

Case report:

Alternative methods of Retrieval of separated Instruments – a simpler approach

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Abstract

One of the most common mishaps that occur during routine endodontic treatment is fracture of instrument inside the root canal. The separated instrument in the root canal prevents thorough cleaning and shaping procedures. Continuous pain or discomfort occurs in the involved tooth if the broken instrument is not removed or bypassed. There are several methods and techniques available to retrieve the separated instruments from the root canal. This article describes the successful removal of a broken instrument from the root canal in a simple way rather than a complex chairside procedure. This article describes two cases of instrument fragment removal namely H file Braiding technique, other rotary system with copious irrigation.

Key words: Mishaps, simple chairside technique, instrument retrieval

Introduction:

The separation of instruments during endodontic therapy is a troublesome incident, and its incidence ranges from 2% to 6% of the cases investigated (1). Occasionally during nonsurgical root canal therapy, a separated instrument in a root canal system may block access to the apical terminus. The most common causes for file separation are improper use, limitations in physical properties, inadequate access, root canal anatomy, and possibly manufacturing defects (2). The separated fragment blocks the access to thorough root canal cleaning and shaping procedure apical to the level of separation or irritates the periapex when it juts out of the root apex. This is significant in a tooth, as it affects the final outcome of the endodontic therapy (3). Hence an attempt to bypass or retrieve the instrument should be made before leaving it and obturating to the level of

separation or embarking upon surgery. Nonsurgical approach is always preferred first to remove a broken instrument and it will be influenced by the diameter, length and position of the obstruction within a canal and the type of the metallic object (4, 5). Instruments located in the straight portion of the canal can easily be removed (6). The case reports presented here are about the successful retrieval of a separated file using combination of most basic method which can be possible in any clinical setup namely H- file Braiding technique, other rotary techniques & copious irrigation.

Case Reports

Case 1

A 45 year old female patient reported to the Department of Conservative dentistry & endodontics with a chief complaint of severe pain in 46 since 15 days. On clinical examination a grossly carious 46,

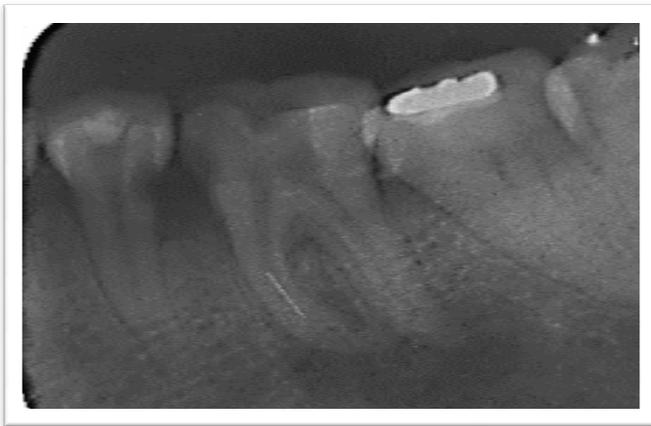
tender on percussion with draining sinus tract present on buccal gingival area. Emergency Access opening was done & patient is recalled after 3 days.

Radiographic examination showed curved mesial root canal anatomy and large periapical radiolucency present in both mesial & distal root of 46.



Preoperative Radiograph

When patient reported after 3 days, working length was determined. During BMP with hyflexsystem 20.04 was separated in MB canal in middle third.



Radiograph with separated 20.04 in MB canal

Coronal two third of MB canal was enlarged using gatesglidden drills no 1 & 2. Separated instrument was bypassed using 6, 8 & 10 no k file along with EDTA. After that file was bypassed using rotary path files no 10, 15, and 20 successfully till working length. Further BMP was done with protaper next system till X2. Separated file came out of the canal during irrigation with normal saline following X2 protaper next. After file retrieval, root canal treatment was successfully completed.



Obturation IOPA

Case 2

- A 24 year old male patient reported in our department with chief complaint of pain in 46 since 3 months. On clinical examination, deep carious lesion was present on mesial side of 46 and tooth was slightly tender on percussion and nonvital (cold test). Radiographic examination showed radiolucency present on mesial half of 46 approaching the pulp chamber, slight widening of PDL space was present with respect to mesial root. Working length IOPA was taken. During BMP with Hyflex file system 25.06 file was separated in apical third of distal canal.



Radiograph with Separated 25.06 file

Initially file was by passed using precurved no 8 k file followed by no 10, 15, 20 k file. EDTA gel was used to lubricate the file for easy bypassing. Irrigation with copious amount of diluted Naocl was done between each instrument, part of canal coronal to the separated instrument (WL 16mm) was enlarged circumferentially using protaper next file system X3 & X4 then again it was bypassed using no 15, 20 & 25 H File, which were rotated in clockwise direction to engage the separated file, the separated file successfully came out along with 25 no H file. After file retrieval, root canal treatment was successfully completed.



Obturation IOPA

Discussion:

The success of endodontic treatment is dictated by appropriate shaping, disinfection and three dimensional obturation of the root canal system. The success and failure of root canal treatment has three criteria; clinical, radiographical and histological. A separated file poses a challenge to endodontist. A separated file within the canal should always be

removed and only if it fails other techniques should be implemented. Though the clinician sticks to the guidelines recommended to minimize the risk of fracture, there is still some possibility of instrument separation in clinical practice. In order to modify the treatment plan, once this kind of mishap occurred, it is imperative for the dentist to have good knowledge about the role of separated instrument in long-term

prognosis of root canal treatment, various methods to manage it, and the best one suits for that condition. The case reports presented here are about the successful retrieval of a separated file using combination of most basic method which can be possible in any clinical setup namely H- file Braiding technique, other rotary techniques & copious irrigation. There are various advances that has come up in this regard but this simple chairside procedure is less time consuming and less complicated.

Various factors attribute to the breakage of rotary files, these factors are the canal curvature, anatomic variations, practitioner experience, co-operation from patient, frequency of use, torque and speed of rotation. The separation rate of Nickel Titanium (NiTi) rotary instruments were reported to range between 1.3% and 10.0%, whereas separation rates of stainless steel (SS) instruments were reported to range between 0.25% and 6% (7,8,9) .

Clinicians may be misled by the unjust concept that endodontic mishaps, such as fractured instruments, perforations, overfilling, etc. can be the direct cause of endodontic failure. All endodontic mishaps may

not lead to a reduced prognosis, but any error that compromises, microbial control is likely to increase the risk of a failure. Separated root canal instruments is one of the most troublesome incidents in endodontic therapy, especially if the tooth is non vital and fragment cannot be removed. In the majority of cases, the procedural mishap does not directly compromise the prognosis, unless a concomitant infection is already present.

The four treatment protocols have been suggested by the literature for management of fractured instruments in root canals: 1. Allowing the separated instrument to be retained in the canal and treating the remaining portion of canal. 2. Bypassing the separated fragment and treating the canal. 3. Retrieving the separated fragment and treating the canal. 4. Surgical approach for retrieval of separated fragment followed by treatment accordingly.

Conclusion

Successful removal is a challenge that relies on knowledge, training, familiarity with the instrument & technique, preservice & creativity. Always to begin with simple method should be employed first.

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