

Knowledge of Emergency Management of Avulsed Teeth Among General Dentists in Kathmandu

Upadhyay S, Rokaya D, Upadhyaya C

Dental Department

Kathmandu University School of Medical Sciences

Dhulikhel Hospital – Kathmandu University Hospital

Dhulikhel, Kavre, Nepal

Corresponding Author

Sumita Upadhyay

Dental Department

Kathmandu University School of Medical Sciences

Dhulikhel Hospital – Kathmandu University Hospital

Dhulikhel, Kavre, Nepal

Email: sumitadhungana@yahoo.com

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ABSTRACT

Background

An avulsed permanent tooth is one of the most emergency situations in dentistry. Dentists handling the situation should have adequate knowledge in this field.

Objective

To assess the level of knowledge of emergency management of avulsed teeth among general dentists in Kathmandu.

Methods

A questionnaire containing 10 close ended questions about emergency management of avulsed teeth was distributed among 102 general dental practitioners working in different private dental hospitals and clinics of Kathmandu. The dental hospital and clinics were randomly selected. This cross sectional study was conducted between January 2012 to February 2012. Data were entered into SPSS 11.5. Descriptive analysis was carried out to assess the frequency.

Results

General dentists of Kathmandu did not have adequate knowledge about emergency management of avulsed teeth.

Conclusion

An education program should be conducted to increase the knowledge of general dentists in the management of traumatic injuries to teeth.

KEY WORDS

Avulsion, emergency, general dentists, replantation

INTRODUCTION

Tooth avulsion (exarticulation /total luxation) implies total displacement of tooth out of its socket. Maxillary central incisors are the most frequently avulsed teeth.¹ Though infrequent (0.5 to 3%), avulsion of permanent teeth is the most serious of all dental injuries.¹ The prognosis depends on the measures taken at the place of accident or the time immediately after the avulsion.^{2,3}

Treatment objective for avulsed permanent teeth is to replant as soon as possible and then to stabilize the replanted tooth in its anatomically correct position to optimize the healing of periodontal ligament and neurovascular supply while maintaining the esthetics and functional integrity except

when replanting is contraindicated by the child's stage of dental development (risk for ankylosis where considerable alveolar growth has to take place); compromising medical condition; or compromised integrity of the avulsed tooth or supporting tissues.⁴

The dentist's knowledge in the emergency management of avulsed tooth is very important. There is no any published data regarding knowledge of dentists in this field. Purpose of this study was to evaluate the knowledge of general dentists working in Kathmandu about the management of avulsed teeth.

METHODS

A cross-sectional study was conducted among general dentists working in different private dental hospitals and clinics of Kathmandu. The time period of the study was between January 2012 to February 2012. The private dental hospitals and clinics of Kathmandu were randomly selected. A total of 102 participants who had completed B.D.S (Bachelor of Dental Surgery) degree were randomly selected from those hospitals and clinics, those who willing to participate were only included. A questionnaire was distributed among them which contained 10 close ended questions (multiple choice questions). They were asked to complete the questionnaire in front of the investigator. Confidentiality was maintained as it did not require name and contact number of the participants. Data were entered into SPSS 11.5. Descriptive analysis was carried out to assess the frequency.

RESULTS

The existing level of knowledge of general dentists about emergency management of avulsed teeth is depicted in table 1. Among the studied group, almost all of the participants, 98(96.1%) said that an avulsed permanent tooth cannot be replanted in all cases. Majority of them, 63 (61.8%) said that the critical time for the replantation is within 20 minutes, 38 (37.3%) said it to be 20 to 60 minutes and a very less 1 (1%) said it is one to two hours.

More than half of the participants i.e. 61 (59.8%) chose Hank's balanced salt solution as an optimal storage media, 32 (31.4%) chose patient's saliva, 5 (4.9%) milk, 3 (2.9%) saline solution and the least 1(1%) chose tap water. A very high number of dentists i.e. 84 (82.4%) thought that the treatment of an avulsed tooth is not same in case of short or prolonged extra alveolar dry time whereas, 18 (17.6%) thought that it to be same.

For the type of splint, 65 (63.7%) suggested that rigid splint should be used and 37 (36.3%) suggested the flexible splint. Higher number of participants 45(44.1%) chose longer splinting duration as six weeks, 37 (36.3%) as four weeks and 20 (19.6%) as two weeks. Calcium hydroxide as an intra-canal medicament was suggested by 70 (68.6%), zinc oxide eugenol by 20 (19.6%) and antibiotic paste by 9 (8.8%) of the dentists. 3 (2.9%) were not sure about the medicament.

When asked about the prognosis, only 12 (11.8%) participants said that the teeth with open apex has better prognosis while 90 (88.2%) said that teeth with closed apex has better prognosis. Majority of them i.e. 70 (68.6%) thought that primary teeth should be replanted and 32 (31.4%) thought that it should not. A very high number of the dentists i.e. 93 (91.2%) had never attended any education program regarding management of traumatic injuries to teeth while only a very less of them, 9(8.8%) said that they had attended.

DISCUSSION

This study provided baseline information about existing level of knowledge of emergency management of teeth avulsion among the dentists in Kathmandu.

A very high percentage of participants (96.1%) correctly reported that avulsed tooth cannot be replanted in all cases. Tooth cannot be replanted in cases of extensive caries, severe root damage and in cases with advanced periodontal disease. However in most situations, replantation of avulsed tooth can be performed even with a dubious prognosis, where the tooth is considered as a temporary restoration. Until such time, a definitive treatment planning and specialist consultation can be carried out.¹

For the question regarding critical time for the replantation, 61.8 % of the dentists responded that it was within 20 minutes while 37.3 % suggested 20-60 minutes. An avulsed permanent tooth should be replanted as soon as possible. The risk of ankylosis increases significantly with an extra oral dry time of 20 minutes.⁴ If the tooth cannot be replanted within five minutes it should be stored in a medium that will maintain vitality of periodontal ligament fibers.^{2,5}

It was encouraging to know that 59.8 % of the dentists chose Hank's balanced salt solution (HBSS) as the storage media for an avulsed tooth. Guidelines given by International Association for Dental Traumatology also suggests HBSS as storage media.^{2,3} Optimal storage media in order of preference are: Viaspan (a specialized tissue culture medium), Hank's balanced salt solution (HBSS), cold milk, patient's saliva, saline solution, water.^{1,6,7} Though Viaspan and HBSS has been found to be better media for storage due to their ability to maintain the viability of periodontal ligament cells for longer period of time than other media, cost factor and availability creates a barrier for their use.

Only 4.9 % of the dentists chose milk as the storage media whereas 31.4 % preferred patient's saliva. Studies have found that cold fresh milk is a good tooth storage media.⁸ Although water is detrimental to cell viability due to its low osmolality and long term storage (i.e more than 20 minutes) in water has an adverse effect on periodontal ligament healing, it is better choice than dry storage.¹

For the question regarding the treatment of an avulsed tooth before replantation; in case of short or prolonged extra alveolar dry time, 82.4 % said that it is not same for both cases. In teeth with prolonged extra alveolar periods, where periodontal ligament can be assumed as necrotic, it has been suggested that root surface be treated with fluoride solution (2.4% sodium fluoride phosphate acidulated at pH 5.5) for 20 minutes prior to replantation. Prior to this, the necrotic periodontal ligament is removed with a scaler.¹ The incorporation of fluoride ions in the cementum layer has been found to yield root surface resistant to resorption.⁹ Further, if the tooth has been dry for more than 60 minutes before replantation, root

Table 1. Knowledge level of general dentists.

| | | Frequency | Percentage |
|------|--|-----------|------------|
| Q.1 | Can an avulsed permanent tooth be replanted in all cases? | | |
| | a. Yes | 4 | 3.9 |
| | b. No | 98 | 96.1 |
| Q.2 | What is the critical time for the replantation of an avulsed tooth? | | |
| | a. Within 20 mins | 63 | 61.8 |
| | b. 20-60 mins | 38 | 37.3 |
| | c. 1-2 hour | 1 | 1.0 |
| | d. Not sure | 0 | 0 |
| Q.3 | What is the optimal storage media? | | |
| | a. Hank's balanced salt solution | 61 | 59.8 |
| | b. Milk | 5 | 4.9 |
| | c. Patient's saliva | 32 | 31.4 |
| | d. Saline solution | 3 | 2.9 |
| | e. Tap water | 1 | 1.0 |
| Q.4 | Is the treatment of an avulsed tooth before replantation same in case of short or prolonged extra alveolar dry time? | | |
| | a. Yes | 18 | 17.6 |
| | b. No | 84 | 82.4 |
| Q.5 | Type of splint used is | | |
| | a. Rigid | 65 | 63.7 |
| | b. Flexible | 37 | 36.3 |
| | c. Anyone | 0 | 0 |
| | d. Not sure | 0 | 0 |
| Q.6 | Splinting period is for | | |
| | a. Two weeks | 20 | 19.6 |
| | b. Four weeks | 37 | 36.3 |
| | c. Six weeks | 45 | 44.1 |
| | d. Not sure | 0 | 0 |
| Q.7 | What is the intra-canal medication used during root canal treatment? | | |
| | a. Zinc oxide eugenol | 20 | 19.6 |
| | b. Calcium hydroxide | 70 | 68.6 |
| | c. Antibiotic paste | 9 | 8.8 |
| | d. Not sure | 3 | 2.9 |
| Q.8 | Which one has better prognosis? | | |
| | a. Open apex (immature tooth) | 12 | 11.8 |
| | b. Closed apex (mature tooth) | 90 | 88.2 |
| Q.9 | Should primary tooth be replanted? | | |
| | a. Yes | 70 | 68.6 |
| | b. No | 32 | 31.4 |
| Q.10 | Have you ever attended any education program regarding management of traumatic injuries to teeth? | | |
| | a. Yes | 9 | 8.8 |
| | b. No | 93 | 91.2 |

canal treatment may be carried out extra-orally prior to replantation.³

After replantation, an avulsed permanent tooth should be splinted. A splinting technique should allow physiologic movement of the tooth during healing. So, a flexible splint should be used.¹⁰ The result was quite unsatisfying as 63.7 % informed that they use rigid splint for avulsed tooth and 36.3 % said that flexible splint should be used.

A very high number of the dentists preferred splinting for longer duration as 44.1% of them suggested that splinting period should be six weeks. 36.3 % suggested it to be four weeks and a low percentage, 19.6 % correctly said that it should be for two weeks. International Association for Dental Traumatology (IADT) suggested up to two weeks splinting for an avulsed tooth decrease the risk for ankylosis.¹⁻³

Calcium hydroxide as an intracanal medicament during root canal treatment was suggested by 68.6 % of the dentists. Calcium hydroxide is recommended for intracanal medication for up to one month followed by root canal filling, or obturation can be carried out when an intact lamina dura can be visualized radiographically.¹¹ It is generally agreed that calcium hydroxide has a beneficial effect on the outcome because of its antibacterial properties, ability to dissolve necrotic tissues and its ability to prevent or control inflammatory resorption.^{12,13} Ledermix (corticosteroid antibiotic intra-canal paste) has also been proposed following pulp extirpation as an intracanal medicament. The anti-inflammatory and antibacterial actions may decrease root resorption by directly inhibiting resorptive cells.¹⁴ So far, no human clinical studies have compared the effectiveness of ledermix and calcium hydroxide as an intra-canal medicament.

A very high percentage (68.6 %) of dentists thought that an avulsed primary tooth should be replanted which was quite dissatisfying. To prevent further injury to developing successor, an avulsed primary tooth should not be replanted.^{4,15}

About the prognosis of tooth, an alarming number of dentists (88.2 %) thought that closed apex has better prognosis than the tooth with open apex which is exactly opposite. An immature (open apex) tooth has the potential to establish revascularization when there is a minimum of a 1.0 mm apical opening.¹⁶

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Furthermore, studies have found that pretreatment of immature tooth with topical doxycycline before replantation will double the chance of revascularization.^{17,18} On the other hand, a mature tooth (ie. closed apex or apical opening <1 mm) has little or no chance of revascularization.⁴

Reviewing all these, it seems that the general dentists of Kathmandu do not have adequate knowledge regarding management of avulsed teeth. It was surprising to see that 91.2 % of the dentists had never attended any education program regarding emergency management of avulsed teeth. This explains the reason of insufficient knowledge in this field. Education programme about emergency management of avulsed teeth to the general dentists along with recent guidelines will contribute to the increase in the standard of care to the needy people.

The year of working experience of dentists was not recorded in this study. Knowledge of management of the dentist may be higher in those with greater duration of working experience and low in newly graduated dentists. This may be the limitation of the present study.

CONCLUSION

The general dentists of Kathmandu do not have adequate knowledge of emergency management of avulsed teeth. As management of avulsed teeth is one of the emergency situations in dentistry, they are in need of the education program in this field.