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Bypassing a Broken Instruments (Clinical Cases)

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Abstract: ***In some cases, removal of a fracture instruments is impossible or undesirable. Alternatives are:leaving the instrument in place, attempt to bypass the instrument or surgical removal. The aim of this paper is to present clinical cases including bypassing the fracture instruments during endodontic retreatment. Clinical cases: the retreatment of two lower molars with broken instruments in the root canals is presented in this paper. Conclusions: Bypassing the instrument is an alternative for cleaning and shaping the root canal.***

Keywords: broken instrument, bypass, endodontic retreatment

1. Introduction

During endododntic treatment, risk of instrument fracture exists. The fragments can be stainless steel files, Ni-Ti files, a segment of spiral filler (Lentulo) or any other material left inside the canal [1, 2].

In some cases, removal of a fracture instruments is impossible or undesirable. Alternatives are:leaving the instrument in place, attempt to bypass the instrument or surgical removal [3, 4]. . Bypassing the instrument is conservative procedure if retrieval of the instrument fails. which is the technique of going around a fractured instrument with another instrument usually a smaller one. In this way the root canal beyond the fractured instrument can be clean and the fracture instrument is incorporated in the root canal filling [3, 4, 5, 6, 7].

The aim of this paper is to present clinical cases including bypassing the fracture instruments during endodontic retreatment.

2. Clinical Case 1

A 27-years-old female patient visited the dental office having pain complains and presence of submucosal abscess in area of teeth 46 and 47. Radiographic examination revealed chronic apical periodontitis, and broken instrument in mesial and distal root of tooth 46 (Fig. 1,A).

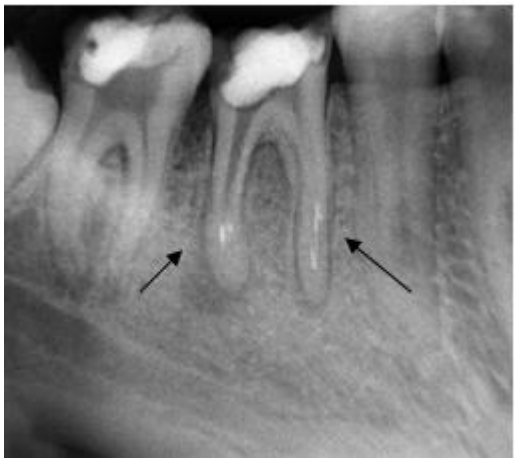


Figure 1: A)Separated files in tooth 46 in mesial and distal root.

First appointment including the following steps:

1) Diagnostic radiograph.
2) Straight line access was established. Crown-down technique was used.The coronal part was enlarged and straightend with Gates Glidden 1,2, 3 and ProTaper Sx (Maillefer, Switzerland).
3) Bypassing was started by using a size 06-08 stainless steel K-Files for searching for a way to bypass the instrument. Ultrasonic tips were used – endosonore files ISO 15 (EMS). The file was used at low power.
4) After bypassing the broken instrument, working length was established using Raypex – 5 (VDW, Germany).
5) During the shaping of the canal, irrigation with 2.5 % sodium hypochlorite was performed. Patency was check with a size 06-08 stainless steel K-file between every instrument until K file 20.
6) Intracanal dressing of Calcium hydroxide and Iodoform was placed for 5 days. The cavity was closed with a cotton pellet and temporary restoration Coltosol F.

The second appointment includes the following steps:

1) The temporary restoration was removed. Calcium hydroxide and Iodoform was removed using passive ultrasonic irrigation with an endosonore files 15 (EMS)
2) Final shaping in apical area was with K-file 25. After bypass the instrument of the canal the final root canal shaping was completed with hand files.
3) Smear layer removal was performed with a rinse of 17 % EDTA for 1 min. The canals were dried with paper points.
4) AH Plus was used as a root canal sealer and the canals were filled with cold lateral condensation technique (Fig.1, B). After root canal obturation a temporary restoration with glass ionomer cement was placed.



Figure 1: B) Bypass the fragments and the canals were obturated with sealer and cold lateral condensation technique

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3. Clinical Case 2

A 47-years-old male patient received treatment after fracture of tooth restoration. Diagnostic x-ray showed broken instrument – paste filler Lentulo in mesial-lingval root canal (Fig. 2, A). Retreatment was started because root canals were exposure a long time on bacterial action in oral cavity and not successfully performed primary endodontic treatment.



Figure 2: A) Preoperative radiograph, tooth 36. Separated root canal filler Lentulo in mesial root.

The first appointment includes the following steps:

1) Completely removal of carious dentin.
2) Crown-down technique was used. Rm file 25/.04 (Micro-Mega) stainless steel hand instrument was used for removing the sealer from coronal part. Endoflare file (Micro-Mega) was used in coronal part. The sealer was removed with rotary endodontic instruments R-Endo (Micro-Mega). R1Ni-Ti file 25/.08 – remove the filling material from the coronal third and R2 Ni-Ti file 25/.06 – remove the filling material from the middle-third of the root canal (Fig.2, B).
3) Ultrasonic tips was used - endosonore files ISO 15 (EMS).
4) Bypassing was started with stainless steel K-files a size 06-08.
5) After ensuring bypassing of the separated root canal filler we proceed to cleaning and shaping the canals using hand instruments until K-file 25. Patency was check with a size 06-08 stainless steel K-files between every instrument.
6) 2.5% sodium hypochlorite was used for irrigation. 17 % EDTA solution – for smear layer removal, applied for 1 min in the root canals.
7) Intracanal dressing of Calcium hydroxide was placed for 5 days.



Figure 2: B) Removing a part of root filling material.

The second appointment includes the following steps:

1) After removing the Calcium hydroxide in the absence of pain and exudates we proceed with root canal obturation with cold lateral condensation technique and paste AH Plus (Fig. 2, C).

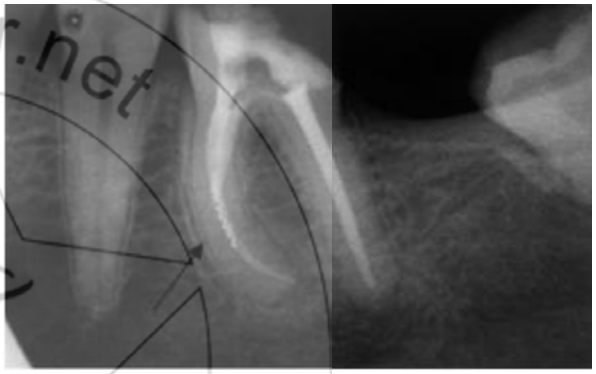


Figure 2: C) Bypass and sealing the fragment into place

4. Conclusions

If retrieval of broken instrument fails, bypassing of the instrument is alternative option for cleaning the root canal. For safe preparation of the canal during bypassing the broken instrument it is necessity to know and use appropriate armamentarium and suitable techniques.

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