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First-aid knowledge about tooth avulsion among dentists, doctors and lay people

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Abstract – In avulsion, teeth are bodily displaced out of the bony socket. Boys, aged 7–9 years, are most prone to avulsion of maxillary central incisors. Tooth avulsion should ideally be treated with immediate replantation. Because of the urgency in treatment, personnel dealing with this injury should have knowledge about the first-aid treatment. This study was conducted to assess the first-aid knowledge about tooth avulsion among dentists, doctors, students, school teachers and the general public in Lahore, Pakistan. Data were collected using a form with one open-ended question about the first-aid treatment of traumatic avulsion. Immediate replantation of the avulsed tooth was suggested by 10.1% of 377 respondents. Among dentists, 45.8% suggested immediate replantation, with the rest suggesting transport of the tooth to a dentist for replantation. Among all other groups (non-dentists) immediate replantation was suggested by 4.6% and transport to a dentist by 3.3%. Non-dentists in Pakistan, including doctors, have insufficient knowledge about the immediate treatment of tooth avulsion. Dentists, in comparison, have significantly more knowledge, but may need training in selection of the appropriate treatment option and handling and care of the avulsed tooth.

Nearly one in three children is exposed to dental trauma (1). Tooth avulsion is a type of dental trauma in which the whole tooth is displaced out of the bony socket. Avulsion frequency among dental trauma in the permanent dentition is between 0.5 and 16% (2–7). Avulsion injuries in children most frequently occur between ages 7 and 9 years when the permanent incisors are erupting, and are more common in boys than in girls (8). Most often the injury involves only a single tooth. The tooth most commonly avulsed in the permanent dentition is the maxillary central incisor (4).

The immediate management of an avulsed permanent tooth is to hold it by the crown, rinse for up to 10 s under saline or tap water (9) and immediately replant, irrespective of the stage of root development (10, 11). If immediate replantation is not possible, the tooth should be stored in Hank's balanced salt solution (HBSS), milk, saline or saliva (12), and immediately taken to a dentist for replantation and splinting (8, 13).

The urgency in treatment necessitates that personnel dealing with tooth avulsion should have knowledge about the first-aid management. Dentists have been reported to an adequate (14) or high level of knowledge about tooth avulsion compared with physicians (15), but their selection of intervention may not be according to the literature (16, 17). It is not known whether dentists in Pakistan have comparable or different level of knowledge. Groups of people who from time to time have to handle avulsed teeth but have insufficient knowledge about the management of tooth avulsion include doctors (14, 18), teachers (19–25), parents (26, 27) and children (1).

This study was undertaken to assess the knowledge about the immediate first-aid treatment of permanent tooth avulsion among dentists, doctors, students, school teachers and general public in Lahore, Pakistan.

Methods

The study was conducted at the Lahore Medical & Dental College (LMDC), Lahore, Pakistan, and other educational institutions in Lahore, Pakistan. Approval was obtained from the Research and Ethical Committee of the college and from the administrations of the other educational institutions. The form designed for the study was tested in a pilot survey of five individuals and necessary modifications made. One open-ended question was asked followed by a clarification of terminology in parenthesis: 'If a permanent tooth is knocked out (avulsed) in an injury, what is the best immediate first aid treatment? ('knocked out' or 'avulsed' means that the whole tooth has come out from its place in the mouth and has fallen on the ground)'.

Groups were based on profession and included dentists and doctors working at LMDC, first and second year students of Bachelors of Dental Surgery (BDS) and first year students of Bachelor in Medicine and Bachelor in Surgery (MBBS) at LMDC, ninth and 10th grade students from Aitchison College Lahore, third grade students from Lahore American School, school teachers from Aitchison College Lahore, Lahore American School and Aims High School, and a group with members of the general public.

Data collection time of 2 weeks was allocated with an aim to have 50 individuals consecutively collected in each

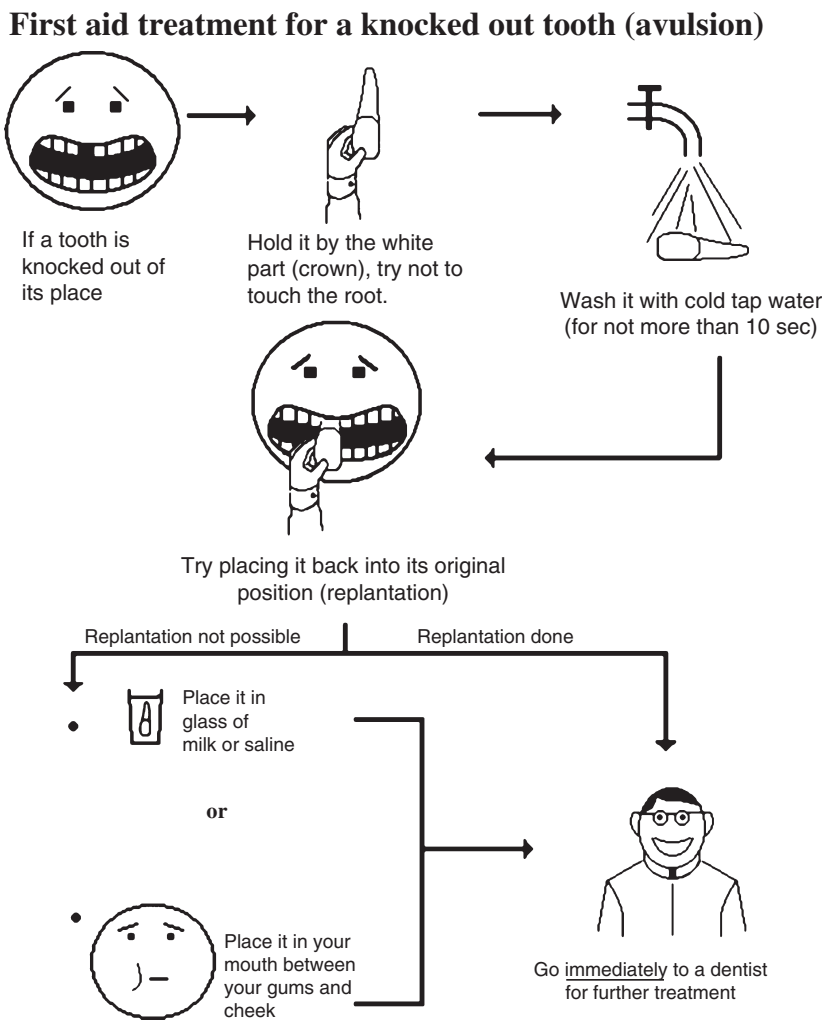

Fig. 1. Handout on first aid treatment of tooth avulsion.

group. All the medical and dental students in the selected classes were requested to fill the form. These classes had had no formal teaching about tooth avulsion. Among members of the faculty of LMDC, 75 forms were distributed each to dentists and doctors. Forms were distributed to 80 school children aged 8–15 years as allowed by the institutions involved, and 120 forms were distributed amongst school teachers of these institutions. Amongst the general public, 75 forms were distributed to families of students and staff at the Sports Day of LMDC. After collection of the forms from each group, a handout graphically illustrating the correct management of this injury was distributed to participants (Fig. 1).

The responses were coded under three main headings: those that suggested immediate replantation, those that suggested transport of the avulsed tooth to a dentist and those that suggested other inappropriate options. Each category was sub-categorized according to suggested treatment and care. Data were analyzed using SPSS v.11 (SPSS Inc., Chicago, IL, USA).

Table 1. Response rate of the participants

Group	No. respondents	Response rate (%)
Dentists	48	64
Medical doctors	35	46.7
1st year BDS students	46	96
2nd year BDS students	54	86.7
1st year MBBS students	58	77.3
School children, aged 8–15 years	64	80
School teachers	40	33.3
General public	32	42.7
Total	377	61.8

Data are the number (%) surveyed.

Results

A total of 377 forms were collected, a response rate of 61.8% (Table 1). There were 198 (52.5%) male respondents and 179 (47.5%) female respondents.

Immediate replantation at the scene of the accident was suggested by 10.1% of all the respondents. In comparison of groups, immediate replantation was suggested by 47.9% dentists. Among all other groups (non-dentists), immediate replantation was suggested by 4.6%. Dentists showed significantly more knowledge about immediate management of tooth avulsion as

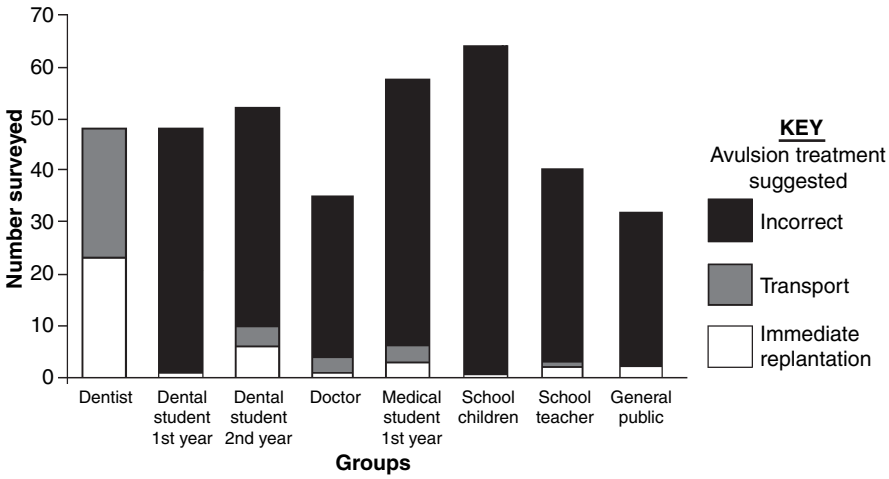

Fig. 2. First aid treatment of tooth avulsion suggested by groups.

Table 2. Measures suggested for immediate first-aid treatment of permanent tooth avulsion

		Non-dentists (n = 329)							
Suggested measures	Dentists (n = 48)	1st year dental students (n = 46)	2nd year dental students (n = 54)	Doctors (n = 35)	1st year Medical students (n = 58)	School children (n = 64)	School teachers (n = 40)	General public (n = 32)	Total (n = 377)
Immediate replantation	47.9	2.2	11.1	2.9	5.2	0	5	6.3	10.1
Transport	52.1	0	7.4	8.6	5.2	0	2.5	0	9.5
Incorrect	0	97.8	81.5	88.5	89.6	100	92.5	93.7	80.4

Data are the number (%) surveyed.

Table 3. Steps of immediate replantation suggested by dentists

Treatment breakdown	Dentists (n = 23*)
Handle from the crown	39.1
Rinse the tooth	
With saline	17.4
With water	26.1
With both saline and water	4.3
Not mentioned	8.7
Duration of rinse	
Maximum of 10 s	4.3
Time period not mentioned	95.7
Go to the dentist afterwards	52.2

Data are the number (%) surveyed; percentages may add to greater than 100% as some respondents suggested more than one step.
*No. dentists who suggested immediate replantation.

Table 4. Steps of transport to a dentist suggested by dentists

Treatment breakdown	Dentist (n = 25*)
Handle from the crown	36.0
Transport medium	
Saline	20.0
HBSS	20.0
Milk	64.0
Saliva (mouth)	72.0
Carriage to the dentist	
In less than 30 min	8.0
Immediately	40.0
Time period not mentioned	52.0

Data are the number (%) surveyed; percentages may add to greater than 100% as some respondents suggested more than one step.
*No. dentists suggesting transport to a dentist.

compared with non-dentists ($P < 0.001$). In comparison of non-dentist groups with each other, there were no significant differences in their level of knowledge. Results have been summarized in Fig. 2 with details in Table 2.

Among 23 dentists recommending immediate replantation, 39.1% specified appropriate handling by the crown, 56.5% recommended rinsing the tooth, 4.3% specified rinsing for less than 10 s and 52.2% suggested going to a dentist after replantation (Table 3).

The option of transporting the avulsed tooth to a dentist was suggested overall by 9.5% of respondents. Among dentists 52.1% suggested this option. Among non-dentists, the option of appropriate carriage to a dentist was suggested by 3.3% (Table 2).

Among 25 dentists recommending transport of the tooth, 36% recommended handling the tooth by the crown. Most dentists suggested multiple options for transport media, with 72% mentioning saliva, 64% milk, 20% saline and 20% HBSS. 'Immediate' transport to a dentist was recommended by 40%, with 8% recommending transport within 30 min. Time duration of transport was not mentioned by 52% (Table 4).

Table 5. Cumulative percentage of treatment measures suggested for permanent tooth avulsion

Suggested treatment	Percentage of respondents*	Percentage of dental respondents*	Percentage of non-dental respondents
Measures to control bleeding	47.3	0	54.2
Visit a dentist	42.2	77.0	41.3
Rinse	23.7	0	27.2
Immediate replantation	10.1	47.9	4.6
Use analgesics	9.1	0	10.4
Apply ice	6.1	0	23.0
Do nothing	6.1	0	23.0

Data are the number (%) surveyed. *Percentages may add to greater than 100% as some respondents gave more than one answer.

Table 6. Percentage of respondents in groups suggesting visit to a dentist after permanent tooth avulsion

Group	Percentage of respondents suggesting visit to a dentist
Dentist	77.0
Doctor	54.3
Dental student 2nd year	22.6
General public	18.3
School teacher	17.2
Medical student 1st year	15.1
School children	15.1
Dental student 1st year	11.8
Total	42.2

Data are the number (%) surveyed.

Incorrect treatment options were recommended by 80.4% of respondents (Table 2). None of the dentists were in this category. Different measures to control bleeding (54.2%) and rinsing (27.2%) were frequent responses among non-dentists (Table 5). Application of cotton wool was the most frequent measure suggested for control of bleeding.

Going to a dentist for treatment after tooth avulsion was suggested by 42.2% of respondents. Half of the doctors and 77% of the dentists recommended visiting a dentist. The other groups also recommended a visit, but to a much lesser extent (Tables 5 and 6).

Discussion

Appropriate replantation of an avulsed permanent tooth within 30 min has 90% chance of success. After 2 h, there is negligible chance (5%) of long-term retention of the tooth (11). An attempt should thus be made to immediately replant the avulsed tooth. Nearly half the dentists surveyed (47.9%) suggested immediate replantation, but appropriate handling was not specified by the majority, with only one dentist mentioning the appropriate duration of rinsing (Table 3).

Transport of the avulsed tooth in an appropriate medium to a dentist was suggested by the rest of the dentists surveyed. This option may have been preferred over immediate replantation because of perceived difficulty in replantation at the site of trauma or because of ease of access to dental facilities or because of lack of knowledge. Among the recommended media for transport, saliva is considered the least preferred (12), although it was suggested most frequently (72%) by dentists in this study (Table 4). The need for urgency in transport was indicated by nearly half (48%) of the dentists in this group, who suggested immediate transport, or transport within 30 min.

The knowledge of dentists in this study about tooth avulsion treatment is comparable with other studies (14–16), although there may be need for further training in prioritizing treatment options, appropriate handling and care of the tooth, selection of the transport medium, and early transport of the avulsed tooth.

Non-dentists in this study had little knowledge about the appropriate initial treatment of tooth avulsion (Table 2). Most non-dentists, including doctors, considered tooth avulsion a permanent loss and were concerned only about bleeding and pain. Visiting a dentist for treatment was not considered necessary by the majority, even 6.1% of the respondents opted to do nothing (Table 5).

The percentage of doctors suggesting immediate replantation (2.9%, Table 2) was similar to that of physicians working in emergency rooms in Israel (4%).18 In Kuwait, 16.7% physicians had received information about tooth avulsion, although 96.6% did not have dental health education as part of their studies (14).

School children are most prone to this injury, but have little information about the treatment (1). None of the 64 school children in this study suggested replantation or transport of the avulsed tooth to a dentist. All the children were from schools with oral health components in their curriculum, but with no information on dentoalveolar trauma.

Teachers generally have rudimentary knowledge about tooth avulsion (19–25). In this study, 92.5% of school teachers had insufficient knowledge. Even when aware of the correct treatment, teachers may be hesitant to immediately replant teeth because of lack of expertise and training (19). Provision of information to school teachers has proven to be successful in improving their knowledge about management of tooth avulsion (28).

The medical and dental students in this study had not been formally taught about tooth avulsion. Their knowledge was inadequate and similar to that of doctors and the general public.

The participants of this study were all literate and mostly from the middle and upper-middle socioeconomic strata. The doctors and dentists had received their training from different institutions in Pakistan. During data collection doctors, teachers and the general public obviously lacked knowledge about tooth avulsion and did not show much interest in the study. This is reflected in their low response rate. The results of this study are likely to be representative of most dentists, doctors and lay people (29).

Doctors, school teachers and children may encounter avulsion injuries, but are unlikely to suggest or provide

appropriate treatment in Pakistan. These groups and parents are in need of training about management of tooth avulsion (7, 14–27).

Non-dentists in Pakistan, including doctors, have insufficient knowledge about the immediate treatment of tooth avulsion. Dentists, in comparison, have significantly more knowledge, but may need training in selection of the appropriate treatment option and handling and care of the avulsed tooth.

References

1. Andersson L, Al-Asfour A, Al-Jame Q. Knowledge of first-aid measures of avulsion and replantation of teeth. An interview of 221 Kuwaiti schoolchildren. Dent Traumatol 2006;22:57–65.
2. Tuli T, Hachl O, Rasse M, Kloss F, Gassner R. Dentoalveolar trauma. Analysis of 4763 patients with 6237 injuries in 10 years. Mund Kiefer Gesichtschir 2005;9:324–9.
3. Lygidakis NA, Marinou D, Katsaris N. Analysis of dental emergencies presenting to a community paediatric dentistry centre. Int J Paediatr Dent 1998;8:181–90.
4. Şaroğlu I, Sönmez H. The prevalence of traumatic injuries treated in the pedodontic clinic of Ankara University, Turkey, during 18 months. Dent Traumatol 2002;18:299–03.
5. Gelbier S. Injured anterior teeth in children. A preliminary discussion. Br Dent J 1967;123:331–5.
6. Hedegard B, Stalhane I. A study of traumatized permanent teeth in children 7–15 years. I. Sven Tandlak Tidskr 1973;66:431–52.
7. Ravn JJ. Dental injuries in Copenhagen schoolchildren, school years 1967–1972. Community Dent Oral Epidemiol 1974;2:231–45.
8. Glendor U, Halling A, Andersson L, Eilert-Petersson E. Incidence of traumatic tooth injuries in children and adolescents in the county of Västmanland, Sweden. Swed Dent J 1996;20:15–28.
9. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 2. Factors related to pulpal healing. Endod Dent Traumatol 1995;11:59–68.
10. Andreasen JO, Borum MK, Jacobsen HL, Andreasen FM. Replantation of 400 avulsed permanent incisors. 4. Factors related to periodontal ligament healing. Endod Dent Traumatol 1995;11:76–89.
11. Andreasen JO, Hjørting-Hansen E. Replantation of teeth. 1. Radiographic and clinical study of 110 human teeth replanted after accidental loss. Acta Odontal Scand 1966;24:263–86.
12. Trope M. Clinical management of the avulsed tooth. Dent Clin North Am 1995;39:93–112.
13. Flores MT, Andersson L, Andreasen JO, Bakland LK, Malmgren B, Barnett F et al. Guidelines for the management of traumatic dental injuries. II. Avulsion of permanent teeth. Dent Traumatol 2007;23:130–6.
14. Westphalen VP, Martins WD, Deonizio MD, da Silva Neto UX, da Cunha CB, Fariniuk LF. Knowledge of general practitioners dentists about the emergency management of dental avulsion in Curitiba, Brazil. Dent Traumatol 2007;23:6–8.
15. Abu-Dawoud M, Al-Enezi B, Andersson L. Knowledge of emergency management of avulsed teeth among young physicians and dentists. Dent Traumatol 2007;23:348–55.
16. Cohenca N, Forrest JL, Rotstein I. Knowledge of oral health professionals of treatment of avulsed teeth. Dent Traumatol 2006;22:296–301.
17. De França RI, Traebert J, De Lacerda JT. Brazilian dentists' knowledge regarding immediate treatment of traumatic dental injuries. Dent Traumatol 2007;23:287–90.
18. Holan G, Shmueli Y. Knowledge of physicians in hospital emergency rooms in Israel on their role in cases of avulsion of permanent incisors. Int J Paediatr Dent 2003;13:13–9.
19. Blakytny C, Surbuts C, Thomas A, Hunter ML. Avulsed permanent incisors: knowledge and attitudes of primary school teachers with regard to emergency management. Int J Paediatr Dent 2001;11:327–32.
20. Chan AWK, Wong TKS, Cheung GSP. Lay knowledge of physical education teachers about the emergency management of dental trauma in Hong Kong. Dent Traumatol 2001;17:77–85.
21. Mori GG, Turcio KHL, Borro VPB, Mariusso AM. Evaluation of the knowledge of tooth avulsion of school professionals from Adamantina, São Paulo, Brazil. Dent Traumatol 2007;23:2–5.
22. Newman LJ, Crawford PJ. Dental injuries: ''first aid'' knowledge of Southampton teachers of physical education. Endod Dent Traumatol 1991;7:255–8.
23. Al-Jundi SH, Al-Waeili H, Khairalah K. Knowledge and attitude of Jordanian school health teachers with regards to emergency management of dental trauma. Dent Traumatol 2005;21:183–7.
24. Caglar E, Ferreira LP, Kargul B. Dental trauma management knowledge among a group of teachers in two south European cities. Dent Traumatol 2005;21:258–62.
25. Sae-Lim V, Lim LP. Dental trauma management awareness of Singapore pre-school teachers. Dent Traumatol 2001;17:71–6.
26. Raphael SL, Gregory PJ. Parental awareness of the emergency management of avulsed teeth in children. Aust Dent J 1990;35:130–3.
27. Al-Jame Q, Andersson L, Al-Asfour A. Kuwaiti parents' knowledge of first-aid measures of avulsion and replantation of teeth. Med Princ Pract 2007;16:274–9.
28. Al-Asfour A, Andersson L, Al-Jame Q. School teachers' knowledge of tooth avulsion and dental first aid before and after receiving information about avulsed teeth and replantation. Dent Traumatol 2008;24:43–9.
29. Mahmud K, Ud din A, Awan R. Pakistan social and living standards measurement survey (2006–07). Government of Pakistan, Islamabad: Federal bureau of statistics; 2007.