

# Clinical Considerations in the Non Surgical Management of Tooth with Radix Entomolaris: A Case Report

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## ABSTRACT

**Aim:** to report the successful management of the tooth with radix entomolaris with chronic apical periodontitis.

**Summary:** this paper presents the successful management of tooth with anatomic variation in the form of radix entomolaris with chronic apical periodontitis using root canal treatment as a treatment modality. Identification of the all the canal orifices and the presence of the buccolingual curvature were the key considerations while managing such cases.

**Conclusion:** tooth with radix entomolaris can be successfully managed using the current concepts of root canal treatment. Future case reports with the utilization of technical advances in the endodontics may help in improving the outcome.

**Key words:** root canal treatment, radix entomolaris, chronic apical periodontitis

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## INTRODUCTION

Root canal treatment is being utilized as a treatment modality as per the traditional recommendation for the management of the irreversible pulpitis and the apical periodontitis (1). Such treatment modality comprises the basic steps of access opening, biomechanical preparation, obturation and the definitive restoration. Each step has its own significance in the clinical aspects –to both clinician and patient related outcomes. Critical evaluation of all such considerations and its implication may help in obtaining the optimal outcome related to the root canal treatment.

Although, various considerations regarding the technical and materialistic aspects are important in relation to root canal treatment, anatomical aspects have its own significance which may potentially affect the outcome (2-4). Such considerations include the anatomical complexities of root canal system and the anatomic variations associated with the tooth and the root canal system (2-4). Root canal treatment is basically dealing with the cleaning and the shaping of the root canal system in such a way that facilitates the 3 dimensional obturation with adequate apical and the coronal seal. The anatomic complexities and the anatomical variations associated with the root canal system tend to influence the outcome associated with the root canal system potentially (2, 3). Therefore, the consideration of such anatomical factors becomes quite necessary to obtain successful outcome.

Radix entomolaris is one such anatomical variation, usually associated with the mandibular first molar in the form of the additional distolingual root (5, 6). Since there is a presence of the extra root in the form of supernumerary root, it also comprises extra canal in majority cases. Further, curvature usually present in the buccolingual direction in such cases demands for the additional technical considerations while doing biomechanical preparation (7). Present case report highlights on the clinical considerations for the management of tooth with supernumerary root in the form of radix entomolaris.

## CASE REPORT

A systemically healthy, 38 years old male patient had reported to the department of Conservative Dentistry and Endodontics of Post graduate Institute of Dental Sciences, Rohtak with the complaint of swelling and pus discharge in the lower right back teeth region since 1 week. History taking had revealed the presence of mild pain in the same region

few months back which was lasted for 4-5 days and was relieved by using over the counter analgesics. On clinical examination, there was a presence of deep class II caries on the mesioocclusal aspect of right mandibular first molar. Further, there was a presence of small sized swelling with pin point erythematous opening in the periapical area of the same tooth. Upon palpation, although, there was no tenderness on percussion testing, mild tenderness in the periapical area was present. Swelling was soft in consistency and associated with pus discharge on pressure using blunt instrument. Pulp sensibility testing including the electric pulp testing and the cold test had shown negative response compared to adjacent control tooth. Radiographic examination of the intra oral periapical radiograph obtained using the digital imaging system had shown the presence of the radiolucent area involving enamel, dentin and approaching pulp.

Further there was a presence of the well-defined periapical radiolucency, associated with the root apex. Assessment of the roots and root canals on radiograph had shown the presence of an additional distolingual root and root canal system, which was also associated with the periapical radiolucency. Based on the all these clinical and radiographic finding, clinical diagnosis of the chronic apical periodontitis was made. Possible treatment options, associated risk and benefits were explained to the patient. Emphasis on the tooth preservation and awareness towards the dental care had led to the selection of root canal treatment as a treatment modality for the management of radix entomolaris with clinical diagnosis of the chronic apical periodontitis. Written informed consent was obtained from the patient before commencing the root canal treatment.

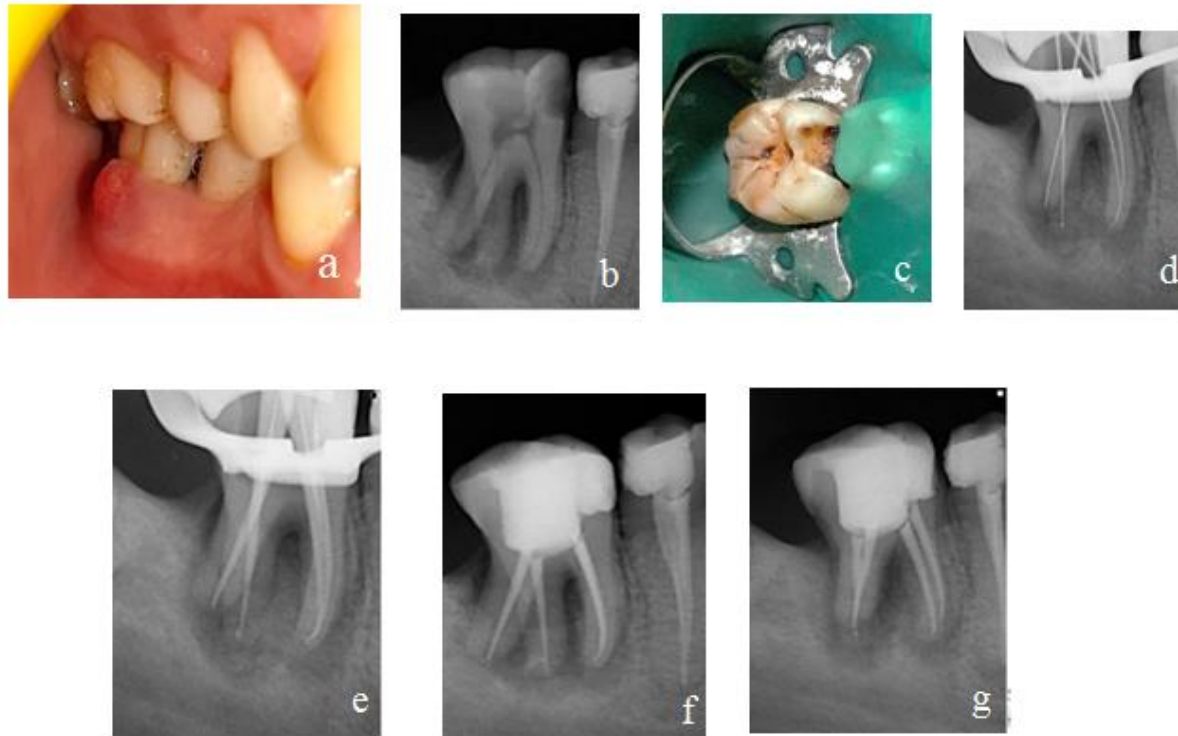
### **Clinical procedure**

The patient received local anaesthesia (2% lidocaine with 1:80,000 epinephrine) using a conventional inferior alveolar nerve block. After rubber dam isolation, caries was excavated, and mesial proximal surface was restored using the composite resin restorative material before the access preparation to improve an isolation. The access cavity was then prepared and extended little more in the distolingual direction to search for the distolingual orifice. The pulp chamber was debrided, all the canal orifices were located using DG-16 explorer and the working length was determined with the help of an electronic apex locator (Root ZX; J Morita, Tokyo, Japan) with size 15 K-files. Confirmation of the same was done using the intra oral periapical radiograph obtained with standard exposure parameter using digital imaging system. Glide path was prepared using stainless steel hand files up to the size of # 20 in all the canals. Root canal preparation was performed using Mtwo rotary files (VDW, Munich, Germany) according to the manufacturer's instructions using single length technique.

While preparing the distolingual canal, adequate care of the buccolingual curvature by tactile sensation was taken to minimize the risk of the instrument separation. Five millilitres of 5% NaOCl was used as an irrigant after each instrument change. Irrigation procedure was performed using a 30-G needle placed 2 mm short of the working length. After root canal instrumentation, canals were irrigated with 5 mL 17% EDTA solution for 1 minute followed by a final wash with 5 mL 5% NaOCl. Canals were dried with sterile absorbent paper points, filled with calcium hydroxide paste, and restored with Cavit (3M ESPE, Seefeld, Germany). In the second visit, scheduled after 1 week the tooth was again isolated using rubber dam and the intracanal dressing was removed with H-files and copious irrigation with 5 mL of 5%NaOCl followed by 5 mL 17% EDTA and a final rinse with 5 mL 5% NaOCl. Canals were then dried with absorbent paper points and obturated using the lateral condensation technique with gutta-percha and zinc oxide-eugenol-based sealer. After obturation, the cavity was restored with composite resin for the definitive restoration. An immediate postoperative radiograph was then taken using standard exposure parametersto check for the adequacy of the treatment and as a baseline for the future comparison.

### **Outcome assessment**

Assessment of clinical signs and symptoms have shown the sign of resolution of the swelling with stoppage of pus discharge within 4-5 days after the first visit. Further follow ups were scheduled at 6 and 12 months for the evaluation of success. Determination of success was based on both clinical and the radiographic examination. At the end of follow up, clinically, tooth was functional and there was no presence of signs and symptoms associated with periapical disease in association with treated tooth. Radiographically, there was an evidence of complete healing at the end of follow up. Based on both clinical and the radiographic findings, treatment was considered as successful at the end of follow up.



**Figure 1: Clinical procedure – a) Preoperative photograph b) Preoperative radiograph c) rubber dam isolation d) Working length determination e) Master cone radiograph f) Postoperative radiograph g) 12 months follow up**

## DISCUSSION

Management of teeth with anatomic variations usually demands for the additional clinical considerations in the various steps of root canal treatment. Teeth with supernumerary roots and canals primarily needs additional considerations in the step of access opening. Locating all the present orifices of root canal system is an essential and important step to further proceed for the thorough cleaning of root canal system. Inability to identify and localize the root canal orifices usually lead to missed canal. Such missed canal may form the constant source of infection and irritation by harbouring the remnants of pulpal tissue and the microorganism (5). Therefore, the identification of the all canal orifices and thorough debridement of root canal system, followed by the optimal seal by obturation are the key considerations for the successful outcome following the root canal treatment. In present case report, adequate care was taken to locate all the canal orifices in case with radix entomolaris.

Additional distolingual root present in mandibular first molar in cases of radix entomolaris usually show curvature in the buccolingul direction (5-7). Such curvatures are difficult to appreciate on the two dimensional radiograph since, periapical radiographs, technically meant to reveal the anatomic structures and variations in the mesiodistal direction. After locating the distolingual orifice, next challenge was the presence of the buccolingual curvature in the distolingual root in the present case report, which was managed with optimal considerations of tactile sensation during the biomechanical preparation.

Mechanical instrumentation, although, helps in the debridement of the pulpal remnants from the root canal system and reduces the microbial load to the greater extent, irrigation of the root canal system is the key essential step to improve the canal cleanliness (8-11). Thorough irrigation of root canal system with the current concepts of the irrigation using the sodium hypochlorite in the present case report might have contributed to the successful outcome by its cleaning action, particularly in the areas of anatomical complexities. Although, successful outcome obtained in the present case report, considerations of the various technological advances such as dental operating microscope, ultrasonics, irrigation activation system, advances in rotary file system can be utilized in future cases with such anatomic variations to improve the outcome (5). Such advances may help clinician in easy identification of canal orifices and thorough debridement of root canal system which may influence the outcome greatly.

## CONCLUSION

This case report presents the successful management of tooth with of radix entomolaris by non-surgical endodontic treatment. Utilization of various technical advances can be considered in the future case reports to improve the outcome.

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