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Atraumatic Technique for Removal of Broken Root Tips of Maxillary Posterior Teeth with Endodontic K File - A Technical Consideration

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Abstract

Background: Extraction of tooth often feels tricky situation for dental surgeon specially root gets fracture of maxillary posterior teeth. Maxillary premolars are often gets fracture while extracting for orthodontic treatment.

Method: In such cases complete extraction without damaging alveolar bone is necessary. Various methods are described in literature are appreciated but we require much quicker, less invasive method which here the attempt is made with the help of K file.

Results: This technique was implemented in 17 cases with successfully retrieval among 13 (76.5%) cases with average time for retrieval 4 minutes.

Conclusions: A simple and very effective method using K file for retrieving broken root tip of maxillary teeth with minimal collateral damage to the surrounding structures.

Keywords: Maxillary premolars; Fracture root tip; K- file;

Introduction

Atraumatic extraction is mandatory when concerned to do for orthodontic treatment. Maxillary premolars get fracture much often especially 1st premolars with flaring roots. Similarly grossly decayed weaken maxillary molars get fracture while extracting either at furcation area or at root tips. The palatal root fracture of maxillary molars is frequent [1]. It is due to its typical anatomy of being slender and at angulations from the crown plus course of root caries.

The extraction is considered ideal if it is painless, quick, with minimal trauma to adjacent soft tissues which leads to faster healing without creating problem for future prosthetic treatment [1]. While consideration of orthodontic treatment preservation of buccal as well as palatal cortical plates are up most important. The extraction procedure should not damage to inter-radicular bone structure. Various treatment modalities have been mentioned in literature for removal of fracture root like a bony window method above the root apex or surgical removal of bone around the root within the socket and retrieving the root fragment, removal with apex elevators, periotome, luxators syringe needle method [2-4]. Endodontic 'H' file also used for retrieval of broken root tips [5]. Raising buccal flap and use of straight probe also used as mentioned by Singh, et al. [6].

Case Description and Results

Procedure

Simple steps were used to remove fractures root tips which are as follows.

Step 1:-Judgment of fractured segment remained inside socket.

It has to be taken on the basis of the portion of root came out plus using radiograph.

Step 2:- locate patency of root canal orifice in remained fracture piece.

No 10 of no. 15 K file to be used to relocate orifice; pulp tissue should be removed.

Step 3:- Selection of file to retrieval of root piece.

The file should be used is new one preferably larger than No. 20 K file. Base on 13 cases usual choice is No. 25 K file for premolar roots and for buccal and mesial roots of maxillary molars while No 40 K file for palatal root of maxillary molars. However, No 30 and No. 35 files can be used based on diameter of orifices. The length of file either 21 or 25 is depend on accessibility in to oral cavity; and the position of root piece, and socket.

Step 4:- Application of force and movements (Figure 1)

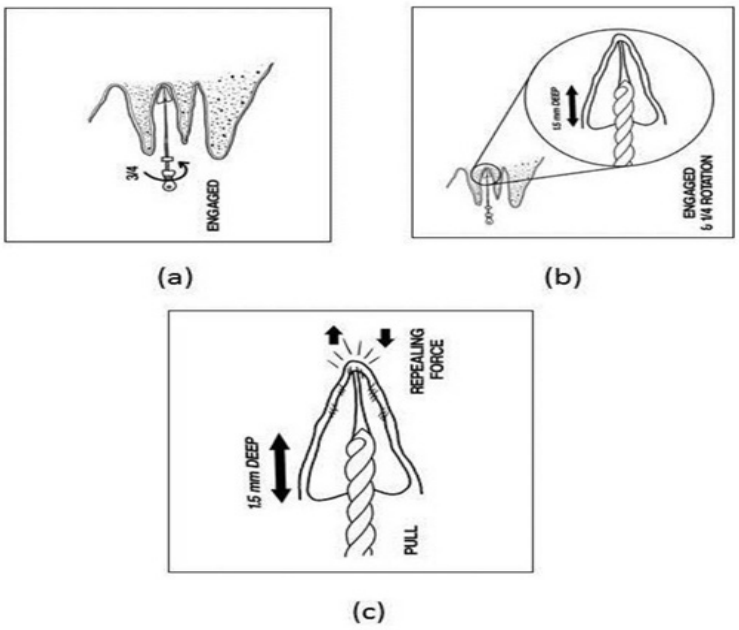

Figure 1: Schematic representation of force: **(a)** Engagement of file with root-piece with 3/4th clockwise rotation. **(b)** About 1 to 1.5mm insertion of file in to root-piece followed by 1/4th rotation. **(c)** Force should be given towards apical direction with 1/4th clockwise rotation. This will help to produce rubber band- elastic effect by apical periodontal fibres. This will repeal the root tip in opposite direction.

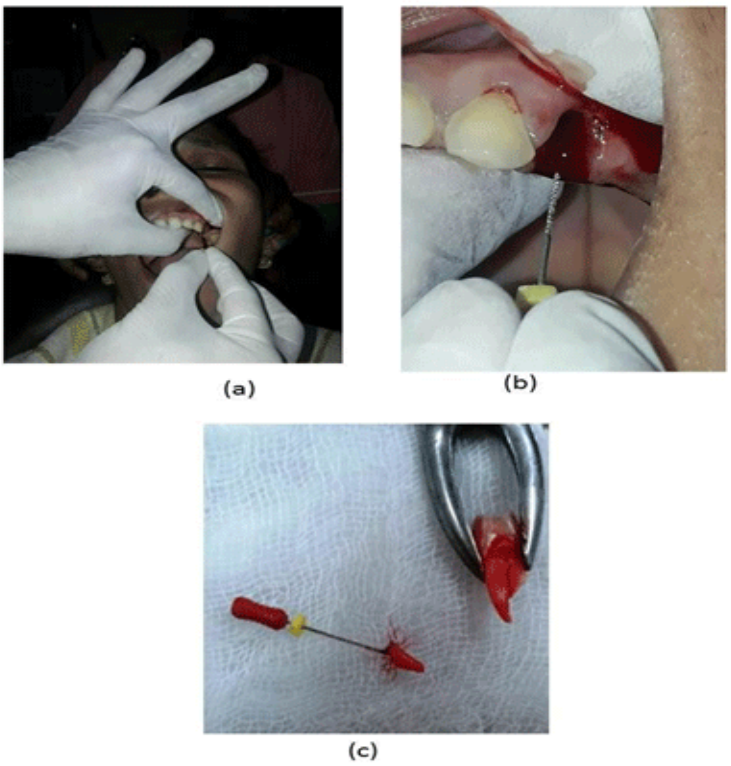

Figure 2: Retrieval of broken root piece of premolar. Supporting alveolar bone **(a);** followed by movements as mentioned earlier **(b).** The tooth and retrieved broken root piece **(c).**

After inserting appropriate number file in to orifices first 3/4th clock wise rotation should be given ensuring engaged of the file, it should be check for tug back and ensured for at least 1.5mm engagement of file with root piece. With supporting alveolar socket force should be given towards apical direction with 1/4th clockwise rotation which will help to produce rubber band- elastic effect by apical periodontal fibres which in turns to repeal the root tip in opposite direction. The clockwise rotation helps to break lateral fibres attached to cortical plates which in turns free of root piece from bony socket. After 2 -3 repetition of above movements it should be pulled out. Root piece comes along with file as shown in (Figure 2 and Figure 3). This technique was implemented in 17 cases with successfully retrieval among 13 (76.5%) cases with average time for retrieval 4 minutes.

Figure 3: Retrieval of broken palatal root piece of Maxillary molar with No. 40K file.

The technique has following advantages.

- Easy technique to carried out even undergraduate can easily perform
- As K files are readily available, no special armament or instrument required.
- K file has least chances of breakage over H file plus it is much flexible helpful in curved root. Using H file in wet canals may lead to instrument fracture [7].
- No gross anatomical disturbance.
- No damage to surrounding soft tissue
- No need of sutures.
- Less invasive technique extremely useful in orthodontic extraction cases.
- No surgical assistant is required.
- Patient friendly as less average time to retrieval with minimum or nil apprehension associated with surgical hand piece or elevator.
- It has better grip than using straight probe

Precaution to be taken in the cases where proximity of root tip to maxillary sinus is expected. This is sensitive and judgmental technique which one can master easily with expertise. Peterson advocates use of wedge principle to remove broken root piece [8]. Which should be use routinely before proceed for invasive procedures. K file is much better easily available. However; this technique is not useful at all in mandibular roots due to less elasticity of mandibular bone.

Conclusion

A simple and very effective method using K file for retrieving broken root tip of maxillary teeth with minimal collateral damage to the surrounding structures, upholding the essence of atraumatic exodontias leads to best out come in to future treatment modalities like orthodontics as well as prosthetics.

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