

CASE OF THE MONTH - 1

ENDODONTIC TREATMENT OF BILATERAL MANDIBULAR CANINES WITH TWO CANALS.

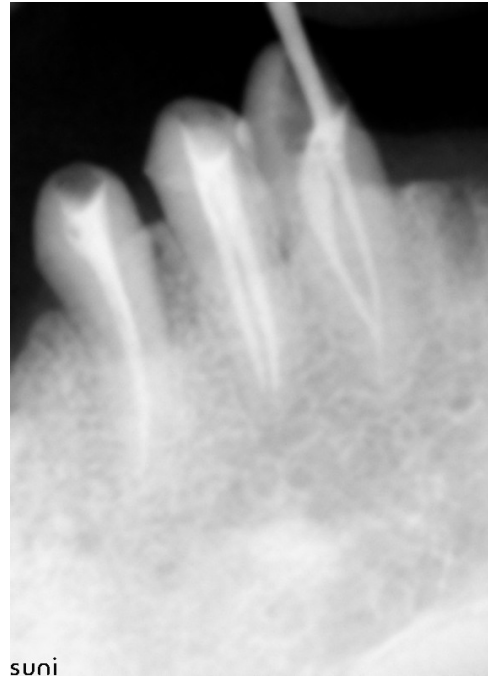
Successful endodontic therapy of a tooth demands that the dentist should have a thorough knowledge of the root canal morphology as well as detailed radiographic evaluation and diagnosis of the status of the root canals and the periapical areas. Improper diagnostic protocol may lead to the failure of endodontic treatment. A wide morphological divergence of the root canal systems is known to exist. Varying numbers of the root canals in different teeth, their anatomy and interconnections have been studied and reported by several authors. Generally, mandibular canines have one root canal with one apical foramen. However, according to slowey 1974 the incidence of two root canals in one root with two separate foramina in the mandibular canine is approximately 6% and occurrence of two roots with two canals is rare (1.2%). The aberrations generally occurring in the root canal system create a challenge for the clinician and also influence the outcome of the endodontic procedure. The purpose of this paper is to report a case involving a right mandibular canine with two separate canals requiring intentional endodontic therapy.

Case report

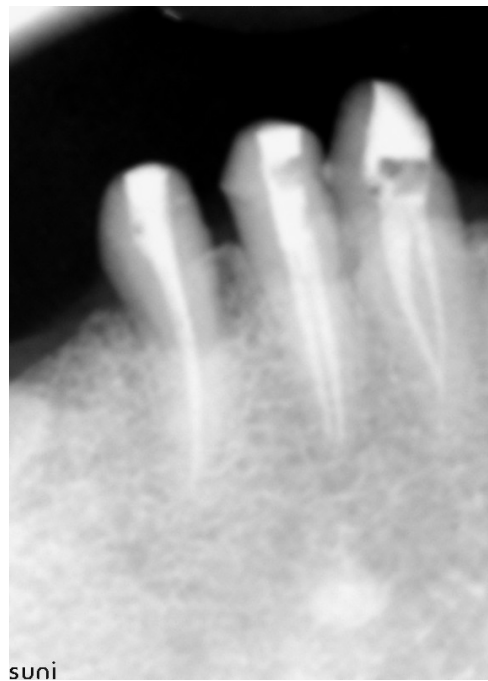
A 50-year-old female patient was referred to Department of Conservative Dentistry and Endodontics, SIBAR institute of dental sciences, Guntur, India for intentional root canal therapy of the right and left mandibular canine and other remaining teeth to receive a fixed partial denture. The diagnostic radiograph were taken for 33 and 43 which showed a single root and presence of two canals was not conspicuous in either of them. Local anesthesia was administered and the tooth was isolated using rubber dam for tooth. The access to pulp chamber was achieved using round diamond bur at high speed. The access cavity was modified to facilitate the location of buccal and lingual canal orifices. The patency of each canal was checked using size 15 k flexo-file. Working length of the canals was determined using apex locator (ROOT ZX, J Morita) and confirmed radiographically. The canals were prepared using crown down technique with protaper rotary files till finishing file F2. Copious irrigation was done using 3% sodium hypochlorite with every change of instrument. The smear layer was removed using 17% EDTA followed by NaOCl rinse. The canals were dried using paper points. Master cone selection was done followed by obturation using gutta-percha and AH plus sealer. The access cavity was temporarily restored and the patient was recalled after 1 week. At the following visit, the patient was asymptomatic. At another visit access opening was done in tooth 33, it was found that it was having the same canal configuration as 43. It was treated in same manner as 43.



RCT IN 43



RCT 33,34,35



NOTE THE TWO CAANLS PRESENT 43,33,34

Case discussion

The anatomy of root canal system dictates the condition under which root canal therapy is carried out and can directly affect its prognosis. Extra root or root canals if not detected are a major reason for failure of this treatment.

In the present case , two root canals with separate foramina were distinctly observed in the mandibular right canine (Vertucci type IV).Although the etiology of this anomaly is unknown, an in growth of tissue from Hertwig's epithelial root sheath, trauma or other disturbances during morphodifferentiation may affect root form and size in later periods. In the present case, however, there was no history of trauma.

The prevalence of anatomical variations documented in the present study makes it imperative for analyzing the possibilities of variations in root canal anatomy of mandibular canines .These aberrations, further demand the need for proper diagnosis, treatment planning and careful execution of the treatment modality. The clinician must be familiar with the anatomic variations encountered in different teeth and must prudently execute the endodontic procedure by good tactile sensation explore for these variations in every tooth using state of art technology such as:

I. Multiple radiographs: Well angulated periapical films should be taken. (Mesio-angular, disto-angular, straight) when evaluating an endodontic failure.

II. Digital radiography: This affords a variety of software features, significantly enhancing radiographic diagnostics in identifying hidden, calcified or untreated canals.

III. Visual enhancers: Magnifying glasses, transilluminating devices, dental operating microscopes are used to improve visualization.

IV. Coronal flaring: This should be done for better visualization of canal orifice.

V. **White line test:** Shelf of dentin meets the pulpal floor and forms a groove. It forms a visible road map that can be followed and explored to find canal orifice.

VI. **Red line test:** In vital cases, blood flows into the orifices, fins and isthmus areas thus serving as a road map for identification of canal orifices.

VII. Surgical length burs: They enhance direct vision by moving the head of the handpeice further away from the occlusal table and improving the line of sight along the shaft of the bur.

VIII. Piezoelectric ultrasonic. Troughing of grooves with ultrasonic tips (CPR tips).

IX. Examination of the pulp chamber floor with a sharp explorer (DG 16)

X. Dyes: 1% methylene blue dye is irrigated into the pulp chamber and subsequently rinsed thoroughly with water, dried and visualized to see where the dye has been absorbed. Frequently the dyes will be absorbed into the orifices, fins and isthmus areas

XI. Champagne bubble test using Sodium Hypochlorite: After cleaning and shaping procedures, the access cavity is flooded with NaOCl and the solution is observed to see if bubbles are emanating toward the occlusal table from canal orifice. A positive bubble reaction signifies that NaOCl is reacting with residual tissue within the instrumented or the missed canal. or with the residual chelator present within the prepared canal.

XII. Ruddle's solution: This irrigant is a contains 5% sodium hypochlorite (NaOCl), Hypaque and 17% EDTA. Hypaque is a water soluble, radiopaque, contrast solution which can be utilized to visualize root canal system anatomy, monitor the remaining wall thickness during preparation procedures, detect pathological defects and manage iatrogenic mishaps. The composition of the Ruddle Solution simultaneously provides the "solvent action" of full-strength NaOCl, "visualization" as its radiopacity closely matches that of gutta-percha and improved "penetration" as the tension-active agent lowers the surface tension.

CONCLUSION

The fact that the mandibular canines generally present a single root and a single canal led in the past to the belief that this is the only anatomical possibility. However, case reports have shown that these teeth also may present different anatomic configurations, including two separate roots or a single root with two canals (Vertucci type IV).. The use of multi-angled diagnostic radiographs and operating microscope may be very useful in the diagnosis and treatment of such cases. The clinician should be aware of such variations to treat the patient in a most appropriate way.

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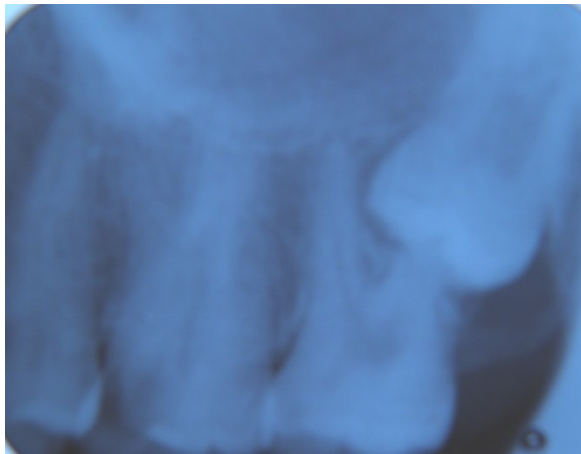
Dept of conservative dentistry & Endodontics.

CASE OF THE MNTH – 2

ATYPICAL ROOT MORPHOLOGY OF MAXILLARY FIRST MOLAR.

The variation of pulp cavity morphology, especially in multirooted teeth, is a constant challenge for diagnosis and successful endodontic therapy . Knowledge of the most common anatomic characteristics and their possible variations is fundamental, because the improper treatment of one canal can lead to endodontic treatment failure . Anatomic characteristics of permanent maxillary molars are generally described as a group of teeth with three roots, one palatal and two buccal, each root with one root canal. The occurrence of a second mesiobuccal canal when there are four canals also is common. Some studies report variations in the number of root canals,

Patient name : Buchibabu, 23yrs/ male, Op no 379763: RCT 26 (variation in morphology)



Pre operative radiograph



After Accessopening



Sectional Obturation done in apical 1/3



Mid 1/3 obturation with warm vertical condensation



Access cavity restored with GIC

Case report.

A 25-year-old male patient was indicated for the treatment of the left first maxillary molar . Clinical and sensitivity tests lead to a diagnosis of acute irreversible pulpitis, indicating the need for endodontic treatment. The diagnostic radiograph was not conclusive regarding the number and shape of the root canals, suggesting some type of morphological variation. After anesthesia, rubber dam placement, and coronal access opening a deep pulp chamber which was constricted mesiodistally was evident which could be described as an inverted alphabet 'v'. The orifices of the canals were not visible as the floor was too deep. The occlusal reduction was done in order to increase illumination and visibility, the palatal canal was continuous with the pulp chamber and two canals, a distobuccal and mesiobuccal were located . working length was determined using I-root apex locator (S. Denti Korea), the canals were prepared using protaper rotary

files. The canals were filled till the orifice with single cones. Later the pulp chamber was filled with warm vertical condensation and access cavity was restored with Type 9 GIC.

Discussion.

When anatomic variations are detected clinically, treatment can be performed with conventional or rotary preparation and root canal filling techniques respecting technical and biological principles. The use of apex locators is indispensable in determining the working length. The case presented here had changes in morphology of the pulp chamber analogous to the changes in configuration of canals which is more frequent. This type of a pulp chamber can pose a challenge for treatment, due to poor visibility and accessibility leading to poor control over the operating field. In such situations removal of tooth structure for flaring may not be advisable as this may reduce the strength of the tooth. And use of a microscope or loupes in addition to occlusal tooth reduction is advocated.

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