

Intentional Replantation of Permanent Mandibular First Molar to Remove Overextended Gutta Percha: A Case Report

Sanchit Kumar¹, Avninder Kaur², Reetu Singh³, Neha Kashav⁴, Tshering Yangkila Bhutia⁵

Received on: 12 April 2023; Accepted on: 30 May 2023; Published on: 31 August 2023

ABSTRACT

Intentional replantation has been traditionally accepted as last resort in treatment of teeth where surgical endodontic treatment is contraindicated. Iatrogenic breakage of Gutta percha beyond apex does predispose such treatment needs, especially, where vital structures surround the operational area. This case report describes a case of adolescent male individual where iatrogenic endodontic complication was successfully managed and presents one-year follow-up of uneventful healing.

Keywords: Case report, Intra-operative complications, Overextended Gutta percha, Tooth replantation.

Dental Journal of Advance Studies (2023): 10.5005/djas-11014-0003

INTRODUCTION

Success of endodontic treatment depends upon the mechanical debridement, chemo-mechanical preparation, and fluid tight seal. Obturation of a root canal is considered successful, if it is within the confines of root canal space. Overextension of Gutta percha leads to mechanical irritation of the peri-apical tissues despite the inert nature of it. If left untreated can lead to chronic inflammatory reaction in the peri-apical tissues and might lead to pain. If non-surgical attempt fails to retrieve Gutta percha peri-apically and whereas surgical option is extremely challenging to the dentist, the only option left is intentional replantation.

Historically, intentional replantation is a surgical procedure used for the treatment of persistent endodontic infection of a tooth. It is defined as "deliberate extraction of a tooth and after evaluation of root surfaces, endodontic manipulation, and repair, placement of the tooth back into its original socket."¹ In the past, this treatment procedure brought in negative impression by many clinicians. Moreover, Grossman² and Weine³ advocated intentional replantation as "a procedure of last resort." However, a recent systematic review reported from eight different studies, judges a success rate of this procedure between 80 and 94%.^{4,5} Thus, intentional replantation can be considered as a viable treatment option in our routine dental practice as compared with periapical surgery or other conventional endodontic methods.^{6,7} Nevertheless, intentional replantation does come with various postoperative complications, external root resorption, and replacement resorption being dominant one.^{3,8} From the current evidence, intentional replantation can be done in patients with persistent endodontic infection; however, it has been seldom reported in the literature in case of overfilling beyond apex.

The current case report describes one such case of intentional replantation for managing over-obtured right mandibular permanent first molar in which Gutta percha was 4–5 mm over extruded.

^{1–5}Department of Pediatric and Preventive Dentistry, Bhojia Dental College and Hospital, Bhud, Baddi, Himachal Pradesh, India

Corresponding Author: Avninder Kaur, Department of Pediatric and Preventive Dentistry, Bhojia Dental College and Hospital, Bhud Baddi, Himachal Pradesh, India, Phone: +91 9814319434, e-mail: avninder21@yahoo.com

How to cite this article: Kumar S, Kaur A, Singh R, et al. Intentional Replantation of Permanent Mandibular First Molar to Remove Overextended Gutta Percha: A Case Report. *Dent J Adv Stud* 2023;11(2):86–88.

Source of support: Nil

Conflict of interest: None

Patient consent statement: The author(s) have obtained written informed consent from the patient's parents/legal guardians for publication of the case report details and related images.

CASE REPORT

A 13-year-old boy reported to the Department of Pediatric and Preventive Dentistry with the chief complaint of pain in the right lower back tooth region. Upon clinical examination, the patient had grossly carious 36 and 46. As the tooth 46 was tender on percussion a radiograph of that region was advised. The radiograph findings showed marked radiolucency involving enamel dentine and pulp, so that patient was suggested to undergo conventional root canal therapy to preserve the tooth. Following obturation of the tooth, a post operative radiograph was taken which showed overobturation of the mesio-lingual canal and Gutta percha cone extending 4–5 mm beyond the apex (Fig. 1). Initially, conservative treatment option was used where the overfilling was removed with H-file (no. 25); however, it resulted in breakage of Gutta percha beyond apical foramina while Gutta percha from both mesial canals was successfully removed. The patient was made aware of the endodontic complication that

Fig. 1: Gutta percha extending 4–5 mm beyond apex in 46 with respect to mesio-lingual canal



Fig. 2: Composite flexible wire splint placed with respect to 44–47

had occurred and various treatment modalities were discussed with the patient. The patient declined to go with periapical surgery and extraction of the tooth. So, intentional replantation was the preferred treatment option. An informed consent was taken from the patient's mother, and patient was scheduled for the procedure next day.

Intentional Replantation Procedure

The patient was given 0.12% chlorhexidine as a pre-procedural rinse. Profound local anesthesia was achieved with 2% lignocaine hydrochloride with 1:200000 adrenaline. Tooth was carefully luxated and extracted with minimum trauma and then placed in tender coconut water and care was taken to avoid touching the root surface for preservation of periodontal tissue. The blood-filled socket was carefully explored for broken Gutta percha fragment and a 25H file was used to remove the fragment out, simultaneously another operator carefully cleaned the root canals and extraoral placement of calcium hydroxide iodoform paste was done into the canals. The tooth was restored with GIC Cement and carefully replanted into the socket. A composite wire splint was placed for 2 weeks (Fig. 2) and patient was kept on periodic follow-up. Extra-oral time was recorded to be 10 minutes. After 2 weeks, tooth had grade



Fig. 3: Follow-up after 4 months

I mobility; however, other signs of inflammation were negative, the splint was removed to promote physiologic tooth movement and prevent ankylosis.

Follow-up

After 4 weeks, although the patient had no clinical signs of inflammation, however, radiographically angular bone defects were evident at the crestal bone, with loss of trabecular pattern around the tooth. The lamina dura also seemed to be showing discontinuity especially around mesial root. Therefore, periodontal curettage followed by copious irrigation with diluted povidone iodine was done. The patient was asked to follow up after 2 weeks but he missed the appointment instead came after 2 months. At 2 months, resorption of intracanal medicament (calcium hydroxide iodoform paste) was quite evident on intra oral periapical radiograph (IOPA) X-ray. However, the patient was completely asymptomatic on clinical evaluation. Again, irrigation and curettage were done and the patient was asked for follow up. At 4 months, radiographically signs of healing were beginning to show up, as bone formation could be seen to be occurring at the crestal level and trabecular pattern was returning (Fig. 3). A thin periodontal ligament (PDL) space can be seen along the root margins is a proof that ankylosis of the tooth has not occurred. The tooth was now obturated conventionally, using Gutta percha, and the patient was asked for follow up at 6 months. At 6 months, there was complete absence of signs of inflammation. Hence, the patient was suggested to follow up at 6 months interval. At one year, the patient was asymptomatic, and there was no clinical and radiographic sign of failure and uneventful healing was present and the patient is put to continued follow-up protocol (Fig. 4).

DISCUSSION

Endodontic complications occur infrequently regardless of careful endodontic therapy of teeth. However, it is imperative that clinician possesses necessary clinical skills to manage such complications. One such complication in this category is over obturation of root canals. It can lead to neurological complications such as anesthesia or paresthesia and delay in peri-apical healing. Over obturation of canals is a tricky procedure to overcome, if Gutta percha breaks beyond apex. Such condition complicates the procedure and leads to more invasive treatment options.

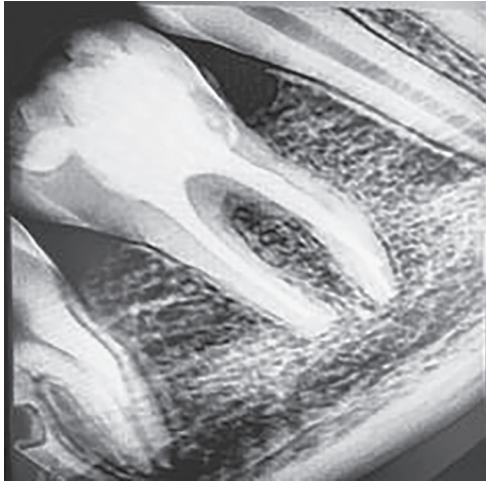


Fig. 4: Follow-up after 1 year showing Gutta percha obturation with respect to 46

The success rate of over obturated cases is significantly lower (75%) as opposed to general success rate of 85–95%, moreover, overextended material can predispose unpredictable interaction between host defense system and root canal materials.⁹ In the present case, the foreign body would have produced a chronic inflammatory reaction leading to a sequelae of periapical pathologies. Inability to retrieve the extruded material non-surgically necessitated invasive treatment modalities. Apical surgery in mandibular posterior teeth is complicated due to thick buccal cortical plate and surrounding vital structures. Hence, intentional replantation stood as a viable treatment modality in this case.¹⁰

Root anatomy further facilitates intentional replantation, as straight roots enable atraumatic removal and replantation of the tooth back into position. Moreover, viability of PDL cells needs to be continuously maintained, hence tender coconut water was used as preferred storage media available, as evidence suggests its properties to nourish and preserve PDL cells. A flexible splint was preferred in this case as it does not hamper physiologic mobility and reduces chances of ankylosis.

Intentional replantation, though a less novel procedure has considerable success rate as published in recent systematic review. According to Wu,¹ cumulative tooth survival rate at the end of

one year was 93.1% and decreased linearly to 82.3% by the end of fourth year. However, a mean survival rate of 88% was reported in a systematic review by Torabinejad et al.⁴ Moreover, other confounding factors such as presence of a sinus tract or periapical abscess, destruction of periodontal bone and PDL cells widely regulate the outcome of intentional replantation procedure.

CONCLUSION

The present case report describes the successful use of intentional replantation for the management of extruded Gutta percha of mandibular molar. It is quite evident from the literature that the success rate for this treatment modality is significantly regulated by case selection. Hence, immaculate diagnosis and case selection render this treatment modality as a viable treatment option to mitigate such endodontic complications.

REFERENCES

1. Wu SY, Chen G. A long-term treatment outcome of intentional replantation in Taiwanese population. *J Formos Med Assoc* 2021;120(1):346–353. DOI: 10.1016/j.jfma.2020.05.017.
2. Grossman LI. Intentional replantation of teeth. *J Am Dent Assoc* 1966;72(5):1111–1118. DOI: 10.14219/jada.archive.1966.0125.
3. Weine FS. The case against intentional replantation. *J Am Dent Assoc* 1980;100(5):664–668. DOI: 10.14219/jada.archive.1980.0227.
4. Torabinejad M, Dinsback NA, Turman M, et al. Survival of intentionally replanted teeth and implant-supported single crowns: A systematic review. *J Endod* 2015;41(7):992–998. DOI: 10.1016/j.joen.2015.01.004.
5. Choi YH, Bae JH, Kim YK, et al. Clinical outcome of intentional replantation with preoperative orthodontic extrusion: A retrospective study. *Int Endod J* 2014;47(12):1168–1176. DOI: 10.1111/iej.12268.
6. De Chevigny C, Dao TT, Basrani BR, et al. Treatment outcome in endodontics: The Toronto study phases 3 and 4: Orthograde retreatment. *J Endod* 2008;34(2):131–137. DOI: 10.1016/j.joen.2007.11.003.
7. Ng YL, Mann V, Gulabivala K. Outcome of secondary root canal treatment: A systematic review of the literature. *Int Endod J* 2008;41(12):1026–1046. DOI: 10.1111/j.1365-2591.2008.01484.x.
8. Grossman LI. Intentional replantation of teeth: A clinical evaluation. *J Am Dent Assoc* 1982;104(5):633. DOI: 10.14219/jada.archive.1982.0252.
9. Lin LM, Rosenberg PA, Lin J. Do procedural errors cause endodontic treatment failure? *J Am Dent Assoc* 2005;136(2):187–193. DOI: 10.14219/jada.archive.2005.0140.
10. Kotadia P, Singh S, Raghavendras SS. Management of endodontic complication by Intentional Replantation. *Saudi J Oral Dent Res* 2016;1:167–170. DOI: 10.21276/sjodr.2016.1.3.13.