

Case Report**Management of mandibular lateral incisor with two roots: A case report**Mahajan P¹, Grover R², Bhandari SK³, Monga P⁴, Keshav V⁵

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ABSTARCT

Successful outcome of endodontic treatment depends on the identification of all root canals which in turn guarantee complete extirpation of pulp tissue, proper chemo-mechanical cleaning and shaping and three dimensional obturation of the root canal system with an inert filling material. However endodontic treatment can fail for many reasons, such as diagnostic errors, persistence of the infection in the root canal system, errors in debridement and shaping of the root canal systems, instrument fractures, poor restorations and extra roots or canals if not detected are the reasons for failure. Undetected extra roots or root canals have been considered as a major reason for failure of root canal treatment. Many of the challenges faced during root canal treatment may be directly attributed to an inadequate understanding of the canal morphology of teeth. A broad knowledge of both the external and internal anatomy of teeth is of great importance for adequate endodontic treatment. We present a case report of 2 roots in mandibular lateral incisor.

Key words: Extra roots, root canal anatomy, 3 dimensional obturation, mandibular incisors

Introduction

Successful outcome of endodontic treatment depends on the triad of: identification of all root canals which in turn guarantee complete extirpation of pulp tissue, proper chemomechanical cleaning and shaping and three dimensional obturation of the root canal system with an inert filling material. ^[1] However, there can be many reasons for failure of endodontic treatment, such as errors during diagnosis, persistence of the infection in the root canal system, errors in debridement and shaping of the root canal systems, instrument fractures, poor restorations and

undetected extra roots or canals. Undetected extra roots or root canals have been considered as a major reason for failure of root canal treatment. Many of the challenges faced during root canal treatment can be due to an inadequate understanding of the canal morphology of teeth. Therefore, thorough knowledge of both the external and internal anatomy of teeth is of great importance for successful endodontic treatment. ^[2] This case report presents a striking feature of presence of extra root in the mandibular lateral incisor.

Case Report

A 17-year-old male patient reported to the Department of Conservative Dentistry and Endodontics in Genesis Institute of Dental Sciences and Research, Ferozepur, Punjab with the chief complaint of tenderness, pain and swelling with lower anterior region. Clinical examination revealed discharge of pus, swelling buccally with respect to lower incisors and tenderness to palpation and percussion. The intraoral periapical (IOPA) showed periapical radiolucency with respect to lower anteriors 31, 32, 41, 42 (Fig. 1)

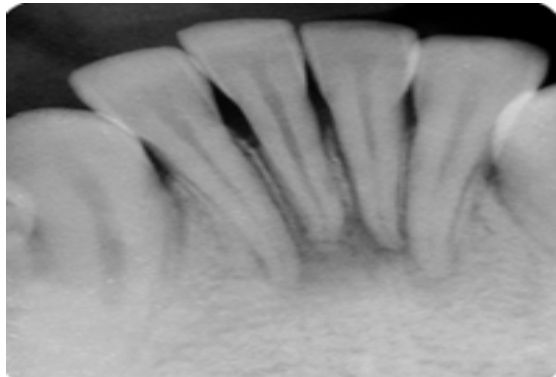


Fig. 1 Periapical radiolucency WRT 31,32,41,42

Non- surgical endodontic root canal treatment was planned for all 4 mandibular incisors. During treatment, it was found that mandibular right lateral incisor had 2 canals which was further confirmed with an IOPA X-Ray (Fig. 2)

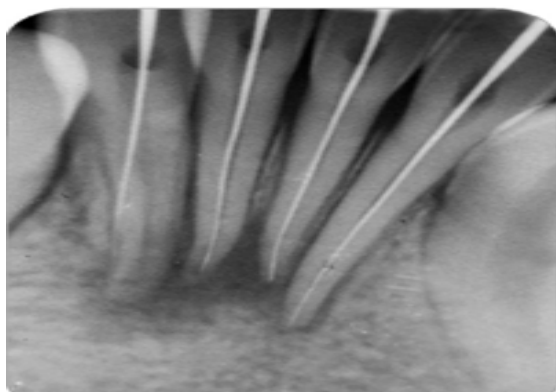


Fig. 2 Two Rooted mandibular right lateral incisor

The tooth was isolated with rubber dam and access was gained to the pulp chamber with high-speed round diamond bur number 1015 (KG Sorensen, Burveri, SP). Further, compensatory wearing was carried out with a high-speed Endo-Z stainless steel bur (Maillefer-Dentsply, Switzerland) to improve the exploration of canals. Pulp was extirpated, root canals were irrigated with 2.5% sodium hypochlorite (Brilux, Brazil). Working length was determined using mesial angulation IOPA X-Ray. (Fig 3) Thorough chemo-mechanical preparation was carried out by the step back method under continuous irrigation with 2.5% sodium hypochlorite solution (Brilux, Brazil). After preparation, roots canals were obturated with lateral condensation method using zinc oxide eugenol as a sealer. (Fig, 4, 5)

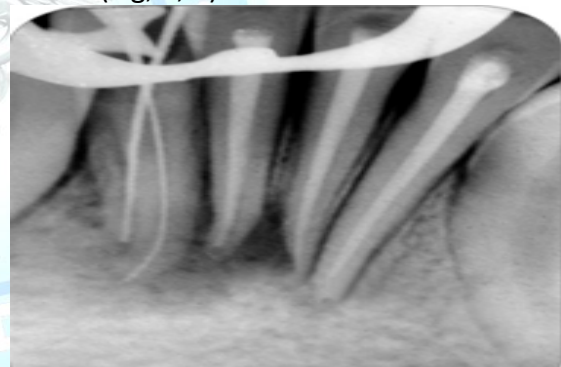


Fig. 3 Working length #32 (Mesial angulation)

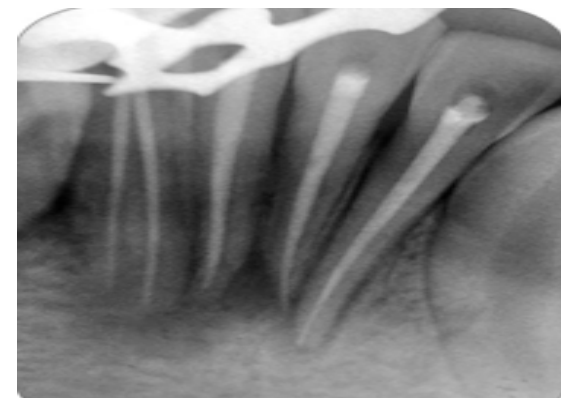


Fig. 4 Master Cone #32

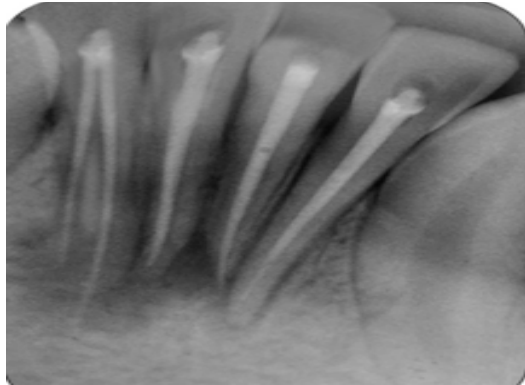


Fig. 5 Obturation #32

Discussion

Successful root canal therapy depends on thorough knowledge of the normal and abnormal internal anatomy of the treated tooth. Studies have shown various

abbreviations from normal like multiple foramina, loops, fins, deltas, additional canals, accessory canals, intercanal connections and “C-shaped” canals. Consequently the practitioner must possess knowledge and must treat each tooth assuming that complex anatomy occurs often enough to be considered normal.^[1] Endodontic treatment of single rooted teeth is considered simple as these teeth usually have single root canal, but at times it also presents with variations. Various investigators have studied root canal system in mandibular incisors and reported following findings^[3]

Investigators	Year	Type I%	Type II%	Type IV%
Rankine Wilson and Henry	1965	60.0	35.0	5.0
Madieriea and Hetem	1973	88.5	11.0	5.0
Dowson	1974	59.0	40.0	1.0
Vertucci	1985	92.5	5-2.5	

Walker in 1988 reported the occurrence of a second canal in the mandibular incisors was infrequent in people of East Asian origin but more frequent in people of European origin. Gomes and others in 1996 found second canal in 35.8% of 53 mandibular lateral incisors. Miyashita and others in 1997 examined 1085 extracted mandibular incisors. Single canal was found in 85% of the root canals while second canal was found in 15% of total specimens.^[4]

Although some of the morphological variations may depend on different ethnic

backgrounds, two canals should be expected in about one-quarter for mandibular incisors. This proportion is not found clinically by practitioners during root canal treatment due to the failure of the dentist to recognize the presence of the second canal and at times an extra root.

Mandibular incisors have been traditionally treated as teeth with a single canal. Anatomical studies have shown that a considerable percentage of mandibular incisors ranging between 12.4%^[5] and 68%^[6] possess a dentinal bridge in the pulp

chamber that divides the root into two canals. The two canals usually join and exit through a single apical foramen, but they may persist as two separate canals. Clinicians usually fail to recognize the presence of a second canal either due to lack of knowledge of root canal morphology or they do not have enough experience and skill to negotiate that canal resulting in failure of root canal treatment. ^[7] At times it is necessary to modify access preparation as inadequate access opening into the tooth leaves a lingual shelf of dentine over the second (usually the lingual) canal. Modifying the conventional access preparation allows better visualization and instrumentation of additional canal. ^[8] The traditional lingual access of lower anteriors is modified by extending the access toward the cingulum. ^[9]

Radiographs play a very important role when such variations are noticed. Careful interpretation of the radiographic features is essential to ensure that additional root canals are not overlooked. ^[10] From a clinical standpoint, only by correct examination and interpretation of radiographic images the clinician can detect variations in both root and canal anatomy and be aware of them before and during endodontic procedures. ^[2] A variety of techniques have been used to study the internal anatomy of lower incisors. Although radiographs are unlikely to show the complexities of the root canal system such as lateral canals and eccentrically located apical foramina, but it can reveal the main anatomical features. Radiographs are non-invasive, simple to do, fast and needs little equipment. Hence, in the present study radiographs were taken in a mesial direction as well. ^[1]

Conclusion

This case report highlights the importance of thorough knowledge of root canals and its variations. Extra canals in mandibular incisors are not a rare entity as suggested by few investigators. Detailed knowledge and at times the modification of access opening are needed. The practitioners should be aware of how many canals and roots to expect, their location, length and relationship to each other. Wilson and Henry have suggested that the access opening must be widened labio-lingually as well as inciso-gingivally to locate the extra canal, if any ^[11] It's also emphasized that radiographs taken from different angles are a must to anticipate the presence of extra canal and extra root.

References

1. Mukhaimer R, Jarbawi M. Radiographic study of the root canal system of mandibular incisors in Palestinian population. *Open Journal of Stomatology* 2013;(3):452-456.
2. Rodrigues EA, Silva SJA. A Case of Unusual Anatomy: Maxillary Central Incisor with Two Root Canals: Case Report. *Int J Morphol* 2009;27(3):827-830.
3. Hema BS, Chandu GS. Endodontic management of Type II canal in mandibular incisor: A case report. *Indian J Stomatol* 2011;2(4):270-2.
4. Shaikh MA, Kalhoro FA, Sangi L. Frequency of Second Canal in Mandibular Lateral Incisors (In-Vitro). *Pakistan Oral & Dental Journal* 2014; 34(1):147-149.
5. Miyashita M, Kasahara E, Yasuda E, Yamamoto A. Root canal system of the mandibular incisor. *Journal of Endodontics* 1997;(23):479-484.

6. Sert S, Aslanalp V, Tanalp J. Investigation of the root canal configurations of mandibular permanent teeth in the Turkish population. *International Endodontic Journal* 2004;(37):494-499.
7. Ingle JI, Bakland LK, Baumgartner JC. *Endodontics 6th ed.* BC Decker Inc, Hamilton;2008.
8. Daokar SG, Yadao ASK, Ghunawat DB, Kakde DD. All the mandibular incisors with double canals in a single patient. *Journal of International Oral Health* 2015;7(2):1-4.
9. Janik JM. Access cavity preparation. *Dental Clinics of North America* 1984; 28(4):809-18.
10. Khandelwal A, Prashanth MB. An Endodontic management of mandibular incisor with bifurcated root canal. *International Journal Of Dental Clinics* 2011;3(2):87-88.
11. Wilson RW, Henry P. The bifurcated root canal in lower anterior teeth. *Journal of American Dental Association* 1965;(70):1162.

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