

## INVERTED “Y” ANATOMY OF MAXILLARY CENTRAL INCISOR

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### ABSTRACT:

Success in root canal treatment is achieved after thorough cleaning and shaping followed by complete obturation of the canal system. Therefore, endodontic therapy requires magnification & illumination for specific and complete knowledge of the internal and external dental anatomy, and its variations. The internal anatomy of the maxillary central incisor is well-known and usually presents one root canal system. This case report describes an endodontic treatment of traumatized maxillary central incisors with two canal systems. When root canal treatment is performed, the clinician should be aware that both external and internal anatomy may be abnormal.

**Keywords:** magnification, maxillary central incisor, two canals

### INTRODUCTION:

Anatomical variations must be considered in clinical and radiographic evaluation during endodontic treatment. Access cavity modifications may be required for stress free entry to complex anatomy. Higher magnification and illumination are one of the useful tools for access cavity preparation and to recognize and locate additional canals.

Thus, a broad knowledge of both the external and internal anatomy of teeth is of great importance for adequate endodontic treatment. Many anatomical studies had reported that maxillary incisors are always comprised of a single root, while variations in the number of lateral canals and/or position of apical foramen commonly seen.<sup>[1]</sup> However, recently, maxillary central incisors have been reported with 1, 2, and

occasionally 3 root canals. Therefore, it is important for the operator to consider existence of anatomical variations of root canal systems, and that these variations can also be found in the maxillary central incisors.

### CASE DETAIL:

A 55-year-old male patient reported to the department with complain of pain in the upper front region of the jaw for the past 1 week. On elaborating the history trauma occurred 2 months ago. On examination, tender on percussion noted w.r.t tooth no. 11 and 21. Tooth no. 11 & 21 was fractured. Cold vitality pulp test revealed delayed positive response in relation to 11 and 21. Intraoral periapical (IOPA) X-ray reveals no periapical changes in relation to 11 and 21. Furthermore, the presence of two canals was evident in maxillary incisors [Figure 1]. Probably, this case lies under Type II canal

according to both Weine and Vertucci type of classification. After the pulp vitality tests and radiographic examination, the teeth were diagnosed with Ellis Class III fracture. Therefore endodontic therapy was planned followed by crown w.r.t 11 & 21.

#### CLINICAL PROCEDURE

Under local anesthesia first tooth no. 11 was treated followed by tooth no. 21 after 1 week. The tooth was isolated with a rubber dam and disinfected. The access preparation was performed with high-speed round diamond burs No. 1015 (KG-Sorensen, Barueri, SP, Brazil), under continuous irrigation with water spray. Mesial canal is the master canal was negotiated with 15 size file (Mani files, Japan). Since the IOPA X-ray revealed the presence of second canals distally, access cavity was extended slightly distally and distal canal orifice was scouted with no. 8 size K file. The root canals were irrigated with 1% sodium hypochlorite solution. The intraoral camera picture shows the presence of two orifices mesiodistally in both central incisors [Figure 3]. In tooth no. 11, working length established 24 mm in mesial canal and 18 mm in distal canal where it joins the mesial canal. Then cleaning and shaping was done by using protaper system (Dentsply), up to file number F3 for mesial canal system, and F2 for the distal canal system. The right permanent maxillary central incisor was obturated by using F2 and F5 Gutta-percha (Dentsply) in mesial and distal canals respectively. The post-operative X-ray was

taken to confirm the obturation quality [Figure 4] and access cavities were sealed with temporary material. One week later temporary material was replaced by light cure composite (Tetric N ceram, Ivoclar Vivadent). Finally, both central incisors were restored with Porcelain fused to metal crowns [Figure 5]. The patient was observed for 3 months through clinical and radiographic examination and the tooth remained asymptomatic



Figure 1

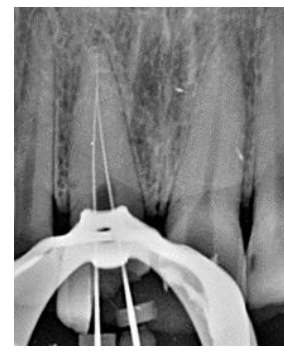


Figure 2



Figure 3



Figure 4

### DISCUSSION:

Maxillary incisors are commonly single-rooted with one canal.<sup>[1]</sup> The description of multiple canals in these teeth is limited to case reports of anomalies known as fusion, gemination or dens invaginatus. When a maxillary incisor presents two roots or two or three root canals, conditions such as fusion, gemination, dens in dente, palatogingival or distolingual groove and some variation in the normal development of Hertwig's epithelial root sheath must be considered.<sup>[2]</sup> Some case reports illustrated a rare case of two roots in maxillary central incisor with two roots in a normal clinical crown.<sup>[3]</sup>

In the present case, both clinical examination and preoperative radiograph showed no evidence of enamel or dentinal invagination, thus making dens in dente or dens invagination are unlikely causative factors. Another developmental anomaly, which may be evaluated radiographically similar to this case, is palatogingival or

distolingual groove, but on clinical examination ruled it out.<sup>[4]</sup>

The present report illustrates a rare case of maxillary central incisor with two root canals, also without morphological anomaly of the crown. A correct diagnosis and evaluation should be made before treating the teeth with unusual anatomy. Radiographic examination with varying angles should be undertaken, when faced with a suspicious image. In the present clinical report, it was possible to visualize the canals through the evaluation of the pre-operative X-ray. The access cavity was extended mesiodistally to improve the visibility and the access for the endodontic instrumentation that was carried out with rotating instruments, considering the canal curvature.<sup>[5]</sup> Although the maxillary central incisor has one canal, clinicians need to be aware of unexpected root canal morphology when performing root canal therapy. Surgical Loupes, Endodontic endoscopes, dental operating microscopes as commercially available instruments that can help the clinicians to accomplish these goals.<sup>[6]</sup>

In this case on careful pre-operative evaluation, IOPA X-ray shows presence of two canals in upper right incisors. In central incisors, it looks obvious from the pre-operative X-ray where two canals were located mesiodistally (mesial canal being the master canal), whereas in an intraoperative X-ray. This is a rare occurrence, which was reported only in very few article previously.<sup>[6]</sup>

## CONCLUSION:

Careful preoperative evaluation and diagnosis are essential for endodontics. The clinician should be careful that even the most routine of cases might deviate from the usual and should be always attentive to detect anatomic anomalies.

**Clinical Significance:** The description of multiple canals in maxillary central incisor is limited to case reports of anomalies known as fusion, gemination or dens invaginatus. This case report illustrates a rare case of having two root canals in both maxillary central incisors, without morphological anomaly of the crown.

## REFERENCES:

1. Vertucci FJ. Root canal anatomy of the human permanent teeth. Oral Surg Oral Med Oral Pathol 1984;58:589-99.
2. Hosomi T, Yoshikawa M, Yaoi M, Sakiyama Y, Toda T. A maxillary central incisor having two root canals geminated with a supernumerary tooth. J Endod 1989;15:161-3.
3. Lambruschini GM, Camps J. A two-rooted maxillary central incisor with a normal clinical crown. J Endod 1993;19:95-6.
4. Khojastehpour L, Khayat A. Maxillary central incisor with two roots: A case report. J Dent 2005;2:74-7
5. Sponchiado EC Jr, Ismail HA, Braga MR, de Carvalho FK, Simões CA. Maxillary central incisor with two

root canals: A case report. J Endod 2006;32:1002-4.

6. Sheikh-Nezami M, Mokhber N. Endodontic treatment of a maxillary central incisor with three root canals. J Oral Sci 2007;49:245-7.