



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

International Journal of Current Research  
Vol. 11, Issue, 09, pp.6925-6929, September, 2019

DOI: <https://doi.org/10.24941/ijcr.36530.09.2019>

## RESEARCH ARTICLE

# KNOWLEDGE AND ATTITUDE REGARDING EMERGENCY MANAGEMENT OF TOOTH AVULSION AMONG MEDICAL INTERNS AND DENTAL INTERNS

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### ARTICLE INFO

#### Article History:

Received 19<sup>th</sup> June, 2019  
Received in revised form  
24<sup>th</sup> July, 2019  
Accepted 26<sup>th</sup> August, 2019  
Published online 30<sup>th</sup> September, 2019

#### Key Words:

Avulsion, Dental,  
Medical, Interns.

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Citation: Dr. Deepak Jha, Dr. Anuradha Pathak and Dr. Haridarshan Singh Sidhu, 2019. "Evaluation of various marketed formulations of boswellia by RP-HPLC and HPTLC", *International Journal of Current Research*, 11, (09), 6925-6929.

### ABSTRACT

**Aim:** The aim of this study was to investigate knowledge and attitude of medical interns and dental interns regarding emergency management of avulsed teeth. **Method:** 40 medical interns and 40 dental interns were surveyed. All surveyed participants had served in either hospitals or dental centres with emergency department duties. Informed consent was sought from all the participants. Data was collected using a self-administered questionnaire. **Results:** Majority of the medical interns (n=36, 90%) surveyed had never received any information on management of tooth avulsion. All dental interns (100%) had received information about emergency management of tooth avulsion. 30% (n=12) of the medical interns demonstrated some knowledge, 70% (n=28) low knowledge and none of the medical interns showed high knowledge. In contrast, 33 dental interns (83%) had high knowledge, 7 (17%) some knowledge, none demonstrated low knowledge. **Conclusion:** There is a need to improve knowledge of medical interns regarding emergency management of traumatic tooth avulsion.

## INTRODUCTION

Traumatic dental injuries occur frequently in children and young adolescents. These injuries mostly occur during sports-related injuries in schools, playgrounds, road traffic accidents, physical violence. The consequences of traumatic dental injuries range from minor subluxation to more complicated intrusion or avulsion injuries. Tooth avulsion is the complete displacement of a tooth from its socket due to accidental or non-accidental injury. Avulsion of permanent teeth accounts for 0.5-3% of all dental injuries (Glendor *et al.*, 1996; Andreasen *et al.*, 2007). Avulsion of permanent teeth mostly occurs between the age of 7 and 9 years and the maxillary permanent central incisors are the teeth mostly involved (Andreasen and Andreasen, 1994; Cho and Cheng, 2002; Robertson and Noren, 2001; Caldas and Burgos, 2001). The prognosis of an avulsed tooth is very much dependent upon the immediate actions taken at the place of accident (Andreasen *et al.*, 2007; Andreasen and Andreasen, 1990; Peterson *et al.*, 1998; Trope, 2002; Andreasen *et al.*, 2002). Avulsed permanent teeth can be saved if replanted immediately or stored in a physiologic solution such as saline, milk or even saliva until professional help is obtained (Andreasen *et al.*, 1994; Andreasen and Andreasen, 1990; Peterson *et al.*, 1998; Trope, 2002; Andreasen *et al.*, 2002; Andersson *et al.*, 1990). The main challenge in replantation of an avulsed tooth is in maintaining the vitality of the periodontal ligament cell layer. Loss of an anterior tooth in early ages of life results in functional, aesthetic consequences and may have severe

psychological consequences in the child. Medical professionals are often the first to attend victims of traumatic injuries, either at the site of accident or at hospital emergency departments. But due to lack of adequate knowledge cases of tooth avulsion are either ignored or prompt referral to the dentist is not done at the earliest. This leads to delaying of the treatment and further jeopardizing the prognosis. Medical physicians with adequate knowledge, skills of the treatment of avulsed tooth will play a vital role in providing initial first aid and timely referral to the dental specialists. Hence, emphasis must be given to improve the knowledge and awareness regarding emergency management of dental avulsion among medical interns. The aim of this study was to investigate knowledge and attitude of medical interns and dental interns regarding emergency management of avulsed teeth.

## MATERIALS AND METHODS

A total of 40 medical interns and 40 dental interns were randomly chosen for the study. Informed consent was obtained from all the participants. A questionnaire consisting of several multiple choice questions was distributed to the participants. The questionnaires were filled up by the participants under the supervision of the author. The questionnaires were collected immediately after the participants had answered the questions. The questionnaire was divided into three parts. The first part consisted of questions on information about personal details, i.e., gender, medical or dental intern. Part II composed of 10 questions which enquired about the knowledge regarding

**Table 1. Knowledge regarding emergency management of tooth avulsion**

Questions	Responses	Medical Interns	Dental Interns
1. Have you ever received any information on what to do if a tooth is knocked out?	YES NO	36 4	40 0
2. Can you differentiate between a primary and permanent tooth?	YES NO	20 20	40 0
3. What would you prefer in order to rule out aspiration of an avulsed tooth?	(a) It is enough to check if the child has begun coughing (b) It is enough to check lung ventilation with a stethoscope (c) A chest radiograph should be taken (d) Bronchoscopy is required (e) Do not know	2 8 25 0 5	0 0 35 5 0
4. What is your opinion on replantation of avulsed primary teeth?	(a) Yes, in any circumstances. (b) Yes, except in the case of an unconscious patient or severe systemic conditions. (c) Yes, except in the case of avulsion of multiple teeth. (d) No, in any circumstances. (e) No opinion.	2 5 0 8 25	0 0 0 40 0
5. What is your opinion on replantation of avulsed permanent teeth?	(a) Yes, in any circumstances. (b) Yes, except in the case of an unconscious patient or severe systemic conditions. (c) Yes, except in the case of avulsion of multiple teeth. (d) No, in any circumstances. (e) No opinion.	3 10 4 2 21	0 35 5 0 0
6. You are informed by telephone that a child was injured and permanent tooth is avulsed. Which of the following will you recommend to the parents?	(a) Wrap the tooth in a clean piece of gauze or handkerchief and look for a dentist quickly (b) Replace the tooth back in the mouth as soon as possible and seek a dentist (c) Put the tooth in cold and fresh milk and look for a dentist (d) Do not know	22 4 5 9	0 27 13 0
7. How urgent do you think professional help should be sought in case of a tooth avulsion?	(a) Within 20 minutes (b) Within a few hours (c) Within a day (d) No need to seek professional help if bleeding has ceased	16 20 2 2	32 8 0 0
8. You found the avulsed tooth and it is dirty. What would you do?	(a) Throw it away because it is dirty (b) Wipe the tooth with tissue paper or towel (c) Clean the tooth with isopropyl alcohol or soap and water and a brush (d) Rinse the tooth under tap water gently without scrubbing it (e) Do not know	9 3 15 2 11	0 0 3 37 0
9. If you find an avulsed tooth, how would you handle the tooth?	(a) By the crown (b) By the root (c) Anywhere (d) Not sure	0 0 20 20	40 0 0 0
10. If the avulsed tooth could not be replanted on the site of injury, what would be the most suitable medium for storage and transfer to the dental office?	(a) Fresh cold milk (b) Tap water (c) Isotonic saline (d) Saliva (e) Allow the tooth to dry and cover in sterile gauze (f) No idea what medium to use	6 3 11 2 2 16	26 0 3 11 0 0

**Table 2. Attitude regarding emergency management of tooth avulsion**

Questions	Responses	Medical interns	Dental interns
1. If you were at a site when someone has an avulsed tooth, you would	(a) Call for help and take no other action because you lack knowledge and training (b) Call for help and take no other action because you are concerned about medico legal consequences (c) Be confident and replant the tooth (d) Not confident but still would attempt to replant the tooth	30 7 3 0	5 2 33 0
2. How important do you think is the knowledge of dental trauma management in your clinical practice?	(a) Very important/important (b) Good to know (c) Not important as I am not a dentist	5 12 23	40 0 0
3. Do you think dental trauma management should be covered in your undergraduate course?	YES NO	18 22	40 0

emergency management of tooth avulsion. The questions were formulated such that following fields of knowledge were assessed:

- Proper cleaning technique of a contaminated avulsed tooth before replantation
- Appropriate storage media for an avulsed tooth
- Differentiation between a primary and permanent tooth
- Critical extra-alveolar time of an avulsed tooth

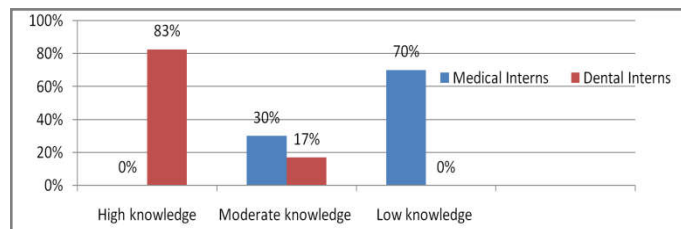
Part III consisted of three questions which assessed the attitude of the participants regarding emergency management of tooth avulsion.

The data was collected and descriptive statistics were obtained. Study data was analyzed using SPSS. The chi-square test was also used to analyse the data. Statistically significant differences were assumed when  $P < 0.05$ . Knowledge level was assessed by scoring of the participant's answers. A score

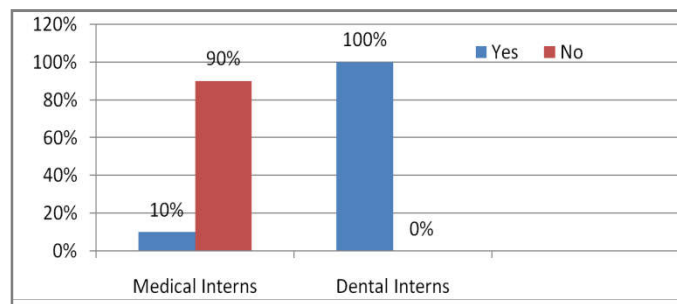
of 1 was granted to the most correct option. A total score of 10 points indicated full knowledge while a score of 0 indicated no knowledge. Between these two scores a scale of high knowledge (8-10 points), some knowledge (4-7 points) and low knowledge (0-3) was formulated.

**RESULTS**

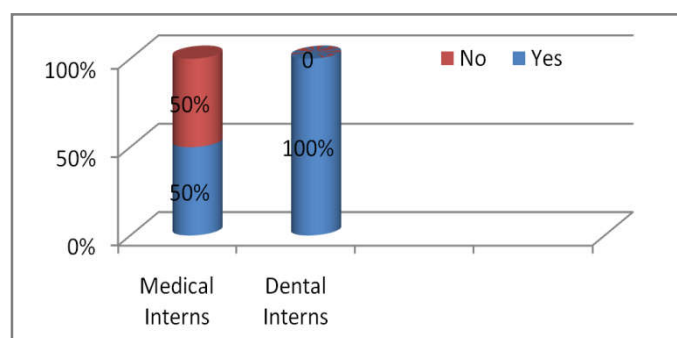
The study sample comprised a total of 80 interns from medical and dental institutions. There were 40 interns from medical institution and 40 interns from dental institution.



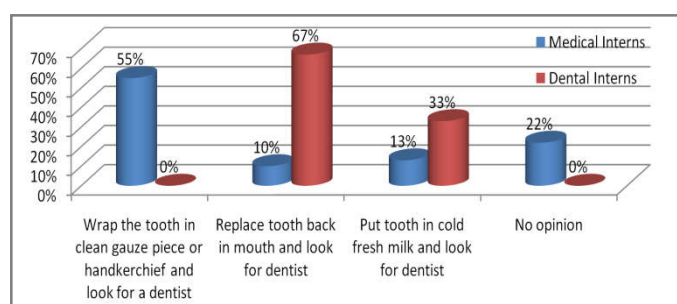
**Figure 1. Knowledge level regarding emergency management of tooth avulsion**



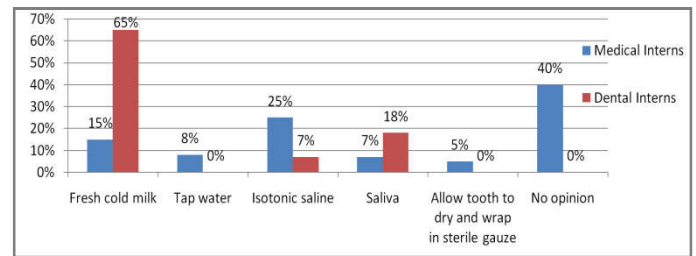
**Figure 2. 90% of medical interns surveyed never received any information on management of tooth avulsion. All dental interns (n=40) had received information about it.**



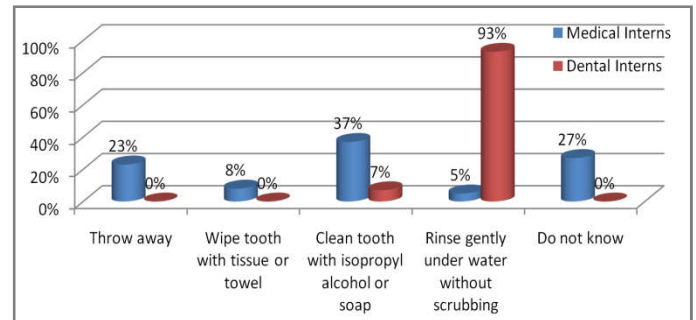
**Figure 3. Only 50 % of medical interns were confident that they could differentiate between primary and permanent teeth.**



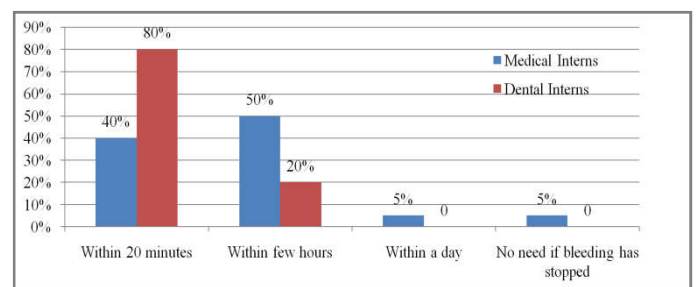
**Figure 4. What should be recommended if intern is informed on telephone that a child is injured and permanent tooth has been knocked out?**



**Figure 5. Responses for most suitable storage media for storage and transfer to dental office**



**Figure 5. What should be done if an avulsed tooth is found to be dirty??**



**Figure 7. Responses for how urgent should professional help be sought in case of tooth avulsion**

**DISCUSSION**

This study provides information about the level of knowledge and attitude of medical and dental interns regarding emergency management of an avulsed tooth. The results of this study indicate that only the dental interns possessed high knowledge about emergency management of dental avulsion.

Fig. 1 shows the level of knowledge regarding emergency management of tooth avulsion among medical and dental interns. Majority of the medical interns, 70% (n=28) showed low level of knowledge, only a few 30% (n=12) showed some level of knowledge and none of the medical interns had high level of knowledge regarding the emergency management of dental avulsion. In contrast, nearly 83% of dental interns had high knowledge and 17% showed some level of knowledge. None of the dental interns showed low level of knowledge. A study conducted by Eby Varghese *et al.* (2017) reported that 98.4% of medical students had low knowledge and 1.6% of medical students had some knowledge on emergency management of tooth avulsion. The results of this study are in line with the results of studies done by Eby Varghese *et al.* (2017); Diaz *et al.* (2009), Lin *et al.* (2006).

Fig. 2 shows that a majority (90%) of medical interns had never received any knowledge regarding emergency

management of dental avulsion injuries. This study shows that only 10% of the medical interns reported that they had some information about management of tooth avulsion, but majority among these stated that they had received this information through medical literatures. In contrast, all 100% of dental interns had received prior information regarding emergency management of tooth avulsion. The dental interns had received this information through their undergraduate curriculum. Abu-Dawood *et al.* (2007) in their study reported that 83.3% of medical professionals had never received any information or training regarding what to do if a permanent tooth is avulsed. Hence, this study indicates lack of knowledge regarding management of dental avulsion injuries among the medical professionals.

Fig. 3 shows that only half (50%) of the medical interns were confident that they could differentiate between primary and permanent teeth. In contrast, all the dental interns (100%) were confident in differentiating between primary and permanent teeth. In this study, almost 50% of medical interns had no opinion whether a primary tooth should be replanted (Table 1). 100% of dental interns had the knowledge that avulsed primary tooth must not be replanted under any circumstances (Table 1). The management of avulsion of primary teeth is different than that for permanent teeth. Wherein avulsed permanent teeth should be replanted, primary avulsed teeth are not indicated for reimplantation. Reimplantation of primary teeth shows high failure rates because of pulp necrosis, infection and there is always a possibility of damage to the permanent tooth during the procedure (Andreasen *et al.*, 1990; Wilson, 1995).

Fig. 4 shows data about what the study groups would recommend if they were informed about avulsion of permanent teeth of a child on the telephone. 55% of medical interns were of the view that avulsed tooth should be wrapped in gauze or a clean handkerchief. 22% of medical interns had no opinion regarding what to do in such instances. 13% were of the view of placing the tooth in cold fresh milk. Only 10% (n=4) of medical interns responded that avulsed permanent tooth can be placed into the child's mouth until the child is brought to a dentist. In contrast, majority 67% of dental interns had the opinion that avulsed permanent tooth can be placed into the child's mouth until the child is brought to a dentist. Remaining 33% were of the view of placing the tooth in cold fresh milk.

Fig. 5 shows data regarding responses for most suitable storage media for avulsed tooth. Majority 40% of medical interns responded that they had no knowledge regarding storage of avulsed tooth. 25% were of the view of placing tooth in isotonic saline medium. 15% replied with fresh cold milk as their preferred option. 8% were of the view of placing it in tap water. 5% thought that the tooth could be allowed to dry by wrapping in gauze. 7% had the opinion of using saliva as a storage media. Among the dental interns, 65% responded with fresh cold milk as their preferred choice. 18% were of the view of placing the tooth in saliva. 7% of dental interns were of the view of placing the tooth in isotonic saline for storage.

Transport and storage of an avulsed tooth is of importance in maintaining the vitality of the periodontal cells of the avulsed tooth. In this study, knowledge regarding appropriate storage media was found to vary considerably among the study groups. It was observed that the dental interns were aware of physiologic media such as milk, saliva and saline but such knowledge was lacking in the medical interns. Milk can be

used as a storage media in cases of tooth avulsion for a short period of time. The pH and osmolality of milk are compatible to the cells of PDL and so it can be used as a storage media for avulsed tooth for a short period of time. Studies by Blomlof (1983), Trope and Friedman (1992) recommend that milk acts as an excellent storage media for 6 hours. Saliva present in the oral cavity can be used as a storage medium for a short period of time until the patient is brought to the dentist. Placing the tooth back in the mouth is advantageous as it will prevent drying of the teeth, thereby, preventing destruction of the PDL cells. Wrapping the tooth in a gauze piece or handkerchief would cause drying of the teeth which will lead to rapid destruction of the PDL cells.

Fig. 6 shows knowledge about what should be done if an avulsed tooth has become dirty. Majority 37% of medical interns responded that they would clean a dirty avulsed tooth with isopropyl alcohol or soap solution. Also, 23% responded that they would throw away an avulsed tooth as it had become dirty. 27% of medical interns had no opinion regarding management of dirty avulsed tooth. 8% were of the view of wiping the tooth with tissue or towel. Only 5% of medical interns had the view that dirty avulsed tooth should be rinsed gently under running water without scrubbing action. In contrast, majority 93% of dental interns had the opinion that dirty avulsed tooth should be rinsed gently under running water without scrubbing action. IADT guidelines for the management of dental trauma state that the avulsed tooth should be gently rinsed without any scrubbing action under physiologic solutions as scrubbing action could cause damage to the PDL cells.

Fig 7 shows knowledge about how urgent professional help should be sought after avulsion injury. 50% of medical interns responded that professional help could be sought within few hours of the injury. 40% of medical interns had the view that help should be sought within the first 20mins following injury. 5% answered that help could be sought within a day's time. 5% of medical interns had the opinion that no professional help was required if bleeding from the avulsed socket had ceased. In contrast, majority 80% of dental interns were of the opinion that professional help should be sought within first 20 minutes after the avulsion injury has occurred. 20% had the view that help should be sought within few hours after the injury. Extra oral dry time plays an important role in the prognosis of avulsed tooth. The vitality of PDL cells is important for the success of replantation. Longer extra-oral dry time causes rapid destruction of the PDL cells. The guidelines for the management of dental trauma published by the International Association for Dental Traumatology (IADT) recommend the immediate replantation of a tooth to obtain the best prognosis (Andersson *et al.*, 2012). The results of this study indicate an important implication which is to include educational programs, campaign and seminars to broaden and increase the knowledge of medical personnel regarding emergency management of dental trauma and especially, dental avulsion injuries.

## Conclusion

Majority of medical interns participating in the present study had low knowledge regarding the emergency management of tooth avulsion. Medical professionals are most often the first to attend to cases of traumatic injuries, maybe at the site of accident or hospital emergency departments. Most of these

traumatic injuries involve trauma to dentofacial structures. Dental injuries like avulsion of permanent teeth have a favourable prognosis, but this heavily depends upon the actions taken in the emergency phase. This study including various other studies have shown that medical professionals, medical students and medical interns have low knowledge in the emergency management of tooth avulsion. Hence it is of utmost importance that medical interns, who would later serve as medical professionals must have sound knowledge on the emergency management of dental trauma, especially that of avulsed teeth. This can be achieved by incorporating information about emergency management of dental trauma in the undergraduate curriculum of medical students. Such information can also be taught by means of lectures, clinical postings in hospital-based dental clinics, or first-aid workshops on dental trauma. Also, posters about basic first aid treatment pertaining to dental avulsion can be provided in the emergency units. This would enable the medical interns to act efficiently and effectively, thereby reducing the extra-alveolar time and in return, contributing to the better prognosis of avulsed teeth.

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