

Management of avulsion of tooth – A review

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ABSTRACT:

“Avulsion” the word derived from Latin “avellere” which means “to tear off”. Tooth avulsion is an emergency situation which requires immediate observation and management. To preserve the tooth, the dental physician should have knowledge in various procedures to follow before and after replantation. The aim of this review article is to highlight the different treatment modalities which can provide good prognosis of the avulsed tooth.

KEYWORDS: Avulsion, Replantation, Dentoalveolar injuries, Storage medium

INTRODUCTION

Dentoalveolar injuries due to trauma are the most common issue faced in children and adolescents. Knowledge about the emergency management of these injuries is needed to handle the situation efficiently. One among these injuries is the avulsion of tooth which is known as complete dislocation of the tooth from its socket that accounts up to 6 % of all dentoalveolar injuries. Avulsion leads to interruption of periodontal fibers and it also cause damage to the remaining supporting structures of the tooth like alveolar bone, cementum and gingiva ⁽¹⁾. As of now reimplantation of permanent avulsed tooth is the recommended treatment protocol. The primary goal of treatment is to preserve the cell integrity of periodontal fibers and to prevent root resorption. Immediate replantation within 5 minutes of time preserves the viability of the periodontal ligament cells ⁽²⁾. Therefore, Duration plays an important role in the management of the avulsed tooth ⁽³⁾. Replantation followed by the usage of supporting device (splints) enhances the periodontal healing by providing immobilization ⁽⁵⁾.

STORAGE MEDIUM’S EFFECT ON PERIODONTAL HEALING

Ideal storage medium should have prolonged shelf life and enhance the proliferative capacity of the periodontal ligament cells ⁽⁴⁾. Efficient management of avulsed tooth is achieved only evaluating upon many factors such as extent of trauma, contamination of the tooth, storage medium, extra oral timing of the avulsed tooth and manipulation⁽⁶⁾. Anti- resorptive therapy is performed to lessen the inflammatory resorption which is caused by the contamination of bacteria and necrosis of tissues. In this therapy, storage medium is mixed along with 800 micro grams of doxycycline and 640 micro grams of dexamethasone and the avulsed tooth be soaked in this enriched medium for about 20 minutes ⁽⁸⁾.

STORAGE MEDIUM	COMPOSITION	USAGE
Hanks balanced salt solution (HBSS)	8 g/L sodium chloride, 0.4 g/L of D-glucose, 0.4 g/L potassium chloride, 0.35 g/L sodium bicarbonate, 0.09 g/L sodium phosphate, 0.14 g/L potassium phosphate, 0.14 g/L calcium chloride, 0.1 g/L magnesium chloride, and 0.1 g/L Magnesium sulphate.	<ol style="list-style-type: none"> 1) Excellent storage media for the avulsed tooth 2) Vitality, mitogenicity, clonogenic properties of the periodontal ligament cells are maintained thereby promotes the periodontal healing. 3) It can be used to store a tooth extra orally more than 24 hour at 4 degree Celsius temperature ⁽¹⁰⁾.
Eagles medium (EM)	4 mL of L-glutamine, 105 IU/L of penicillin, 100 µg/mL of streptomycin, 10 µg/mL of nystatin and calf serum (10% v/v)	<ol style="list-style-type: none"> 1. Used when extra oral storage time is 8 hours or less ⁽¹⁰⁾.
Milk	Pasteurized milk	<ol style="list-style-type: none"> 1. Used within 20 minutes after avulsion 2. Tooth ankylosis followed by replantation is avoided while we use milk as a storage medium ⁽¹²⁾.
Via span	Transparent medium	<ol style="list-style-type: none"> 1. Used within 8 hours of extra oral storage period. 2. Preserve the viability of periodontal ligament cells.
Saliva	Electrolytes, immunoglobulin, proteins, enzymes and nitrogenous products	<ol style="list-style-type: none"> 1. Microorganisms in the saliva interfere in the periodontal healing ⁽¹⁰⁾. 2. Used when extra oral storage period is lesser than 30 minutes ⁽¹¹⁾.
Coconut water	Electrolytes, Essential vitamins.	<ol style="list-style-type: none"> 1. Excellent storage media for avulsed tooth ⁽¹⁴⁾. 2. Difficult to neutralize the coconut water.
Normal saline	Solution of 0.90% w/v of NaCl	<ol style="list-style-type: none"> 1. It lacks the basic nutrients thereby not promotes the viability of the periodontal ligament cells. 2. It is used if the storage period is lesser than 2 hours ⁽⁹⁾.
Oral rehydration	Sodium chloride,	<ol style="list-style-type: none"> 1. Viability of the periodontal ligament cells

solution (ORS)	potassium chloride, Trisodium citrate,Glucose anhydrous	is preserved. 2. It is easily available.
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Table no: 1(composition of Storage medium and their usage in the storage of avulsed tooth)

SPLINTING OF THE AVULSED TOOTH

There are many types of splinting exist such as rigid fixation, semi rigid fixation, non rigid fixation and flexible types. Ideally semi rigid splinting is used in the cases where there is no bony fracture involvement which usually composed of composite resin with orthodontic wire or nylon thread. It promotes the vitality of periodontal ligament cells ⁽⁵⁾.

REPLANTATION OF AVULSED TOOTH WITH LONGER EXTRAORAL PERIOD

Inflammatory root resorption and ankylosis of the tooth are the main complications due to delayed replantation. Girish Kubasad et al., reported that the avulsed tooth treated with CaOH followed by obturation with gutta percha showed minimal resorption compared to tooth treated with CaOH alone⁽¹³⁾. If extra oral period (Dry time) is greater than 60 minutes there would be a poor prognosis in case of permanent tooth due to inflammatory root resorption and ankylosis of tooth.

CONCLUSION

Avulsion of tooth is an dental emergency occurred due to trauma (slip and fall, road traffic accident etc.). To manage the situation efficiently one should update in emerging treatment protocols. Storage medium for an avulsed tooth is changing according to the availability and extra oral period of avulsed tooth (dry time) . Replantation of avulsed tooth is the primary procedure followed by fixation of the tooth either by rigid or semi rigid splinting devices and obturation of the root canals with gutta-percha sealant.

Ethical clearance – Not required since it is a review article

Source of funding – nil

Conflict of interest – nil

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