



RESEARCH ARTICLE

DRIVE THROUGH THE KNOWLEDGE OF EMERGENCY PHYSICIANS TOWARDS EMERGENCY  
MANAGEMENT OF AVULSED TOOTH- A CROSS SECTIONAL SURVEY

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ABSTRACT

**Objectives:** The objective of the survey was to assess Knowledge And Attitude of Emergency Physicians Towards Emergency Management of Avulsed Tooth in Mangalore city, Karnataka, Mangalore.

**Materials and Methods:** This was a time bound study in which approximately 40 emergency physicians had participated 12 questionnaire were distributed to medical hospital emergency physicians in Mangalore (private / public). The questionnaire gathered data on the respondent's professional profiles, self assessed perceived knowledge and actual knowledge of emergency management of tooth avulsion.

The data was statically analyzed using chi-square test using software program SPSS 17.0.

**Results:** 57.5% of the study group were aware of the meaning of avulsed tooth. 25 % of the physicians had responded to the ideal time for replantation of the avulsed tooth. 72.5% had responded rightly to what is the best medium to preserve the tooth. 60% of the physicians had stated that the knowledge regarding emergency management of tooth avulsion was not sufficient 77.5% reported that lack of dental knowledge was the main barrier faced in promoting management of avulsed teeth.

**Conclusion:** In the light of such results an important implication from this study revealed the lack of dental knowledge. Henceforth a Pamphlet was distributed emphasizing the detailed emergency management of avulsion. This was acknowledged positively. It is therefore Dentist responsibility to make the Physicians aware of the importance of first aid for avulsed tooth with appropriate measures.

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INTRODUCTION

Traumatic dentoalveolar injuries represent the most serious oral health problem among children and adolescents. Prompt, appropriate and immediate treatment is necessary to significantly improve the prognosis of Traumatic injuries. (Hashim Raghad, 2012) Tooth avulsion is the total dislodgement of an intact tooth from its socket. (Dali Mamta et al., 2014) Among facial injuries, dental trauma is the most common and avulsion occurs in 1-16% (Andersson et al., 2012; Soares Ade et al., 2008) and an even greater percentage of those among children because of falls, fight and car accidents, and sport activities occurring between the ages of 7 and 9 years, the time when the permanent incisors are erupting. According to Andreasen and Andreasen, avulsion of permanent teeth accounts for approximately 0.5–3% of all dental trauma. (Korkut et al., 2016) Losing an anterior tooth at a young age may have severe psychological consequences. The immediate replantation of a permanent avulsed tooth is essential to restore

the function and esthetics and critical for long term success of the treatment. Avulsion presents a challenge with regard to its proper emergency management. (Jyothi et al., 2011) A study of oral trauma in children by Meadow et al. found that 62% of injuries were due to falls, 13% from sports accidents and 8% from fighting between children. (Meadow David, 1984) Most often, dental trauma occurs in toddlers as they are learning to ambulate. As they attempt to walk, they often stumble and have frequent falls which can injure their oral cavity. Thirty percent of children experience trauma to their primary teeth, while 22% of children experience trauma to permanent teeth, prior to age 14. (Cameron and Widmer, 2003; Flores, 2002) In the primary dentition, the peak incidence is between the ages of 2-4, whereas in the permanent dentition the peak is in the range of 8-10. The most commonly avulsed teeth in children are the permanent maxillary central incisors, followed by the maxillary laterals and then the mandibular incisors (Wilson et al., 1997; Kaste et al., 1996) Without re-implantation of avulsed permanent tooth, can have many effects on children and adolescents including loss of function, compromised esthetics, lowered self esteem, and having to endure the long arduous

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process of fabricating a restoration to replace the tooth. (Cameron and Widmer, 2003) Cortes *et al* described that children with teeth that sustained trauma affected the child's ability to smile, laugh, show teeth without embarrassment, and maintain a normal emotional state without being irritable. (Cortes *et al.*, 2002) In addition to the deleterious effects on the children, parents are also burdened by the time commitment needed to complete the treatment of trauma, loss of work and the monetary costs of the future prosthetic replacement of the tooth. Avulsion presents a challenge with regard to its proper emergency management. The principal challenge is to maintain the vitality of periodontal cells, as prognosis of a replanted tooth is directly proportional to the viable periodontal cells. Use of physiological storage media like milk, saliva or saline is critical to maintain the viability of periodontal cells until professional help is obtained. (Andreason 4<sup>th</sup> edition) Many patients with avulsed tooth visit medical doctors due to lack of awareness or unavailability of a dentist. To ensure proper and appropriate management of the avulsed tooth, it is essential that medical professionals have sufficient knowledge on the emergency management

## MATERIALS AND METHODS

This is an prospective type of study which was conducted over a period of 2 months. The study sample was the emergency physicians posted in causality in the various hospitals in the Mangalore city, Karnataka, India. Ethical clearance was obtained from Institutional ethical committee and study was initiated. Informed written consent was obtained from the physicians prior to participation. The data was collected by means of a multiple – choice questionnaire including 12 questions. The survey was voluntary and strict confidentiality was assured that their personal data will not be revealed. Emergency physicians posted in the casualty department of the hospitals visited were included in the study. Total of 40 doctors had participated in the survey. The questionnaires were handed in under the supervision of the examiner and were collected immediately after answering and matched with correct answers according to accepted current literature. The 12 – item questionnaire was divided into two parts. The first part, consisted of four questions on personal and professional data including the age, gender, years of experience. The second part aimed at assessing the knowledge of physicians on the emergency management of avulsed tooth .Knowledge was assessed on the meaning of avulsed tooth, immediate management of an avulsed tooth. The critical extraalveolar time of the avulsed tooth, different storage methods and media, the best optimum cleaning technique of avulsed tooth before replantation, barriers faced in promoting the management of avulsed tooth. All the questions were close ended. All the answered questionnaires were coded, assessed and analyzed

### Statistical analysis

Data entry and the subsequent construction of a database were performed using the statistical software program SPSS 17.0. Chi-squared tests were used to analyse the relationships between professional profiles, self-assessed perceived knowledge, and actual knowledge of emergency management of avulsed tooth, with a level of significance set at  $p < 0.05$  (at confidence interval 95%).

## RESULTS

About 40 physicians had participated from Mangalore city, Karnataka, India. They readily agreed to participate in the

study. They had returned the completed questionnaires on the same day. The demographic data of the respondents are presented in Table 1, which indicated 57.5% of the respondents were males and 42.5% of the respondents were females. It was noted that 47.5% were 20 – 25 years old. 17.5% of the study group had 5 -10 years experience. The responses of table II of the questionnaire.

**Table 1. Questionnaire of the personal information**

Gender	Male
	Female
Age	20 -25
	25 -30
	30 – 35
	35- 40
	40 – 45
Number of years in practice	0 – 5years
	5 -10years
	>=10years
Type of practice	Private only
	Academic only
	Private and Academic

**Table 2. Questionnaire about the knowledge and attitude towards management of dental injuries**

1. What is meant by avulsion of tooth?	
N	%
a.Total dislodgement of intact tooth out of its socket.	
23	57.5
b.Partial dislodgement of intact tooth out of its socket.	
8	20.0
c.Dislodgement of fractured segment of the intact tooth.	
7	17.5
d.Don't know.	
2	5
2. How many cases of tooth avulsion injury have you attended in your day- to- day practice?	
N	%
a.0 cases.	
26	65
b.1 -5 cases.	
9	22.5
c.5-10 cases.	
2	5
d.More than 10 cases.	
3	7.5
3. Which would be the first place would you redirect the child patient in case of teeth avulsion injury?	
N	%
a.I do it myself.	
1	2.5
b.General dentist.	
14	35
c.Pediatric dentist	
18	45
d.Oral surgeon.	
7	17.5
4. How urgent do you feel that a dentist's opinion is needed?	
N	%
a.Immediately.	
12	30
b.Within 30 minutes.	
12	30
c.Within few hours.	
13	32.5
d.Within 24 hours.	
3	7.5

However majority of the physicians were aware of the meaning of avulsed tooth and chosen to redirect the case to dentist in case of avulsed tooth. Knowledge about the ideal time and storage medium was insufficient. Majority of the physicians were of the opinion that the knowledge regarding emergency management of tooth avulsion was not enough and reported that lack of dental knowledge was the main barrier faced in promoting management of avulsed teeth. Comparison of knowledge among physicians based on age group are depicted in Tables 3,4 and Table 5 shows based on their experiences.

5. Ideal time for replantation of the avulsed tooth?

N	%
a. Within 30 minutes after avulsion.	
10	25
b. Within 30-60 minutes after avulsion.	
5	12.5
c. Within 1-2 hours after avulsion.	
5	12.5
d. Don't know.	
20	50

6. You were informed by telephone that the child was injured and permanent tooth was avulsed which of the following treatments would you recommend?

N	%
a.Wrap the tooth in a clean gauze and seek dentist .	
19	47.5
b.Replace the tooth as soon as possible into socket and seek dentist.	
11	27.5
c.Place tooth in cold fresh milk and seek dentist.	
7	17.5
d.No opinion.	
3	7.5

7. If permanent teeth to be replanted had fallen onto the ground and was covered with dirt ,what would you prefer prior to replant an avulsed tooth?

N	%
a.Wipe the tooth with a tissue paper .	
4	10
b.Clean the tooth with a tooth brush.	
6	15
c.Rinse the tooth gently under running tap water for a few seconds without scrubbing it.	
27	67.5
d.No need to clean the tooth because it is useless	
3	7.5

8. What do u think is the best medium to preserve the tooth?

N	%
a.Fresh milk.	
11	27.5
b.Saliva.	
12	30
c.Water.	
8	20
d.Saline.	
9	22.5

9.9.What is your opinion on replantation of avulsed primary teeth?

N	%
a.Yes , in any circumstances.	
1	2.5
b.Yes, except in the case of an unconscious patient.	
9	22.5
c.Yes, except in the case of multiple avulsed teeth.	
29	72.5
d.No, in any circumstances.	
1	2.5

10.10.Would you prescribe some medicaments after teeth avulsion injury?

N	%
a.No	
1	2.5
b.Yes, anti-inflammatory, analgesic.	
5	12.5
c.Yes, antibiotic, anti-inflammatory, analgesic	
29	72.5
d.Yes, analgesic.	
5	12.5

11.Does your knowledge regarding emergency management of tooth avulsion is enough?

N	%
a. Enough	
2	5
b. Moderately enough.	
8	20
c. Not enough.	
24	60
d.No opinion.	
6	15

12.12.What are the barriers you face in your practice in promoting the management of avulsed teeth?

N	%
a.Lack of time.	1 2.5
b.Lack of dental knowledge.	31 77.5
c.Lack of interest.	1 2.5
d.All of the above.	40 100

Table 3- Comparison on the question regarding the knowledge of what is meant by avulsion of teeth between different age groups

		Age Groups				Total
		20 -25	25 -30	30 - 35	>35	
Q1	1.00	Count 10	7	4	2	23
		% 52.6%	53.8%	80.0%	66.7%	57.5%
	2.00	Count 3	4	1	0	8
		% 15.8%	30.8%	20.0%	0.0%	20.0%
	3.00	Count 4	2	0	1	7
		% 21.1%	15.4%	0.0%	33.3%	17.5%
	4.00	Count 2	0	0	0	2
		% 10.5%	0.0%	0.0%	0.0%	5.0%
Total		Count 19	13	5	3	40
		% 100.0%	100.0	100.0	100.0	100.0

$X^2=5.8$   $p=0.76$  ns

\*p -p value, †-ns - not significant

Table 4-Comparison on question for the knowledge regarding emergency management of tooth avulsion is enough between different age groups

		Age groups				Total
		20 -25	25 -30	30 - 35	>35	
Q11	Enough	Count 0	1	0	1	2
		% 0.0%	7.7%	0.0%	33.3%	5.0%
	Moderately enough	Count 5	1	2	0	8
		% 26.3%	7.7%	40.0%	0.0%	20.0%
	Not enough	Count 11	9	3	1	24
		% 57.9%	69.2%	60.0%	33.3%	60.0%
	No opinion	Count 3	2	0	1	6
		% 15.8%	15.4%	0.0%	33.3%	15.0%
Total		Count 19	13	5	3	40
		% 100.0%	100.0	100.0%	100.0%	100.0%

$X^2=11.154$   
 $p=0.255$  ns

\*p -p value, †-ns - not significant

Table 5-Comparison on question for What are the barriers you face in your practice in promoting the management of avulsed teeth according to the experience

			Experience		Total
			0 - 5	>5	
Q12	Lack of time	Count	1	0	1
		%	3.1%	0.0%	2.5%
	Lack of dental knowledge	Count	23	8	31
		%	71.9%	100.0	77.5%
	Lack of Interest	Count	1	0	1
		%	3.1%	0.0%	2.5%
	All of the above	Count	7	0	7
		%	21.9%	0.0%	17.5%
Total		Count	32	8	40
		%	100.0%	100.0	100.0

$\chi^2=2.903$   $p=0.407$  ns

\*p -p value

†-ns - not significant

## DISCUSSION

A favourable prognosis for avulsed and replanted teeth is significantly dependent upon the combination of minimal time spent outside the socket, appropriate storage, and transportation medium and minimal aggression to the root surface and periodontal ligament. Considering that immediate correct management of Traumatic Tooth Avulsion Injuries (TTAI) can improve both short and long-term outcomes, it is important to promote awareness regarding emergency management modalities among emergency healthcare professionals. This study provided information about existing level of knowledge of dental avulsion among emergency physicians practicing in Mangalore. In recent decades, studies have been conducted in many countries to evaluate the knowledge of dentists, healthcare professionals, teachers, and other lay persons regarding emergency management of TTAI. The knowledge of emergency management of TTAI among emergency medical physicians in India, however, has not been reported upon in the literature. This survey included emergency physicians from private and public practice in Mangalore city. 57.5% males and 42.5% females participated in the survey. 65% of participants have no prior knowledge regarding management of avulsed tooth, 25% of physicians had attended tooth avulsion injury in day to day practice. Majority of the doctors gave an opinion that dental trauma should be ideally managed by dentist. Studies have shown that teeth that are protected in a physiologically ideal media can be replanted within 15 minutes to one hour after the accident with good prognosis. The ideal storage medium should be proficient in preservation of cell vitality, adherence and clonogenic capacity (Zhao and Gong, 2010) and readily available at the site of the accident or easily accessible. (Ashkenazi *et al.*, 2000) If the avulsed tooth is transferred to a liquid medium such as the patient's own saliva, milk or saline within the first 15 minutes following avulsion, it is likely that some of the cells in the periodontal ligament and cementum will survive and play a role in regeneration. (Huang *et al.*, 1996; Venkataramana *et al.*, 2015; Leelavathi *et al.*, 2016) 75% of participants were unaware of ideal time of replantation of avulsed tooth. Although one of the more requisites of dental avulsion treatment is tooth replantation as soon as possible keeping periodontal cells viable for healing in possible pulp revascularization. A delay in providing a proper treatment jeopardise the prognosis of avulsed tooth, hence immediate management should be considered. (Kaur *et al.*, 2014) Storing in water is not recommended as the osmolality is very low, 27.5% of respondents gave fresh milk as the best

storage media, Milk as a favourable osmolality and composition for the viability of PDL cells and thereby recommended for temporary storage of avulsed tooth for replantation. (Ayc *et al.*, 2012)

Despite years of research showing that cell membranes will be destroyed if stored in normal saline, an alarming number of physicians (42.4%) thought that a tooth could be stored in such a medium. There seems to be an urgent need to educate the physicians and correct these misconceptions. (Chanchala *et al.*, 2016) The apotheosis of present study is that the majority of the respondents were unsatisfied with the level of knowledge and expressed their desire for further education. Taking this into consideration a pamphlet with a detailed description of management of avulsed tooth highlighting the ideal storage media and immediate precautions were distributed to all the participants. This was acknowledged positively. It is therefore Dentist responsibility to make the Physicians aware of the importance of first aid for avulsed tooth with appropriate measures. This can be accomplished by conducting dental education programmes. Comprehensive strategies seen mandatory for up-to-date knowledge. Different approved guidelines can be developed and distributed in the form of posters and brochures to enhance further knowledge. This study had some limitations which are to make an accurate comparison with this distribution of responses our sample size would need to be much larger. A follow up study could broaden the pool of participants by questioning all the emergency department physicians in Mangalore, Karnataka, India.

### What this study reveals

The emergency medical physicians require further training on appropriate emergency management of TTAI in children. Continuing education, seminars, and other types of training activities should be provided to emergency physicians to help improve their level of knowledge on the emergency management of dentoalveolar tooth injuries. (Cruz-da-Silva *et al.*, 2016)

### Conclusion

In the light of such results, it can be concluded that further knowledge is required among the emergency physicians regarding the accurate management of avulsed teeth. Hence it is the responsibility of dentists as health care professionals to broaden the knowledge. This can be done by campaigning the compulsory continuing educational and preventive program for the emergency physicians.

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