

## Evaluating the knowledge of sports participants regarding dental emergency procedures

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**Abstract** – Dental trauma is a common consequence of sports practice to which emergency treatment is critical. The purpose of this study was to evaluate the knowledge of sports participants about dental trauma procedures, particularly tooth avulsion. A specific questionnaire concerning concepts, experiences and behaviors after dental trauma and the use of mouthguard was standardized and validated with 80 people. The validated questionnaire was then distributed to 310 sports participants. The results showed that 28.4% had experienced a kind of dental trauma; 42.6% would look for a dentist for treatment; 51.7% reimplanted or would reimplant the avulsed tooth; 6.5% would maintain the avulsed tooth in milk. Although 47.4% of the participants were aware of the possibility of accidents during sports practice, only 13.9% reported to use a mouthguard. This study showed an overall lack of knowledge of sportsmen and sportswomen with regards to tooth avulsion, thus reinforcing the need for educational campaigns to improve the immediate emergency treatment of tooth avulsion.

Sports practice is beneficial and healthy, although some practices can increase the risk of traumatic injuries to dental and oral tissues (1, 2). Many sports predispose to the occurrence of dental trauma, such as mountain biking, inline skating, and skateboarding (3). According to Kumamoto and Maeda (2), in 2004, the sports involving direct contact showing higher risk of dental trauma include boxing, soccer, basketball and hockey. Other authors also support this hypothesis (4–7). Some studies in the US have shown that 60% of sports practitioners have already experienced dental trauma as an accidental episode during sport activities (8, 9).

The consequences of dental trauma can vary from simple tooth fractures to the complicated tooth avulsion (1). According to Pakev and Radthe (10), tooth avulsion accounts for 0.5–16% of all cases of dental trauma. Ideally, the avulsed tooth must be reimplanted in its socket (11). Immediate reimplantation (11, 12) or maintenance of the avulsed tooth in storage media compatible for survival of periodontal ligament cells before reimplantation (1) is fundamental for a successful reimplantation procedure.

When the tooth is maintained in wet storage medium (i.e. milk), reimplantation can be made later and subsequently the chance of success is increased (13–16). However, often people let the tooth dry, keeping it wrapped in plastic or sometimes immersed in solutions that do not allow for cell survival (5–7). This may lead to ankylosis and root resorption, both undesirable consequences of tooth reimplantation (11).

Therefore, appropriate emergency treatment in cases of dental trauma is critical for the success of reimplant procedures. Emergency procedures can be handled by untrained people who witness the accident, not only by the dentist, thus, knowledge of dental trauma by sports participants is fundamental (8, 9).

The purpose of this study was to evaluate the knowledge of dental trauma by sports participants in cities of São Paulo State, Brazil.

### Material and methods

For the execution of this work (approved by the Institutional Review Board of Araçatuba Dental School, Unesp – Process FOA 2007-01871), one specific questionnaire was finalized. This questionnaire was prepared according to questionnaires used previously in studies about dental trauma (1, 3, 17). The questionnaire was validated then administered to 80 sports participants in a de-identified format. After 7 days, the questionnaires were collected; the answers organized and processed with Epiinfo 2000 3.3.2 (CDC, Atlanta, GA, USA).

The questionnaire was divided into four parts: part I contained questions about sex, age, sport activities and time of activities (Table 1); part II contained questions about the importance of emergency treatment in cases of dental trauma, experience with dental trauma and procedures in cases of dental trauma (Table 2); part III contained questions about tooth avulsion (Table 3); and part IV contained questions about the possible occurrence of accidents during sports activities and the use of a

Table 1. Questions in part I of the questionnaire distributed among sports practitioners

1. Sex:
<input type="checkbox"/> male
<input type="checkbox"/> female
2. Age:
<input type="checkbox"/> under
<input type="checkbox"/> 20–40
<input type="checkbox"/> 41–60
<input type="checkbox"/> 61 or more
3. Sport activity _____
4. Time of sports practice:
<input type="checkbox"/> < 1 year
<input type="checkbox"/> 1–5 years
<input type="checkbox"/> 6–10 years
<input type="checkbox"/> 11 years or more

Table 2. Questions in part II of the questionnaire distributed among sports practitioners

1. Have you suffered any kind of trauma in any teeth?
<input type="checkbox"/> yes <input type="checkbox"/> no
(if yes, answer questions 2 to 4. if no, answer from question 5)
2. What kind of lesion did you have?
<input type="checkbox"/> fractured part of the tooth
<input type="checkbox"/> fractured the root of the tooth
<input type="checkbox"/> the tooth was loose but did not fall out of the mouth
<input type="checkbox"/> the tooth fell out of the mouth completely
<input type="checkbox"/> fractured a bone in the face
<input type="checkbox"/> cut on the lip
<input type="checkbox"/> others _____
3. How did you proceed?
<input type="checkbox"/> did nothing
<input type="checkbox"/> looked for a dentist immediately
<input type="checkbox"/> looked for a dentist the following day
<input type="checkbox"/> went to the ER
<input type="checkbox"/> went to university dental services
<input type="checkbox"/> others _____
4. Did you have any sequelae?
<input type="checkbox"/> no
<input type="checkbox"/> I was submitted to dental treatment and everything is fine
<input type="checkbox"/> the tooth changed color
<input type="checkbox"/> the tooth had to be extracted
<input type="checkbox"/> others _____
5. If you witnessed any case of dental trauma, what would you do?
<input type="checkbox"/> would take the person immediately to the dentist
<input type="checkbox"/> would comfort the person and look for an ER
<input type="checkbox"/> would not know how to proceed
<input type="checkbox"/> would look for a doctor
<input type="checkbox"/> would look for a hospital
<input type="checkbox"/> nothing

mouthguard (Table 4). The questionnaire was distributed to 320 sports participants and collected after 7 days. The participants answered in a de-identified format and the answers were organized and processed with Epiinfo 2000.

## Results

A total of 310 sports people answered the questionnaire. Results for part I demonstrated a majority (70%) of male participants of which 50.41% were between 20 and 40 years old. Among the cited sports were soccer (35%), jiu-jitsu (15.8%), mountain biking (11.5%), handball

Table 3. Questions in part III of the questionnaire distributed among sports practitioners

1. Do you have any experience with dental avulsion (when a tooth comes completely out of its socket after a trauma)?
<input type="checkbox"/> yes <input type="checkbox"/> no
2. Did you or would you reimplant the tooth (to put the tooth back in its original socket) after dental avulsion?
<input type="checkbox"/> yes <input type="checkbox"/> no
3. Do you think any cleaning procedure is necessary before reimplantation?
<input type="checkbox"/> yes <input type="checkbox"/> no
4. If yes, what would you do?
<input type="checkbox"/> wash the tooth with a toothbrush
<input type="checkbox"/> wash the tooth with tap water
<input type="checkbox"/> put the tooth back in the socket
<input type="checkbox"/> do not know
5. If you did not replant the tooth, how would you transport it to the dentist?
<input type="checkbox"/> saline solution
<input type="checkbox"/> patient's mouth
<input type="checkbox"/> in hand
<input type="checkbox"/> in paper, plastic or cloth
<input type="checkbox"/> tap water
<input type="checkbox"/> milk
<input type="checkbox"/> other _____

Table 4. Questions in part IV of the questionnaire distributed among sports practitioners

1. When you are practicing sports, do you think you may lose a tooth?
<input type="checkbox"/> yes <input type="checkbox"/> no
2. Are you aware of mouthguards for use during sports practice?
<input type="checkbox"/> yes <input type="checkbox"/> no
3. Do you use or have you used mouthguards?
<input type="checkbox"/> yes <input type="checkbox"/> no
4. If not, why?
<input type="checkbox"/> difficulties during communication
<input type="checkbox"/> difficulties during breathing
<input type="checkbox"/> esthetics
<input type="checkbox"/> because I never heard of it

(10.6%) and volleyball (10.3%). For 31.6% of the interviewees, sports practicing had been a routine for 11 years or more; 32.3% have been practicing for 1 to 5 years.

Only 28.4% of the interviewees had experienced some sort of dental trauma. Of these, 41.9% were crown fractures and 23.94% were cuts of the lip. Tooth avulsion represented 5.64% of the cases. When asked about their procedures at the moment of the trauma, 33% reported to seek for a dentist the following day, 25% did not do anything and 26% went to the dentist on the same day. Approximately 62% of the sports practitioners who suffered dental trauma did not present any sequelae, 20.42% underwent specialized dental treatment with success and 5.64% had their teeth extracted. According to the interviewees, only 7.7% would not know how to proceed in cases of dental trauma. Several of them (42.6%) would take the affected person immediately to the dentist.

The results for part III, with questions about dental avulsion, demonstrated that only 7.1% had experienced a case of tooth avulsion. Of these, 51.7% answered that the tooth should be reimplanted in its socket. Previously

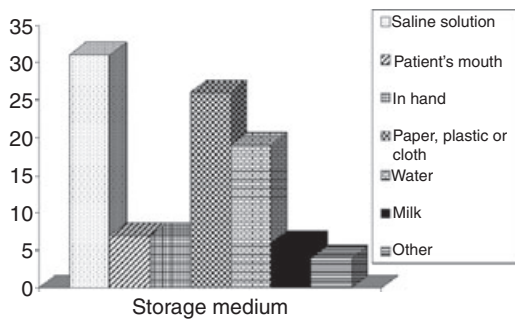


Fig. 1. Perceptual of the storage medium used for interviewees to avulsed teeth.

to reimplantation, 28.1% believe that the tooth should be washed in tap water and 18.1% believe that no additional procedure is necessary. The answers about storage medium for the avulsed tooth are presented in Fig. 1.

Exactly 47.7% of sports participants believe in the possibility of dental trauma during their sport activities. Of the 310 interviewed participants, 65.5% are knowledgeable of the availability of mouthguards for sports practice, however only 13.9% reported to use or to have used them. Most common causes related for not using mouth guards include difficult breathing (20.3%) and communication (18.1%) and lack of esthetics (13.2%).

## Discussion

According to the results of this study, 28.4% of the participants have experienced a kind of dental trauma. Our results corroborate the studies of Levin et al. (1) and Ferrari e Ferreira de Medeiros (4), where 27% and 28.8% of the participants related to have experienced dental trauma, respectively.

Crown fractures were the most frequently reported traumatism in this study. This can be explained in part by the popular practice of sports of direct contact, such as soccer, jiu-jitsu and handball in the population of this study, which consisted mostly of young males. The rapid impulse of the impacting force as a result of direct trauma as experienced in the sports cited above most likely results in an injury mechanism conducive to a crown fracture (3, 18, 19).

In this study, 42.6% of the participants would take the affected person to the dentist immediately and 7.7% would not know how to proceed. In cases of tooth avulsion, 51.7% of the participants would reimplant the tooth in its socket. For 28.1% of the participants, the tooth should be washed in tap water; for 18.1% of the participants, no additional procedure would be necessary prior to reimplantation. Milk was considered the ideal storage medium for the avulsed tooth by 7% of the participants. These results demonstrate that part of the interviewed population is aware of the importance of appropriate emergency procedures in cases of dental trauma. Moreover, approximately one-half of the participants reported they would reimplant the avulsed tooth. Nevertheless, often the participants lacked

information on correct management of the avulsed tooth, especially with regards to storage medium, to assure treatment success.

These results are not unique. Studies with elementary school faculty and staff have also shown overall lack of information regarding emergency procedures postdental trauma, especially tooth avulsion (20–22). In a study by Panzarini et al. (17), the unawareness of Physical Education students and faculty of a college in Aracatuba, SP, Brazil, was also highlighted.

Levin et al. (1) related that 27% of the participants in their study were knowledgeable of the need for mouthguards but only 3% reported to actually use it. Notwithstanding, Holmes (7) described his population as compulsory users of mouthguards. In this study, we found that the great majority of the participants are aware of the availability of mouthguards (65.5%), nevertheless only 13.9% reported to use or to have used these protection devices. This reinforces the need for educational campaigns emphasizing the important role of the mouthguard in the prevention of dental trauma among sports practitioners (2).

In conclusion, our study shows an evident lack of knowledge among sports participants regarding dental trauma procedures. An educational program destined to improve emergency management of dental trauma, particularly tooth avulsion should be proposed. An ideal dental health education package on the management of tooth avulsion should include and emphasize the following information: critical time for reimplantation, specific storage medium, consequences of tooth avulsion and the use of a properly fitted mouthguard.

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