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Periapical Cyst Following Replantation of Avulsed Teeth: A Case Report

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Case Report

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ABSTRACT

Introduction: Avulsion has been described as the traumatic displacement of the tooth out of the socket, and it accounts for 0.5% to 16% of traumatic injuries in the permanent dentition. Many complications have been associated with avulsed tooth following replantation. This paper aimed at presenting a case of the large cystic lesion following replantation of avulsed teeth.
Case Presentation: A case of a 17-year-old undergraduate student who presented in the dental clinic for medical screening as a mandatory exercise upon gaining admission. During the examination, a purulent pus discharge was noticed on the labial sulcus about tooth 11. History revealed that she had avulsion of teeth 11 and 12 about 4-years earlier that was replanted and splinted for 2-3 weeks and subsequently she was discharged from the clinic without any further treatment. Radiographic examination revealed periapical radiolucency without well define margin about teeth 11 and 12. Periapical surgery was carried out and two large cystic cavities were seen at about teeth 11 and 12 during surgery. The histology report of the specimen revealed a benign lesion suggesting periapical cyst.

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Conclusion: There is the need for adequate follow-up and monitoring of replanted teeth the following avulsion to arrest any complication that might arise from the procedure. Also, the importance of endodontic treatment following replantation of the avulsed tooth cannot be overemphasized.

Keywords: Avulsion; periapical cyst; replantation; trauma.

1. INTRODUCTION

Avulsion has been described as the traumatic displacement of the tooth totally out of the socket and it accounts for 0.5% to 16% of traumatic injuries in the permanent dentition [1,2]. Avulsion of permanent teeth occurs most often in children between 7 to 9 years of age [1], an age when the relatively resilient alveolar bone provides only minimal resistance to extrusive forces. An avulsion is seen following trauma to the teeth from falls, traffic accidents, fights, sports injuries, bicycle accidents, assault, child abuse and other collisions [3,4,5]. The maxillary central incisors are the teeth most commonly affected, with the incidence greater in males [3,4] because of their relative propensity for physical activities.

Re-implantation is the treatment of choice for avulsion [4,6] but is however not recommended for deciduous incisors due to the attendant risk to the permanent successors [7]. Survival of the tooth after re-implantation depends on the extra-alveolar period [8,9], extra-alveolar dry time, storage medium, type of splint used, the period of endodontic treatment, medications prescribed, oral hygiene, and patient's general health condition [10]. The single most important factor to ensure a favourable outcome after replantation is the speed with which the tooth is replanted [11], with the optimal result seen if the tooth is re-implanted within 30 minutes following avulsion. Choice of treatment is related to the maturity of the root (open or closed apex) and the condition of the periodontal ligament cells. For matured teeth with closed apices, endodontic treatment is indicated with the implantation, for immature teeth with open apices however, the goal for replanting is to allow for possible revascularization of the pulp space. If that does not occur, root canal treatment may be recommended [10].

Following replantation of teeth, two main complications may occur, periodontal attachment damage and pulpal necrosis [11]. Where there is no subsequent infection, severe damage to the periodontal ligament – by the trauma itself, by un-physiologic storage conditions or by inadequate handling – will result in ankylosis and replacement resorption. In all mature replanted teeth and most teeth with an immature root stage, pulp necrosis will occur with sequelae of periapical pathology, get infected and may cause inflammatory root resorption. [12] Consequently replanted teeth should be monitored by frequent controls during the first year, and subsequently yearly [10].

In this report, we present a case of large infected periapical cyst following reimplanted avulsed upper Centrals without endodontic treatment after four years of replantation.

2. CASE PRESENTATION

A 17-year-old undergraduate student presented in the dental clinic for a medical and dental screening, a mandatory exercise for new students entering into the institution. During the intra-oral examination, purulent discharge was noticed on the upper labial sulcus about tooth number 11 (Fig. 1).

Fig. 1. Presurgical clinical photography showing purulent pus discharge from sinus about tooth 11

On further enquiry, the patient gave a history of trauma about four years before presentation, which resulted in avulsion of teeth numbers 11 and 21. She claimed she presented at a dental clinic about 30 minutes after the incidence with the teeth wrapped in a clean handkerchief. At the dental clinic, the attending dentist replanted the teeth and splinted the teeth for about 2-3 weeks.

Fig. 2. Presurgical radiograph showing an ill-defined radiolucency around the roots of tooth 11 and 21

Fig. 3. Intraoperative clinical photograph before the cystic enucleation

Fig. 4. Intraoperative clinical photograph showing one of the cystic cavity (empty) and second cavity with the cyst

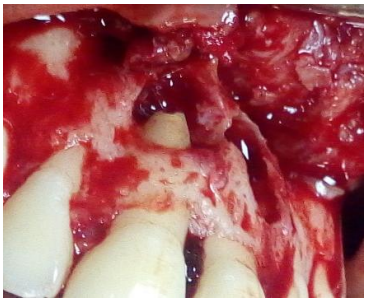

Fig. 5. Intraoperative clinical photograph showing two large cystic cavities

The splint was subsequently removed and nothing further was done.

The patient reported having occasional pain and swelling in association to the replanted teeth for more than a year but had not sought any intervention. She also complained of purulent foul-smelling discharge from the teeth.

On further examination; there was an incompetent lip seal but no limitation in mouth opening. Intra-orally, the oral hygiene was good and there was no halitosis. The molar relationship was Angle's class 1 molar relationship, however, there was increased

overjet of about 4.5 mm. All the permanent teeth except third molars were present in the mouth; there was no carious lesion. There was grade 1 mobility of teeth numbers 11 and 12. There was no discolouration of the affected teeth, but they were slightly tender to percussion. Sensibility test to ice stick did not yield any positive response.

A provisional diagnosis of infected periapical cyst was made and a periapical radiograph of teeth numbers 11 and 12 was taken. The periapical radiograph showed apical radiolucency with no well-defined border (Fig. 2). A definitive diagnosis of the infected periapical cyst was made and the patient was planned for periapical surgery with cystic enucleation.

Following periapical surgery, two large cystic masses were removed from two different cystic cavities (Figs. 3, 4, 5). Root canal treatment was carried out on teeth numbers 11 and 21, and the canals obturated with gutta-percha. The postoperative radiograph was taken (Fig. 6) and the patient was monitored daily for the first three days and then a week after the suture was removed and adequate healing of the surgical site was achieved.

The specimen removed from the surgical site was subjected to histological examination to ensure that there were no malignant changes. The histologic report showed fibro-collagenous tissue markedly infiltrated by acute and chronic inflammatory cells (mainly neutrophils and lymphocyte), and thin-walled vascular channels. The findings were consistent with an infected periapical cyst.

3. DISCUSSION

This report demonstrates a complication that can occur if endodontic treatment is not carried out following reimplantation of an avulsed tooth with a closed apex. Inflammatory root respiration and its sequelae are a fairly common complication after replantation of an avulsed tooth. The case is however unique in that because the patient was not followed up, there was ample time for the formation of a periapical cyst before the patient presented at the clinic. Retrospectively, the teeth became necrotic and subsequent bacterial contamination of the root canals, along with the continuous presence of noxious stimuli, led to the formation of a granuloma at the root region. Eventually, there was cystic degeneration of the aforementioned granuloma. To prevent this kind of complication, the consensus is to do a root canal therapy after replantation [10,11,12], the ideal time to begin treatment is 7–10 days post-replantation [10]. Extraoral endodontic treatment before reimplantation is not advocated because of the potential additional damage to the periodontal ligament by prolonged

Fig. 6. Immediate post-operative radiograph showing a root-filled

Fig. 7. 2-month post-operative radiograph showing remarkable bone healing

extraoral period, by extraoral root filling procedures, as well as by the root filling materials themselves [12]. Also, the need for adequate follow-up and monitoring of implanted teeth cannot be over-emphasized. If the patient had been monitored, appropriate interventions could have been carried out to prevent the formation of a periapical cyst.

4. THE RELEVANCE OF THIS STUDY TO THE CLINICIAN

- This will help the clinician to make an informed decision on replanted avulsed teeth.
- Help in the proper management of avulsed tooth.

5. CONCLUSION

This study demonstrates the importance of early endodontic treatment in replanted avulsed permanent teeth. This will help to prevent the attendant post-replantation complication and ensure good prognosis for the replanted teeth.

CONSENT

As per international standard or university standard, written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard, written ethical approval has been collected and preserved by the author(s).

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

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