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## Assessment of knowledge and attitude of parents on emergency management of avulsion of permanent teeth, in Kottayam district - A cross sectional study

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### Abstract

**Introduction:** Dental avulsion is characterized by the entire tooth being forced out of its socket, the periodontal ligament being cut, and either an alveolar bone fracture or not. Because of its benefits on both a physiological and psychological level, reimplantation of the avulsed tooth is regarded as the best option of treatment. The prognosis of a reimplanted tooth is determined by the vitality of the periodontal ligament cell on the root surface. It is thought that parents' awareness of the critical actions that must be performed right away following a tooth avulsion is essential to the treatment's success.

**Aim:** To assess the knowledge and attitude of parents in Kottayam district about avulsed permanent tooth of their children and their emergency management using a questionnaire.

**Materials and Methods:** The study population consisted of 159 parents of children, aged between 6 to 12 years, conducted among different schools in Kottayam district. A pre-validated, self-administered structured questionnaire in regional language (Malayalam) as google form was used for data collection. Chi square and T test were used for statistical analysis.

**Results:** The overall knowledge level of parents was found to be inadequate on analyzing each of the responses they have marked. There was no statistically significant difference in terms of educational qualification, gender, residential area and age group and the attitude of participants. Majority of parents showed a positive attitude.

**Conclusion:** There is a lack of awareness among parents regarding how to handle dental avulsions in children in an emergency and that educational initiatives are required to enhance the appropriate handling of dental avulsions in an emergency.

**Keywords:** Dental avulsion, traumatic dental injuries, knowledge and attitude, emergency

### Introduction

One of the most significant oral health issues that affect children and cause them pain and suffering is dental trauma. Little mishaps occur frequently when kids engage in daily activities like riding, skating, running, etc. [1]. A child's general quality of life may be negatively impacted by traumatic dental injuries, which can have a direct or indirect effect on the tooth's location in the arch as well as the child's look, mastication, and speech. Low self-esteem, function, confidence, and aesthetics could be the end result of them. Traumatic dental injuries (TDI) are predicted to rank as the sixth most common illness globally. The research estimates that the prevalence of traumatic dental injuries (TDI) is between 13 and 17.5 percent worldwide, with a pooled rate of 13% in India [2]. The injuries vary in severity from little cracks in the enamel to more serious jaw fractures and tooth avulsions [3].

Dental avulsion is the total displacement of the tooth from its socket. It results in significant injury to the tissues of the pulp and periodontal ligaments, either with or without an alveolar bone fracture [4].

At 0.5% to 3% of all traumatic injuries of the permanent dentition, it is the most severe type of dental trauma and is common in society. According to epidemiological research, boys experience tooth avulsions three times more frequently than girls, which is most likely related to their active involvement in violent games and sports.

It affects children aged 8 to 12 usually years old who have permanent dentition, and the maxillary central and lateral incisors are the teeth most frequently affected [5]. Dental avulsions have an impact on a child's appearance, functionality, and mental health [6].

Prompt and appropriate emergency management is extremely important for the best long-term prognosis of teeth affected by avulsion, especially in young children [7]. Dental avulsions can be treated in a number of ways, including prompt reimplantation of the avulsed tooth followed by endodontic therapy, mild orthodontic movements, and prosthodontic rehabilitation of the avulsed tooth [5].

The prognosis of a replanted tooth depends on the period of time elapsed between trauma and replantation, the type and condition of storage medium, the stage of root formation and the presence of contamination [8]. Given that most dental injuries happen in the home, parents' awareness of the critical actions that need to be performed right away following a dental avulsion is thought to be crucial for a better prognosis [9].

Numerous studies demonstrate that the general population and the various specialists who may be engaged in the care of dentoalveolar injuries are ignorant of this topic [5].

So, the purpose of the present study is to assess the knowledge and attitude of parents about avulsion of permanent teeth and its emergency management.

## Objectives

### Primary objective

To assess the knowledge and attitude of parents in Kottayam district about avulsed permanent tooth of their children and their emergency management using a questionnaire.

## Materials and Methods

### Study design and study setting

The present study was a descriptive cross-sectional study conducted among different schools in Kottayam district. The duration of the study was 3 months.

### Ethical consideration

The study got approval from Institutional Scientific Research Committee and Ethical Committee and Review Board, Government Dental College, Kottayam (IEC/M26/2023/R489 /DCK) dated 18/05/2023.

### Inclusion criteria

1. Parents those who gave the signed informed consent.
2. Parents of children with 6 to 12 years of age.

### Sample size

Sample size was calculated by a pilot study conducted among around 20 participants.

Formula:

$$n = \frac{Z\alpha^2 \times SD^2}{d^2}$$

Mean knowledge = 18.71

Standard deviation (SD) = 3.538

Z $\alpha$  = 1.96

d<sup>2</sup> (Relative precision) = 0.31

$$n = \frac{(1.96)^2 \times (3.538)^2}{0.31}$$

N=158.67

Therefore, the total sample size (n) can be round off to 159.

## Methodology

The study population consisted of parents of children, aged between 6 to 12 years. Participants were enrolled based on convenience sampling. The study was conducted among different schools in Kottayam district. A signed informed consent form according to the ethical guidelines was subsequently obtained from the participating parents through the higher authorities of the schools. The participants were asked to complete a 10-stemmed questionnaire which was a modified form of questionnaire used by Raphael and Gregory [10] in their study. The questionnaire was validated by the Head and Professors of department of Pediatric dentistry, Government Dental College, Kottayam. The questionnaire was provided in regional (Malayalam) language as google form.

The questionnaire was essentially comprised of two parts: First part contained the general demographic data and the second part includes closed questions which assessed the knowledge and attitude of the participant towards the first-aid management of avulsed permanent tooth.

Each question was provided with options which maybe correct or incorrect answers. Participants were requested to mark the option which they perceive as the most appropriate answer.

## Statistical analysis

Collected data were entered in MS Excel and statistical analysis was done using the Software, Statistical Package for Social Sciences (SPSS, Version 16.0). Chi square and T test were used to analyze the sample and the responses of the questionnaire. A significant relationship was assumed to exist, if the p-value was found to be  $\leq 0.05$ .

## Results

A total of 159 parents were polled to find out parents' knowledge and attitude about managing avulsed permanent incisors in an emergency basis.

Of the questioned population, male respondents made up 71 and female respondents made up 88.

None of the respondents were illiterate, despite the fact that more than half of the respondents had completed at least a higher secondary education. And also, most of the respondents were from village backgrounds.

## Parental knowledge about reimplantation

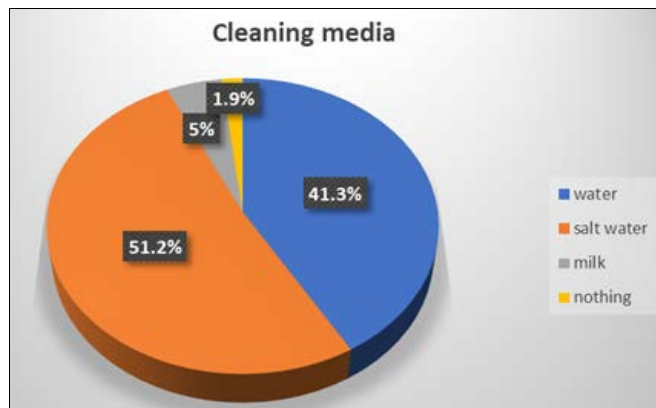
When asked if they were aware of the option of reimplantation as an emergency treatment for an avulsed tooth, nearly half of the parents (40%) said they thought it may be done as a first-aid measure. About 36.3% participants believed that the reimplantation is possible even if the avulsed tooth is broken. But more than half of the participants (63.1%) agreed that the broken avulsed tooth cannot be reimplanted. Merely 20% of participants believe that reimplantation ought to happen right away, and only 8.8% parents responded that reimplantation should be done within one hour of the incident. While most of the parents (49.7%) marked that it should be done when they visit the dentist. Majority of parents (99.4%) agreed that the reimplantation of avulsed tooth should not be done by their own.

**Cleaning and transport media**

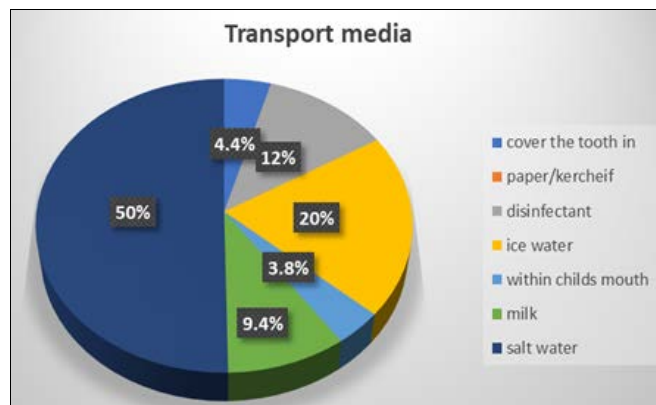
For cleaning and transporting the avulsed tooth, the majority of responders chose the incorrect media. When parents were asked what their preferred method was for cleaning their soiled avulsed tooth, the two most often mentioned options were water (41.5%) and salt water (51.6%). Around half of the respondents (50.3%) thought that the ideal medium to employ for transferring the avulsed tooth was salt water. While 20% believed that the avulsed tooth should be carried in ice water and 11.9% responded to disinfecting solutions.

**Previous knowledge about dental avulsion**

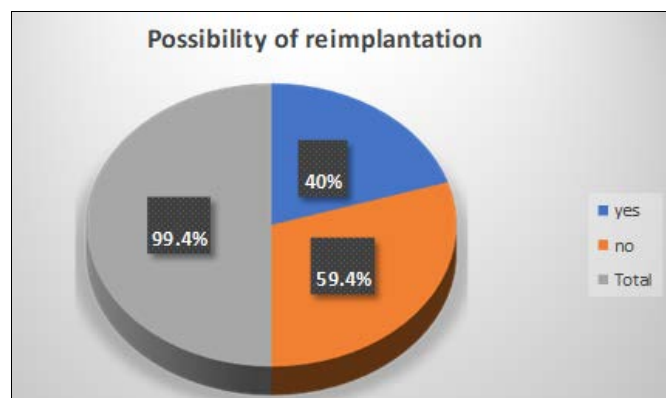
Additionally, the collected data showed that 72.3% of respondents had never before received advice about the emergency management of a permanent tooth that had become avulsed. The two primary sources of information for individuals who had previously received similar guidance were books (5.7%) and the media (12.6%).



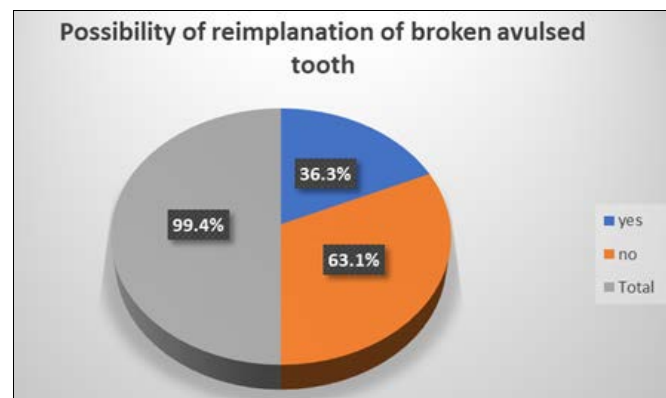
**Fig 4: Knowledge about Ideal Timing for Reimplantation**



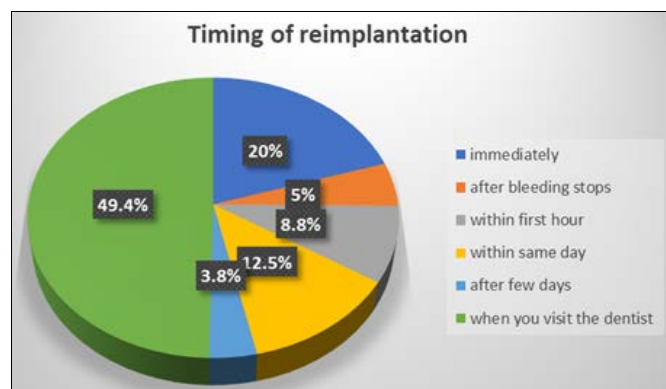
**Fig 5: Preferred cleaning and transport media for avulsed tooth**



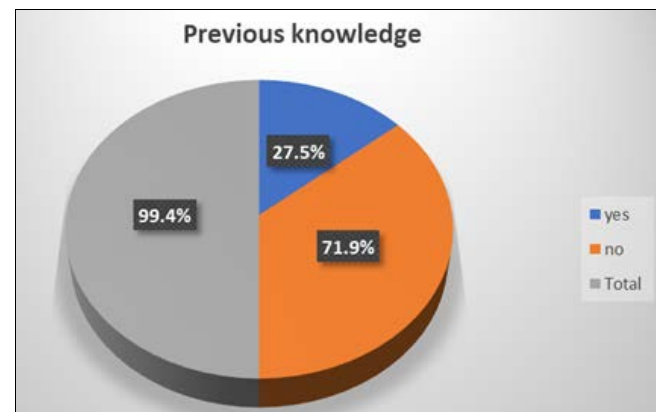
**Fig 1: Distribution of Participants by Gender**



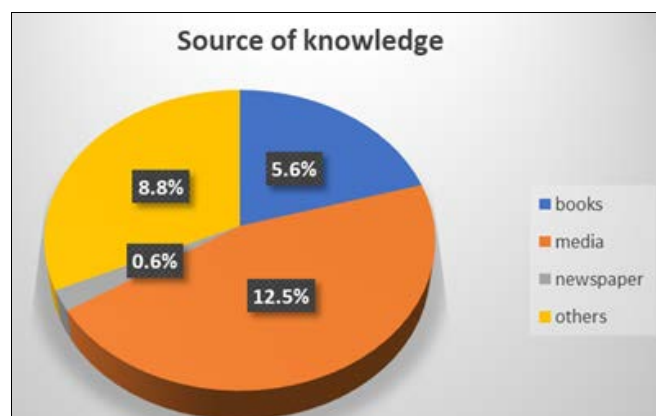
**Fig 2: Educational Background of Participants**



**Fig 3: Awareness of reimplantation as an emergency treatment**



**Fig 6: Previous knowledge and source of information on dental avulsion**



**Fig 7: Parental attitudes towards the importance of saving an avulsed tooth**

### Parental attitudes

The majority of parents (99.4%) who responded to our poll believed that saving an avulsed permanent tooth is important. And most of the respondents (95.6%) expressed a desire to learn more about the emergency treatment of permanent teeth that have avulsed. When the accident occurred, 79.9% of the parents said they would see a dentist rather than a doctor or the nearby hospital. The responses according to different parameters are given in the following tables.

There was no statistically significant difference among the participants in gender basis in any of the attitude questions. While considering the educational qualification parents with higher education are more aware about the need of saving the permanent teeth of their children and they have the right attitude towards seeking the correct treatment while such incidents happen. They showed more interest than others to know more about avulsion and its emergency management. As most of the participants are from village areas, they showed more positive attitude than participants from the cities.

### Discussion

Dental avulsion is the most serious form among traumatic injuries. It is characterized by complete loss of tooth from its socket and destruction of its periodontal attachments. The teeth most commonly lost by avulsion are permanent maxillary anterior teeth.

These teeth have an important role in the psychological development of children and adolescents. Since people are giving priority to aesthetics nowadays, traumatic dental injuries especially avulsion needs to be manage in a proper way and in an emergency basis. Because the delayed management will affect the prognosis of the tooth. Even though there are different treatment modalities are available, like rehabilitation of missing tooth with prosthodontic means and implants etc., the reimplantation of avulsed tooth is the better way to manage this situation since avulsion mostly occurring during the growing age of the child and other treatment modalities may affect the growth and development of the jaws and other teeth.

The quantity of viable periodontal membrane directly affects a reimplanted tooth's prognosis. The majority of authors consider the following three elements to be crucial for a favourable outcome: minimum injury to the root surface and periodontal ligaments; minimal extra-alveolar dry time; and appropriate storage and transport medium<sup>[11, 12, 13, 14]</sup>.

In a case report by Yadav S *et al.*<sup>[14]</sup>, an avulsed mature permanent tooth was reimplanted in a young boy. The tooth was preserved in milk after around 15-20 minutes of injury and transplanted after 2 hours at a dental hospital. And they have done the endodontic therapy and followed up this case for up to 2 years. It was found that the endodontic therapy prevented the subsequent inflammatory root resorption.

According to Petrovic B, *et al.*<sup>[15]</sup> low survival results from the combination of unphysiological storage and delayed replanting. Andreasen JO, *et al.*<sup>[16]</sup> conducted a study in which they have found that 90% of teeth that were reimplanted within thirty minutes had a successful outcome; teeth that were reimplanted after two hours had only 5% probability of remaining in place over the long run. Furthermore, the prognosis of a reimplanted tooth is primarily established in the first 15 minutes following avulsion.

A total of 159 parents participated in our study. When asked about the possibility of reimplantation of avulsed permanent tooth, more than half of the parents (59.4%) responded that

the avulsed tooth cannot reimplant. About 63% parents responded that if the avulsed tooth is broken, then its reimplantation is not possible. In a study by Ozer S *et al.* 90.7% of the respondents, by far, said they would never put an avulsed tooth back in its socket<sup>[17]</sup>.

Every participants in the present study denied the option of self-reimplantation of avulsed tooth. Parents may not have reimplanted the avulsed tooth out of ignorance, fear of harming the kid, or the belief that bleeding equates to death<sup>[18-20]</sup>. However, according to Raphael SL and Gregory PJ's study, roughly 75% of participants were open to trying self-reimplantation<sup>[10]</sup>.

Regarding the timing of reimplantation around half of the parents (49.4%) stated that the avulsed tooth should be reimplanted when you visit the dentist. Only 8.8% chose reimplantation within the first hour of occurrence of trauma and 20% chose immediate reimplantation.

In the present study it was found that 51.2% parents opted salt water as the cleaning medium of tooth and 41.3% chosen water. The different options for the transporting medium to be used in our study include cold water, milk, salt water, cover the tooth in hand kerchief/paper, disinfectants and within the child's mouth. Half of the participants (50%) opted salt water and 20% selected ice water. And only 9.4% selected milk as transport medium.

Lack of information regarding transport media has been confirmed by several studies conducted by Raphael SL *et al.*, Shashikiran ND *et al.*, Abdellatif AM and Hegazy SA, Santos ME *et al.*, Ayodele A *et al.*, Al-Jame Q *et al.*, and Ozer S *et al.*<sup>[8, 10, 17-19, 21, 2]</sup>. Despite being the most successful storage medium since its introduction by Krasner and Person in 1992, Hank's Balanced Salt Solution (HBSS, Save-A-Tooth®) was not included in the questionnaire. This is because the expense and unavailability of HBSS make its use as a storage media impractical in India<sup>[23]</sup>. When used as a transport medium, dry tissue, tap water, distilled water, ice, alcohol, and mouthwash which dehydrates and degrades cells<sup>[24]</sup>. Similar results found in other studies also<sup>[25-27]</sup>.

The ability to maintain or restore cell viability, adhesion, clonogenic potential, and accessibility at the accident site are all requirements for the perfect storage medium<sup>[17]</sup>. Both milk and soft coconut water meet both requirements. Milk has important nutritional components, is comparable to the osmolality and pH of periodontal ligament cells, and allows for the maintenance of cell viability for six hours<sup>[28]</sup>. In our study only 9.4% parents selected milk as transport medium. However, after one hour of storage, it was shown that the vitality of periodontal ligament cells in milk was lower than that of HBSS, which meant that milk was only suitable for the temporary storage of avulsed teeth<sup>[23]</sup>.

When we enquired about the previous knowledge of parents regarding dental avulsion and its management only 27.5% parents given positive response. And most of the information were obtained through the medias.

In a study by Oliveira TM *et al.*, it was found that there is a deficiency of technical knowledge among the mothers. Their findings indicate that mothers and dental experts need to communicate more effectively. And they suggested that educational campaigns and prevention programs on dental traumatic injuries must be established to spread awareness among parents/care givers<sup>[29]</sup>. Similar results obtained in a questionnaire study conducted by Nikam AP *et al.*<sup>[1]</sup>. This study necessitates the importance of educating the general public about the emergency treatment of avulsed teeth. And they also recommended a proper communication between

caregivers and dentists in order to effectively manage dental avulsion<sup>[1]</sup>.

Most of the parents believed that saving an avulsed permanent tooth was essential. There was no statistically significant difference in terms of gender, educational qualification and residential area. This proved that, despite their lack of knowledge on how to save an avulsed tooth, the participating parents had a favorable attitude toward doing so.

Another finding from the present study was when traumatic dental injuries such as dental avulsion occur most of the parents would prefer to see a dentist for medical treatment compared to physicians or nearby hospitals, there was no significant statistical association found between the participant's residential locality and possibilities of seeking treatment for dental avulsion. In contrast some other studies<sup>[19, 30]</sup> have shown that most rural parents would send their child to a doctor or a nearby hospital instead of dentist, due to the lack of access to dental clinic in the vicinity of their residential area. There was no statistically significant association between the participant's educational qualification, age group and gender and their attitude towards this particular entity. Almost every parents showed a positive attitude.

The present study indicates a need of educational interventions to be implemented among parents, caregivers etc. regarding dental avulsion and its emergency management. The knowledge level of parents are not up to the mark. And there should be a proper dentist – parent communication about all of these entities.

## Conclusion

Within the constraints of the current investigation, it was determined that parental knowledge of what to do in the event of a dental avulsion was inadequate, independent of their educational background and geographic location. However, they demonstrated a favorable attitude towards obtaining more guidance on the emergency treatment of avulsed permanent teeth via the internet and media. The degree of parent's education had a clear correlation with their enthusiasm and preferred source of information.

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