



## Minimally Invasive Technique for Retrieval of Fractured Root Tip

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### Abstract

Extraction of maxillary premolars is often indicated for orthodontic treatment. Often when removing the premolars the surgeon faces a tricky situation when the root fractures. It is a tedious and agonizing task for both the surgeon and the patient to remove this broken root piece as the buccal cortex needs to be preserved in cases of orthodontic extraction. Various methods have been used for retrieval of broken root piece, but they have their own complications. Through this article we would like to describe a minimally invasive technique for retrieval of a broken root piece by preserving the periosteal attachment and buccal cortical plate.

**Keywords:** Fractured Root Piece; Endodontic File; Orthodontic Extraction

### Introduction

A surgeon faces a challenging and tricky situation when there is fracture of root while removing a tooth especially when the extraction of tooth is advised prior to orthodontic treatment. Extraction of teeth indicated prior to orthodontic treatment is a very technique sensitive procedure by itself, requiring preservation of adjacent bone and soft tissue. When removing a tooth the surgeon often hears a familiar cracking sound which is nothing but the yielding of alveolar bone to apical pressure. However, after removing the tooth, it is seen that the root tip has fractured and is retained in the socket. This is a tricky and potentially dangerous situation [1].

Fracture of tooth or root during removal is sometimes inevitable as the tooth may be weakened either by caries or a large restoration. But it mainly occurs due to improper application of forceps to the tooth. It is surprising that root fracture doesn't occur that frequently as it should have happened due to complex curvatures

of the root pattern of the extracted teeth. The maxillary premolars are most susceptible to root fracture in cases of extraction for orthodontic purpose due to presence of two slender roots in most cases. Also the palatal root fracture of maxillary molars is frequent due to it being slender and at an angulation from the crown [2]. There are various techniques which have been propagated in the literature for removal of broken root like creating a bony window above the root apex or removal with apex elevators [3], periotome, luxators, syringe needle [4] or by engaging endodontic 'H' file into the root canal [1]. However these techniques have their own set of complications [5]. In our experience with more than 40 such cases where tooth root was fractured in the apical one third, we found out that removal of the fractured root portion with a Protaper endodontic file was the minimally invasive technique causing the least trauma to the adjacent soft and hard tissue (Figure 1). The Protaper file was engaged into the root canal of the tooth using a clockwise motion followed by pulling the remaining portion of the

root fragment from within the socket. However we realized that this procedure could only be used for teeth where slight mobility of the teeth was achieved with forceps prior to fracture of root. We observed the following advantages while using this technique for retrieval of fractured root piece:

1. Relatively easy technique.
2. No damage to adjacent bone and soft tissues.
3. No need for specialized instrumentation.
4. No need for assistance.
5. No suturing required for closure of wound.
6. Decreased apprehension of the patient which is normally seen with the use of surgical handpiece for tooth removal.
7. As the Protaper file is sturdy and has a good grip on the handle, a proper force can be applied with decreased chances of bending or breakage of the file.



**Figure 1:** Removal of fracture root tip of Maxillary right premolar with Protaper Endodontic File.

## Conclusion

This is an easy and simple technique which should be used for atraumatic removal of fractured root tip specially in cases where extraction of tooth is advised for orthodontic purpose. However

one should master the technique with expertise prior to its application.

## Sources of Support

NIL

## Conflict of Interest

NIL

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