

CASE REPORT

RETRIEVAL OF A SEPARATED FILE USING INSTRUMENT RETRIEVAL SYSTEM

Authors : (1) Amit Kumar, (2) Anurag Singhal, (3) Vineet Vinayak, (4) Chandrawati Guha

(1) PG Student, Department of Conservative Dentistry & Endodontics, Institute of Dental Sciences, Bareilly (U.P)

(2) Professor & Head, Department of Conservative Dentistry & Endodontics, Institute of Dental Sciences, Bareilly (U.P)

(3) Professor, Department of Conservative Dentistry & Endodontics, Institute of Dental Sciences, Bareilly (U.P)

(4) Reader, Department of Conservative Dentistry & Endodontics, Institute of Dental Sciences, Bareilly (U.P)

Correspondence : Dr. Amit kumar, PG Student, Department of Conservative Dentistry & Endodontics, Institute of Dental Sciences, Bareilly (U.P) Email - amit_kumar1203@rediffmail.com

ABSTRACT : The separated instrument particularly a broken file leads to metallic obstruction, in the root canal and blocks thorough cleaning and shaping procedure. When attempts of bypassing such a fragment go in vain, it should be retrieved by mechanical devices. Instrument Retrieval System is one such device for Orthograde removal of Intra canal metallic obstructions. This clinical case demonstrates usage of Instrument Retrieval System in successful retrieval of a separated file which was tightly binding in the coronal third of root canal of mandibular right first molar.

Key words : Breakage, canal obstruction, instrument retrieval, retreatment, instrument separation

INTRODUCTION

The separation of instruments during endodontic therapy is a troublesome incident and ranges from 2-6% of the cases investigated.^{1,2} The separated fragment blocks the access for thorough root canal cleaning and shaping procedure apical to the level of separation or irritates the periapex when it jets out of the root apex. This is significant in a tooth which is non vital and associated with periapical pathosis as it affects the final outcome of the endodontic therapy. Hence an attempt to bypass or retrieve the instrument should be made before obturating to the level of separation or embarking upon surgery. Orthograde retrieval is often difficult, time consuming and the success rate ranges from 55–79%.^{2,3}

The factors influencing broken instrument removal should be identified and fully appreciated. The ability to non-surgically access and remove a broken instrument will be influenced by the diameter, length and position of the obstruction within a canal.^{4,5}

The potential to safely remove a broken instrument is further guided by anatomy, including the diameter, length, and curvature of the canal, and additionally limited by root morphology, including the thickness of dentin and the depth of external concavities.^{2,3}

A file removal system was developed to minimize the amount of dentin removal and the time required to remove a separated instrument.⁶

The prognosis of the case is dependent on the stage of canal instrumentation at the time the instrument separates. It has been suggested that separation of an instrument occurring in the later stage of canal instrumentation, especially at the apex, has the best prognosis because the canal is probably well debrided

and probably free from infection.^{1,4,7}

CASE REPORT

A 35 year old female patient was referred to the Department of Conservative Dentistry and Endodontics, Institute of Dental Sciences Bareilly with chief complain of persistent pain during mastication in relation to her lower right back teeth. Medical history of patient was non contributory.

Intra oral clinical examination revealed deep class II lesion in relation to mandibular right first molar tooth, which was slightly tender on percussion. Radiographic examination revealed a fragment of separated file in the coronal 3rd of the of mesiobuccal root canal of 46. The patient was advised retreatment in tooth 46.

During the procedure the access opening was modified and a 10 no. K-file was inserted in mesiobuccal to check for patency. A mesially angulated IOPAR revealed a broken instrument in mesiobuccal canal.

Treatment modality was carried in 3 visits.

VISIT 1

The goal of this stage was to establish straight line access to the separated file with minimal removal of dentin to conserve the root structure. Gates Glidden no. 2 and 3 of low- speed were used. It followed the path already created by the separated file when it was first brought into the canal before the breakage.

VISIT 2

The purpose of this stage was to conservatively trim away the dentin and expose the coronal few millimeter of separated instrument and loosen it.

VISIT 3

This stage involved a device that would

mechanically engage the fragment to retrieve it. Instrument retrieval system (IRS) was used to remove the instrument from the canal.

Discussion

Intra canal separation of instruments usually prevents access to the apex, impedes thorough cleaning and shaping of the root canal, thus may compromise the outcome of endodontic treatment and reduce the chance of successful retreatment.^{1,2,3}

In such cases, prognosis following an endodontic therapy depends on the condition of the root canal, (vital or non vital) tooth (symptomatic or asymptomatic, with or without periapical pathology), amount of cleaning and shaping at the level of separation in the canal and is generally lower than the one with normal endodontic treatment.^{1,8} Hence every attempt should be made to bypass or retrieve the separated instrument. The orthograde retrieval depends on cross sectional diameter, length, curvature, dentin thickness and morphology of the root, composition, cutting action (clock wise or counter clock wise) of the instrument, length, location and amount of binding or impaction of the fragment in the canal.² Today separated instruments can usually be removed due to technological advancements in vision, ultrasonic instrumentation, and micro tube delivery methods. Specifically, the dental operating microscope allows clinicians to visualize most broken instruments. In combination, the microscope and ultrasonic instrumentation have driven "micro sonic" techniques which have dramatically improved the potential and safety when removing broken instruments.⁶

The Instrument Removal System (IRS) provides a procedural breakthrough for the removal of intracanal obstructions such as silver points, carrier-based obturators or broken file segments.

The instrument with the black handle 19 gauge (1.00 mm) is designed to work in the coronal one-third of larger canals, whereas the instrument with the red handle is 21 gauge (0.80 mm) allowing it to be placed deeper into more narrow canals. Each complete instrument is comprised of a color coordinated micro tube and screw wedge.^{6,7,8}

Conclusion.

The best antidote for a broken file is prevention. Adhering to proven concepts, integrating best strategies and utilizing safe techniques during root canal preparation procedures will virtually eliminate the broken instrument procedural accident. Prevention may also be greatly facilitated by thinking of negotiating

and shaping instruments as disposable items.⁵ Simply discarding all instruments after the completion of each endodontic case will reduce breakage, lost clinical time. However, on occasion, an instrument will break in spite of the best existing technologies and techniques, the broken file segment may not be able to be retrieved. In these instances, and in the presence of clinical symptoms and/or radiographic pathology, surgery or extraction may be the best treatment option.

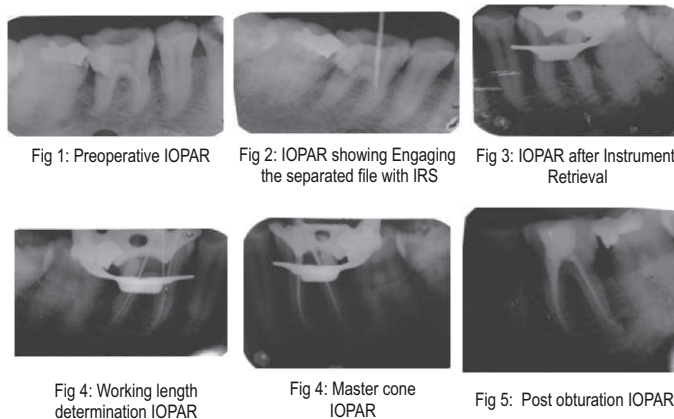


Fig 1: Preoperative IOPAR

Fig 2: IOPAR showing Engaging the separated file with IRS

Fig 3: IOPAR after Instrument Retrieval

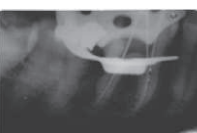


Fig 4: Working length determination IOPAR



Fig 4: Master cone IOPAR



Fig 5: Post obturation IOPAR

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