

Knowledge of General Dental Practitioners Regarding Treatment of Avulsed Teeth in Srinagar, India.

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Abstract: *Tooth avulsion is a complex traumatic injury characterized by complete displacement of a tooth from its socket in alveolar bone owing to trauma. The treatment for permanent tooth avulsion includes immediate replantation. The aim of this study was to evaluate the knowledge of dental clinicians in Srinagar, India regarding the management of avulsed teeth*

Methodology: *A total of 100 general dental practitioners were selected from various private dental clinics in Srinagar city and were questioned using a 11 item questionnaire about dental traumatology. The questions included general knowledge about tooth avulsion, replantation of primary and permanent teeth, treatment procedure before replantation, extra-oral time and storage media for an avulsed tooth and results were tabulated. Statistical analysis was done using IBM SPSS software version 11.0.*

Results: *The results showed that 79% of the participants would replant the tooth in case of avulsion. 76% of the subjects considered extra-alveolar time the most important factor for replantation and 56% favoured Less than 30 min to be the ideal extra-alveolar period. Majority of the dentists would clean and remove PDL before replantation, 72% considered milk as the best storage medium. 69% of the dentists preferred endodontic treatment of an avulsed tooth immediately after replantation and were in favour of rigid splint (67%). Duration of splinting was considered to be 2 weeks and favoured follow up of 5 years. Knowledge regarding replantation of an avulsed primary teeth, majority 68% would not prefer replantation.*

Conclusion: *It is important for the general dentists to update their knowledge regarding basic management of dental emergencies and improving the public oral health.*

Keywords: *Tooth avulsion, Knowledge, Dental practitioners*

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I. Introduction

Dental traumatic injuries are one of the most common dental health problems, resulting in functional, esthetic and psychological disturbances to the child as well as for the parent. Such injuries are considered emergency situations and require immediate attention, representing a challenge to dental professionals.^{1,2} Majority of the dental injuries involves anterior teeth resulting from simple falls followed by participation of children in sports activities.^{3,4} Studies have shown that a high number of school children have experienced dental trauma in the permanent dentition.^{5,6} In a study by Ravishanker et al⁷ prevalence of TDI to anterior permanent teeth was 15.1% in 12-year-old school children in South India which was more than a study by Ingle et al,⁸ in which prevalence of traumatic dental injuries to the permanent incisors of 11-13 year old school children was 11.5% in, Chennai. Tasneem et al⁹ conducted a study on Prevalence of Traumatic Dental Injuries to Anterior Teeth of 12-Year-Old School Children in Kashmir which was found to be 9.3%. Among dental injuries Permanent tooth avulsion has been reported the most common dental trauma and is more frequent in boys than girls because of their active participation in sports.^{10,11} The most commonly teeth involved are maxillary central incisors and lateral incisors, in the permanent dentition of 8 to 12 year old children.¹² Appropriate and immediate intervention would improve the prognosis and success rate of treatment in Traumatic Dental Injuries. The best and immediate treatment for an avulsed tooth is replantation back into the socket. Prognosis of the tooth depends upon many factors like the viability of the Periodontal ligament, the extra alveolar dry time, the storage medium in which the tooth was kept before the patient reaches dental office. General dental practitioners have the responsibility to diagnose and treat all forms of dental injuries. Studies have shown limited knowledge among dental health professionals regarding management of tooth avulsion.^{13,14} Hence, there is a need to assess general dental practitioners' knowledge regarding the management of an avulsed tooth due to trauma. The purpose of this study was to evaluate the knowledge of managing tooth avulsion injuries among general dental practitioners by means of a questionnaire, in Srinagar city.

II. Methodology

This is a questionnaire based study formulated to determine the knowledge of general dentists towards management and treatment of an avulsed tooth. A total of 100 general dental practitioners were selected from various private dental clinics in Srinagar city and were questioned using a 11 item questionnaire about dental traumatology. Dentists who were willing to participate were given the questionnaire, and they completed and returned the questionnaire immediately. The questions included general knowledge about tooth avulsion, replantation of primary and permanent teeth, treatment procedure before replantation, extra-oral time and storage media for an avulsed tooth and results were tabulated. Statistical analysis was done using IBM SPSS software version 11.0.

III. Results

A total of 100 dentists participated in this study working as general practitioners. The results showed that 79% of the participants would replant the tooth in case of avulsion whereas 20% of them would refer such cases to a dental specialist or a post graduate and only 1% would discard such avulsed teeth. 76% of the subjects considered extra-alveolar time the most important factor for replantation whereas 10% chose Storage medium, 6% chose Survival of the PDL and 8% selected Root formation stage as the important factor for replantation. When questioned about the ideal extra-alveolar period, 56% favoured Less than 30 min, 32% chose 30min to 1 hour and 12% answered 2 to 3 hrs. Regarding any prior treatment of replantation, majority of the dentists would clean and remove PDL, 32% would wash the tooth with saline, 22% would wash with tap water and only 5% would not clean the tooth prior to replantation. Most respondents (69%) would gently irrigate the socket with saline before replantation, 26% would remove coagulum with curretes and only 5% would directly put the tooth back in socket without any treatment. 72% considered milk as the best storage medium while 14% thought saliva was the best medium, 8% considered Saline (8%) and 6% considered Tap water as the best medium. 69% of the dentists preferred endodontic treatment of an avulsed tooth immediately after replantation, 19% would do few days after replantation, 4% would do it before tooth replantation and 8% said it depends on extralveolar time and root formation. Most respondents were in favour of rigid splint (67%) as compared to flexible splint (25%) and 8% would leave the tooth without splinting. Duration of splinting was considered to be 2 weeks by 34%, 3 weeks by majority 44% and 4 weeks by 22% of the subjects. 46% favoured follow up of 5 years, 32% considered 3 years to be sufficient and 22% favoured only 1 year follow up. Knowledge regarding replantation of an avulsed primary teeth, majority 68% would not prefer replantation whereas 32% would replant the avulsed primary tooth.

IV. Discussion

It is generally accepted that replantation is the treatment of choice for an avulsed tooth. That is what the majority (79%) of the participants chose in this study, however their knowledge regarding some points in the protocol for avulsed tooth replantation was uneven such as splinting technique and PDL management and its preservation. Similar finding was found by Rocha et al¹³ in which authors found that most of the GDP had limited knowledge regarding storage media, splinting techniques, time splint for the avulsed tooth and replantation of the avulsed primary tooth. The key factors for the treatment protocol and better prognosis of tooth replantation are minimal extraoral dry storage period and moist storage for the avulsed tooth.¹⁴ Extraoral time is the most factor to be considered for the prognosis of an avulsed tooth.^{15,16} 76% of the dentists favoured extraoral time as an important factor. When a patient comes to a dental office with an avulsion injury, its important to take a complete and a thorough history of fall, place where the tooth got avulsed, including the extraoral time-interval between injury and replantation, the medium in which the tooth was brought to the clinic. The ideal dry time has been found to be not more than 20 minutes.¹⁷ 56% of the respondents in this study favoured less than 30 min to be an ideal extraoral time. The maintenance of Periodontal ligament vitality is another most important factor for a good prognosis of an avulsed tooth because the presence of necrotic PDL remnants on the root surface can lead to the occurrence of inflammatory root resorption, resulting in loss of replanted tooth which is the major cause of loss of replanted tooth.¹⁸ In our study 41% of the dentists favoured cleaning and removal of PDL before tooth replantation, whereas, 32% favoured Washing with saline and 22% recommended washing with tap water. When the avulsed tooth is replanted, visible contamination should be rinsed gently with tap water or sterile saline, by holding the crown portion of the tooth and without scraping the root surface off as this can destroy the viable periodontal ligament cells.^{19,20,21} In this study, 72% of the general dental Practitioners affirmed that milk was the most appropriate storage media for avulsed teeth, when a specialized medium was not readily available. Storing the avulsed tooth in a complete dry environment will cause death of PDL cells leading to ankylosis.²² The avulsed tooth if kept in a suitable storage medium will improve its survival rate. Storage medium should be readily available, preserve cell vitality, should have adherence capacity, clonogenicity, antioxidant property, compatible physiological pH and osmolality, and low cost.^{23,24} Milk can maintain almost all these properties for as long as 24 hrs at 4°C.²⁵ Studies have shown that

milk has the ability to maintain viability of PDL fibroblast and is superior to saliva and water, but not as good as Hanks Balance Salt Solution.^{26, 27} Trope et al., also demonstrated that HBSS or Viaspan are better than milk, as storage media.²⁸ Regarding the socket treatment prior to replantation 69% of the dentists do gentle irrigation with saline. The alveolar socket should be rinsed gently with a saline to remove the contaminated coagulum, and in case of socket collapse or fracture, the socket should be re-contoured gently using a blunt instrument.²⁹ Regarding the decision for endodontic treatment 69% of the subjects in this study would perform endodontic treatment immediately after replantation. According to AAPD guidelines on management of acute dental trauma, a tooth with atleast 1mm opening of the apex may revascularize.³⁰ If the extra oral dry time is more than 60 min and no consideration has been given to preserving the periodontal ligament, the endodontics may be performed extraorally with the utmost care to achieve a root canal system that is free of bacteria.³¹ If the tooth was kept moist in a non-physiological storage medium for 20-60mins, endodontic treatment can be done within 7 to 10 days.²⁹

Repositioning of an avulsed tooth is followed by splinting in order to stabilize the tooth in the socket to its original position and to ensure adequate fixation, preventing accidental ingestion. In addition, splinting also protects teeth against traumatic forces during the vulnerable healing period.³² Flexible splinting for 2 weeks is indicated for stabilisation of the treated tooth and to optimize healing of periodontal ligament neurovascular supply.³¹ However in this study, the rigid splint is suggested by 67% of General Dentists and Flexible splint by 25%. 44% of the dentists recommended 3 weeks and 34% recommended 2 weeks as the appropriate splinting time. While about 46% of the respondents would monitor the replanted tooth for a minimum of 5 years by clinical and radiographic examinations. International Association of Dental Traumatology guidelines do not recommend replanting avulsed primary teeth because such a procedure may damage the permanent successor.³³ In our study, majority 68% of the general dentists did not recommend replantation of the avulsed primary tooth. Which is in accordance with Cohenca et al³⁴ in which 85.3% of participants did not recommend such a procedure. There is a need to improve knowledge among the general dentists regarding diagnosis and treatment management of traumatic dental injuries, hence improving general oral health.

V. Conclusion

Dental practitioners are expected to diagnose and manage all kinds of dental problems with good prognosis. This study found lack of knowledge among general dental practitioners regarding some points in the protocol for avulsed tooth replantation. Hence dentists should follow current literature and update their clinical skills and knowledge and consider carefully evidence-based recommendations that may provide safe and effective treatment of avulsed permanent teeth.

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Questionnaire And Response:

1. If a patient reports to your clinic with an avulsed tooth, what is the first step you would do?

Refer the patient to some other dental specialist (20%)	a) Try for replantation (79%)	b) Discard the tooth (1%)
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2. If you choose replantation, what would be the most important factor to consider for replantation.

Extra-alveolar time (76%)	a) Storage medium (10%)	b) Survival of the PDL (6%)	c) Root formation stage (8%)
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3. What is the ideal extra-alveolar period?

Less than 30 min (56%)	a) 30min to 1 hour (32%)	b) 2 to 3 hrs (12%)
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4. What should be done before tooth replantation?

Cleaning and removal of pdl (41%)	a) Washing with saline (32%)	b) Washing with tap water (22%)	c) Replantation without any procedure (5%)
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5. How would you treat the socket prior to replantation ?

Gentle irrigation with saline (69%)	a) Removal of coagulum with curettes (26%)	b) No treatment (5%)
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6. Which is the most appropriate media storage for an avulsed tooth?

Milk (72%)	a) Saliva (14%)	b) Saline (8%)	c) Tap water (6%)
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7. Decision for endodontic treatment

Immediately after replantation 69%	Before tooth replantation 4%	Few days after replantation 19%	Depends on extraalveolar time and root formation 8%
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8. What type of splint would you use to stabilize the tooth?

Rigid splint 67%	a) Flexible splint 25%	No splinting 8%
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9. Replanted teeth should be splinted for approximately how many weeks.

2 weeks (34%)	a) 3 weeks (44%)	b) 4 weeks (22%)
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10. Follow up duration

1 year 22%	a) 3 year 32%	b) 5 years 46%
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11. Replantation of avulsed primary teeth is indicated?

Yes (32%)	a) No (68%)
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Questionnaire and response

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