

## **Endodontic Management of Six Canals in Mandibular First Molar: A Case Report**

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### **INTRODUCTION**

The main objective of root canal treatment is thorough mechanical and chemical cleansing of the entire pulp space followed by complete obturation with inert filling material<sup>1</sup>. Missed canals and spaces within the root canal system may contain microorganisms and their byproducts and may contribute to failure of therapy<sup>2</sup>. Therefore, it is imperative that aberrant anatomy is identified before and during root canal treatment of such teeth.

Till date few clinical reports have described more than two canals in the mesial root of mandibular molars. Among these, the occurrence of middle mesial canal in the lower mandibular molar is (1–15%); also called “intermediary mesial canal” or “medial mesial canal”<sup>3-10</sup>. Kottor et al.<sup>11</sup> and Ahmed et al.<sup>12</sup> found a prevalence rate of 4% and 3% for 3 canals in mesial and distal roots.

Radiographic examination using conventional intraoral periapical views is important for the evaluation of the canal configuration. However, it has its inherent limitation to assess the root canal system completely. An accurate evaluation of root canal number and morphology should be done using various diagnostic methodologies with magnifying loupes, dental operating microscope, and adjunctive diagnostic aids like cone beam CT and so forth can also be used.<sup>13,14</sup>

This clinical case report describes the unusual morphology of a mandibular first molar with two roots and six root canals detected during routine root canal treatment.

**HISTORY:** A 44 year old female patient reported to the Department of Conservative Dentistry and Endodontics, ITS Dental college, Ghaziabad with the chief complain of pain in the lower right back region of the jaw past three months. Her past medical history was found to be non-contributory. Clinical examination revealed a deep carious lesion in right mandibular first molar no. 46. The preoperative diagnostic radiograph of 46 [Fig. 1] revealed a deep carious lesion involving the pulp with slight widening of the periodontal ligament space.

**TREATMENT PLANNING:** The clinical and radiographic findings led to a diagnosis of chronic irreversible pulpitis, necessitating endodontic therapy.

**CASE DESCRIPTION:** After administration of local anesthesia (Lidocaine 2% with epinephrine 1:80,000) and rubber dam isolation, the carious lesion was removed and an adequate endodontic access made. Inspection of the pulp chamber floor showed orifices corresponding to mesiobuccal, mesiolingual, and distal canals. On careful examination of the grooves connecting the canal orifices, the middle mesial and middle distal canal orifice was identified with a DG-16 endodontic explorer (Hu-Friedy, Chicago, IL, USA) and the canal was subsequently negotiated. Individual canal instrumentation was performed using a crown down preparation with Hyflex rotary instruments (Coltene, USA ). Copious chemical irrigation was performed with 5.25% sodium hypochlorite solution and EDTA (Glyde, Maillefer, Dentsply, Switzerland). The canals after preparation were finally flushed with sterile saline, dried with sterile paper points, and calcium hydroxide dressing was given. At the subsequent visit after a week, the tooth was asymptomatic and was obturated with gutta percha cones (Dentsply, Maillefer) using AH-Plus sealer (Dentsply, Konstanz, Germany). The patient experienced no postoperative sequelae and an appropriate post-endodontic restoration was performed in a subsequent appointment to ensure an adequate coronal seal.



Figure 1: Preoperative radiograph

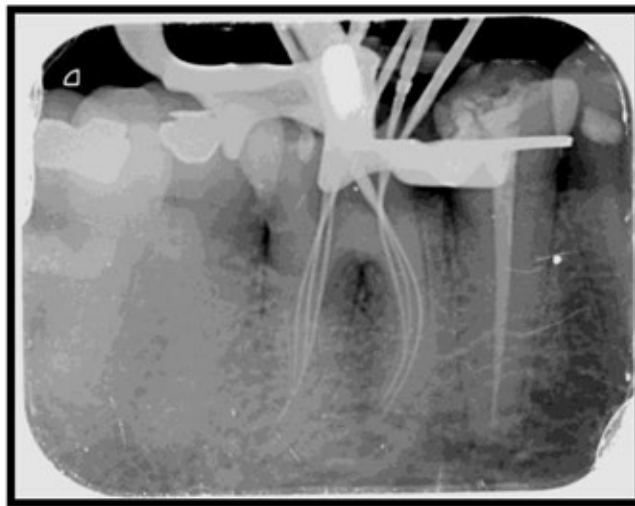


Figure 2: Working length radiograph

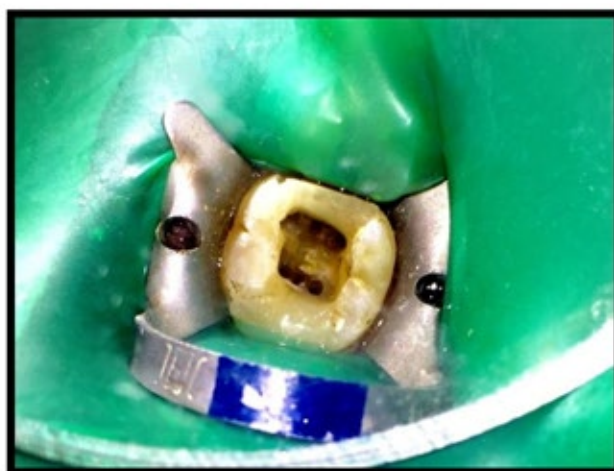


Figure 3: Six separate orifices



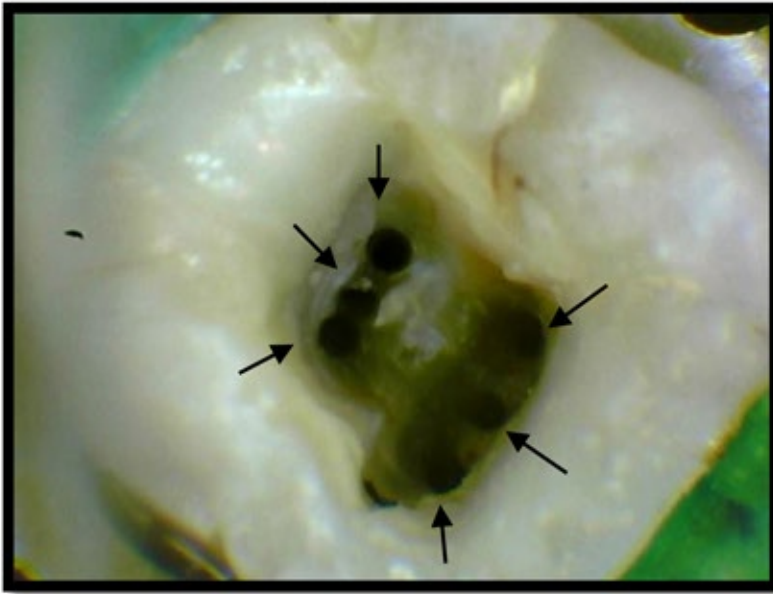


Figure 4: Magnified view of canals with intraoral camera

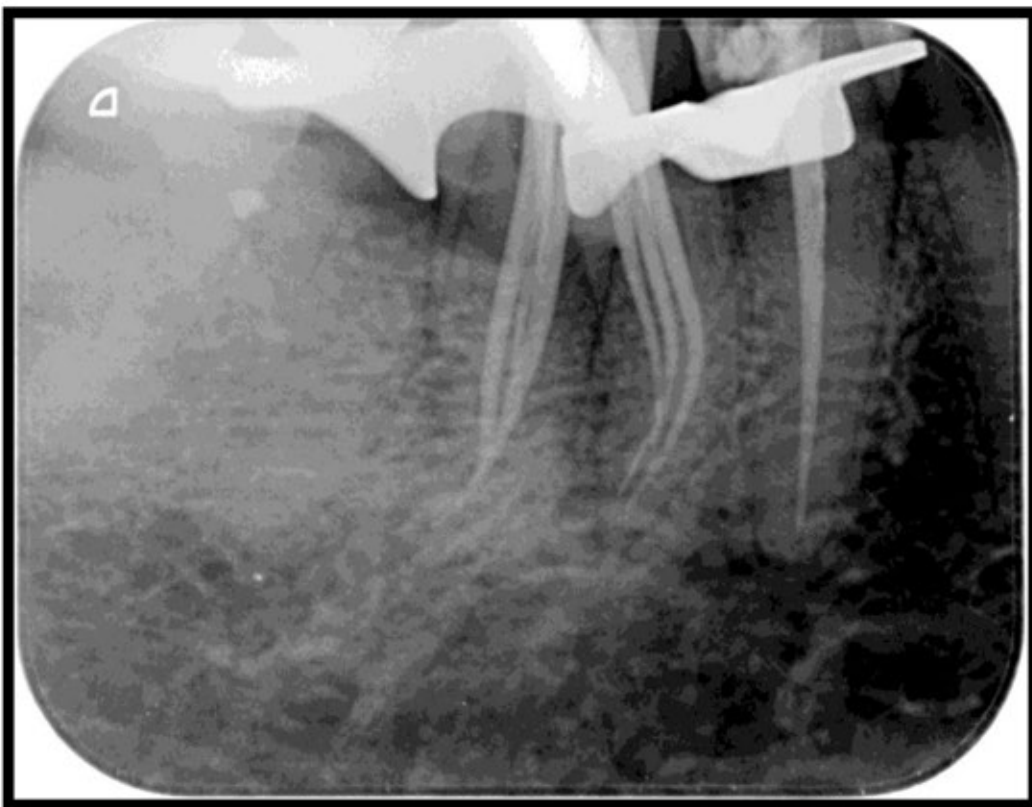


Figure 5: Master cone radiograph

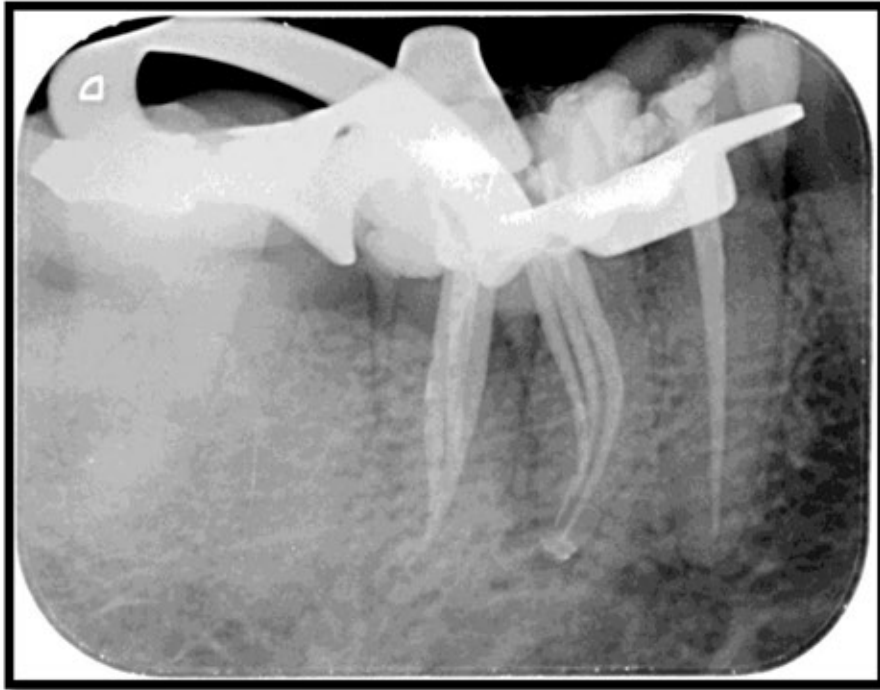


Figure 6: Obturation



Figure 7: Six separate orifices post obturation

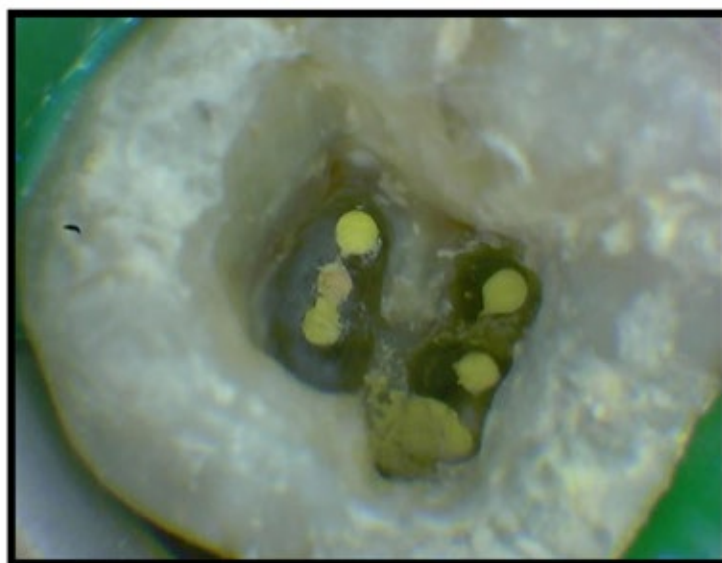


Figure 8: Magnified view of canals post obturation with intraoral camera



Figure 9: After post endo restoration

**CONCLUSION** Treating additional aberrant canals can be challenging, but the inability to find root canals may cause failures. Mandibular first molars with six root canals are rare, but each case should be carefully investigated clinically and radiographically to detect any anatomic anomalies. Possible variations in the internal anatomy of human teeth should be known to ensure successful endodontic treatment.



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