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RESEARCH ARTICLE

A MORPHOLOGICAL ODDITY IN MANDIBULAR LEFT SECOND PREMOLAR WITH TWO ROOTS: A CASE REPORT

Dr. Manish Sundesha and Dr. Anita Choudhary

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Abstract

Thorough knowledge of different root canal morphology with appropriate assessment of the pulp chamber floor and proper interpretation of radiographs are prerequisite for successful root canal therapy. The possibility of additional or extra root or canal should be considered even in teeth with a low frequency of abnormal root canal anatomy. This article reports on a case of mandibular second premolar with two roots which was successfully treated using endodontic therapy with adequate restoration.

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Introduction:-

The success of root canal therapy depends on the root canal anatomy and morphology of tooth. Complete knowledge of root canal anatomy and morphology assist us to locate all the canals properly and helps in proper cleaning and shaping followed by obturation of the canal spaces in all dimensions¹. Mandibular premolar has obtained popularity for having the most aberrant anatomy². The second premolars normally has one canal, however many reports on different patterns of root canal anatomy in premolars were reported earlier³. Vertucci et al. reported that one root canal at the apex in the mandibular second premolar has an incidence of 97.5% and those with two canals is only 2.5% of the teeth nevertheless three root canal patterns is uncommon⁴. According to Zillichand Dawson 11.7% occurrence of two canals and 0.4% of three canals and Ingle reported 12% chance of second canal and 0.4% of a third canal in mandibular second premolar⁵. This current article reports on the clinical case of a mandibular second premolar with morphological oddity of two roots.

Case Report

A 43 year old male patient reported to the Department of Conservative Dentistry and Endodontics at Vyas Dental College and Hospital, Jodhpur with the chief complaint of pain in the left mandibular premolar tooth since 1 week. Patient's medical history was non-contributory. Clinical examination revealed a carious and occlusally attrited left mandibular second premolar. The tooth was tender on percussion. Radiographic examination of the tooth indicated with an unusual anatomy of two roots in mandibular second premolar. Widening of the apical periodontium also seen radiographically this indicated periapical pathology and the necessity for root canal treatment. The clinical examination, radiographic examination and vitality tests led to a diagnosis of acute apical periodontitis of the left mandibular second premolar requiring endodontic therapy. The tooth was anaesthetized using a 2% solution of lignocaine hydrochloride containing 1:80000 adrenaline (Lignox 2% A, Warren, Indoco) after giving inferior alveolar nerve block. Subsequently, the tooth was isolated with a rubber dam. Endodontic access cavity was prepared with a round diamond bur in a high speed airtor handpiece. The pulp chamber was inspected and a sharp DG 16 explorer was used to locate the canal orifice. After obtaining the canal patency, a #10K file (Dentsply, Maillefer) was precurved and inserted in a distolingual direction to traverse the canal bifurcation into the second root. The working length radiograph confirmed the presence of a single coronal canal bifurcating in middle one third

and coinciding with the separation of the two roots. The two canals exited in separate apical foramina located in the respective roots. Proper cleaning and shaping of the canals was performed using crown-down technique under copious irrigation with 5.25% sodium hypochlorite solution and 17% EDTA followed by final rinse with normal saline. The root canals were dried with paper points and the tooth was temporized. After three days the canals were obturated with cold lateral compaction of gutta percha cones (Dentsply) coated with kerrsealapex (calcium hydroxide) sealer. Post obturation restoration radiograph was taken to evaluate the quality of obturation.



Fig.1:- Pre-operative radiograph.



Fig. 2:- Working length radiograph.



Fig. 3:- Post-operative radiograph.

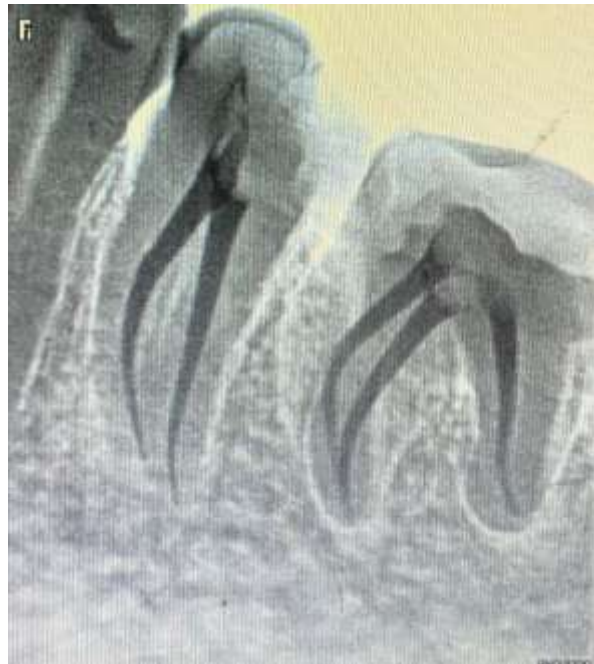


Fig. 4:-Post-operative radiograph

Discussion:-

The presence of root canal variability has been subject of research since recent advancements in diagnostic equipment in dentistry⁶. The finding of extra roots and canals in mandibular second premolars is undoubtedly is a

very challenging task⁵. According to the University of Washington assessed the failure rate in endodontic therapy of mandibular second premolars is 4.54 % is due to the tremendous variations in morphology of the root canal⁴. Scott and Turner describe the accessory root of mandibular second premolar as Tome's root¹.

A wide range of opinions are reported in the previous literature regarding the number of root canals but there are very few reports on the variations in the number of roots that present in the mandibular second premolars⁷. Considering the fact that so many aberrations exist in these teeth, it becomes mandatory that when a patient comes with pain or sensitivity to hot and cold after root canal treatment the clinician must suspect the presence of missed canals². Various diagnostic aids are available for this purpose such as high quality pre-operative radiographs taken in different horizontal angulations, probing the floor of the pulp chamber with a sharp explorer, using ultrasonic tips, staining with 1% methylene blue dye, using the dental operating microscope and the sodium hypochlorite 'champagne bubble' test⁸.

This current case represents an unusual finding of an additional root with left mandibular second premolar in young patient. Radiographic interpretation revealed no complex internal anatomy of tooth structure that may require special attention. As the computed tomography facility was not available at the hospital, intraoperative periapical radiographs with different angles showed the presence of buccal and lingual roots with two distinct canals with left mandibular second premolar. The treatment plan of the patient was normal and all the canals were obturated to achieve three-dimensional hermetic seal. Because of the clinician's awareness of the probabilities of unusual anatomy, radiographs from different angles were made to assess the root morphology⁸. Careful interpretation of different angled radiographs, proper access preparation and a detailed exploration of the tooth are essential prerequisites for a successful endodontic treatment outcome.

Conclusion:-

Clinician should have fine knowledge of variations related to the various canal configuration and different types in mandibular premolars. Tactile examination is a key step in locating the extra or split canals. Three-dimensional obturation not only seals the apical third but also seals multiple accessory canals and furcal canals.

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