

## Endodontic Management of Carious Lower Second Molar with Single Root and Single Canal

Dr H C Baranwal<sup>1</sup>, Dr Amrita Kumari<sup>2</sup>

Conservative Dentistry and Endodontics, BHU, Varanasi

**Corresponding Author:** Dr Amrita Kumari

### ABSTRACT

Root canal morphology is boundless in its variability and clinicians must be aware that anatomic variations constitute a tough challenge to endodontic success. Knowledge of variations in internal anatomy of teeth is imperative for success of endodontic therapy. Aim of this case report is to present endodontic management of relatively rare case of mandibular second molar with single root and a single root canal. Uncertainty in the canal morphology of the second molar is quite common.

**Keywords:** Mandibular second molar; Sealapex; Single canal

### **Introduction :**

A comprehensive understanding of the anatomy of teeth involved in root canal therapy is essential for successful endodontic therapy<sup>1</sup>. Clinicians should be familiar with the morphology and the associated intricate root canal anatomy of the teeth, otherwise effective debridement, and obturation may not be possible.

Usually, the mandibular second molar presents with two distinct roots: a mesial root with two canals and a distal root with one or two canals. Disparities in the form, configuration, and number of root canals in (mandibular) molars have been deliberated widely in endodontic literature<sup>2, 3</sup>. Reading of periapical radiographs in routine practice is essential as it helps to consider

the number, length, curvature and aberration of the root canal system of the tooth and supporting structure. Vertucci *et al.*<sup>5</sup> by exploiting cleared teeth that had their pulp cavities stained with hematoxylin dye, and found a considerable more complex canal system and recognised eight pulp space configurations. Weine *et al* reported in a study 1.3% of mandibular second molars had Single Canal Configuration<sup>6</sup>. The purpose of this case report is to report endodontic management of single canal in single rooted mandibular second molars.

### Case Report

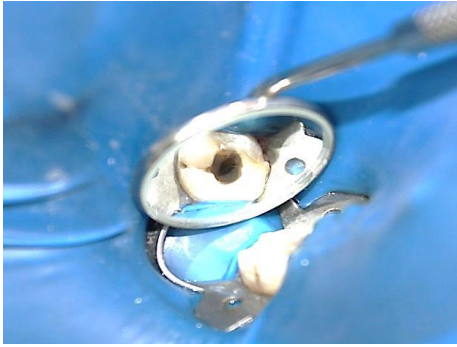
A 23 year old male patient reported to the department of conservative dentistry and endodontics with the chief complain of pain with cold and hot sensitivity in lower right back tooth region. On clinical examination, there was caries with respect to #47. Radiographic examination (figure-a), IOPA reveals radiolucency in crown involving enamel, dentin and reaching into pulp. Also, the root canal morphology showed a fused conical root with a wide canal, constricting toward the apex. Diagnosis of acute irreversible pulpitis was confirmed and root canal therapy was planned.

After adequate anaesthesia, under rubber dam isolation access cavity was prepared (figure-b) and the pulp extirpated. Dental loupe (Zumax 3.5) with LED headlight was

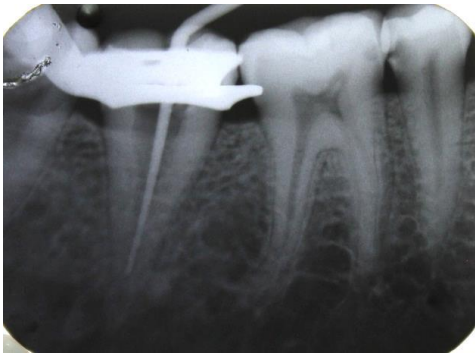
used for aided magnification and better visualization. DG #16 explorer was used to explore the pulpal floor and it revealed a single round shaped orifice whereas classical c-shaped canal orifice configuration or any other canal orifices could not be located. After gaining access, the canal patency was established with a suitable ISO K file. Working length (figure-c) was determined with the help of electronic apex locator (Coltene canal pro 2) and confirmed using a radiograph. Cleaning and shaping was done using a step back technique using suitable sized ISO K file and copious irrigation with a combination of irrigants, that is, sodium hypochlorite and saline was done throughout the procedure. After drying the canal with paper point, Sealapex was coated in the canal wall through master apical gutta-percha (figure-d) and canal was obturated using BeeFill 2in1 (VDW) obturation device for Downpack and Backfill technique. Post-obturation restoration was done with light cure composite (figure-e).



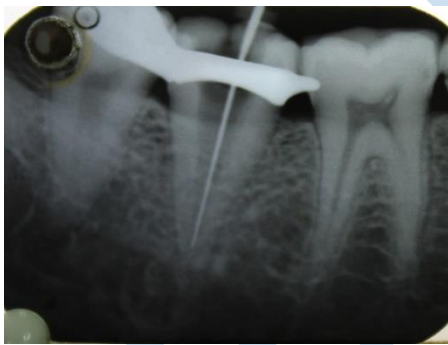
a. Pre-operative



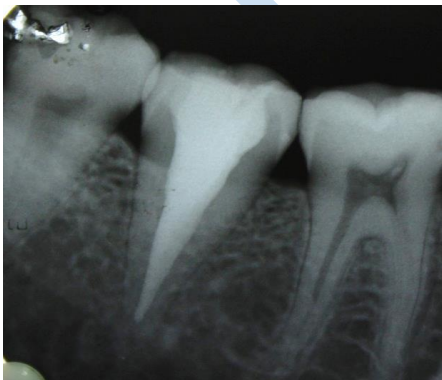
**b. Access cavity under rubber dam isolation**



**c. Working length IOPA**



**d. Master cone**



**e. Post Operative**

### Discussion

Complete knowledge of the root canal anatomy and its anomalies is essential. The disparity of root canal morphology, especially in multirouted teeth, is a constant challenge for diagnosis and successful endodontic therapy. Extra or missing canal, apical ramifications, apical deltas, or lateral canals are commonly encountered variations in canal morphology and their incidence and significance have been well documented<sup>7</sup>. One of the commonest variations in the mandibular second molar is the occurrence of C-shaped canals while other variations comprise two or four canals instead of the commonly occurring three canals, supernumerary roots, taurodontism<sup>8</sup>, additional or lesser number of canals in one or more of the roots. Gopi Krishna et al. 2006 reported a rare case of maxillary first molar with a single root and single root canal using spiral CT<sup>9</sup>. On observation of the pulpal floor only one canal with a round orifice was located, indicative of the presence of a single canal<sup>10</sup>. Further exploration with DG #16 explorer reveal absence of any additional orifice opening of the pulpal floor. The canal orifice of the tooth was wide and tapering towards the apex. Biomechanical preparation with hand file with copious irrigation and agitation was done to ensure

complete removal of debris. Thermoplastized obturating technique along with warm vertical compaction which helps in better flow of gutta-percha is used, as it ensures compact obturation of the wide canal and any unusualness present in canal system without voids. Endodontic loupes are helpful adjuncts to manage c-shaped canal complexity.

**Conclusion :**

A thorough knowledge and recognition of the basic and intricacy of canal configuration can facilitate more effective canal identification and unnecessary removal of healthy tooth structure in an attempt to search for missing canals.

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