



Management of Gerniation with C Shaped Canal in Maxillary Lateral Incisor-A Case Report

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Abstract

Maxillary lateral incisors are the most common teeth to have developmental anomalies, but C shaped root canal is rarely found in those teeth, in this case report we describe the occurrence and successful endodontic treatment of germination with C shaped root canal in maxillary lateral incisor and its esthetic rehabilitation. It is of utmost importance to mention that CBCT was used for the proper analysis of the root canal system.

Keywords: CBCT; C- Shaped Canal; Maxillary Lateral Incisor

Introduction

For a successful endodontic therapy the clear understanding of the root canal system is of utmost importance. Variations in the root canal system is a common occurrence. One of the most common variation is the C shaped canal system which is found specially in the mandibular second molars. But rarely it has been found in the anterior teeth. Maxillary lateral incisors are the most common anterior teeth to have variations such as palatogingival groove, dense invaginatus, germination etc. Till now only one case report has been mentioned in the literature by Boveda, et al. [1].

This case report is about a rare occurrence of C-shaped canal with germination in the maxillary right lateral incisor.

Case Report

The present case report is about a 20-year-old female patient who reported to the post graduate clinic of the Department of Conservative Dentistry and Endodontics with the chief complaint of esthetic problem in the upper

front teeth. The patient's medical history was non relevant. Patient gave history of trauma during 5 years back. On clinical examination, the maxillary right lateral incisor was discolored and there was sinus opening in the labial mucosa in relation to 11 and 12 (Figure 1b). The teeth were tested for vitality and responded negative. Radiographic examination revealed diffused radiolucency in relation to 11 and 12 with two roots in 12 (Figure 1a). To confirm the root anatomy CBCT was done , which revealed a C - shaped canal system in the cervical and middle third and exiting in two separate foraminas (Figure 1c). The diagnosis was given as chronic periapical abscess in relation to 11 and 12. And non surgical endodontic therapy followed by all ceramic crown fabrication was planned.

A rubber dam was placed and a conventional endodontic access opening was established with an Endo Access bur and an Endo Z bur (Dentsply Tulsa, Tulsa, OK). Coronal enlargement was performed with a nickel-titanium ProTaper SX rotary file (Dentsply Maillefer, Ballaigues, Switzerland) to improve the straight-line access.

Working length was established using a No. 15 k file (Dentsply M access) (Figure 2). Root canals were cleaned and shaped using hand k files (Dentsply M access) system upto the size of 40 with a taper of 0.02 with step back technique till three sizes larger than the master apical file. 5.25% Sodium hypochlorite (Multilabs) and 17% EDTA were used intermittently for irrigating the canals. The final rinse was done using normal saline. the canals were dried using absorbant paper points (Dentsply Maillefer). Following this the canal was coated with calcium hydroxide intracanal paste and kept for seven days. After seven days the canals

were revisited and intracanal medicament was removed with 17% EDTA and the master apical file (40, 2% taper). The canals were checked for any exudate and then dried using absorbent points. The canals are then obturated with AHPlus sealer (Maillefer Dentsply, Konstanz, Germany) and thermoplasticised gutta percha (Figure 3). Post op CBCT was not taken due to financial implication of the patient. The access cavity was filled with resin based composite. After one week the tooth were prepared for all ceramic crowns in relation to 11 and 12. And final ceramic crowns were bonded to the tooth (Figure 4).



Figure 1: a) Preoperative radiograph, b) clinical photograph, c) preoperative CBCT Image.



Figure 2: Working length.

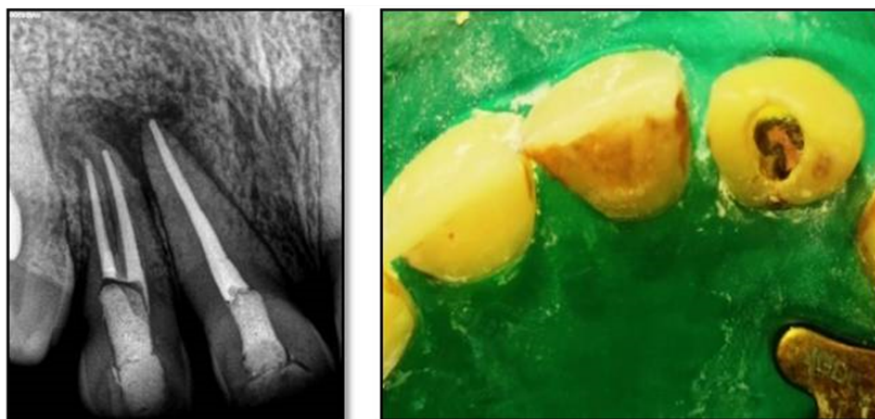


Figure 3: Post-obturation radiograph and clinical photograph determination.



Figure 4: Post-operative radiograph and clinical photograph after crown placement.

Discussion

The maxillary anterior teeth particularly the lateral incisors often shows anatomic and morphologic variation such as palatogingival groove, dense invagination, dens evaginatus, fusion gemination, etc [2]. But C shaped canal system in maxillary lateral incisor has been reported in literature only once.¹ The C-shaped canal configuration is termed so because of the C-shaped cross-sectional anatomical configuration of the root and root canal [3].

In 1979, Cooke, et al. [4] first described the term C-shaped root canal. They reported three cases where the root canals were like the English capital letter 'C', in which canals were connected by a continuous slit. C-shaped canals are commonly found in permanent mandibular second molars. C-shaped root canal was classified into three categories by Melton [5].

In general, the two dimensional radiography suffice for the diagnosis purpose but when there is variation we have to switch to 3D modalities sometimes to correctly analyse and

give a proper diagnosis. Cone-beam computed tomography (CBCT) provides three-dimensional images with high precision and sensitivity, offering a more detailed analysis of the case, a more adequate planning of root canal treatment, and guidance throughout the operative phase [6].

In this case report we describe an unusual case of maxillary lateral incisor having c shaped root canal and emerging as two separate root canals. The accepted theory for C shaped root canal is the lack of fusion of the HERS in multirooted teeth [7]. In case of the maxillary lateral incisor it might be because of incomplete gemination of a single root or it might be due to other factors which is still unknown to us. CBCT has helped us to see the internal anatomy of the tooth which was not possible with 2D radiography. Non - surgical healing with calcium hydroxide was tried as it was less invasive than surgical procedure and also the clinical and radiographic presentation didnot indicate any need for surgical intervention and calicum hydroxide has the property of hard tissue induction. Thermoplasticized gutta percha technique was used because it was a case of C shaped canal where lateral connection might me there and which cannot

be successfully done by any other technique.

Finally, since it was in esthetic region and the tooth was discolored, we went for all ceramic crowns which were bonded after etching with 9 % HF acid followed by silane coupling agent and luted with resin luting cement.

Conclusion

A successful endodontic therapy starts with proper diagnosis and the proper treatment planning. Conventional radiography might not always give us the proper clue, so in such cases CBCT is helpful. Moreover, this kind of rare cases need more of reporting in literature, so that the prevalence can be ruled out.

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