

## CASE REPORT

# Complicated untreated apical periodontitis causing paraesthesia: A case report

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### Keywords

apical periodontitis, calcium hydroxide, endodontic retreatment, mandibular canal paraesthesia, treatment decision-making.

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### Abstract

The purpose of this article was to report a case of untreated apical periodontitis resulting in severe late complications. A patient with an asymptomatic crowned root canal-treated mandibular molar revealing a radiographic substandard endodontic treatment and a slight periapical radiolucency was made aware of the treatment options and opted for no treatment. The lesion slightly increased in size after 6 years, but the tooth remained asymptomatic and endodontic retreatment was again refused. After 4 more years, the patient presented with an abscess and severe pain, complicated by paraesthesia of the left chin and lip. Radiographic examination revealed that the lesion had increased considerably to involve the mandibular canal. The treatment protocol included long-term intracanal medication with calcium hydroxide and follow-ups revealed complete resolution of the periapical radiolucency and the paraesthesia had completely subsided.

### Introduction

Apical periodontitis is caused by bacterial infection of the root canal system (1). Intracanal bacteria are usually organised as biofilms adhering to the root canal walls (2). In approximately 80% of teeth with primary or post-treatment apical periodontitis, bacterial biofilms occur in the apical third of the canal system (2). Consequently, successful treatment of apical periodontitis is dependent upon effective control of intraradicular biofilms. If bacteria survive the effects of treatment, there is a significantly increased risk for the lesion to persist and even progress (3).

Apical periodontitis is commonly asymptomatic (4) and in many cases it is diagnosed by chance (5), for example, following a radiographic examination for implants or restorative planning. As the tooth is asymptomatic, it may be difficult to convince a patient endodontic treatment or retreatment was indicated (6). If left untreated, an apical periodontitis lesion may develop into a chronic abscess with an associated intra- or extra-oral draining sinus tract, large cyst, chronic focal sclerosing osteomyelitis or possible exacerbations such as an acute abscess and cellulitis, depending on host immunity. This case report illustrates the risks of leaving apical

periodontitis untreated and reinforces the need for proper endodontic treatment to avoid possible serious complications.

### Case report

A 42-year-old woman presented for a routine dental examination. She was found to be periodontally sound with some interproximal carious lesions in the maxillary posterior teeth. The mandibular left first molar was crowned, and the patient stated that the tooth had been root canal-treated approximately 10 years earlier. The tooth was asymptomatic and responded normally to vertical and lateral percussion and palpation.

A periapical radiograph revealed a substandard root canal treatment with the canals appearing underprepared and the apical third of the distal canal unfilled. Thickening of the PDL space was observed around the entire perimeter of the distal root, with no evident apical radiolucency (PAI score 3) (7) (Fig. 1). The patient was informed that the root canal filling was of suboptimal quality and retreatment or no treatment with periodical follow-ups were fully explained. She opted for the latter, due to the lack of symptoms and that removal of the crown with the need for replacement.



**Figure 1** Radiograph of tooth 36 taken in November 2005. Only thickening of the periodontal ligament space around the distal root was evident.

The patient returned 6 years later and requested the possibility of replacement of her missing mandibular right molar (46) with an implant. Tooth 36 was still asymptomatic, and percussion and palpation gave responses within normal limits. A periapical radiograph revealed a distinct periapical radiolucency now present associated with the distal root (PAI score 4) (Fig. 2a). A cone-beam computed tomography (CBCT) scan further confirmed the periapical radiolucency (Fig. 2b-d). The patient was made aware that the periapical condition of tooth 36 had slightly worsened and retreatment was once again recommended. The patient again declined.

She returned almost 4 years later seeking treatment 'for an abscess', with severe pain and swelling on the left cheek as well as fever. Tooth 36 was now mobile, with the feeling of being "elongated", and tender to both percussion and palpation. A periapical radiograph revealed that the radiolucency had increased considerably (PAI score 5) (Fig. 2e). Antibiotics were prescribed

(Amoxicillin 2 gm day<sup>-1</sup> for 5 days) and after 1 week the swelling and pain had subsided. However, at 7-day review, the patient stated she felt her lower left lip and chin "had been anaesthetised". A CBCT scan (Fig. 2f-h) revealed that the radiolucency was now in direct communication with the mandibular canal (Fig. 2f-g).

Endodontic retreatment was immediately initiated. The crown was sectioned and removed (Fig. 3a). The previous root canal filling material was a paste, and easily removed. Working length was established with an electronic apex locator (Root ZX, Morita Corp, Tokyo, Japan) and confirmed radiographically (Fig. 3b). The canals were instrumented with Gates-Glidden burs in the coronal two-thirds, and with Hedström hand files in the apical third. The last instrument used for apical preparation was size #40 in the mesial canals and #55 in the distal canal. Irrigation was performed with copious amounts of 1% sodium hypochlorite. The canal was finally irrigated with sterile saline solution, dried with sterile paper points and filled with calcium hydroxide mixed with saline to a creamy consistency (Fig. 3c). The calcium hydroxide paste was placed with a lentulo spiral and then condensed at the canal orifice with the blunted end of large paper points. The access cavity was temporised with IRM (Dentsply International, Milford, DE, USA).

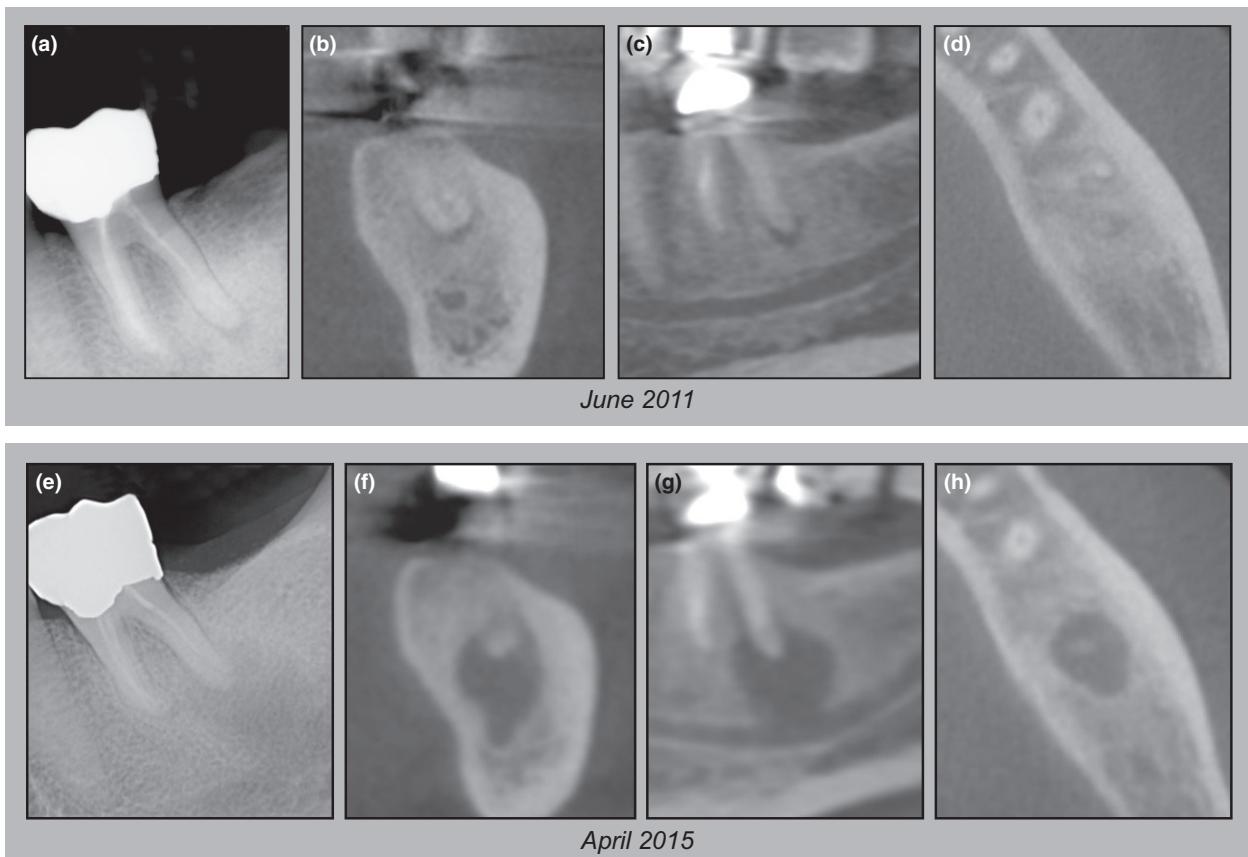
The patient stated that the paraesthesia had slowly diminished over the postoperative period, and completely disappeared after 4 weeks. However, she declared that the tooth was not completely comfortable, with intermittent dull ache. The tooth was slightly tender to percussion. The canals were reopened, flushed with 1% sodium hypochlorite and filled again with a fresh calcium hydroxide slurry paste. Access was sealed with IRM. The canals were revised twice more in successive months.

After a total period of 8 months of intracanal medication, the tooth was asymptomatic. A radiograph showed that the original radiolucency had almost completely healed (PAI score 3) (Fig. 3d). After rubber dam application, the intracanal medication was removed and the canals were finally obturated with gutta-percha and sealer (Pulp Canal Sealer EWT, Sybron Dental, Orange, CA, USA) using a lateral condensation technique (Fig. 3e).

A follow-up radiograph taken 9 months after obturation (17 months after the commencement of endodontic retreatment) revealed healing of the periapical radiolucency compatible to PAI score 2 (Fig. 3f). The tooth was asymptomatic.

## Discussion

Apical periodontitis is an infectious disease that can be treated with a high success rate by non-surgical endodontic treatment or retreatment, periapical surgery



**Figure 2** (a) Radiograph of tooth 36 taken almost 6 years later. The tooth was still asymptomatic, but a distinct radiolucency could be appreciated around the distal root apex. (b–d) Cone-beam computed tomography (CBCT) scans, taken at the same time, confirmed the radiolucency. (e) Radiograph taken 4 years later showing that a large periapical lesion was present on the distal root. (f–h) CBCT scans revealed that the radiolucency expanded to reach direct continuity with the mandibular canal.

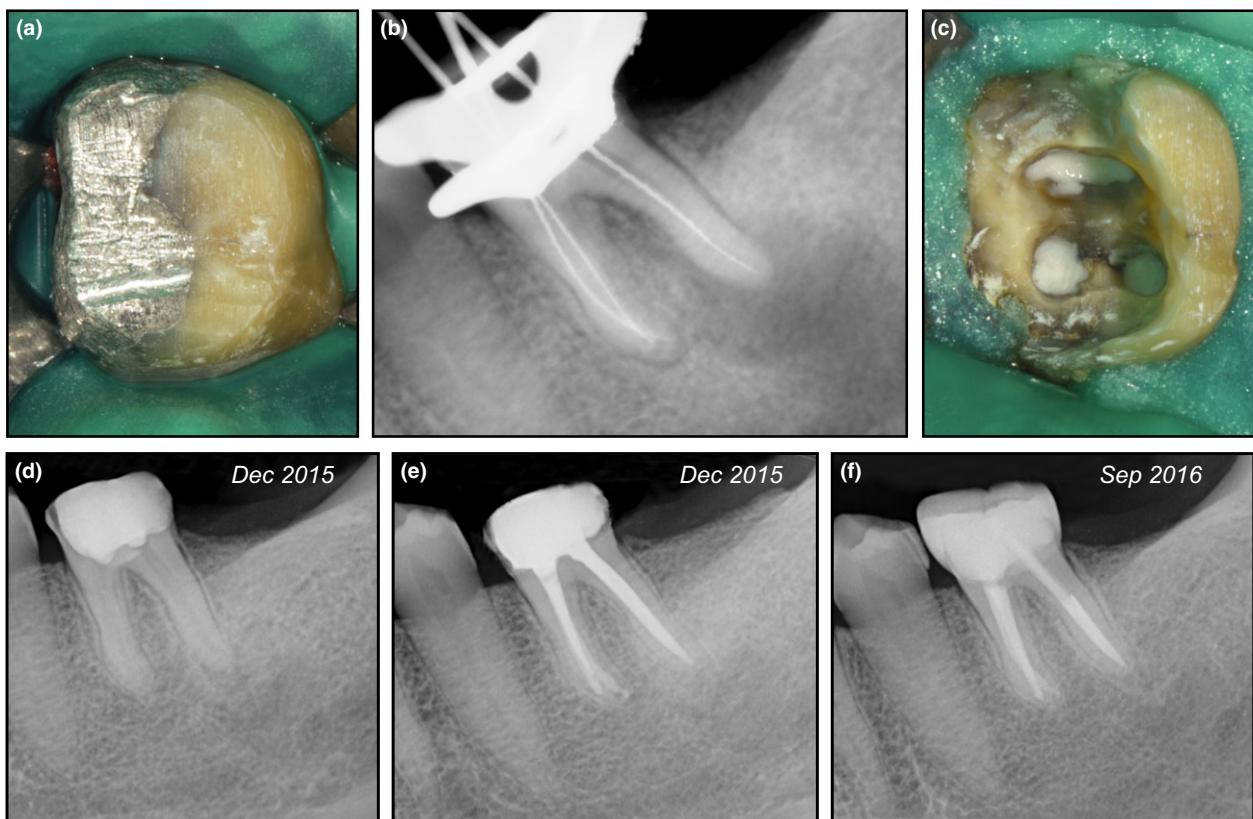
or extraction (8). Although some articles have expressed a “relaxed view” concerning treatment decision-making for teeth with persistent asymptomatic lesions (5,9), it is important to stress that endodontics is a clinical discipline with the aim to prevent and treat apical periodontitis (10). As such, leaving apical periodontitis untreated is not indicated, even if asymptomatic. In these cases, a bacterial biofilm is likely present within the canal and needs to be controlled.

The main reasons to treat or retreat teeth with asymptomatic apical periodontitis are: (i) the endodontic infection has contributed to the overall oral infectious burden, which along with caries, periodontal diseases and other infections, may affect the general health of patients and be associated with conditions such as coronary heart disease, infective endocarditis and low-birth-weight preterm births (11–13); (ii) the lesion can expand and reach anatomical areas such as the maxillary sinus and mandibular canal, leading to complications such as sinusitis and paraesthesia (14–17); (iii) the lesion can

rapidly become acute and progress to an abscess or cellulitis, which in some (albeit rare) cases can be life-threatening (18,19).

There are few reports on the prevalence of exacerbation and abscess formation of asymptomatic apical periodontitis lesions but it has been estimated at 5% per year based on cross-sectional observations (20). The prevalence of abscesses may indeed be higher – biopsies of apical periodontitis lesions obtained with extracted teeth revealed that abscesses accounted for 35% of the lesions (21). In addition, apical abscesses corresponded to 47% of non-traumatic dental diseases of outpatients seeking care in a paediatric emergency room in the United States (22).

Paraesthesia is caused by nerve injury and is characterised by a tingling, tickling or numb sensation, with partial loss of local sensitivity. Paraesthesia associated with endodontics may occur due to apical extrusion of filling material or intracanal medicaments, during periapical surgery, or as a consequence of an expanding



**Figure 3** (a) After removal of the crown, the tooth was isolated. (b) Working length was confirmed radiographically. (c) Intracanal medication with calcium hydroxide. (d) Radiograph taken 8 months after beginning of retreatment. The radiolucent area had considerably reduced in size. (e) Postobturation radiograph. (f) Follow-up radiograph taken 9 months after root canal filling (17 months after beginning of retreatment). The peripapical lesion healed completely.

apical periodontitis lesion (16,23,24). This case of paraesthesia of the lower left lip and chin was related to the close proximity of the lesion to the mandibular canal.

In the case reported, two reasons to not leave apical periodontitis untreated were evident – the lesion developed into an acute abscess and expanded to affect the mandibular canal, causing paraesthesia. These complications developed approximately 10 years after the patient was initially seen. Patients should therefore be made aware of the risks of leaving apical periodontitis untreated.

Surgery was avoided in this case due to the tooth's location and that the lesion had reached and involved the mandibular canal. Therefore, the canal was retreated using an antimicrobial protocol with calcium hydroxide. Paraesthesia fortunately resolved within 4 weeks. Ultimately, the lesion completely healed 17 months after the endodontic retreatment was initiated.

This case report has illustrated that, if left untreated, apical periodontitis may exacerbate and lead to severe complications such as paraesthesia. After appropriate

endodontic treatment, the patient's symptoms and paraesthesia had fortunately resolved.

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### Disclosure

The authors have no interest to disclose.

### Author contributions

All authors have contributed significantly. All authors are in agreement with the manuscript.

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