



Puzzling Pain Of Retained Gutta- Percha (GP) :A Unique Case Report

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Article History	Abstract
Received: 02/10/2023 Revised: 30/10/2023 Accepted: 5/11/2023	When a tooth is avulsed and replanted following traumatic dental injury, complications such as replacement and inflammatory resorption are a common sequelae. Ultimately, resorption may result in loss of the tooth. This case report describes a traumatic injury (Avulsion) to a permanent tooth resulting in complete root resorption within a short period after endodontic treatment, which required surgery because of persistent GP cones in bone. Even if it is impossible to avoid resorption completely, the overall knowledge of both dentists and patients regarding traumatic dental injuries should be improved to delay the progress of resorption.
CC License CC-BY-NC-SA 4.0	Keywords: Dental trauma, Resorption, Avulsion, Replantation, Gutta Percha, GP cones

Introduction

In clinical practice, traumatic injuries to the incisors are observed very frequently in pediatric cases, and the number of children who experience such trauma is increasing yearly. However, because the age at the time of injury and the condition of the teeth during the initial visit to the hospital vary and a wide range of treatment measures have been advocated for trauma to permanent teeth. The prognosis of patients with such trauma is often affected by the skill and experience of the dentist. Numerous studies have attempted to determine the most appropriate treatment of avulsed teeth.¹⁻⁴

Total luxation or avulsion of teeth is treated by replantation. The term refers to replacement of a tooth in its socket with the object of attaining reattachment when the tooth has been completely avulsed from its socket by an accident.

The major cause of failure in replantation of avulsed teeth appears to be resorption of the root. Three types of resorption are found in replantation⁵⁻⁸ 1) Surface resorption 2) Inflammatory resorption 3) Replacement resorption

Replacement resorption is characterized by gradual root resorption including periodontal ligament, cementum and dentin of the root with replacement by bone.

Two major factors which can reduce the possibility of replacement resorption are 1) the reduction of extra oral time of the avulsed tooth to less than 30 minutes before replantation 2) the initiation of endodontic treatment a week after replantation

Here, we report a case of traumatic injury (Avulsion) to a permanent tooth which got reimplanted that resulted in complete root resorption which required surgery because of retained GP cones in bone.

Case report

A male patient aged 14 years visited to the Department of Paedodontics and Preventive Dentistry with the chief complaint of missing tooth and pain in the upper left front region. (Fig -1). His medical history was non contributory. There was a history of trauma 6 years back during a visit to his parent's hometown, the patient had a fall from the staircase. He hit his left maxillary central incisor, resulting in its avulsion. He took the avulsed tooth to a dental clinic immediately and underwent tooth reimplantation approximately two hours after the injury followed by splinting and root canal treatment. There were no other serious postoperative problems and no family history of unerupted teeth or hypodontia. He was examined clinically and had all teeth erupted.



Figure 1- Pre operative view showing missing tooth

Radiographic examination (OPG) revealed a radiopaque mass in the maxillary region. Radio-opacity was observed in the alveolar bone probably due to the retained gutta-percha point or due to the resorption of the root portion of the tooth. This could be suggestive of a foreign body. (Fig-2)



Figure 2- OPG depicting foreign body in the maxillary anterior region

Surgical removal of the foreign body was planned. Part preparation with iodine solution for extraoral antisepsis was done, followed by administration of a volume of 1.5 ml of 2% lignocaine hydrochloride with 1:80,000 adrenaline (LIGNOX 2%). Incisions involved were a crevicular incision with two vertical incisions involving the region of tooth no 12 to upto tooth no 22. Mucoperiosteal flap was reflected and digital X-ray was taken.



Figure 3-Reflected flap with foreign body



Figure 4-Digital X-ray confirming the radiopaque structure

After confirming with the digital X-ray, a calcified or radiopaque structure(Fig 3 & 4) was found between right central incisor (Tooth no 12) and left lateral incisor (Tooth no 22).



Figure 5 –Dimensions of the foreign body(1x1cm)

The foreign body measuring 1×1 cm was removed followed by curettage of the region and later the flap was repositioned and sutured with a 3-0 silk suture. (Fig 5 &6)



Figure6-Post operative view

Based on clinical and radiographic features, it was suggestive of a foreign body. Postoperative OPG showed complete removal of the foreign body (Fig-7) and wound healing was satisfactory after two year without any complications.(Fig-8)



Figure7- Post operative view



Figure 8-Two year follow-up

Discussion

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Trauma to the teeth frequently occurs in childhood immediately after the eruption of maxillary incisors in both the primary and permanent dentitions. In the classification by Ellis and Davey, class V fracture known as avulsion and the incisors, being the most common teeth involved (42 % of permanent and 61 % of primary teeth).⁹

Chappuis et al.¹⁰ reported that after one year the survival rate of a tooth that was completely avulsed and replanted was 95.6% after replantation. They suggested that the induction of replacement resorption after replantation was influenced by the time lag between avulsion and replantation during which the tooth is exposed to dry conditions. Donaldson et al.¹¹ reported that the time limit for successful replantation was 15 minutes, while McIntyre et al.¹ reported a time limit of 20 minutes if the tooth had been exposed to dry conditions. In the present case, complete root resorption had occurred within 2-3 years after the replantation. This could be explained by the poor condition of the periodontal ligament, probably due to the exposure of the avulsed tooth to dry conditions for two hours. It was assumed that root canal filling by Gutta-Percha points (GP points) had been performed outside the oral cavity.

Inflammatory resorption of the root is triggered by small disturbances in the periodontal ligament or cementum due to trauma, and occurs frequently in teeth with an immature root because the dentinal tubule is wide and the cementum coating the root surface is thin in such teeth.¹¹

Moreover, root canal filling using calcium hydroxide is generally recommended to avoid the inflammatory resorption consequent to trauma⁵. In this case, root canal filling was done by Gutta-Percha points (GP points) outside the oral cavity, not only prolonged the extra-oral time, but also resulted in unnecessary damage to the tissue at the developing apical area of an immature root. These treatment flaws are assumed to be the cause of the rapid root resorption.

In a retrospective study by Krikeni et al.¹², it was found that teeth with periapical radiolucency, treatment outcome was not related to the persistence or removal of the extruded material in the follow-up radiograph. As in roots with sealer extrusion, an improved treatment outcome was observed after removal of the material when compared to roots presenting over-filling with gutta-percha. In a recent case report, use of negative pressure technique can be considered as an alternative for removal of apically extruded Gutta-Percha fragment during retreatment procedures.¹³

The rapid external inflammatory resorption and replacement resorption might have also been due to improper techniques such as the avulsed tooth not being returned to its appropriate position.

GP has been the least irritating root canal filling material till date. Fibrous encapsulation, calcification, and foreign-body reactions are some of the common responses to GP extruded into the periapical tissues. Small amounts of plasticizers, coloring agents, and other additives do not play a major role in influencing the irritational qualities of GP cones. An inflammatory reaction is found only when an irritating material made up a significant percentage of the cone, as in calcium hydroxide enriched GP points. Therefore, the use of other additives should be kept to optimum levels.¹⁴

In this case this foreign body is suggestive of retained GP points, which were remained in bone after complete root resorption and the retained GP points were the main cause of pain thus surgical invasion was required in this case. It is also essential to provide sufficient information to parents on the prognosis of teeth that experience trauma and importance of follow-up after replantation.¹⁵

Conclusion

For avulsed tooth, the need to get the right treatment done at the right time is important. It is also important to improve the knowledge of both the dentist and parents regarding the management of avulsed tooth. Because extraoral time is one of the most critical factors affecting prognosis, therefore the avulsed tooth should be replanted immediately into its socket, whenever possible to reduce this time to an absolute minimum. The dentist should instruct the patient or parent on reimplantation technique during the initial emergency telephone call and should emphasize the importance of coming to the office immediately for follow-up splinting and treatment.

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