

Surgical Treatment of Symptomatic Overobtured Maxillary 1st premolar:- A Case Report

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ABSTRACT

Root canal treatment failure relies on several factors. Overfillings, insufficient fillings, missing canals, failure to provide a complete apical plug, and impermeability of coronal restoration are some of them. Failed root canal procedure might not always manifest itself immediately after treatment. Sometimes, root canal treatments, which have not been performed well, can manifest themselves with severe pain or in the form of large periapical lesions after considerable time. Periradicular resection may be considered as a treatment option in lesions that are too large to be treated, or in case of unretrievable extruded fragments but retreatment without surgery should be attempted beforehand.

Keywords: overfilling; retreatment; periapical surgery

INTRODUCTION

The success of endodontic treatment largely relies on effective chemo-mechanical debridement and fluid-tight seal. (1) Ideally, endodontic filling materials should remain confined within the tooth structure and terminate at cement dentinal junction (2)(3) In clinical endodontics, overfilling is not uncommon, particularly in cases involving over-instrumented root canal apices, immature, resorbed roots. (4) It is widely acknowledged that teeth which are over-instrumented and overfilled tend to have a higher failure rate (Bergenholtz et al., 1979; Swartz et al., 1983; Seltzer, 1988). (4) Mechanical irritation by overextension can lead to an inflammatory reaction due to the presence of overextended material. (2) Despite its inert nature, if not addressed, it may result in a chronic inflammatory reaction and potentially lead to pain. (1)

Treatment failures associated with extruded gutta-percha (GP) can arise from factors such as persistent root canal infection, reinfection due to bacterial transportation during over-instrumentation, and a foreign body reaction triggered by the extruded material itself. These failures can be managed using non-surgical methods, surgical methods, or a combination of both. (5)

This article aims to present a case involving a tooth with overextended gutta percha presenting the dilemma clinician faces on how to remove the gutta-percha. (2)(4)

CASE REPORT

A 34-year-old male was referred to the endodontic unit for retreatment of the maxillary right first premolar (tooth 14). The tooth had undergone endodontic treatment five months earlier but had not received a final restoration following the procedure and patient complained of moderate pain intermittently which aggravated on mastication palpation of buccal vestibule [Figure 1]. Upon clinical examination the tooth was tender to percussion and palpation of buccal vestibule in the 1st premolar region. Radiographic evaluation indicated presence of overextended gutta percha in both buccal and palatal roots. [Figure 2].



Figure-1: Preoperative clinical picture of unrestored right maxillary 1st premolar

Initially, a conservative retreatment approach was presented to the patient which involved removal of overfilled gutta percha. Approval for the treatment was obtained, and local anesthesia was administered for the patient's comfort. The access cavity was opened, and the gutta-percha in the coronal third region was removed using Gates Glidden burs and in the middle section by H files. For removal in apical region with an H-file (size 25) it led to the breakage of gutta-percha beyond the apical foramina. [Figure 3].

The patient was informed about the endodontic complication that had occurred, and different treatment options were discussed with him. The patient agreed to the surgical treatment as he was keen to preserve the tooth and declined the option of extraction. An informed consent was taken and the surgical procedure was planned.



Figure-2: Overextended filling material w.r.t 14



Figure-3: GP removed from both canals and apical segment fractured beyond apical foramen

Surgical procedure

Under local anesthesia (2% lignocaine), full-thickness flap was raised revealing the underlying bone, periosteum. Osteotomy site was created using Lindemann bur to expose the root ends. [Figure 4].



Figure-4: Full thickness flap raised and osteotomy site created

Complete curettage was performed, along with granulation tissue removal which led to removal of the extruded gutta percha fragments. [Figure 5].



Figure-5: Extruded GP fragments removed

The apicoectomy of the roots was done using a fissured tungsten carbide bur, 3 mm from the radicular vertex. Retro cavities were created using ultrasonic tips, followed by the filling of the cavities with Biodentine .[Figure 6]. The flap was repositioned and sutured using 3-0 black silk suture.



Figure-6: Root resection and retro preparation with biodentine

The patient was prescribed oral medications, including antibiotics and analgesics, to manage postoperative inflammation and pain. Patient was recalled after 1 week for suture removal and there were no post-surgical complications. After 1 week the patient was completely asymptomatic with no tenderness to palpation and then obturation was performed after thorough chemo mechanical debridement of the canals. [Figure 7].



Figure-7: Obturation w.r.t 14

DISCUSSION

Endodontic complications are rare, even with meticulous endodontic treatment. However, it is crucial for clinicians to have the necessary skills to effectively manage such complications. (1) One such complication is the over-obturation of root canals, which can result in neurological issues such as anesthesia or paresthesia and may delay peri-apical healing. The success rate of over-obtured cases is considerably lower (75%) compared to the general success rate of 85–95%. Additionally, overextended material can lead to unpredictable interactions between the host defense mechanism and root canal filling materials. (1) It can trigger histological reactions ranging from mild periradicular

inflammation to severe necrosis of the periodontal ligament. Consequently, some authors suggest that obturating the root canal short of the radiographic apex may enhance the prognosis of endodontic treatment, whereas over instrumentation and overfilling can compromise its success rate. (3)

In this case, the foreign body likely triggered a chronic inflammatory reaction, resulting in pain. (1) Non-surgical endodontic treatment or retreatment is less complex than surgical treatment and is generally more acceptable to patients therefore initially retreatment was attempted. (5) Over-obturation of canals becomes challenging to address if gutta-percha breaks beyond the apex. This condition complicates the procedure and often necessitates more invasive treatment options. (1) similar condition occurred in the present case such that the inability to remove the extruded material non-surgically required the use of invasive treatment methods. (1) Thus, the retrograde surgical approach was selected. (6) A conservative surgical procedure was carried out which involved the removal of infected tissues by creating a smaller osteotomy site. (7) The extruded fragments were removed via curettage, followed by an apicoectomy and the placement of Biodentine as the root-end filling material. (7) Biodentine was chosen as its main clinical advantage is its quick setting time of 12 to 15 minutes, which offers a clear benefit over MTA's 170-minute setting time, as prolonged setting increases the risk of partial material loss. (8)

CONCLUSION

This case report highlights the successful management of extruded gutta-percha using a conservative surgical approach. The literature clearly indicates that the success rate of this treatment modality is heavily influenced by case selection. Therefore, precise diagnosis and careful case selection are essential to making this approach a viable option for addressing such endodontic complications.

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