Endodontic treatment of birradicular maxillary canine: case report

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ABSTRACT

This paper describes an unusual case of right maxillary canine with two roots. This is the fourth finding that has been reported in the literature. A 66-year-old female patient was referred to endodontic treatment in the tooth #13. Clinical evaluation showed that tooth #13 presented no response after the vitality test. Radiographs were taken and revealed that the tooth #13 presented two roots. Then, the patient was submitted to endodontic treatment. This case report is relevant because it describes an atypical anatomical variation, but with possible occurrence in endodontic clinical. For this reason, the dentist needs to have knowledge of the normal anatomy of the teeth to correctly perform the endodontic treatment, as well as to know the possible anatomical variations, and to thoroughly analyze the diagnostic radiography to have an individualized notion of the anatomy of the tooth to be treated.

Keywords: Endodontics. Root Canal Therapy. Root Canal Obturation.

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» Patients displayed in this article previously approved the use of their facial and intraoral photographs.

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Introduction

Morphological features of the tooth may adversely affect endodontic procedure. Thus, a thorough knowledge of both the external and internal anatomy of teeth is essential to enhance the treatment success rates. Most of extra canals can be detected if the clinician is alert to the clues, which suggest their presence.[1]

Maxillary central and lateral incisors present single canals. However, aberrations of maxillary anterior teeth, such as maxillary central incisors with two roots and two canals have been reported in the literature,[2] maxillary lateral incisor with two roots and two root canals,[3] maxillary lateral incisor with two root canals[4] and lateral incisor with three root canals.[5]

Permanent maxillary canines are single-rooted and single-canaled teeth and the presence of two root canals is a rare condition.[6-8] Maxillary canines with multiple roots is even more unusual[9] and only three cases have been reported in the literature presenting this atypical anatomy.[10-12]

Careful radiographic evaluation and endodontic exploration may lead to identification or suspicion of additional canals. Radiographs using different angulations and an endodontic file within the root canal may help the extra canals detection.[1]

The aim of the present case report is to increase the awareness of clinicians on anatomic aberrations in maxillary canine and show the relevance of diagnostic radiograph to detect possible extra roots. This case report described a maxillary canine with two roots, which is extremely rare.

Case Report

A 66-year-old female patient was referred to endodontic treatment to prevent an infection in the right maxillary canine. Clinical evaluation showed that tooth #13 presented no response after the vitality test before the prosthetic treatment.

The patient´s medical history included radiotherapy. No intraoral or extraoral edema was observed. Clinical evaluation showed that tooth #13 presented previous visible restorations (Fig 1A and B) and it was not sensitive to percussion or palpation.

The periodontal condition was within normal limits (probing =3 mm and normal mobility). Tooth #13 did not respond to cold tests using Endo Frost (Roeko, COLTENE, Switzerland). Radiographic evaluation showed that the tooth presented two roots (vestibular and palatal) with one canal in each root (Fig 1C). The diagnosis was Pulp Necrosis with Asymptomatic Apical Periodontitis.

Two clinical endodontic sessions was performed for the right maxillary canine. In the first session, the access cavity was prepared slowly and carefully, treatment was continued with a rubber dam in place. Two root canals were identified, the palatal one, was found first and easier, was larger, the vestibular one was narrower and was difficult to identify (Fig 1D and E).

Canals were prepared with crown-down technique, involving early flaring with rotary instruments, Gates Glidden #1 and #2, in sequence was determined the working length using an apex locator Figure 1-F showed radiographic apex and root canal configurations, two roots with a single canal each one, from the pulp chamber to apical foramen. Biomechanical preparation was continued with hand-files, stepback technique and abundant irrigation with NaOCl 2,5%, the master apical file was LK#40 in both canals, and apical patency was recapitulated with LK#15. Afterwards, the canals were filled with calcium hydroxide paste and the coronal access was temporary restored with resin-modified glass-ionomer material (Vitrebond, 3M ESPE, St Paul, MN, USA).

One month later, the patient returned for second clinical endodontic session. After accessing the root canals, the calcium hydroxide dressing was removed with copious irrigation and recapitulated using a LK#40. For the final chemomechanical preparation was used NaOCl 2.5%, EDTA 17% and Tergentol. Obturation was performed with gutta-percha and endodontic sealer (Sealapex, SybronEndo, Orange, CA, USA) by lateral condensation technique (Fig 2).

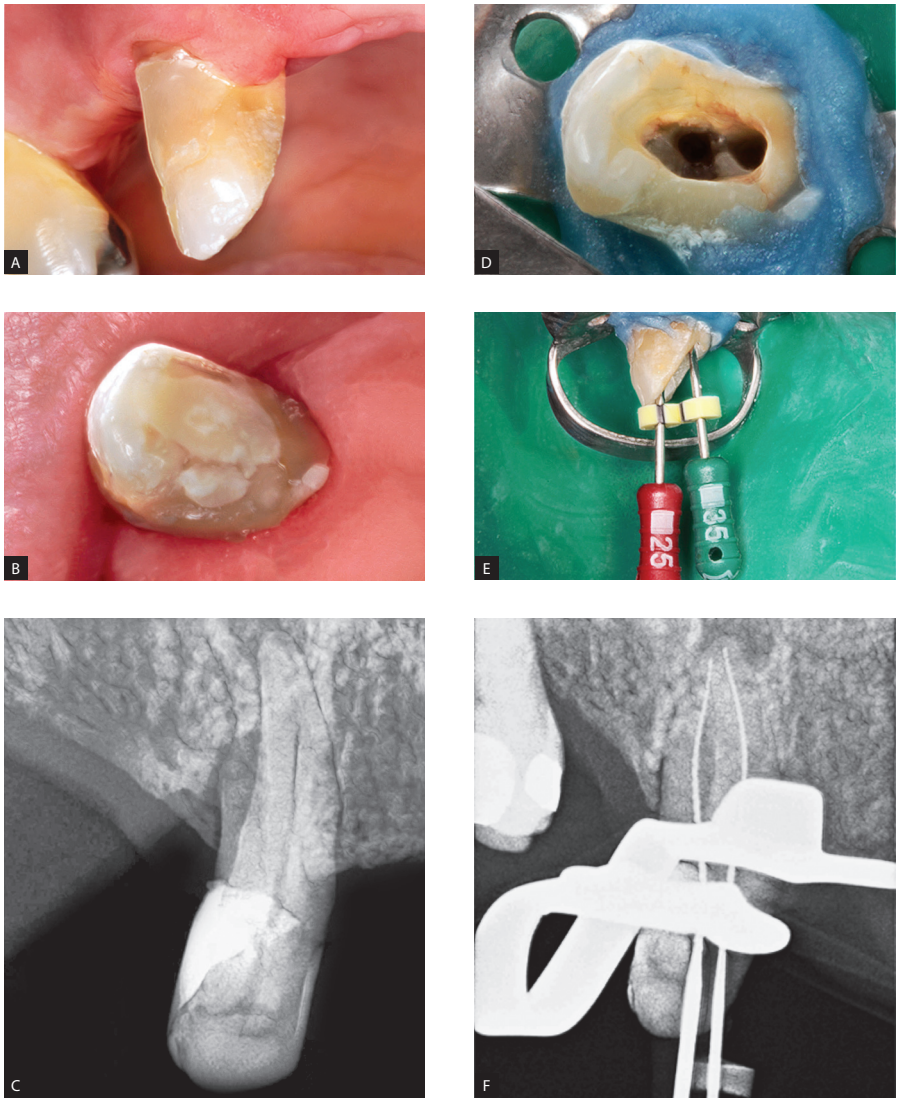

Figure 1. Maxillary canine: (**A**) Clinical view, (**B**) Occlusal view, (**C**) Diagnostic radiograph, (**D**) Final access preparation. Working length: (**E**) Clinical view, (**F**) Periapical radiograph.

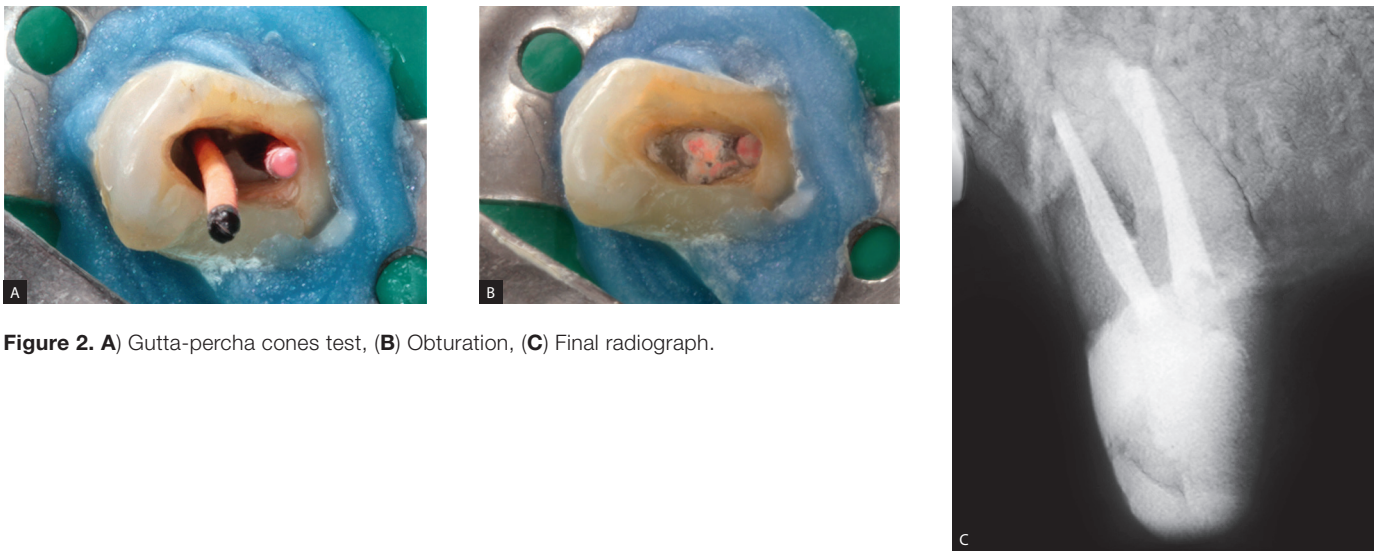

Figure 2. A) Gutta-percha cones test, (**B**) Obturation, (**C**) Final radiograph.

Discussion

This case has shown a maxillary canine with two roots and two single canals. This type of anatomic variation has been reported only three times in the literature before we carried out this case.[10-12]

It is really important to analyze, clinical and radiographically, the initial condition of the tooth to treat, before begin the endodontic treatment, to prevent possible accidents during the treatment. Successful management of endodontic failures depends on diagnostic imaging techniques to obtain the critical information about the tooth under investigation, and its surrounding anatomy.[13]

Despite the root canal anomalies present low prevalence, they should be detected by carefully evaluation. Detailed knowledge of the root canal anatomy, its configuration and variations are essential to the clinicians, which should be aware that root canal systems are not simple, since the endodontic success depends on a thorough debridement of the root canal system. The teeth presenting root canals anatomic variations or additional root canals are often left untreated since the clinicians fail to detect their existence.[1]

Barkhodar and Nguyen[10] have reported a maxillary canine with two roots that was "endodontically treated"; even though, the diagnostic radiograph revealed an advanced calcification in both root canals, and the obturation material could be seen in the bone due to the furcation perforation. Therefore, we have to be aware of unusual dental morphology that should be carefully analyzed in the diagnostic radiographs to prevent accidents or failures; as well as to perform a correct treatment planning and prognostic. After our initial radiographic examination, it was obvious that the maxillary canine presented an unusual configuration.

Conclusion

The present study aimed to aware the clinicians about the anatomy variations of maxillary canine teeth; in addition, a carefully examination should be performed to detect possible extra roots that is usual in single-root teeth.

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