

A Case Report on a Maxillary Central Incisor with Two Root Canals
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Abstract

Background Understanding the internal and external anatomy of the teeth, as well as the differences in presentation, is essential for the effectiveness of endodontic therapy. The maxillary central incisor's internal architecture is well documented, and it typically exhibits a single root and radicular canal system. With the help of radiography and computed tomography exams, this case report details the endodontic treatment of a maxillary central incisor with two roots and two canal systems.

Case Report The endodontics clinic received a 27-year-old female Caucasian patient who needed root canal therapy for her right maxillary central incisor. The tooth was discovered to have an irreversible pulpitis and normal periradicular tissue after radiographic examination and pulp vitality testing. After that, a root canal was performed.

Conclusion Dentists may fail to use a variety of diagnostic tools and may be unaware of all anatomical configurations for root canals, which could result in the untreated canal harbouring residual necrotic tissue and toxic compounds.

Key Words Maxillary central incisor, pulp vitality, root canal



Figure 1. Right maxillary central incisor for root canal treatment.

The removal of infections from the root canal system and the avoidance of systemic reinfection are two of the primary goals of nonsurgical endodontic treatment (1). However, there are a number of

reasons why endodontic therapy may not succeed, including incorrect diagnosis, an infection that persists in the root canal system, mistakes made during the debridement and shaping process, fractured instruments, and inadequate restorations. Therefore, understanding the internal anatomy of the teeth is crucial for providing appropriate endodontic treatment. Dentists should therefore take into account the anatomical peculiarities of root canal systems. The literature indicates that these differences are also present in the maxillary central incisors. Seldom do teeth in this group require two root canal treatments (1–4).

This study aims to demonstrate a clinical instance of endodontic treatment of a maxillary central incisor with two roots and two root canals, as shown by computed tomography (CT) and radiography exams.

Case Report

For root canal therapy of the right maxillary central incisor, a 27-year-old female Caucasian patient was sent to the endodontics clinic of the Amazonia Institute of Superior Education-CIEC/IAES, Manaus, Amazonas (Fig. 1). Following radiographic analysis and pulp vitality testing, the tooth was found to have normal periradicular tissue and an irreversible pulpitis. The tooth was cleaned and placed under a rubber dam for isolation. Following the first radiographic assessment, it was clear that there were two roots—one mesial and the other distal—as well as two root canals (Fig. 2). Using high-speed round diamond burs No. 1015 (KG-Sorensen, Barveri, SP), the access surgery was carried out while being continuously irrigated with water spray. Using a high-speed Endo-Z stainless steel bur (Maillefer, Dentsply, Brazil), compensatory wearing was performed while continuous water spray irrigation was in place. A solution of one percent sodium hypochlorite was used to irrigate the root canals. Following this process, the mesial canal system's file number 40 and the distal canal system's file number 35 were measured for the root and subjected to chemomechanical preparation using the Crown-Down approach with the Pro-File system (Dentsply-Maillefer, Rio de Janeiro, RJ, Brazil).



Figure 2. Presence of two roots and two root canals.

AH Plus cement (Dentsply, Rio de Janeiro, RJ, Brazil) and the hybrid thermo-mechanic approach were used to obturate the right permanent maxillary central incisor. The final X-ray following root canal therapy is shown in Figure 3. To verify the obturation, a postoperative CT examination was performed (Figs. 4 and 5). After three months of clinical and radiological observation, the patient's tooth continued to show no symptoms.

Discussion

This study presents a unique instance of a maxillary central incisor with two root canals that does not exhibit any crown morphological anomalies. The literature (5) states that the root canal's morphological diversity has no upper bound. This underlines how important it is for professionals to understand the anatomical variances in the number and architecture of root canal systems.



Figure 3. The final X-ray after root canal therapy.

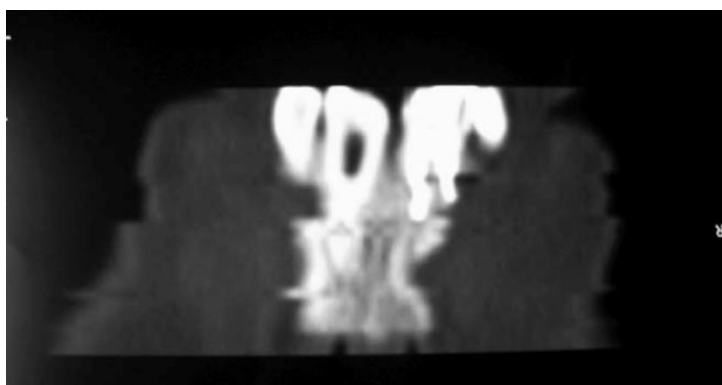


Figure 4. CT examination; longitudinal.

It is uncommon to have several canals in the maxillary central and lateral incisors. Although the survey from (1) said that 3% of maxillary lateral incisors may have two canals, the literature (6)

indicates that 100% of these teeth exhibit single canals. Only case reports of anomalies referred to as fusion, gemination, or dens invaginatus provide a description of many canals in these teeth (7–15).

Few maxillary central incisors with two canals have been documented in the literature (2, 4), and the majority of them exhibit morphological alterations such as fusion and macrodontia (4). A maxillary central incisor with a normal clinical crown and two root canals—one buccal and one lingual—was the subject of an endodontic treatment report (2).

The evaluation of the first X-ray allowed for the visualisation of the canals in the current clinical report. In order to enhance vision and access for the endodontic instrumentation, which was performed with rotating instruments while taking the canal curvature into consideration, the access operation was extended mesiodistally. The tooth was obturated utilising the hybrid thermo-mechanic approach for the same reason. Axial and coronal slices of the CT were used to confirm the filling's boundaries and the root canals' separation.

Conclusion

An unsuccessful endodontic treatment can arise from dentists failing to use various diagnostic resources and not knowing about all possible root canal anatomical configurations, which can leave toxic products and leftover necrotic tissue inside the untreated canal. This study so illustrated how crucial a precise diagnosis is to endodontic practice.

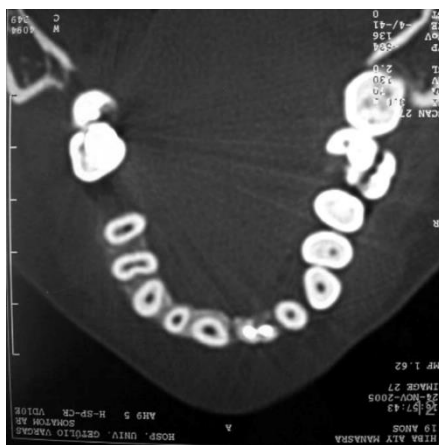


Figure 5. CT examination; transversal

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