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Stapler Pin Retrieval from the Maxillary Central Incisor Root Canal: A Case Report

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Abstract: ***Multiple types of endodontic instruments have been broken by the dentists in the root canals, but limited is known about the different types of metallic objects which are being broken inside the root canals by the patient as well as the dentist. Many techniques are mentioned in the theory for the effective removal of the broken files/instruments. But no such standardized method is mentioned for successful removal of unusual foreign metallic objects. This case reports describe the successful retrieval of a stapler pin from the root canal of maxillary central incisor using H-File.***

Keywords: File retrieval, stapler pin, foreign object, H-file, instrument retrieval

1. Introduction

The success of any Root Canal Therapy depends on the complete mechanical and chemical debridement of the root canal, along with a 3-dimensional obturation and followed by coronal restoration to prevent access of microorganisms in to the shaped canal. One of the important steps of root canal treatment is to biomechanically prepare the root canal to receive the obturating material.[1] However, this is the stage where most of the endodontic mishaps occurs. And one of the most often endodontic mishap is the instrument separation inside the root canal during shaping. Separation of endodontic instruments may obstruct cleaning and shaping procedures of the root canal. The incidence ranges from 2% to 6% of the cases investigated.[2]There are several factors on which the treatment options and clinical outcome of the cases with fractured instruments depends on the position of the instrument in the canal, type of material, instrument size and canal anatomy.[3]

The consequences of both procedures ,i.e., leaving or removing broken instruments from the canal have been discussed theoretically and a variety of methodologies for managing these obstructions have been presented but there is no standardized procedure for successful removal of unusual metallic objects even in difficult cases, but a number of different techniques are recommended, such as: the use of Stieglitz pliers or a small mosquito hemostat to remove silver cones, ultrasonic instrument, operating microscopes or microtube delivery methods.[4,5]

This case report describes a rare clinical case of a stapler pin, inserted by the patient inside root canal, and its removal through non-surgical approach. Parental consent was obtained before the commencement of treatment.

2. Case Report

A 14 year old male patient was referred to the Department of Pedodontics and Pediatric Dentistry of Mahatma Gandhi Dental College and Hospital with the complain of pain in maxillary anterior region since 2 days. Detailed history revealed trauma 1 year back. On oral examination, Ellis class III fracture was seen with respect to 21, discolouration and tenderness on percussion were also present with respect to 21. Intraoral periapical radiograph of the involved tooth revealed foreign metallic object inside the root canal (Fig 1). The periapical tissue appeared normal with no associated pathology. History of the patient revealed that a stapler pin was stuck accidentally inside the affected tooth while removing the food debris from the tooth using it. The incident occurred approximately one year back. Based on the clinical and radiographic examination the tooth was diagnosed with Ellis class III fracture with respect to 21.

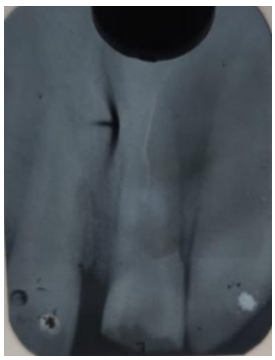

Figure 1: Preoperative radiograph showing the presence of a foreign metallic object inside the root canal of tooth # 21

The parents were explained about the treatment plan. Local anaesthesia, 2% lignocaine with epinephrine, was given at the desired site. Under the rubber dam isolation the access opening was refined using round bur. The instrument was bypassed successfully with no. 8, no. 10 and no. 15 K files (Mani, Inc., Japan), and 17% EDTA. Working length was then confirmed with periapical radiograph. H files (Mani, Inc., Japan) of no. 8 and no. 10 were used gradually along with the use of hydrogen peroxide after every use. The H files were inserted into the canals along the walls of the canals. The instrument was engaged gently and with the help of push and pull motion the retrieval of the foreign object from the root canal was done. The stapler pin was recovered from the canal (Fig 2.). A radiograph was then taken to confirm the removal of the obstruction from the canal space (Fig 3.).

Figure 2: Stapler pin recovered from the root canal

Figure 3: Radiograph confirming the removal of stapler pin

The K file No. 15 was inserted inside the root canal of tooth number 21 under the rubber dam isolation to establish the working length. Working length was then confirmed with periapical radiograph (Fig 4). Root canal preparation was done with step-back technique using 17% EDTA. Obturation was done by using sealer and gutta-percha. The access opening was sealed with the restorative resin. Patient was recalled next day for post/core placement and tooth preparation for the placement of porcelain fused to metal crown, but the patient never turned up for the remaining treatment due to the cost of the treatment.

Figure 4: Radiograph for working length determination

Figure 5: Post-operative radiograph confirming the quality of the obturation

3. Discussion

Separation of instruments in the canal during endodontic treatment may block access to the apices. Intracanal separation of instruments usually prevents access to the apex, which impedes thorough cleaning and shaping of the root canal and thus may compromise with the outcome of endodontic treatment and reduce the chances of successful treatment. This affects the long term prognosis of root canal treatment negatively. Other than the conventional files, there are a variety of objects which have been reported to break and subsequently become blocked in root canals including nails, pencil leads, toothpicks, tomato seeds, hat pins, needles, pins and other metallic objects.[6]

Many methods are described for the removal of the separated instruments or objects within root canals, such as hand instrumentation, ultrasonic devices, Masserann Kit, canal finder system or, sometimes surgical methods are employed.[7] The factors influencing the removal of broken instruments are needed to be identified and fully appreciated. The ability to access and remove the broken instrument non surgically depends on the diameter, length and position of the obstruction within a canal and skill of the operator. Although there are many technical advancements, the success rate for the removal of foreign objects lodged inside the root canals is 55-79%.[8]

In this case, the operator took a good periapical radiograph to ascertain the type of object, its location and to evaluate its surgical or surgical retrieval. The radiograph revealed the presence of a stapler pin as a foreign object. The procedure was done with the use of a simple H-file along with hydrogen peroxide. Hydrogen peroxide was used in order to create effervescence which indirectly loosens the separated foreign object in the root canal.

4. Conclusion

This case report attempt to address and report conventional techniques must be tried to remove the separated instrument before jumping to an advanced technique. Careful pre-endodontic tooth examination, observation of the preoperative radiograph and a straight line access to the foreign object inside the root canal guides its successful retrieval no matter which technique is employed.

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