Endodontic Reintervention Of The Maxillary First Premolar: A Case Report

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Abstract

Objective: This case report describes an endodontic reintervention of the maxillary premolar teeth.

Methods: A 57-year-old female patient came to RSGMP UNHAS with complaints of pain in maxillary teeth when chewing or biting, which has been felt since the last one month. This tooth was treated about 2 years ago. On clinical examination, there was a fractured composite restoration. Radiographs revealed inadequate root canal obturation and periapical radiolucency. Based on subjective and objective examination the dental diagnosis was previously treated.

Result: After treatment the subjective and objective complaints of the patient have disappeared and when control is carried out one year after treatment it appears on the radiological picture the lesion has improved.

Conclusion: Endodontic reintervention is an effective alternative that can be done to treat endodontic failure.

Keywords: Endodontic Failure, Endodontic Reintervention, Previously Treated.

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Introduction

Root canal treatment is reported to have a success rate of 86-95%. The success rate of endodontic treatment is influenced by the cleaning, shaping and obturation of the root canals. Treatment failure rates occur in 14-16% of patients due to anatomical variations, bacterial infections due to inadequate cleaning, shaping, obturation, and coronal sealing which can lead to reinfection of the periapical tissue.

Failure of root canal treatment can cause persistent symptoms such as discomfort when chewing and even severe pain requiring re-intervention or root canal re-treatment. The success of root canal re-intervention depends on factors such as bacterial debridement, removal of residual obturation material from the root canal, root canal preparation, good and hermetic root canal filling, and good restoration. One of the endodontic re-intervention treatments that can be done is non-surgical endodontic reintervention.

Case Report

A 57-year-old female patient came to RSGMP UNHAS with complaints of pain in the right back of the upper jaw when chewing or biting which has been felt since the last one month. This tooth was treated about 2 years ago. On clinical examination, there was a fractured composite filling in the occlusal and distal part of the maxillary right first premolar, positive percussion, negative palpation, normal mobility. The radiological features shows periapical radiolucency, it appears that there is an untreated obturation. Base on subjective, objective and radiographic examination, the diagnosis of 14 previously treated teeth was confirmed.

Case Management

During the first visit, anamnesis, subjective and objective examination, radiological examination, CIE (Communication, Information, Education), and informed consent were carried out. Furthermore, the isolation of the work area with a rubber dam, rewalling at the distal part, was carried out by accessing the cavity on tooth 14 with an endo access bur. The gutta percha in the buccal canal was removed with Headstrom file #20 and xylol solution. Figure 1

Explore the palatal and buccal canals using K-fle # 10, # 15. Determination of the root canal working length by apex locator (Densply) confirmed radiographically (buccal root 22 mm, palatal root 20.5 mm). Figure 3 Preparation of buccal and palatal canals using a protaper gold rotary instrument (Densply) with # S1-F1. Irrigation with 5.25% NaOCl, 17% EDTA, 2% CHX and sterile aquadest at each turn of the irrigation solution, and agitation with endoactivator. The root canals were dried with sterile paper points, application of medicament calcium hydroxide paste (UltraCal XS, Ultradent) and temporarily filled.

At the second visit, a subjective examination was carried out without any patient complaints. On objective examination, palpation and percussion were negative, the gingiva around the teeth was normal. Then the rubber dam was installed. The temporary restoration were opened, the root canals
were irrigate with 5.25% NaOCl, 17% EDTA, 2% Chlorhexidine gluconate, agitated with an endoactivator and a distilled water solution every time the irrigation solution was changed. The root canal was dried with paper points and obturation using the single-cone technique using gutta-percha and AH-Plus sealer (Dentsply). After that, the gutta-percha was cut up to 1 mm below the orifice and restored temporarily. Figure 4

At the third visit, control of root canal treatment was carried out, normal subjective and objective examinations, so that it was followed by root canal preparation for the installation of prefabricated fiber posts (Densply). Taking two-thirds of the coronal gutta-percha using a GGD (Gates Glidden Drill) followed by preparation of the root canal using a drill according to the size of the post used. Then a try-in post was carried out, confirmed by radiographs and inserted using self-adhesive resin cement followed by a core built up (Core It). Figure 5

Gingival management using a retraction cord followed by the preparation of the crown with porcelain material. Double impression maxillary using elastomeric impression material and mandibular impressed with irreversible hydrocolloid, making bite registration to match tooth color using Vitapan 3D Master shade guide and getting 2R 1.5 tooth color.

The next visit was insertion of zirconia porcelain crown, using self adhesive cement. Figure 7

Control was carried out 1 week after insertion of the zirconia crown. No subjective complaints. Radiology shows improvement of periapical lesions. Figure 8

Control 1 year after endodontic reintervention, no patient complaints, negative palpation and percussion, normal gingiva, radiological picture showed improvement in periapical lesions. Figure 9

**Discussion**

Tooth defects that have been treated with endodontic treatment are mainly caused by reinfection of the root canal system. The microorganisms may be persistent microorganisms, or microorganisms that get inside the root canal after treatment due to coronal leakage, root canal treatment processes such as inadequate cleaning, shaping, obturation and final restoration.

The probability of successful endodontic reintervention ranged from 62% - 85.9%. It is important to know the causes of previous treatment failure so that we can determine the appropriate treatment, whether by reintervention both surgical and nonsurgical or by doing an extraction

Endodontic failure in this case was caused by underfilling of the root canal, untreated root canals and also inadequate coronal sealing.7 The treatment procedure performed was non-surgical endodontic reintervention begins with removing the initial restoration, obtaining material for obturation of the root canal, and adequate cleaning and shaping.

Some obturation material removed techniques can be performed manually, rotary instruments, ultrasonic instruments, heat systems, and solvents. Usually used in combination.

In this case the the Hedstrom File was performed. The most frequently manual instrument used for removal gutta-percha and sealers from root canals. How to use it, first insert the K-file between the gutta-percha and the wall of the root canal after there is a gap, the H-file is inserted according to the size of K-file and rotated clockwise. Pressure towards the apex must be avoided so that the guttppercha is not pushed against the apex. This H-file has greater cutting efficiency to remove gutta percha.4,8

The use of solvent agents is recommended because it can help remove gutta-percha without damaging the tooth tissue. Various solvent agents include chloroform, xylol, and eucaliptol. In this case, xylol is used. Xylol is a strong solvent agent and effectively dissolves gutta-percha.4,8,9,10

After removal of the root canal filling material, the clinician should regain access to the apical via the existing root canals. In the case of endodontic reintervention, the usual cleaning and shaping techniques were used, with emphasized irrigation to obtain debridement and disinfection. Radiographs were used to evaluate work length and results of preparation and obturation.4

In this case, Protaper Gold rotary file were used with the Crown-Down Presuless preparation technique, first preparing the coronal third, thus providing easier access to the apical third, reducing extrusion of debris to the apical and more effective irrigation of the apical third of the root canal. Protaper Gold rotary file. (Dentsply) is one of the more flexible Ni-Ti files, resistant to cyclic fatigue, can maintain root canal centering which effectively and efficiently reduces failures during preparation.11 Fiber post are used in this case because they have a modulus of elasticity that is almost the same as dentin, are well adapted, are not corrosive and can spread pressure throughout so as to prevent root fracture.11,12 The restoration used is a porcelain crown (zirconia) restoration. This restoration has good strength, durability and aesthetics, is biocompatible and has a smooth surface. After treatment the subjective and objective
Figure 1  Initial clinical photo and radiograph

Figure 2  Radiograph of removed guttapercha

Figure 3  Clinical photos and radiograph of working length measurements

Figure 4  Try in gutta-percha and obturation

Figure 5  Gutta-percha cutting and post insertion

Figure 6  Insertion of a temporary crown

Figure 7  Clinical photo and radiograph of zirconia crown insertion

Figure 8  Clinical and control radiographs 1 week after insertion
complaints of the patient have disappeared and when control is carried out one year after treatment it appears on the radiological picture the lesion has improved.

Conclusion

Endodontic treatment failure can be caused by various factors such as inadequate cleaning, shaping, obturation and coronal sealing. One of the treatments that can be done is non-surgical endodontic reintervention.

In this case, after the treatment was carried out, the patient’s subjective and objective complaints was healed and when control was carried out one year after treatment, the radiological features of the lesions had improved. It can be concluded that endodontic reintervention must be carried out with special tools and expertise and requires collaboration between dentists and patients in order to achieve maximum results.

Acknowledgment

None.

Conflict of Interest

The authors affirm no conflict of interest in this study.

References