

KNOWLEDGE OF DENTISTS REGARDING TREATMENT OF AVULSED TEETH IN KARACHI

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ABSTRACT

The aim of this study was to evaluate the knowledge of dental clinicians in Karachi regarding the management of avulsed teeth. This cross-sectional descriptive study was conducted by the Department of Operative Dentistry at Bahria University Medical and Dental College, Karachi, over a period of eight months, from March to October 2016. A questionnaire with eleven close-ended questions was devised in English and distributed among dentists in various dental colleges and hospitals in Karachi. The software IBM SPSS Statistics version 23.0 and Chi-square test were used for data analysis and $P < 0.05$ was considered significant. Out of a total of 209, 33% participants of the study were males, and 67% were females. 46% participants were simple BDS graduates, whereas 33% were enrolled in an MDS program. 53% participants practiced in a teaching hospital. Around 44% participants were involved in continued dental education programs regarding avulsed teeth. 69% participants thought tooth should not be replanted in every case. 75% participants considered extra-alveolar time, root completion and storage medium to affect the prognosis combined. 33% responded milk to be the best storage medium, while 31% considered Hank's Salt solution. Majority (58%) were in the favor of flexible splints, and most considered splinting for 7-14 days (83%). Knowledge regarding the management of avulsed teeth is necessary for every practicing dentists. The data from this study showed that dental professionals in Karachi are abreast with the latest knowledge and literature regarding the management of avulsed teeth.

Key Words: Dental Trauma, Knowledge, Tooth Avulsion, Survey.

INTRODUCTION

Dental trauma involves injuries to the tooth, periodontium and supporting alveolar bone. Traumatic dental injuries can have a significant impact on the life of a child, since it causes both physiological and physical pain.¹ Every year a large number of dental injuries are reported especially among children belonging to 7-15 year age group.² Dental injuries may cause intrusion, extrusion, avulsion, luxation and subluxation of the

tooth.³ Main accidents resulting in dental injuries are usually falls that mostly occur while children are involved in outdoor activities such as sports like cycling and skating.⁴ This occurs in both children and adults. Literature states that the "falls and blows to the face" are the most common causes of dental trauma.⁵ Other causes of dental injuries may be due to playground accidents, domestic violence, bicycle and motor vehicle accidents and sports injuries.⁶

Tooth avulsion results in separation of the tooth from the dentoalveolar socket and tearing of the periodontal ligament, leaving viable periodontal ligament (PDL) cells on the root surface.¹ If the PDL attachment does not dehydrate the cells will not undergo severe inflammatory response and allow replantation therefore it is imperative to keep these cells hydrated so that these cells remain vital and reattach to bone on replantation.⁷ The speed with which the avulsed tooth is replanted into the alveolar socket results in a favorable outcome therefore every effort should be made

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to replant the tooth within the first 15-20 minutes, as previously mentioned drying of viable PDL cells should be avoided.⁸

For success of the replanted tooth, maintenance of vitality of the cells over the root is fundamental. However, the immediate replantation or maintenance of the avulsed tooth in storage media compatible for survival of these cells before replantation is an important factor.⁹ For the replantation of a clean tooth with undamaged root surface the avulsed tooth should be stored in an appropriate medium till patient is brought to the dental office. The storage mediums in order of preference are Hank's balanced salt solution, milk, saliva, vestibule of the mouth or container with the patient's spit, normal saline or water.¹⁰ Out of the above mentioned storage mediums the least desirable medium is water. The reason being that its hypo tonicity causes rapid lysis of the cells and increases the inflammation on replantation.¹¹ Furthermore, if the tooth is kept in dry storage medium before replantation maintenance of vitality of the cells is impossible.¹²

The aim of this study was to investigate the knowledge of general practitioner dentists about the emergency management of dental avulsion in the city of Karachi.

METHODOLOGY

This Cross-sectional descriptive study was conducted by the Department of Operative Dentistry, Bahria University Medical and Dental College, Karachi from March 2016 to October 2016.

A pilot study was carried out with 20 random dentists to validate the content of the questionnaire. A self-administered, close ended questionnaire was developed, consisting of two parts. The first part was concerned with demographic data, education and experience of the participant as well as continued dental education program. The second part of the questionnaire included 11 questions regarding the knowledge of the participant about the management of avulsed tooth. Dental graduates, post-graduate trainees and specialists willing to participate in the study were included. The questionnaires were distributed in different dental colleges in Karachi. The data was recorded and analyzed by using IBM SPSS statistics version 23.0 and Chi-square test was used for data analysis and P-values less than 0.05 were considered significant.

RESULTS

A total of 220 questionnaires were distributed, out of which 209 were completely filled and accepted, so the response rate was 95%. Among these 209, 33% participants were males and 67% participants were

females, with the age group of 23-35 years (Fig 1). 46% participants were simple BDS graduates, whereas 33% were enrolled in an MDS program (Table 1). 53% participants practiced in a teaching hospital. Around 44% participants were involved in continued dental education programs regarding avulsed teeth. 67% participants had a clinical experience of less than 5 years, while the experience of 33% ranged between 6-15 years.

69% participants thought tooth should not be replanted in all cases, whereas 23% thought it should be replanted in all cases. 85% participants favored immediate treatment of avulsed tooth, whereas 6% considered treatment to be sought within a few hours. 75% participants thought that prognosis depended on extra-alveolar period, storage medium and injury to PDL combined. 33% considered milk as the best storage medium while 32% thought Hank's Balanced Salt Solution was the best medium. 55% participants thought ideal extra-alveolar time period was 30 mins-1 hour. More respondents were in favor of flexible splints (58%) as compared to rigid splints (34%). 83% suggested the duration of splinting to be 7-14 days. 67.6% thought that the decision for endodontic treatment depended on extra-alveolar period and root formation. 43.5% thought prescribing only anti-inflammatory was sufficient, while 70.8% favored a follow up for 1 year. The results are summarized in Table 2.

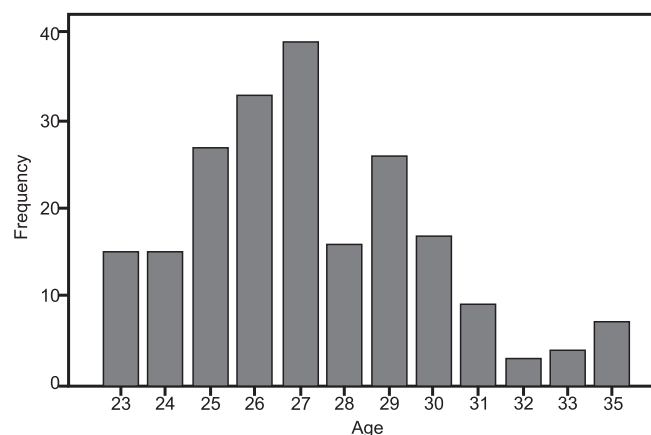


Fig 1: Age distribution of participant Dentists

TABLE 1: EDUCATIONAL QUALIFICATION OF PARTICIPANT DENTISTS

S. No.	Educational Qualification	Frequency	Percentage
1	BDS	97	46.4
2	MSc/MCPS	30	14.4
3	MDS/MDS residents	70	33.5
4	FCPS/FCPS residents	12	5.7

TABLE 2: EMERGENCY TREATMENT OF TOOTH AVULSION

Questions	Answers	
Q.1 Should an avulsed tooth be replaced in socket?	Tooth should not be replanted in all cases	69%
	Tooth should be replanted in all cases	23%
Q.2 How urgently should treatment be sought?	Immediately	85%
	Within a few hours	6%
	Before 24 hours have elapsed	3.2%
Q.3 Factors influencing outcome?	Extra-alveolar period	10.6%
	Storage Medium	9.7%
	Injury to PDL	1.4%
	All of the above	75%
Q.4 Best storage medium	Patient's Saliva	31.5%
	Milk	33.3%
	Hank's Balanced salt solution	31.9%
Q.5 Ideal Extra-Alveolar Period	<30 minutes	39.4%
	30 minutes to 1 hour	55.1%
Q.6 Tooth management before replantation	Hold crown and wash with antiseptic	6.9%
	Hold crown and wash with Saline	42.6%
	Hold crown and wash with tap water	47.2%
Q.7 Type of splints	Flexible Splints	57.9%
	Rigid Splints	34.3%
	No need for splinting	2.3%
Q.8 Duration of splinting	Less than 7 days	6.9%
	7 to 14 days	82.9%
Q.9 Decision for endodontic treatment	Pulpectomy and RCT after 15 days	18.5%
	Depends on extra-alveolar period and root formation	67.6%
	Immediate pulpectomy and calcium hydroxide therapy	8.3%
Q.10 Systemic Medication	Prescribe Anti-inflammatory only	43.5%
	Prescribe anti-inflammatory, antibiotics and tetanus	34.7%
	No medication required	18.5%
Q.11 Follow up duration	1 Year	70.8%
	2 Year	11.1%
	3 Year	8.3%

DISCUSSION

The present study finds that majority of professionals had knowledge in accordance with latest research which is required to manage tooth avulsion. A high number of respondents (69%) were in favor of replantation if the extra-alveolar time and PDL conditions were favourable. Similar finding was found by Andreasen and Bodin¹³ who investigated human teeth replanted after 15 minutes and noted that the majority of teeth had their integrity preserved. This demonstrates that a shorter extra oral time is better to preserve teeth, as there are fewer areas of root resorption. However,

when the tooth cannot be immediately replanted, it should be maintained in some storage medium.¹⁴

Maintenance of the avulsed tooth in a storage medium maintains the vitality of PDL cells present over the root for longer and, in some cases, even stimulates their proliferation.³ Most of the respondents who chose saliva as the storage medium justified their option based on the immediate availability of the saliva. However, Oswald et al¹⁴ found better results for teeth maintained in saliva for 90 minutes than teeth kept in dry storage medium before replantation. The composition and osmolality of milk are more compatible for

survival of cells over the root.¹⁵ Lindskog and Blomlof et al¹⁶ comparing milk with saliva, noted better results when the milk was used. Because of its hypotonicity and microorganisms, the saliva can contribute to cell death. The maintenance of teeth in milk should not exceed six hours.¹⁷

If they could choose a better storage medium, they would use Hanks' balanced salt solution, an option that is well documented in the literature.¹⁸ Comparing milk with Hank's Balanced Salt Solution (HBSS), authors noted that HBSS demonstrated better results, even when the teeth were maintained for twelve hours.¹⁹ Viaspan® (Belzer VW-CSS; Du Pont Pharmaceuticals, Wilmington, DE, USA) is a new widely used solution for the storage and transportation of organs to be transplanted. In Dentistry it is used as a storage medium for avulsed teeth because it maintains PDL cell vitality, leading the cases to a better prognosis.²⁰ Viaspan exhibited better results when compared with HBSS.²¹ However, because of the easy access to milk in the moment of the accident and as six hours are enough to look for a dentist, milk can be chosen as a short term storage medium. Thus, taking into account the aforementioned aspects, the extra-oral time and storage medium are essential factors for the success of replanted teeth.²² After the injury; tooth avulsion should be correctly treated to ensure a better prognosis.

The overall knowledge of the respondents about the type of splinting was adequate and correct. The decisions of the majority of the respondents were generally correct regarding the splinting period. Authors tend to recommend a shorter period of immobilization.²³ Otherwise; a 30 day splinting period has been successfully used in cases of replantation.

The decision regarding endodontic treatment are coincident with recently published guidelines, which suggest an acute approach (endodontic treatment within a few hours) if the tooth is not replanted at the time of injury; otherwise, sub-acute (within the first 24 hours) and delayed (after the first 24 hours).²⁴ It is also a good idea to do endodontic treatment outside the mouth if apices are open and there is no hope for revascularization due to very delayed replantation as it is easier to form an apical barrier extraalveolarly.²⁵

Regarding the use of systemic medication, Anderrson et al reported that the value of systemic administration of antibiotics in human after replantation is still questionable as clinical studies have not demonstrated its value. Experimental studies, however, show that antibiotics are in most situations recommended after replantation of teeth.²⁶ In this study, a large number of respondents justified antibiotics and tetanus prevention in any situation; others would prescribe antibiotics and analgesics only in cases of gross contamination.

CONCLUSION

It is mandatory for a dental professional to have adequate knowledge for the treatment and management of patients presenting with avulsed teeth. Based on the findings of this study, it is possible to suggest that the level of knowledge of dental professionals of the city Karachi regarding the management of avulsed teeth is adequate.

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- 3 **Alina Nasir:** Searched literature review and helped in write up
- 4 **Erum Rashid:** Helped in data analysis and wrote discussion
- 5 **Sara Ikram:** Searched literature review
- 6 **Fasiha Kazi:** Searched literature review.