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Case Report

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NON-SURGICAL ENDODONTIC MANAGEMENT OF A MAXILLARY CENTRAL INCISOR WITH OVER EXTRUDED GUTTAPERCHA: A CASE REPORT

Dr. Priyanka Panikkar[1]*, Dr. Lalitagauri Mandke[2], Dr. Radhika Navare Kulkarni[3], Dr. Leena Padhye[4]

[1]BDS, Postgraduate Student, [2]Professor, [3]Associate Professor, [4]Professor and Head,
Department of Conservative Dentistry and Endodontics, DY Patil University School of Dentistry, Nerul, Navi Mumbai.

***Corresponding Author: Dr. Priyanka Panikkar**
BDS, Postgraduate Student, Department of Conservative Dentistry and Endodontics, DY Patil University School of Dentistry, Nerul, Navi Mumbai.

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ABSTRACT

Foreign body extrusion beyond the apex of the tooth will elicit an inflammatory response in the periapical tissue .In this case report the patient gave a history of root canal treatment initiated 2 years back, she complained of pain and discomfort with respect to 11. On radiographic examination 11, 12 presented with a huge periapical lesion along with the presence of a foreign body (gutta percha) embedded in the lesion. Non-surgical root canal treatment was initiated and the tooth was kept under observation with repeated followups. A 9 month follow up radiograph revealed periapical healing along with resolution of symptoms.

KEYWORDS: Foreign body extrusion, gutta percha, Periapical lesion.

INTRODUCTION

An important determinant for successful endodontic treatment is that the obturation material be confined within the pulpal space.[1]

Over-extension of a foreign body beyond the apex will result in mechanical irritation, which will elicit an inflammatory response in the periapical tissue. Foreign body reactions can be elicited because of the presence of separated instrument, sealer cements, obturating materials, cotton etc. Over-extension of guttapercha is generally seen in cases with over instrumentation, immature apex and resorption.[2]

Gutta percha is well tolerated by the periapical tissues, therefore many a times, the healing of the periapical tissue is not hampered by the presence of gutta percha.[3]

The present case report demonstrates successful non-surgical management of overextruded gutta percha in the periapical lesion.

Case report

A 48 year old female patient reported to the Department of Conservative Dentistry and Endodontics, D. Y Patil School of Dentistry, Nerul, Navi Mumbai with chief complaints of pain and discomfort with respect to 11. The patient gave a history of root canal treatment initiated 2 years back.

On inspection the tooth was tender on percussion. A temporary restoration was present on 11. There was no evidence of swelling or sinus tract around the tooth.

Radiographic examination of the tooth revealed the presence of a radiopaque foreign body embedded within a large periapical lesion. The periapical lesion was involving the roots of 11 and 12. The radiopacity was suggestive of gutta percha. Also the patient mentioned that she had been informed by the previous dentist about the unsuccessful endodontic treatment and over extruded gutta percha. The earlier dentist had attempted retreatment, but he could only remove the obturation from within the tooth; he was unable to remove the over-extruded gutta percha, which got further pushed into the periapical area.

No obturation material was seen in the root canal of # 11 (**Figure 1**). The patient was explained about the various treatment options that could be considered to treat the case and was also appraised about its risks and limitations. The patient was reluctant to get a surgical treatment done and therefore non-surgical root canal treatment was initiated and the tooth was planned to be kept under observation.

Initially the access opening was modified with respect to 11 and access opening was done with 12 as the vitality testing (cold test) of 12 gave negative response. Copious irrigation was done with sodium hypochlorite and saline. The working length was determined by radiograph and confirmed with apex locator (**Figure 2**). Cleaning and

shaping was done by circumferential filing for #11 with K file (Mani, Japan) upto master apical file size number 80; #12 was prepared with Protaper hand files (Dentsply, Maillefer, Switzerland) upto size F2. A calcium hydroxide dressing (Prime Dental, a formulation of calcium hydroxide and barium sulphate) was placed in the canal and a temporary restoration was placed on the tooth.

The patient was recalled after 7 days. The pain and discomfort had reduced considerably and the canal was dry; so it was decided to proceed with obturation. The canal was irrigated with saline. Chlorhexidine was used as a final rinse, the canals were dried with paper points. 11,12 were obturated with gutta percha and AH PLUS sealer (DeTrey, Dentsply, Konstanz, Germamy) by lateral compaction technique. An immediate postoperative radiograph after obturation was taken in which slight periapical extrusion of the sealer was seen in #11 (**Figure 3**).

The patient was recalled for a regular follow-up after one week, which was then followed by 2 weeks,4 weeks and a 9 month follow up. The final 9 month follow-up radiograph revealed that the tooth showed no clinical symptoms along with progressive periapical healing (**Figure 4**).

Permanent composite restoration was placed immediately after obturation of 11 ,12.

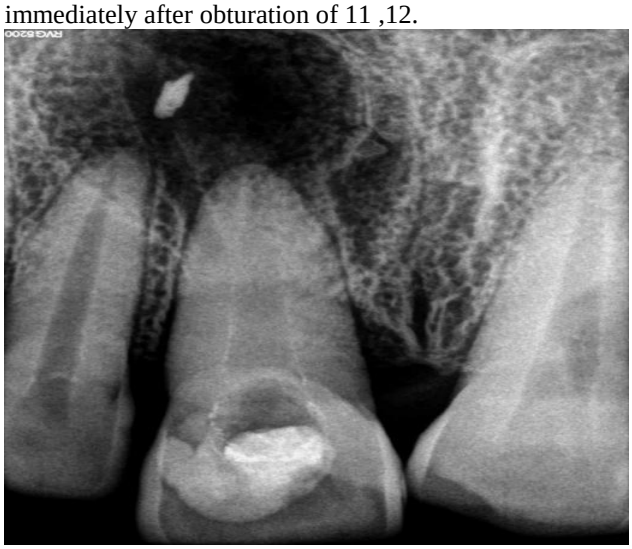

Figure 1: Pre- operative image.

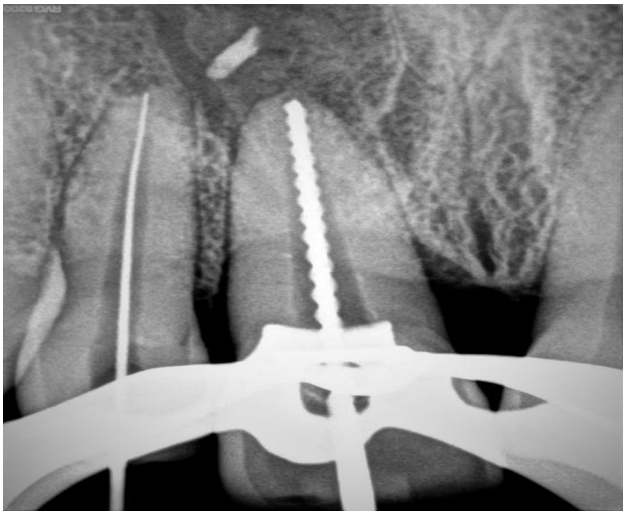

Figure 2: Working length determination done.

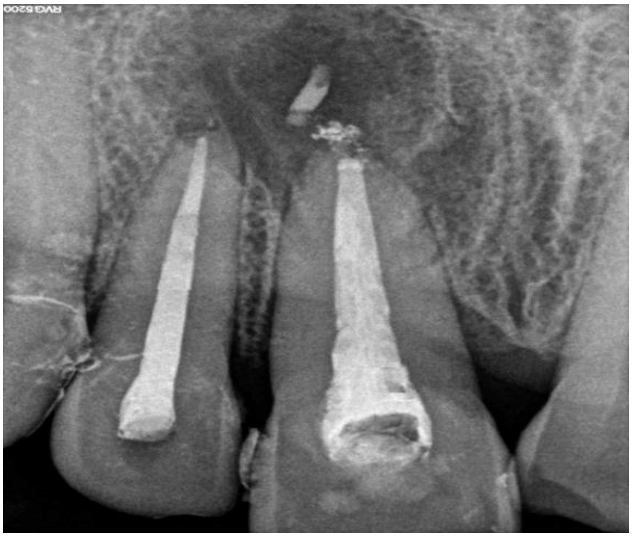

Figure 3: Immediate postoperative radiograph.

Figure 4: 9 month follow up radiograph.

DISCUSSION

Before commencing with any dental procedure, it is necessary to consider all interdisciplinary treatment options in terms of time, cost, prognosis and potential for

patient satisfaction. Endodontic failures must be evaluated so a decision can be made among non-surgical retreatment, surgical retreatment, or extraction. There is a general consensus that non-surgical root canal retreatment is preferred to surgical treatment, simply because the former is less invasive, as well as less traumatic to the patient. In our case, the patient was insistent on a non-surgical approach, and was willing to report for regular follow up. Hence this treatment option was decided.

Removing overextended material is one of the most challenging stages during endodontic retreatment. There is always the possibility of the material getting pushed further periapically during removal, which happened in our case. Since it was impossible to remove the gutta percha by non-surgical technique, it was decided to let it remain in the periapical region. The patient was informed that if this treatment option failed, he had to go for endodontic surgery.

Gutta percha is an inert material hence it is not known to cause any harmful effects to the tissue. It is stated that the success rate of gutta percha is higher when it is confined within the canals; overextension leads to poor prognosis.[4,5,6]

Sjogren et al studied the tissue response in guinea pigs of gutta-percha extruding beyond the apex using subcutaneously implanted Teflon cages. The study showed that large pieces of gutta percha when extruded gets encapsulated by collagen and surrounding tissues and it is free of inflammation. On the other hand, fine particles of guttapercha resulted in a localised tissue response which was intense and it showed the presence of macrophages and giant cells which is one of the major reasons for the impairment in the healing process.[7]

Zinc oxide from gutta percha cones are cytotoxic and can evoke an inflammatory response.[8,9]

The obturating material should extend upto the apical constriction, slightly short of the apex (0-2mm) and should not invade the periradicular tissues,[10,11] but in certain cases this becomes difficult to manage and the sealer gets extruded in the periapical tissue. This happened in our case, as there was lack of good apical stop. It is stated that this material eventually gets solubilized in the tissue fluid or gets phagocytosed.[12]

AH PLUS has an antibacterial effect and shows local tissue repair which is attributed to its low solubility rate. In various studies AH PLUS shows the formation of mineralised tissue histologically in the root canal walls of periapical region.[13]

The major reasons for failure of an endodontic treatment is improper debridement of the canal, presence of bacteria in the canal, poorly obturated canal and coronal microleakage. For success of the endodontic therapy it is imperative to avoid or minimize the above mentioned reasons leading to endodontic failures.[14]

In our case, failure in the earlier endodontic treatment may not have been due to over-extruded gutta percha, it may have been due to inadequate cleaning and shaping in 11. Once meticulous biomechanical preparation of the canal was carried out, the periapical lesion healed, in spite of the presence of the retained gutta percha. Tooth 12 was nonvital, and was previously not treated, so endodontic treatment of 12 also may have contributed to the healing of the lesion.

Apical constriction, which has the narrowest diameter, is generally present 0.5-1mm short of the apical foramen. When instrumentation is carried out beyond the apical constriction, this area gets violated which eventually affects the process of healing.[15]

Removal of irritants from the root canal system and its total obturation results in repair of inflamed periradicular tissue. Depending on the extent of tissue damage, repair varies from a simple reduction and resolution of inflammation to a more complex regeneration, involving remodelling of bone, periodontal ligament and cementum. Repair of the lesion, therefore, may take days to years.[16] The process of healing begins with inflammation and it gets resolved by removal of antigens that are instrumental in inducing the tissue response.[17]

Calcium hydroxide as a material is known to promote healing in many cases.[18] At a high pH calcium hydroxide dissociates into calcium and hydroxyl ions which is said to inhibit the enzymatic activities of microorganisms. Its antimicrobial property along with its ability to promote hard tissue formation makes it the material of choice to promote periapical healing.[19-23]

CONCLUSION

Nonsurgical retreatment should undoubtedly be the first choice for managing endodontic failure cases, when access to root canal is possible.

This case report describes successful management of a large periapical lesion with an embedded foreign body by a non-invasive, conservative approach. It highlights the importance of thorough and meticulous canal disinfection protocol during endodontic procedures, to ensure endodontic success.

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