Case Report
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# Management of Endodontic-Periodontal Lesion in Two-rooted Maxillary Lateral Incisor with Root Resection

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## ABSTRACT

Variation in the number of roots of maxillary lateral incisors have been reported in literature. Failure to identify the presence of the extra roots and canals in these teeth may lead to compromised treatment outcome. Such multi-rooted teeth can sometimes be successfully managed with root resection. Careful preoperative evaluation and radiographs may help in accurate diagnosis, treatment planning, and management of these anatomical variations. This case report demonstrates the successful management of an endodontic-periodontal lesion in a maxillary lateral incisor with two roots with use of root resection procedure in a one-year follow up time.

**Keywords:** Anatomical variation; endodontic-periodontal lesion; lateral incisor; maxillary; missed canal; root resection.

## INTRODUCTION

Permanent maxillary lateral incisors are one of the most variable teeth in the human dentition after third molars, as they exhibit a wide range of morphological features.[1] Most literature have indicated that maxillary lateral incisor is a single-rooted tooth with a single canal.[2] However, cases of maxillary lateral incisors with more than one canal and separate roots have been reported.[2-4] These are thought to be associated with traumatic stimuli during tooth development process.[2] Clinicians should be able to identify the possible anatomical variations of such teeth and modify the treatment plan accordingly for successful treatment outcomes.

## CASE REPORT

A 38-year-old male, with no known medical conditions, presented to Periodontology and Oral Implantology Unit, Department of Dental Surgery, Bir Hospital with the chief complaint of gum swelling with discharge of pus and foul smell in upper front region of the jaw for one year. He gave history of trauma and root canal treatment of the tooth 4-5 years back and denied use of tobacco in any form. On clinical examination, he had apparently good oral hygiene with draining sinus in relation to (irt) 22 (according to two-digit teeth numbering system) and dislodged restoration irt 21 (Figure 1A). Diastema was present between the central and lateral incisors. The tooth 22 was rotated mesiolabially and a pit was seen over the cingulum region (Figure 1B). A probing pocket depth of 13 mm with bleeding on probing was observed on mid-palatal aspect of 22 (Figure 2A).

Intraoral periapical radiograph (IOPA) revealed endodontically treated 21 and 22 with bifurcation and periapical radiolucency irt 22 (Figure 2B). Cone beam computed tomography (CBCT) was suggested further, which confirmed the presence of an extra root lying mesiopalatally to the main root, but not endodontically treated (Figure 2C). Based on the history, clinical, and radiographic examination, this case was diagnosed as primary endodontic secondary periodontal lesion due to missed root canal.

Endodontic consultation was performed and a tentative treatment plan was made which included resection of the extra root and debridement followed by mineral trioxide aggregate (MTA) sealing. Before beginning the treatment, informed

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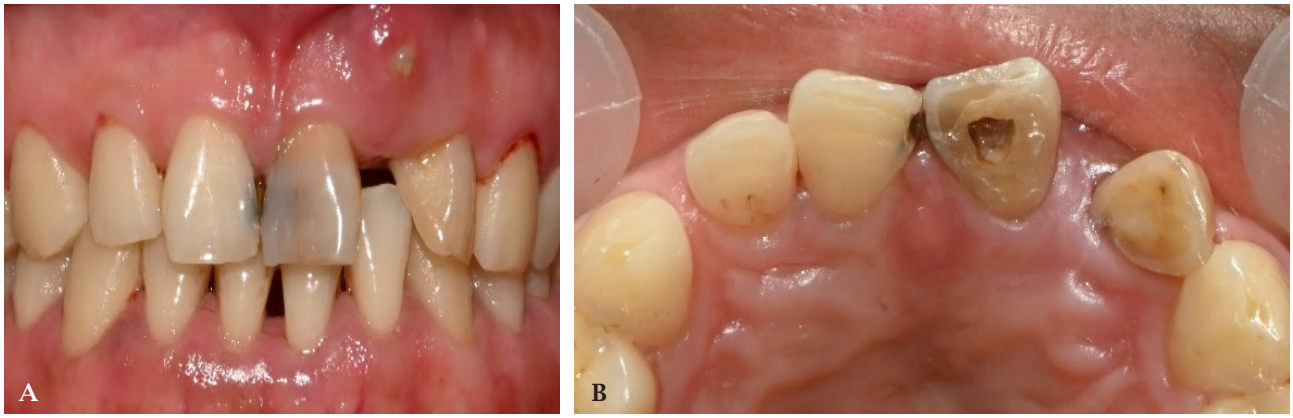


**Figure 1: Pre-operative A) Front view; B) Occlusal view.**

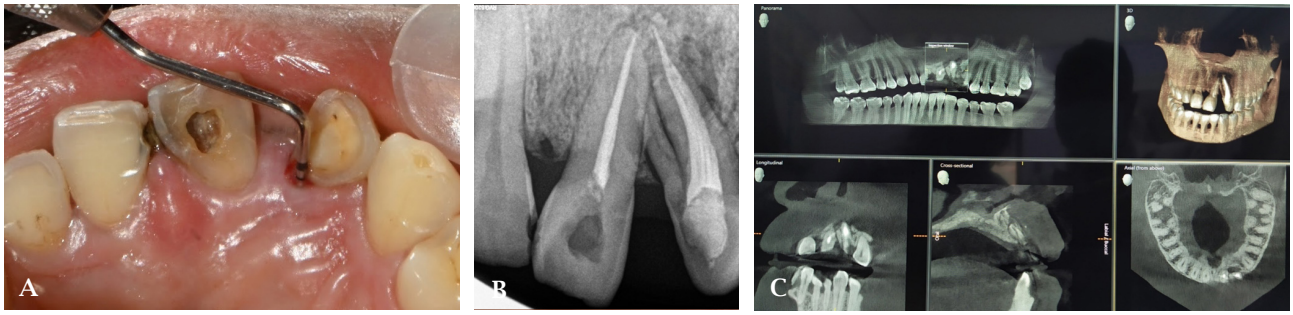


**Figure 2: A) Probing pocket depth of 13 mm; B) The IOPA showing bifurcation and periapical radiolucency; C) The CBCT showing small palatal root.**

consent was obtained from the patient. Under all aseptic conditions, infiltration of local anaesthesia with 1:200000 adrenaline was administered and crevicular incision was given. After reflection of full-thickness flap, bifurcation with an extra palatal root was seen (Figure 3). The region was meticulously debrided and the extra root was resected using a diamond bur and aerotor handpiece. The overhanged enamel margin was contoured and MTA was used to seal the exposed furcation (Figure 4). The 4-0 silk suture was used to place two interrupted sutures for the closure of the flaps (Figure 5A). Amoxicillin 500 mg and Metronidazole 400 mg eight hourly for five days, Acetaminophen 500 mg plus Ibuprofen 400 mg eight hourly for three days was prescribed to the patient. Patient was instructed to swish with 0.2% Chlorhexidine mouthwash twice daily for two weeks and to maintain good oral hygiene. Sutures were removed after one week (Figure 5B).

After one year on follow-up visit, the patient reported complete alleviation of symptoms along with foul smell (Figure 6A). The recall radiograph showed resolution of the periapical pathology (Figure 6B).

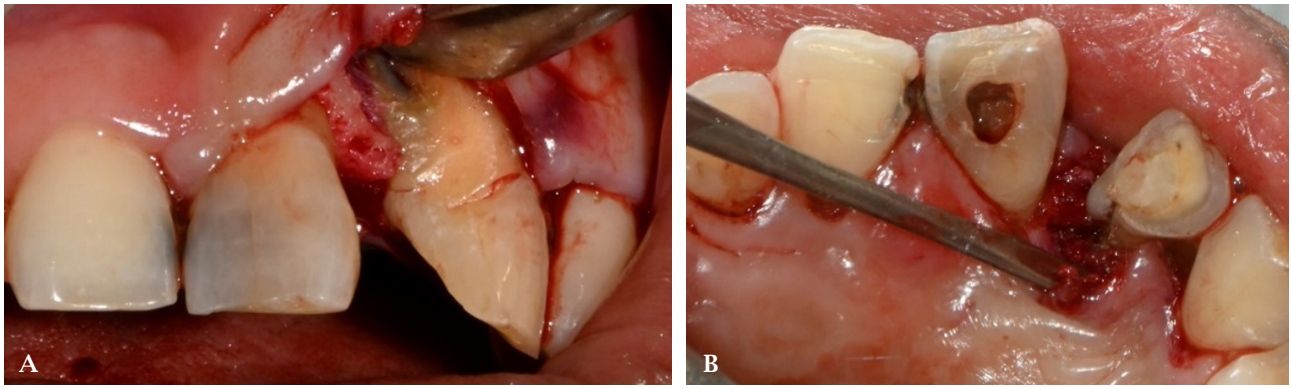


**Figure 3: Reflection of full-thickness flap A) Front view; B) Occlusal view.**

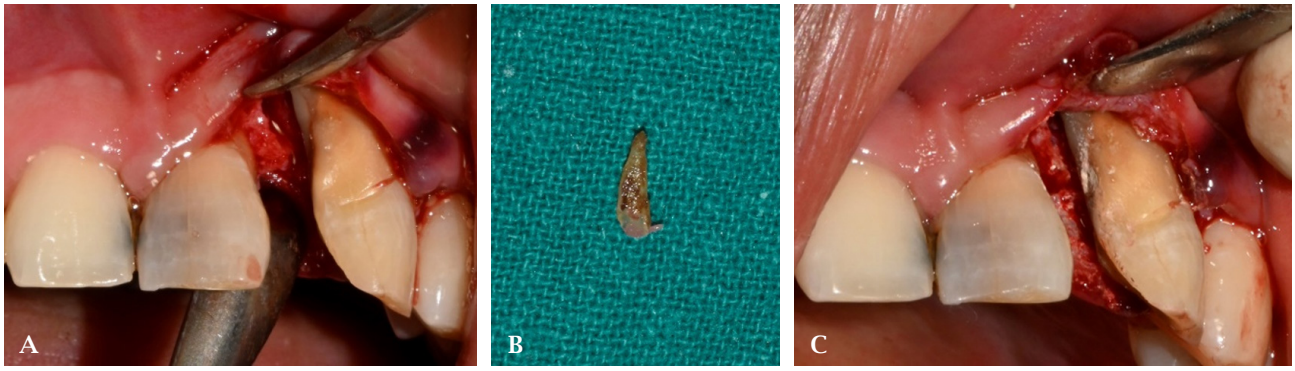


**Figure 4: A) After root resection; B) Resected root; C) MTA sealing.**

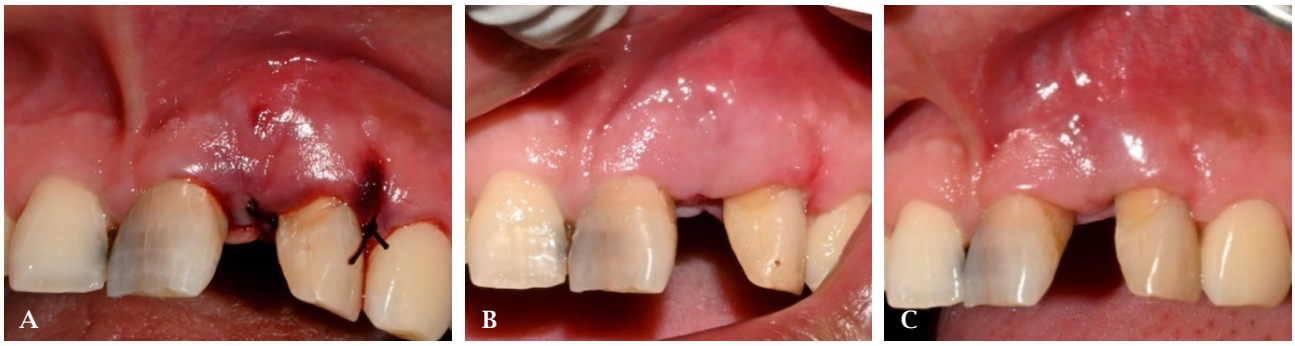


**Figure 5: A) Flap closure with 4-0 silk suture; B) One week post-operative; C) One month post-operative.**

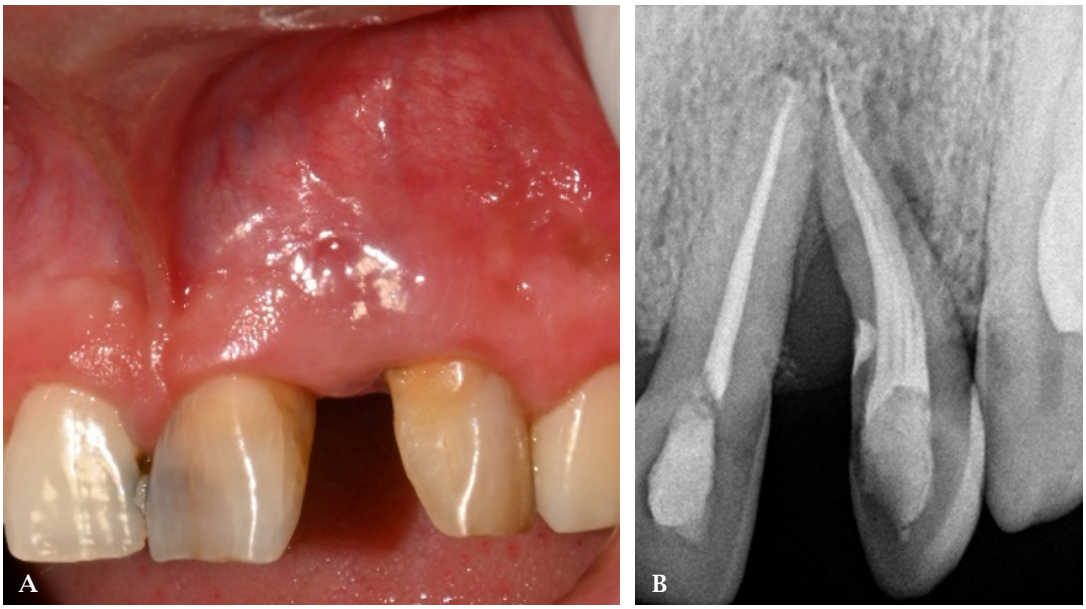


**Figure 6: One year post-operative A) Front view; B) The IOPA.**

## DISCUSSION

Maxillary lateral incisor with two roots is a rare but reported occurrence in the literature.[4] This variation in the number of roots and canals is associated with dental anomalies such as fusion, gemination, dens in dente, and palatogingival groove.[3] Although the main aetiology of this variation is unknown, it is presumed that disturbance in development of Hertwig's epithelial root sheath (HERS) during root development may lead to formation of an accessory radicular portion.[2,5]

This case report demonstrates a case of maxillary lateral incisor with two separate roots and two root canals without exhibiting any morphological anomaly of the crown. Successful endodontic treatment depends on accurate diagnosis and precise determination of number of root canals. Missed root canals that are not obturated might provide a source of persistent irritation which may communicate with periodontal tissues through apical foramen leading to periradicular pathoses.[2,6] These lesions require both endodontic and periodontal therapy for complete healing to occur. In combined endodontic-periodontal lesions, some periodontal defects will resolve on completion of endodontic treatment.[6]

Root resection is the process by which one or more of the roots of a tooth are removed at the level of furcation while leaving the crown and remaining roots in function.[7] This treatment modality is usually preferred for maxillary molars; however, it has been opted in this case, as there was sufficient bone support around the main root and sufficient coronal tooth structure. Multi-rooted teeth can be successfully treated by root resection with reported mean survival rate of 87.2%.[8]

Due to its excellent biocompatibility, marginal adaptation, sealing capacities, and hydrophilic nature, MTA was used in this case for sealing of exposed furcation. The MTA is also capable of stimulating healing and osteogenesis.[9] The overall success rate of MTA was found to be 100% when it was compared with other material at the interval of 24 months.[10]

Additional roots and canals can be detected by routine radiographic examination.[4] Periapical radiographs with variations of angulation can be obtained to increase their accuracy in identifying dental anomalies. Moreover, radiographic modalities such as CBCT, a high-resolution three-dimensional technique, could greatly help in detection of such anatomical variations.

Considering the one-year follow-up period, bone fill was seen in periapical region of the involved tooth. Moreover, the tooth had no abnormal clinical findings at follow up examination.

## SUMMARY

Missed root canals during endodontic therapy may lead to persistent patient symptoms and compromised treatment outcomes. Such presence of the extra roots and canals in maxillary lateral incisors can be identified with knowledge of this variation, careful preoperative evaluation, and accurate imaging aids. These teeth can sometimes be successfully managed with root resection.

## ACKNOWLEDGEMENTS

None.

**Conflict of interest:** None.

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