

Surgical Removal of Fractured Instrument beyond Apex in a Mandibular First Molar- A Case Report

Dr. Sushma¹, Dr. Anshu Singh²

^{1,2}Department of Conservative Dentistry and Endodontics, PGIDS, Rohtak

ABSTRACT

This case report is aimed to present the removal of fractured instrument beyond apex in a right mandibular first molar. Diagnosis depended on both clinical examination and simple radiographic method like IOPA , but distance from vital structures was evaluated using CBCT. Surgery led to the resolution of periapical lesion and then definite restoration of crown was given.

INTRODUCTION

Periapical lesions can occur due to different reasons like improper cleaning and shaping, improper disinfection, improper obturation, fractured instruments, ledges and iatrogenic errors such as perforations, which may lead to persistent of postoperative infection due to inability to clean and disinfect the root canal¹. Persistent coronal leakage can lead to an increase in size of lesion ,therefore a proper coronal seal with restoration is needed to prevent infection. Iatrogenic errors such as instrument fracture and especially, beyond apex can complicate a situation. The separated instrument can be a cause of persistence of microorganisms and prevent periapical healing. Strindberg observed that there are 19% more chances of failure in cases with instrument separation².

The purpose of this case report is to demonstrate that surgery can remove the separated instrument and also debridement can be done which leads to periapical healing. Definite coronal restoration with crown can provide the adequate seal needed for resolution of periapical lesion.

CASE REPORT

A male patient aged 42 years reported with a history of previous treatment in right back lower region and foul smell . Root canal treatment was done 2 years back , but symptoms started developing in the last 2 months. Patient was willing to save the tooth. On clinical examination, the patient had sinus present intraorally approximately 2 mm below apex and there was pus drainage from sinus. IOPA revealed root canal treatment in right mandibular first molar and instrument separation approximately 2 mm beyond apex and radiolucency was present around the fractured instrument. The treatment plan included root canal retreatment , debridement and surgical removal of fractured instrument by surgery followed by porcelain fused to metal crown. Patient was informed about benefits and risks associated with treatment and informed consent was obtained. Canals were instrumented using rotary files and root canal retreatment was completed after complete disinfection. A full thickness flap was reflected, and broken instrument was removed along with debridement and curettage. The sutures were removed after 7 days. The patient was kept under antibiotic medication for 3 days. A temporary crown was placed , which was later on replaced by porcelain fused to metal crown. Follow-up at 12 months revealed closure of sinus and uneventful healing.(Figure-1)

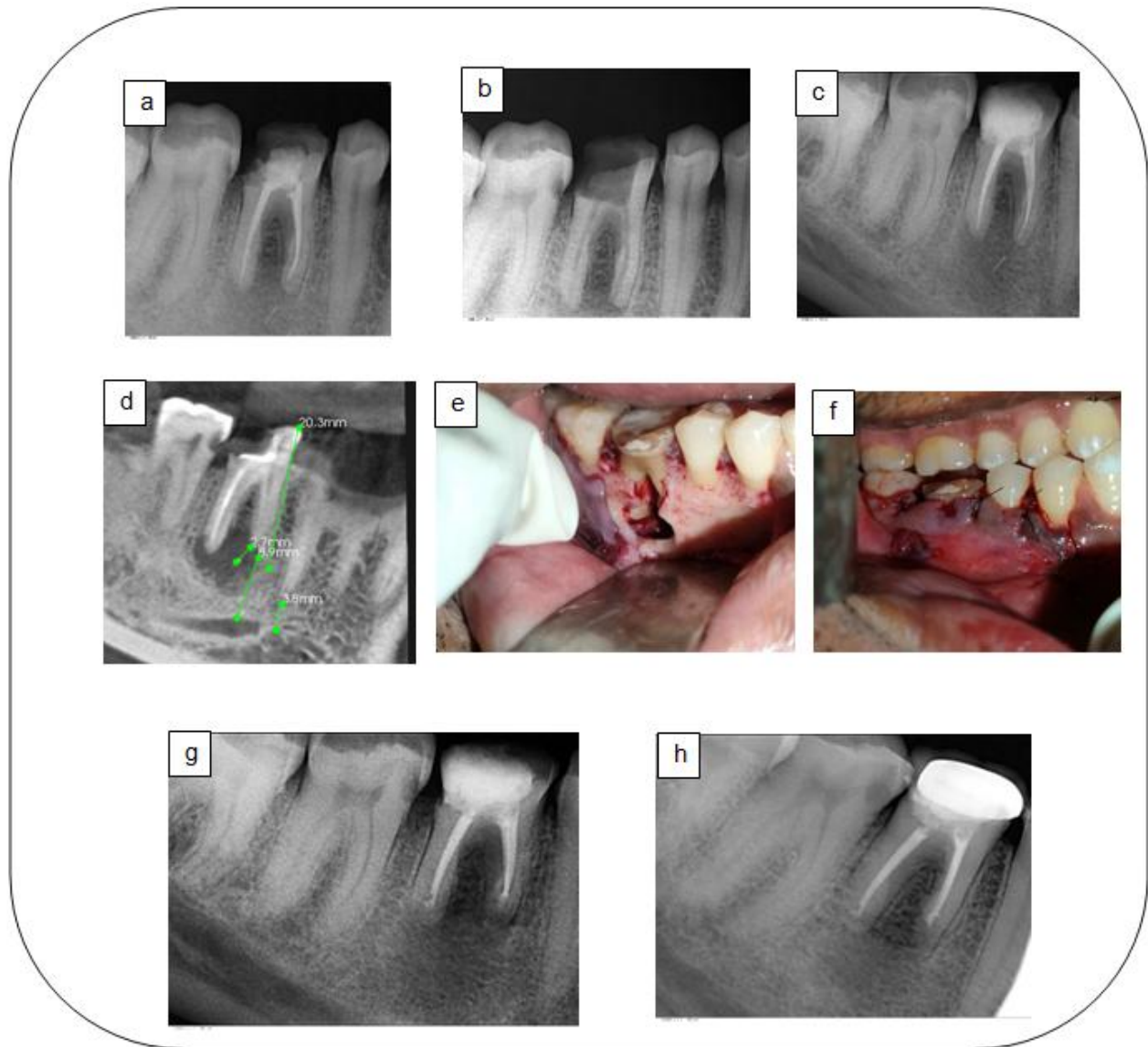


Figure 1. (a) preop IOPA radiograph,(b) GP removal, (c) Re-RCT completed ,(d) preop CBCT section , (e) apical curettage after instrument retrieval, (f) Sutures placed (g) post-surgery MTA placement radiograph and (h) 1-year follow-up radiograph.

DISCUSSION

Periapical radiolucency may occur as a result of persistent infection of root canal. It was observed in a previous study that the presence of fractured instruments can cause reduction in the prognosis of root canal treatment, and it is more severe when preoperative lesion is present. In a metanalysis, no significant difference in healing was observed with separated instrument and no separated instrument³. A prospective study observed a significant difference with separated instrument in retreatment cases than primary root canal treatment⁴.

Overall available evidence is less regarding impact of fractured instruments during root canal treatment. Instrument bypass or instrument retrieval is attempted when the tooth structure remaining after procedure is sufficient. Factors such as preoperative lesion, root canal anatomy, location of fractured instruments, and type of fractured instrument can affect the prognosis of a tooth⁵.

In this case, as the fractured instrument was beyond apex surgical intervention was required to remove the instrument. But some problems may be encountered while doing surgery in mandibular molars, like proximity to vital structures and difficult access because of lingual inclination of molar roots^{6,7,8}. Healing outcome after surgery was assessed by Rud et al criteria⁹.

In this case, there was complete healing, and was rehabilitated with a definitive restoration of porcelain fused to metal crown.

CONCLUSION

Prediction of location of fractured instrument and its removal by surgical intervention led to complete healing of the tooth after 12 months.

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