a succession of inappropriate therapies was attempted. When the true differential diagnosis was established and appropriate treatment completed, the symptoms disappeared and normal function returned. It is well known that clinical endodontic diagnosis is based on the history along with clinical and radiographic examination. Diagnosis of necrotic pulps may be difficult to establish as symptoms and signs may be inconclusive and poorly localized. A meticulous examination is required to establish a diagnosis before treatment, especially when the symptoms are difficult to localize or when the tooth identified by the patient does not have any evidence of pathosis that could be the cause of pain. Referred pain should always be considered in the diagnosis of pulpal pain.

According to the clinical findings of Bender (2000) presented in his review of pulpal pain, sites of referred pain are always the posterior teeth and always unilateral, involving only one tooth in either the maxilla or mandible. Accurate localization of referred pain ensues when proprioceptive fibres are activated. In teeth with referred pain, the inflammation remains confined within the pulp without extension to the periapical region to engage the proprioceptive fibres that provide the sign of tenderness to percussion. Referred pain is usually absent in the following: teeth undergoing root canal treatment, teeth with apical periodontitis, teeth with sinus tracts or fistulae and root filled teeth (Bender 2000).

Report

A 44-year-old female was referred for root canal treatment of tooth 36. This tooth had received an MOD inlay 20 years previously. The tooth was previously sensitive to hot and cold, and had recently developed a spontaneous sharp pain. Periodontal probing depths did not exceed 2 mm on this or adjacent teeth. A periapical radiograph showed a small radiolucency in the inter-radicular area, but with no communication into the gingival crevice. The diagnosis was irreversible pulpitis with the possible presence of a lateral canal related to this radiolucent area.

After removing the inlay, an access cavity was prepared and cleaning and shaping of the root canal system was performed at the first session, under rubber dam isolation, using the ProTaper Ni–Ti rotary system (Dentsply Maillefer, Ballaigues, Switzerland) with abundant 5.25% sodium hypochlorite irrigation. The canals were dressed with calcium hydroxide and the access cavity sealed with IRM cement (Dentsply DeTrey, Konstanz, Germany). On the second appointment, the canals were filled with gutta-percha and Sealite® Regular (Pierre Roland, Merignac, France) sealer using the System B (Analytic Endodontics, Redmond, WA, USA) warm compaction technique for the apical region and the Obtura system (Spartan, Fenton, MO, USA) for the coronal region. During the filling procedure, mild pain was felt by the patient, which was classified as a procedural event; the periapical radiograph (Fig. 1) showed a dense filling of the canal system and the seal of a lateral canal in the inter-radicular area. Postoperative pain was controlled by 1 g Aspirin®

Figure 1 Postoperative radiograph of tooth 36 showing the filling of the root canal system, and the lateral canal in the furcation area.

b.i.d. for 3 days. The tooth was subsequently restored with an inlay core and a metal–ceramic crown.

Eighteen months later, the patient was re-referred because of recurrent pain. Her chief complaint was of spontaneous mild-to-severe pain lasting for few days, during the previous 4 months. Her pain was relieved by the same doses of Aspirin® as before. Radiographic review was inconclusive. On the insistence of the patient, an alveolar flap was reflected to explore the area for a possible crack or fracture into the furcation, but nothing was found. Still feeling the pain, a complete radiographic examination was undertaken (Fig. 2) to reveal the presence of an impacted maxillary right third molar, and a bone defect on the distal side of tooth 27 where there was a 12-mm probing defect.

The third molar was therefore suspected as a potential source of the pain. Although not fully convinced, the general dentist agreed to extract the tooth. He placed the patient on a course of amoxicillin 1 g b.i.d. for 5 days. After 3 days of pain relief, he extracted the wisdom tooth surgically. The patient returned 3 weeks later complaining of pain from the mandibular first molar, whereupon she was re-referred back for an opinion. On clinical

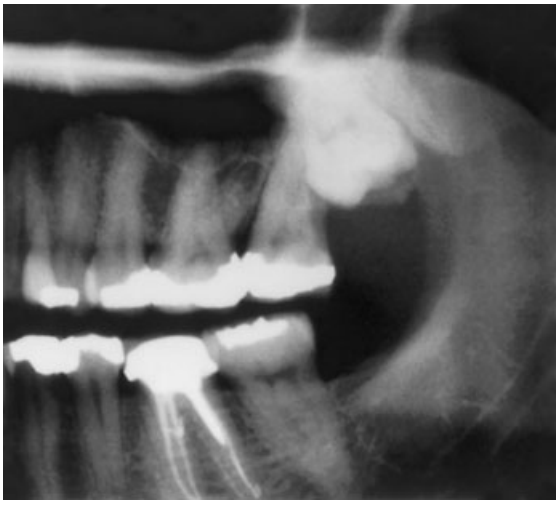

Figure 2 Panoramic radiograph showing the impacted third molar.

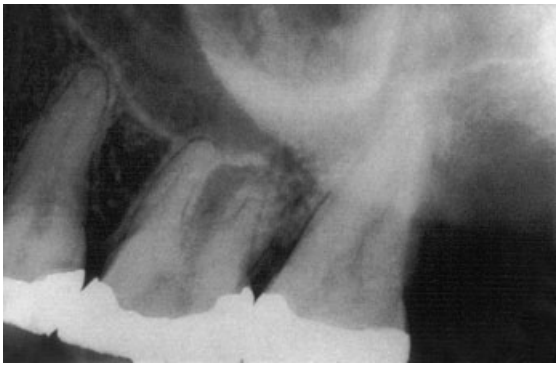

Figure 3 Periapical radiograph of the maxillary right region showing the periodontal defect on tooth 27.

examination, tooth 36 was slightly sensitive to percussion. The opposing teeth were as follows: tooth 26 had an MOD amalgam restoration; tooth 27 had an MO amalgam restoration. The colour of tooth 26 was normal and tooth 27 was slightly greyish. Clinical tests revealed that tooth 26 was sensitive to cold and electric pulp testing whilst tooth 27 did not respond to hot, cold or electric pulp testing. Tooth 27 was slightly sensitive to percussion. The periapical radiograph showed that tooth 36 had no evidence of pathosis. On a different radiograph, tooth 27 had a reduced pulp chamber volume and a widening of the periodontal ligament in the apical area of the palatal root (Fig. 3).

To establish a final diagnosis, the decision was taken to perform selective anaesthesia as described by Weine (1996). The mandibular block did not relieve the pain, but an immediate disappearance of pain was observed after infiltration in the apical area of tooth 27. The diagnosis of pulp necrosis was established for tooth 27. An access cavity was prepared, and immediately after the pulp chamber was penetrated an unpleasant odour was noted and pus appeared in the cavity.

Cleaning and shaping of the root canal system was performed using the ProTaper Ni–Ti rotary system (Dentsply Maillefer) with abundant 5.25% sodium hypochlorite irrigation. A temporary dressing was placed with calcium hydroxide and IRM cement (Dentsply DeTrey). The patient was asked to stop all analgesic drugs and was given an appointment in 7 days to continue the root canal treatment. She was also asked to contact the practice to report on any symptoms; she was completely comfortable without any need for analgesia.

After 1 week, the patient returned, and the absence of pain or signs of inflammation indicated that the final filling could be placed; this was completed with gutta-percha and Sealite (Pierre Roland) sealer, using the System B technique (Analytic Endodontics) for the apical region and the Obtura (Spartan) for the coronal region (Fig. 4).

A 3-month recall revealed a stable situation and a 6-month recall confirmed the disappearance of pain, a reduction of the distal pocket on tooth 27 from 12 to 9 mm, and the absence of sensitivity to percussion on tooth 36.

Discussion

In the case of pulpal pain, it is often difficult for the patient to pinpoint the tooth causing the discomfort. The percentage of A beta fibres that could be sensitive to touch or pressure is <5% of the myelinated nerves of the pulp, resulting in a lack of pulp proprioception (Torneck & Torabinejad 1996). Correct pulpal diagnosis is the key to all predictable endodontic treatment. This diagnosis should be based on presenting symptoms, history of symptoms, diagnostic tests and clinical findings. If it is not

Figure 4 Postoperative radiograph of tooth 27.

possible to establish a diagnosis, therapy should not be initiated (Sigurdsson 2003). In this particular case, an unnecessary surgical intervention was performed on the mandibular first molar that could have been avoided if the possibility of referred pain had been taken into consideration earlier and a complete investigation of the entire dentition completed.

When a patient complains of pain, an attempt should be made to reproduce the reported symptoms to check on the accuracy of its description and to aid in localization. Patients often refer pain to previously root filled teeth that may not be the cause of the problem. A tooth can only be the source of pain if there are objective signs associated with that tooth. The lack of response to vitality tests could be such a sign, provided the tooth has not previously been root filled. If, however, such treatment has taken place, a further objective sign is required before such a tooth can be implicated as the source of pain (Ehrmann 2002). Vitality tests should be interpreted carefully in cases of suspected referred pain as this pain is usually provoked by an intense stimulus acting on the C fibres whilst the conventional electric pulp tester excites only the A-delta fibres making it impossible to reproduce the symptoms by using the electronic pulp tester (Bender 2000). Referred pain, characterized by an intense, boring, continuous pain, always occurs with a previous history of mild-to-moderate pain in the tooth causing the present pain (Bender 2000). Upon questioning, patients often recall the location of previous mild or moderate tolerable pain; usually they are fairly certain as to its localization. However, with the increase in pulpal inflammation over time, there is confusion as to localization and an inability to identify the involved tooth (Bender 2000). This will emphasize the importance of a thorough investigation and questioning of the history of symptoms. The possibility of phantom tooth syndrome should also be taken into consideration as a possible cause of the pain in presence of a confusing situation (Battrum & Gutmann 1996).

In the present case, the lateral canal in relation with the radiolucency in the furcation area of tooth 36 could be a sign of an endodontic involvement in the furcation lesion.

The reduction in probing depth associated with the distal area of tooth 27 might have been partially due to root canal treatment; however, there was an implication that third molar may have caused much of the damage, requiring a different treatment.

Conclusion

A few guidelines can be followed to avoid incorrect diagnosis and subsequently inadequate procedures:

- A patient's description of the location of pain must be treated with caution.

• The history of symptoms provides diagnostic help in determining the tooth causing the pain; evaluation of the dental history, particularly the history of pain in the same tooth before the present pain experience, is an important consideration in rendering proper treatment (Bender 2000).
• If it is not possible to establish the diagnosis or one diagnosis is not dominant within a differential diagnosis, no therapy should be initiated until further evaluation has been performed (Sigurdsson 2003).

Disclaimer

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