Case Report

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You Can Never Judge the Fate of a Broken Tip in Endodontic Practice!

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The fracture of endodontic instruments is a common procedural error created during a root canal therapy. Starting from the hand files and up to the use of rotary systems, the root canal therapy is sometimes associated with the fracture of the instruments inside the root canal. The purpose of this work was to report a clinical case of removal of a fractured endodontic instrument in the root canal of a maxillary premolar, when part of this fragment extended through the apical foramen. In this case, a simple and a feasible chairside technique was used for the retrieval of the separated file tip.

Keywords: Broken instruments, Endodontic mishaps, Masserann Kit, Ultrasonic tips

INTRODUCTION

Cleaning and shaping are an important step in endodontic triad. During this phase, the iatrogenic mishap like separation of the instrument has become a challenge in endodontic practice. The separation of an endodontic instrument instantly transforms a case, from whatever level of difficulty it was pre-operatively, to a new level of severity. Variants in canal anatomy, roots and jaws of a particular patient, have always been the unmodified factors that caused an endodontic mishap. But now, iatrogenic factor has also become an important cause that can also lead to endodontic mishaps.[1,2]

The most common causes for file separation are improper use of file, limitations in physical properties, inadequate access, root canal anatomy, and possibly manufacturing defects. Instrument fractures during root canal treatment unable the clinician from optimal preparation and obturation of the entire root canal system. This affects the long-term prognosis of root canal treatment negatively.

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When instrument separation occurs, the clinician has the choice of leaving the instrument in the canal or attempting to remove it either surgically or non-surgically.[3]

There are various endodontic files available to drive our way into the canal system, but no sure-fire "anti-dote" to back out, once separated. There are three possible outcomes that may be encountered when treating these cases: (i) Retrieval, (ii) bypass and sealing the fragment within the root canal space, (iii) true blockage. Whatever may be the treatment option we indulge, there should be a long-term prognosis of the affected tooth.

CASE REPORT

A 40-year-old female patient reported to the Department of conservative dentistry and endodontics with pain in her upper left back tooth region since last 3 months. The involved tooth was maxillary left second premolar (Figure 1). The tooth was sensitive to percussion and was grossly decayed. Radiography revealed that the pulp was exposed due to the deep carious lesion and the periodontal ligament was thickened. The diagnosis was made as chronic irreversible pulpitis with apical periodontitis and the treatment planning was the root canal treatment with respect to tooth number 25.

Access opening was done using the No. 2 Endo access bur and then working length was determined using 15 no. K

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file and it was confirmed using a radiograph. During the working length determination (Figure 2), it was noticed that the K file got entangled beyond the apex and approximately 3 mm of the file got separated in the canal (Figure 3), which was confirmed by radiograph.[4,5]

Access cavity was modified and coronal enlargement was done for the retrieval of the separated instrument. Then, a 20 no. K file was placed inside the canal in contact with the separated file tip and ultrasonic vibrations were given in direct contact with the file. Copious irrigation was done using 5.25% sodium hypochlorite solution to clear the canal wall from debris and to give the separated file tip a media (Figure 4), through which it can gain access towards the cervical aspect. And this procedure was repeated for few number of times which could loosen the

Figure 1: Pre-operative radiograph

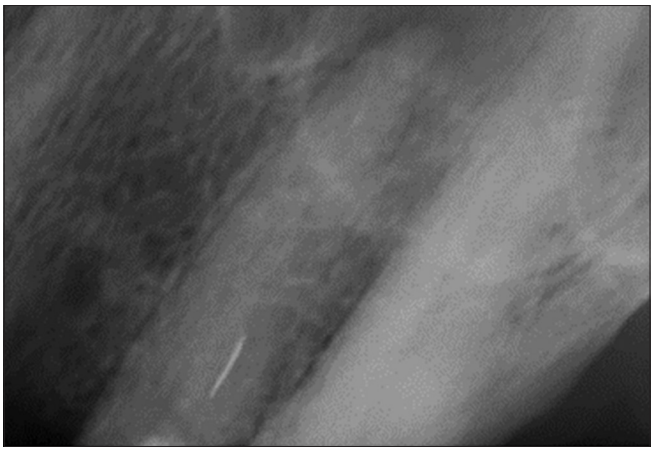

Figure 4: Separated file tip migrated from the apical area till the middle third of the root

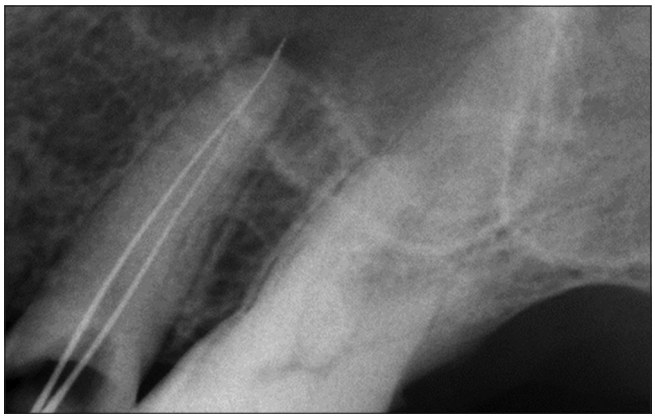

Figure 2: Determination of working length

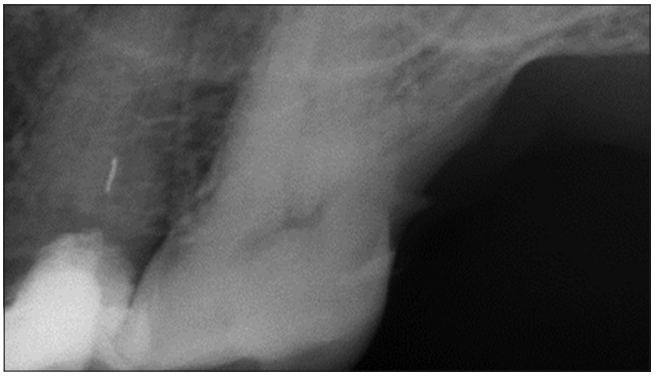

Figure 5: Separated file tip further migrated into the cervical third of the root

Figure 3: Separated file tip which was half inside the canal and a half in the bone

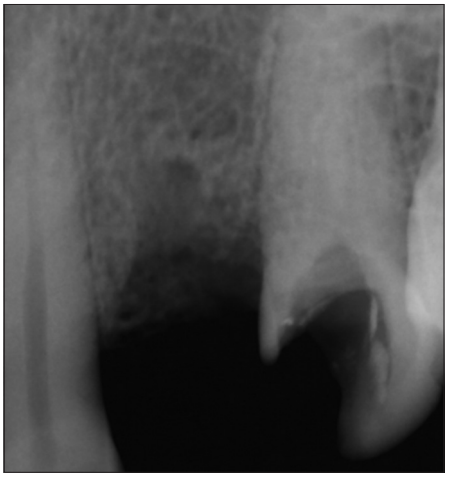

Figure 6: Separated file tip in the coronal part of the tooth

file segment from the apical third of the canal. And these steps were continued till the separated file tip migrated from the apical third to the cervical third of the root canal (Figures 5-7).[6]

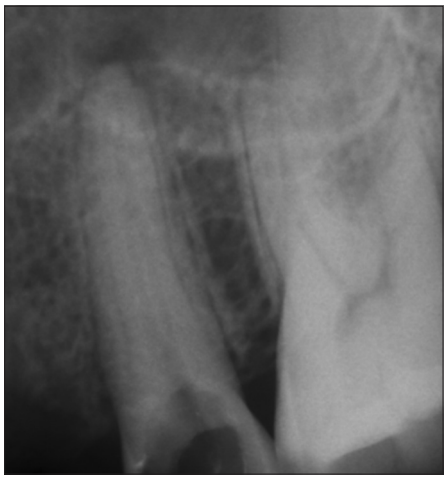

Figure 7: Radiograph showing the complete removal of the separated file tip

Again, the working length was determined using the radiograph and biomechanical preparation was done using rotary pro tapers and was obturated with monocone technique (Figures 9-11).

DISCUSSION

One of the most common mishaps that occur during routine endodontic treatment is the fracture of instrument inside the root canal. Many methods and instruments have been proposed to remove broken instruments from root canals. Nevertheless, removal depends on the depth, width, canal curvatures, and access to the foreign body. When the fragment is in the cervical area, it can be removed by pliers or Stieglitz forceps. Solvents and chelating agents have also been reported to be useful in these cases. Ultrasonic tips

Figure 8: Photograph of separated file tip after retrieval from the canal

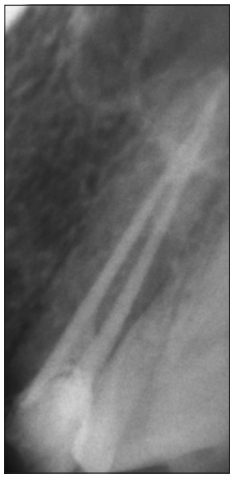

Figure 10: Mastercone radiograph.

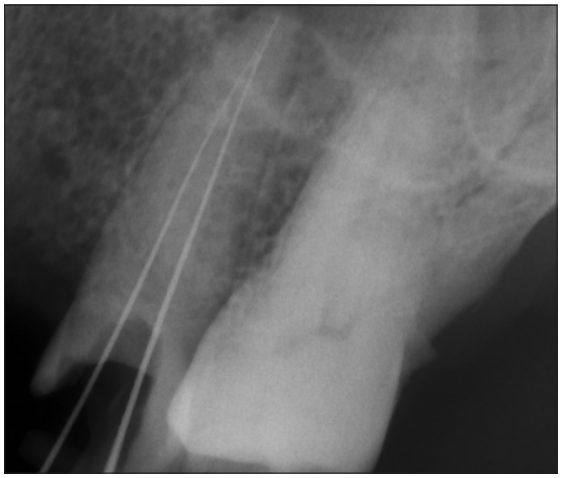

Figure 9: Radiograph showing the new working length

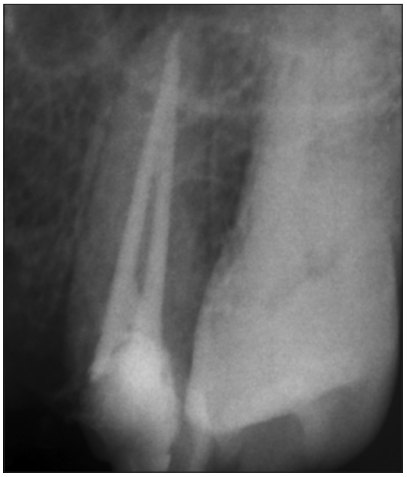

Figure 11: Obturation radiograph

are very useful for the removal broken instruments, silver cones, and posts.

Souyave *et al*. (1985) reported that the Masserann kit, instrument retrieval system, extractor system are the recent methods that can also be used to retrieve the separated instrument from the canal also at the same time they can cause fractures and perforation in some cases. According to Madarati *et al*. it has been reported, the previous enlargement of the dentin walls is essential for the capture of the instrument.[7]

In the present case, the separated file tip was removed from the canal using the ultrasonic vibration along with copious irrigation with sodium hypochlorite. And this procedure was repeated for a few number of times until the file gets dislodged from the apical part of the canal.

CONCLUSION

Removal of a fractured instrument can be difficult and challenging, and it may take a long time to accomplish the retrieval. In this case report, we have used the simple method which can be done in the chairside technique. Use of ultrasonic had been very fruitful in this case to remove the separated file tip.Dr. Marga Ree once said that she was being taught that endodontics is all about the three P's: Passion, persistence, and patience. This hits the nail right on the head as far as instrument retrieval is concerned.

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