

Mandibular Second Molar with Single Root and Single Canal -A Case Report

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Abstract: - The variability of the root canal system morphology of multi-rooted teeth represents never-ending challenge to the endodontic diagnosis and therapeutics. Variations of the root canal systems needn't always within the style of extra canals. Clinicians should remember that there's a prospect of existence of fewer number of roots and passages than the traditional root canal anatomy. This case report presents a rare root canal system in a mandibular second molar tooth with a single root with a single canal. The access cavities displayed only one round /oval canal orifice which is a rare occurrence. A clinician thus requires to have adequate knowledge about root morphology, canal orientation and its variation.

Key Words: — *Root canal, multi-rooted teeth, Root morphology.*

I. INTRODUCTION

The principal objective of endodontic treatment is to stop and, when needed, to treat endodontic disease, apical periodontitis so as to accomplish this objective high quality chemomechanical cleaning, shaping of the intricate root canal system are required so as to eradicate intracanal microorganisms. Variations like additional canals, bi/trifurcations, lateral and furcal canals, apical deltas, and canal ramifications are frequently encountered during root canal treatment, and their incidence and clinical significance have been reported before.¹⁻⁴ Knowledge of gross anatomy is a necessary tool for the success of endodontic treatment. A clinician is required to own an insight of the morphology of tooth associated with its shape, form and structure before commencing treatment. Routine periapical radiographs help us to assess the amount, length, curvature and aberration of the canal system of the tooth.

Generally anatomical configuration of mandibular second molar is that of two roots, mesial and distal, it's seen closer together than the primary mandibular molar, it may also be fused to one conical root with varying internal anatomy and infrequently have c-shaped canal configuration.⁵

C-shaped canal system is usually found in mandibular molars especially in Asian population. Cimilli et al using spiral computed tomographic imaging concluded in their article that the prevalence of c- shaped canals in single rooted second molars was 8%. Vertucci type I canals were most often seen in these c-shaped molars.⁶

A recent study conducted on Iranian population reported the prevalence of 7.2% of c-shaped canals of mandibular second molar. Among second mandibular molars and these configurations were mostly seen among the single rooted mandibular.⁷ A study by Yuan Gao et al described the presence of type I merging variety of canals, where canals merged into one major canal before exiting at the apical foramen and partial dentin fusion areas may appear within the coronal and/or middle portion of the canal.⁸

The aim of this case report is to report the occurrence of single canal in single rooted mandibular second molars that require endodontic treatment.

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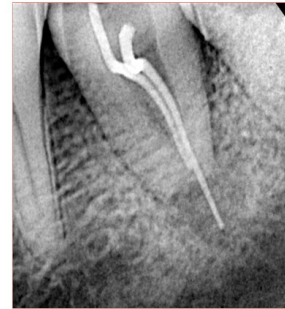
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II. CASE REPORT

A 25 years old male was referred for endodontic treatment in our department. Patient complained of pain in relation to lower left back region, especially after taking hot & cold food & during mastication. The tooth was tender on percussion. Patient had no such medical history. Intraoral examination revealed grossly decayed 37 which was temporally restored. Intraoral periapical radiograph showed over obturated 37 with a sign of resorption in the apical area. Obturation was faulty with lots of lateral space & gutta percha was beyond the apical foramen. Based on these findings the condition was diagnosed as irreversible pulpitis with apical periodontitis. A detailed examination of the radiograph revealed the presence of a single root with a wide single canal of that tooth. Therefore, c shaped canal configuration was anticipated with relation to that tooth. Treatment plan was decided that re treatment of 37 followed by composite build up & crown placement.

At first Local anesthesia was administered through inferior alveolar nerve block using one carpule (1.8 ml) of 2% lidocaine with 1: 100,000 of epinephrine. Another carpule of 0.5 ml was added for buccal and lingual infiltrations. At first high speed hand piece was used to remove the temporary filling material. Then the canal was observed clinically. Then no. 25 hedstrom file is inserted into the open canal for removal of gutta percha. Following examination of the pulpal floor revealed only a single round shaped orifice, classical c shaped canal orifice configuration or any other canal orifices could not be located into the root. Then the canal was properly irrigated with 5.25% NaOCl, and normal saline. Working length was determined by radiographically & electronic apex locator and cleaning and shaping completed by step back method. Irrigation was done with a combination of irrigants. After that the canal was dried using sterile paper points & intra canal medicament Ca(OH)₂ is given at the first appointment.

Patient was recalled after 7 days for second appointment. The canal was cleaned thoroughly following proper irrigation done. Final irrigation was done by 17% EDTA. A snugly fitting master cone was selected and verified radiographically. The canal is coated with sealapex sealer and Finally Obturation of the canal was done by lateral condensation technique.



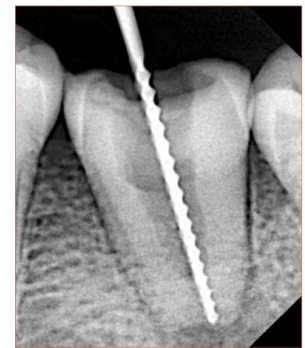
Pre-operative radiograph



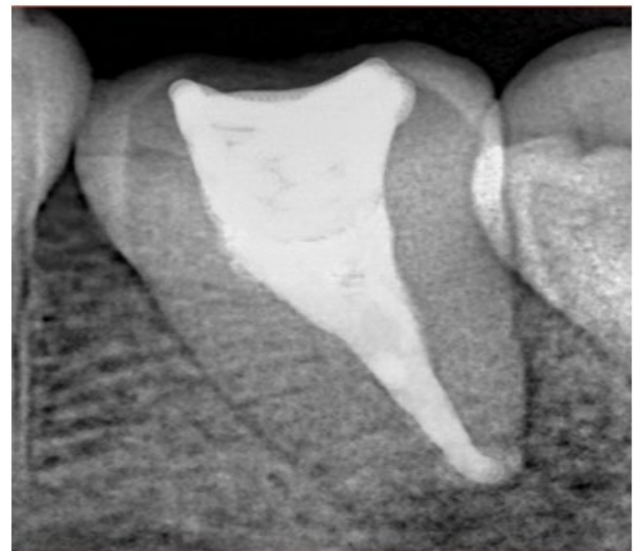
Clean canal after Gutta percha removal



Ca(OH)₂ intracanal medicament given



Working length



Post obturation radiograph

III. DISCUSSION

Anatomical variation like fusion, germination, or anomalies within the roots may often be diagnosed supported preoperative radiographs. Radiographically, a tooth with a c shaped canal system may always have a fused root with a longitudinal groove within the middle of the basis.⁹

The essential feature of c-shaped canals is that the presence of fin or web connecting the individual canals. Wein fan et al described a sort I (merging type) where canal images merged into 1 major canal before exiting from the apical foreman. Partial dentin fusion area might appear within the coronal and or middle portion of the canal system.¹⁰

This case report describes the endodontic management of a mandibular second molar tooth with Single one root canal aided by the contemporary advancements within the field. Assessment of preoperative periapical radiographs demonstrated the presence of 1 root with an oversized canal space suggesting the likelihood of C-shaped canal configuration. Infact, when only one root is present, the root canal system may contain only one large canal or two root canals which will or may not join within the canal system or a C-shaped canal configuration. On observation of the pulpal floor only 1 canal with a round orifice was located, implicational the presence of one canal. Further exploration of the pulpal floor didn't reveal presence of any additional orifice opening.

The anatomical resemblance with the contralateral tooth was demonstrated both radiographically and clinically, a contralateral radiograph taken for educational purpose revealed similar morphology, connotative bilateral occurrences. Endodontic surgical microscopes are helpful adjuncts which can reveal and help to manage c-shaped canal complexity.

Whilst a number of the endodontic procedural errors are encountered during the rummage around for missing or additional root canals, such mistakes are often minimized if the clinician has an awareness of the expected location and dimensions of the pulp chamber also as an understanding of the standard and fewer frequent passage configurations. Although additional canals are more common, the clinician should even be aware that in certain situations; there's a probability of fewer root canal than the normally presumed pulp space morphology. This shall minimize the danger caused by injudicious removal of tooth structure and its subsequent effect on the mechanical properties of the tooth.

IV. CONCLUSION

This case report presented the endodontic management of unusual passage configuration of a mandibular second molar, one passageway from an orifice to an apex, aided by the contemporary digital advancements in endodontics. This report highlighted the importance of textbook knowledge, radiographic examination, and careful intraoperative exploration because the main cornerstones in investigating pulp space anatomy.

Knowledge and recognition of this rare canal configuration can facilitate more practical canal identification and unnecessary removal of healthy tooth structure in a shot to go looking for missing canals. supported the varied studies describing the canal anatomy for second mandibular molar it's difficult to see to which classification of c shaped canal do that above-described canal belong to or can they solely be described as Vertucci 's type I canal system.

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