Removal of Metal Posts in Retreatment of Teeth With Failed Endodontic Treatment (Clinical Cases)

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Abstract: The removal of different materials from the root canal - gutta percha, broken endodontic instruments, silver points is the key to a successful retreatment with failed primary endodontic treatment. It is often required to remove metal posts placed in the root canals in teeth with great destruction of the clinical crown. Their removal is particular importance for accessing endodontic space, cleaning and disinfection of the root-canal system. Clinical cases: The purpose of this report is to present techniques and armamentarium for removing metal posts placed in the root canal in teeth with greatly destroyed clinical crowns and the need for endodontic retreatment. The treatment of three clinical cases (in the area of 25, 36 and 32 teeth) is presented in this report. Conclusions: The removal of root canal posts provides access to the endodontic space for torough cleaning and disinfection. The posts removal carries the risk of complications associated with the formation of ledges, perforations and tooth root fractures. For the safe removal of the metal posts it is required to know the appropriate armamentarium and techniques.

Keywords: endodontic retreatment, removal of metal endodontic posts

1. Introduction

The basis of success in teeth retreatment with failed primary endodontic treatment is the removal of various materials from the root canal – gutta percha, broken endodontic instruments, silver points. This frequently can be metal posts placed in root canals in teeth with large destruction of the clinical crown. Their removal is of essential importance for accessing endodontic space and total cleaning and disinfection of the root canal system [1, 5, 6].

Intraradicular posts used most commonly are pre-fabricated metal posts. They can be cylindrical-conical, screw or cemented with a circular cross-section. Their radiopacity is similar to gutta-percha and fixing cement, and they have a module of elasticity different from that of the dentin. Intraradicular metal posts may produce tension, while in the active points overload arises in the course of the thread leading to a risk of root fracture [2, 7].

The purpose of this paper is to present clinical cases including removal of intraradicular post and core followed by endodontic retreatment.

2. Clinical Case 1

A 31 - year - old patient visited the dental office having pain complaints of tooth 25 (Figure 1) and tooth 36 (Figure 6). During clinical examination the patient had pain and sensibility to apical palpation and vertical percussion. His medical history showed that the patient is in good general condition, without allergy and sensitivity to foods and medicines.

Radiographic examination revealed not successfully performed primary endodontic treatment and placed metal screw posts, as well as the presence of periapical destruction. The filling is with insufficient length and dispersed along the root canal. Treatment plan included removal of metal posts and performing endodontic retreatment in order to keep the teeth in the dentition.

Retreatment of tooth 25

Retreatment of tooth 25 was conducted, including the following steps:

- 1) Removal the tooth crown. Complete removal of coronal restoration.
- 2) Removal the metal screw intraradicular post. Removal of the post is achieved by means of ultrasonic tip. The first step in post removal is the use of diamond coated ultrasonic tip with low frequency without cooling (ET18D Figure 3). This tip removed the cement around the post effectively which helped its loosening. Then an ultrasonic tip was used to remove intraradicular post (ETPR Figure 4). The movement of the tip is with slight pressure on the post counterclockwise for 5-10 minutes. This tip works with low power of the device and without water. When operating at higher power and duration, it is necessary for the tooth to be cooled with water to prevent overheating of the hard dental tissues.
- 3) The mechanism of ultrasonic vibration action on the post is connected with the affecting of the cementing agent adhesion with subsequent loosening of the post. In this case the cementing agent was the zinc-phosphate cement. After loosening the post, it was caught and removed using special pliers with thin jagged branches (Figure 5).
- 4) After removal of the post we passed to the next stage removal of residual cement and paste in the coronal part of the root canal by ultrasonic tip (ET20, figure 8). The sealer was removed from middle and apical part of the root canal with rotary endododntic instruments ProTaper D1-D3.
- 5) After providing the patency of root canals (second canal was revealed palatally), the next procedure followed mechanical and chemical cleaning and shaping the root canal. Crown down technique and rotary K3 nickel-titanium files were used. 3% H₂O₂ and 2.5% sodium hypochlorite were used for short-term medication. 17% solution EDTA was used to remove the smear layer, applied in the root canal for 1 min.
- 6) Intracanal dressing of calcium hydroxide was placed for 5 days.

7) After removal of the calcium hydroxide in the absence of pain and exudate we proceed with root canal filling by cold lateral condensation and paste AH Plus (Figure 2).



Figure 1: Diagnostic radiograph of tooth 25



Figure 2: Post - retreatment radiograph after filling the root canals of tooth 25



Figure 3: Diamond-coated ultrasonic tip ET18D – used to remove dentin calcification or restorative materials in pulp chamber



Figure 4: Ultrasonic tip (ETPR) for removing of intraradicular posts



Figure 5: Forceps – for clamping the posts

Retreatment of tooth 36

Retreatment of tooth 36 was performed including the following steps:

- 1) Removal the tooth crown. Complete removal of coronal restoration.
- 2) Removal the metal screw intraradicular post. Ultrasonic tip was used to loosen of the post. Gripping and removal of the post is accomplished with hollow tube holder used for adjusting the fit of the screw metal post.
- Residual cement from the coronal part of the root canal is removed using an ultrasonic tip (Figure 8 and Figure 9). The sealer is removed with rotary endodontic instruments ProTaper D1-D3.
- 4) After providing the patency of root canals we proceeded their mechanical and chemical cleaning and shaping. Crown down technique and rotary K3 nickel-titanium files are used for shaping the root canal. Because of the broken endodontic instrument in the media-lingual canal and impossibility to remove it we bypassed along the broken segment and this allowed the root canal to be completely disinfected. 3% H2O2 and 2.5% sodium hypochlorite were used for short-term medication. 17% solution of EDTA is used for removing the smear layer.
- 5) Intracanal dressing of calcium hydroxide and iodoform was placed for 5 days.
- 6) After removing the intracanal dressing, in the absence of pain and exudate we proceed withroot canal filling by cold lateral condensation and paste AH Plus (Figure 7).



Figure 6: Diagnostic radiograph of tooth 36



Figure7: Radiograph after retreatment and filling the root canals of tooth 36



Figure 8: Ultrasonic tip (ET20) - used in the coronal part of root canal for removing paste, silver points, broken endodontic instruments



Figure 9: Ultrasonic tip (ET25) - used in the coronal part of root canal for removal of broken endodontic instruments

3. Clinical Case 2

Retreatment of tooth 32

A 63- years- old patient received treatment with complaints of pain of tooth 32. During objective clinical examination pain was established in apical palpation and vertical percussion of tooth 32. It was also found mobility of available bridge structure. Diagnostic X-ray revealed poorly conducted primary endodontic treatment, and placed a metal screw post as well as the presence of periapical destruction. (Figure 10).

Endodontic retreatment of tooth 32 was performed including the following steps:

- 1) Removal of the bridge construction. After its removal it is found that there is a fracture of the coronal portion of the post on tooth 32.
- 2) Removal of the metal screw intraradicular post. Removal of the post is achieved by means of ultrasonic tip and Masseran kit (Figure 12).
- 3) By using an ultrasonic tip residual cement is removed (Figure 8). The sealer is removed with rotary endodontic instrument for retreatment ProTaper D1-D3.
- 4) After ensuring the patency of the root canal we proceed to its mechanical and chemical treatment using the crown down technique and rotary K3 nickel-titanium files. 3% H₂O₂ and 2.5% sodium hypochlorite are used for shortterm medication. 17% EDTA solution was used to remove smear layer, applied for 1 min in the root canal.
- 5) Intracanal dressing of calcium hydroxide was placed for 5 days after drying of the root canal.
- 6) After removing the calcium hydroxide in the absence of pain and exudate proceed with filling of the root canal by cold lateral condensation and paste AH Plus, and a fiber post is placed (fiber reinforced composite post, Figure 11).



Figure 10: Diagnostic radiograph of tooth 32



Figure11: Radiograph after retreatment and filling the root canals of tooth 32 and a fiber post placement





Figure 12: Removal of the broken part of the post by using Masserann micro kit (a, b)



Figure 13: Masserann micro kit

Masserann kit (Micro-Mega, France) is a microtubular device designed specifically for removing intraradicular metal objects such as broken files, silver points and radicular posts [7]. It has been used for over 40 years (Figure 13). The success is between 73% and 44% depending on the tooth which isutilized (anterior or posterior). There is limited use in posterior teeth with thin and curved root canals. Mainly it is used in the coronal third in wide root canals. There is a

different gauge microtubes - from 1.2 to 1.5 mm external diameter. They are introduced into the created space and grip the coronary part of the fractured segment.

Basically, there is a risk associated with the weakening of the root walls and subsequent fracture of the root. So, we need to carefully analyze and consider the possible errors of previous treatment and evaluate the risk and benefits of further treatment [8,9].

In order to reduce the risk of accidents (ledges, perforations and root fractures) during the removal of intraradicular posts,

it is necessary to make an appropriate plan for each case [3, 4]. Radiographic examination is of great significance for establishing the quality of endodontic treatment. However, it is not always possible to ascertain the reason for the failure of primary treatment only by means of x-ray.

4. Conclusions

Removing the posts from root canal provides access to endodontic space for thorough cleaning and disinfection. Removal of the post leads to the risk of complications associated with the forming of ledges, perforations and fracture of the tooth root.

For safe removal of the posts it is necessary to know and use appropriate armamentarium and suitable techniques.

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