

Knowledge of dental students of avulsed permanent teeth

Conhecimento de estudantes de Odontologia sobre avulsão em dentes permanentes

Ana Paula Zambarda Habekost¹, Daniela Elisa Miotto², Fernando Vacilotto Gomes³, João Feliz Duarte de Moraes⁴, Marília Gerhardt de Oliveira⁵, João Batista Blessmann Weber⁶, Clovis Marzola⁷

¹ Specialist - Oral and Maxillofacial Surgery – PUCRS; ² Dental Surgeon - UFRGS; ³ Student of Dentistry – PUCRS; ⁴ PhD - Professor of Mathematics Faculty – PUCRS; ⁵ PhD - Titular Professor – PUCRS; Productivity Researcher for the Brazilian Council for Scientific and Technological Development (CNPq); ⁶ PhD - Professor of Dentistry Faculty – PUCRS; ⁷ PhD – Titular Professor of Dentistry Faculty - USP/Bauru, São Paulo.

Abstract

The survival of an avulsed permanent tooth depends on the management and the appropriate treatment of the injury by the dental surgeon. The aim of this study was to assess the knowledge of first-year and last-year dental undergraduates on guidelines for management and treatment of tooth avulsion. A 10-item multiple-choice questionnaire was distributed among 65 first-year and 60 last-year dental undergraduates at the School of Dentistry, Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Brazil, between 2006 and 2007. Answers were graded 0 to 3. The results revealed a low level of knowledge among first-year and last-year students on the management of permanent avulsed teeth. Knowledge of last-year undergraduates of tooth avulsion was lower than what is required for a future dental surgeon. In conclusion, there is a need to improve the knowledge of dental students in the guidelines for the management of tooth avulsion. Because tooth avulsion is the most prevalent lesion in dentoalveolar traumas, it is of the utmost importance that dental surgeons be prepared to treat it properly, avoiding damage to neighboring teeth and structures, and esthetic, functional, psychosocial and therapeutic implications for the patient.

Keywords: Tooth avulsion - Attitudes, practice, tooth injuries – Dental students; Tooth reimplantation.

Resumo

A manutenção de um dente permanente avulsionado depende de um manejo e um tratamento adequado pelo cirurgião-dentista. O objetivo deste estudo foi verificar o conhecimento sobre avulsão dentária de alunos do primeiro e do último ano da graduação de uma Faculdade de Odontologia. Aplicou-se um questionário com 10 perguntas de múltipla escolha entre 65 alunos do primeiro ano e 60 alunos do último ano da Faculdade de Odontologia da Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Brasil, entre 2006 e 2007. As questões estavam graduadas de 0 a 3. Os resultados revelaram um baixo grau de conhecimento sobre avulsão dentária entre os estudantes do primeiro e do último ano. O conhecimento dos alunos do último ano foi considerado abaixo do requerido para futuros cirurgiões-dentistas. Necessita-se de uma maior abordagem sobre o tema avulsão, manejo e tratamento, para que se aumente o grau de conhecimento desses alunos sobre o assunto. Devido ao fato de a avulsão dentária apresentar uma prevalência grande entre os traumatismos dentoalveolares, é de suma importância que os cirurgiões-dentistas estejam preparados para tratar desse tipo de lesão, evitando-se danos nas estruturas vizinhas, problemas estéticos, funcionais, psicossociais e implicações terapêuticas ao paciente.

Palavras-chave: avulsão dentária – conhecimentos, atitudes, primeiros socorros – estudantes de odontologia; reimplante dentário.

INTRODUCTION

Dentoalveolar traumas to permanent teeth are among the most serious oral health problems in children and adolescents, compared to the clear reduction of tooth decay and to the low prevalence of periodontal disease in this age group¹. This type of trauma and its consequences to the teeth and to adjoining structures have remarkable psychosocial effects on patients.²

Tooth avulsion is one of the most prevalent lesions caused by dentoalveolar traumas. Factors such as storage, transportation, and time elapsed since the trauma are closely related to the possibility of

maintaining the vitality of pulp cells and of the periodontal ligament, a major determining factor for the healing of replanted teeth³. The treatment of avulsion is rather complex as it is time-consuming and relatively expensive, and also requires multidisciplinary management, including endodontic, periodontic or orthodontic treatment, surgery, and esthetic restorations⁴. It is of utmost importance that the dental surgeon know how to and be prepared to manage this type of trauma.⁵

The aim of the present study was to assess the knowledge of first-year and last-year undergraduates attending the School of Dentistry of Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Brazil, on tooth avulsion, to compare the knowledge acquired during the undergraduate course and to verify

Received on 06 June 2009; revised 20 June 2010.

Correspondência / Correspondence: Marília Gerhardt de Oliveira Lucas de Oliveira, 1841/203 - Petrópolis. 90460-001 Porto Alegre - RS - Brazil. Phone/Fax: +55 51 3330-9545. E-mail: mogerhardt@yahoo.com.br

whether students are prepared to treat and follow up this type of trauma after they leave college and start working as surgeons.

MATERIAL AND METHOD

The study population consisted of 65 first-year and 60 last-year students attending a School of Dentistry in

Brazil, between 2006 and 2007. The students were given a hypothetical clinical situation involving avulsion of a permanent tooth and had to answer a questionnaire with 10 multiple choice questions. Each question had only one correct option (CHART 1). The questions assessed students' specific knowledge of avulsed teeth.

Chart 1 – Questionnaire : Tooth Avulsion

NAME: _____ AGE _____
 ADDRESS: _____
 ELEMENTARY AND HIGH SCHOOLS ATTENDED: _____
 TEL.: _____ e-mail: _____ YEAR: _____

Picture the following situation: a nine-year old boy is referred to your dental practice after falling down and hitting his mouth on the ground while playing in the school yard. In addition to making the child feel nervous because of the bleeding and pain, the injury also caused him to lose an upper permanent incisor (tooth 11). Based on this information, answer the following questions by checking only one of the options:

1. Which is the most appropriate management?
 A. You try to calm the child down.
 B. You try to calm the child down and then wash the wound.
 C. You try to calm the child and parents/surrogates down and stop the bleeding by applying pressure on the wound with a gauze dressing.
 D. You try to calm the child and parents/surrogates down, stop the bleeding and ask for the avulsed tooth.
 E. Does not know/ did not answer.

2. A patient arrives at the dental practice with an avulsed tooth. Where should the avulsed tooth be ideally placed?
 A. In a vessel with water. D. In a vessel with saline, milk or hydrogen peroxide.
 B. Back into the socket. E. Does not know/ did not answer.
 C. In the mouth, in contact with the saliva.

3-How long after dentoalveolar trauma is tooth replantation indicated so that the procedure can be successful?
 A. Up to 10 minutes after the trauma. D. Only the next day when the child feels calmer.
 B. Up to 30 minutes after the trauma. E. Does not know/ did not answer.
 C. Up to 90 minutes after the trauma.

4. A patient arrives at the dental practice without the avulsed tooth. What would you do?
 A. You'd stop the bleeding and suture the socket.
 B. You'd stop the bleeding, suture the socket and refer the patient to a qualified professional.
 C. You wouldn't attend to the patient as you don't have enough knowledge to do that; you'd refer the patient to a qualified professional.
 D. You wouldn't do anything at all.
 E. Does not know/ did not answer.

5. When washing the tooth, which of the following would you use?
 A. Delicate jets of water or saline, handling the tooth by its root. D. Hydrogen peroxide.
 B. Delicate jets of water or saline, handling the tooth by its crown and not by its root. E. Does not know/ did not answer.
 C. Sponge and soap.

6. Immediate replantation requires:
 I - semirigid splinting for 60 to 90 days. IV - semirigid splinting for 30 to 45 days.
 II - rigid splinting for 30 to 45 days. V - rigid splinting for 07 to 14 days.
 III - semirigid splinting for 07 to 14 days.
 The correct option (s) is (are) only:
 A. I and IV. D. II and IV.
 B. III. E. V.
 C. III and V.

7- Bearing in mind the proper management of the avulsed tooth, analyze the following statements:
 I - Before replantation, the tooth must be rinsed in soap and water in order to cleanse the contaminated surface;
 II - The patient must be given antibiotics and tetanus vaccine;
 III - Rigid splinting is the most indicated method in case of immediate replantation and should be removed between the 7th and 14th days when endodontic treatment should be initiated;
 IV - A clinical and radiological follow-up should be carried out for at least 2 years.
Only the following options are correct:
 A. I and II. D. II and IV.
 B. I and IV. E. I, II and III.
 C. III and IV.

8. How long after avulsion can a replanted tooth present with pulpal necrosis?
 A. Up to 1 week. D. Up to 2 years.
 B. Up to 1 month. E. Up to 10 years.
 C. Up to 6 months.

9- Check true (T) or false (F):
 I - () The avulsed tooth must be handled by the root apex, rinsed in sterile saline and replanted as soon as possible.
 II - () The prognosis depends on the stage of root development, length of time the avulsed tooth is stored, storage media in which it is placed, and proper management and splinting.
 III - () Dentoalveolar traumas include concussion, subluxation, lateral, extrusive or intrusive luxations, and avulsion. Of these traumas, avulsion is the one that occurs more often.
 IV - () An avulsed tooth should never be placed back in the patient's mouth in contact with the saliva until a qualified professional arrives, since it will be contaminated by soil bacteria. This could cause bacteremia (open socket) and/or tetanus.
 Which is the correct option?
 A. V F F V D. V F V V
 B. V V F V E. F V V F
 C. F V F F

10- Check true (T) or false (F)
 I - () Tooth injury should be regarded as a major problem, not only due to its remarkable prevalence, especially in regions with shortage of social support and materials, but also due to its high impact on the quality of life of children in terms of physical and psychological distress, besides its possible interference with social relationships.
 II - () High rates of violence, traffic accidents and participation of children in sports activities have increased the incidence of tooth injuries, turning them into a public health problem, unlike tooth decay, whose incidence has dramatically dropped in the last decades.
 III - () A trauma to the dentoalveolar structure can cause injury to teeth and soft tissues and also result in fracture of facial bones, and even in brain and neck injury in more severe cases.
 Which is the correct option?
 A. V V V D. V F V
 B. V V F E. F V V
 C. F V F

The study protocol was approved by the Research Ethics Committee of the School of Dentistry of PUCRS/Brazil and Research Ethics Committee of PUCRS/Brazil.

Each question had five answer options (A, B, C, D, E); the highest the score, the deepest the knowledge on the matter: 0 = poor knowledge, 1 = basic knowledge, 2 = good knowledge and 3 = excellent knowledge; Option E was graded as 0 (zero).

Questionnaire results were expressed as frequency distribution and percentage of right answers for each question. The descriptive statistical analysis was made using the SPSS program, in which the chi-square test was used to establish the significance ($p < 0.05$) regarding the percentage of right answers; $p < 0.05$ was regarded as statistically significant.

Table 1 - Percentage distribution of scores per question among first-year undergraduates.

	Score (%)			
	0	1	2	3
Question 1	6.2	12.3	21.5	60.0
Question 2	53.8	21.5	9.2	15.4
Question 3	23.1	7.7	27.7	41.5
Question 4	3.1	4.6	20.0	72.3
Question 5	7.7	6.2	4.6	81.5
Question 6	52.3	15.4	10.8	21.5
Question 7	16.9	43.1	1.5	38.5
Question 8	29.3	21.5	35.4	13.0
Question 9	30.8	6.2	36.9	26.2
Question 10	10.8	18.5	21.5	49.2
Final mean	23.4	15.7	18.91	41.0
Minimum	3.1	4.6	1.5	13.8
Maximum	53.8	43.1	36.9	81.5

Note: * $p < 0.05$

Table 2 - Percentage distribution of scores per question among last-year undergraduates.

	Score (%)			
	0	1	2	3
Question 1	3.3	1.7	3.3	91.7
Question 2	31.0	0	51.7	35.0
Question 3	8.3	0	36.7	55.0
Question 4	11.5	1.7	35.0	51.7
Question 5	10	0	0	90.0
Question 6	19.7	13.3	3.3	63.3
Question 7	0	18.3	0	81.7
Question 8	14.7	15.0	38.3	31.7
Question 9	28.0	0	4.0	66.6
Question 10	18.3	9.4	18.3	53.3
Final mean	14.48	5.94	18.16	62.0
Minimum	0	0	0	31.7
Maximum	31.0	18.3	51.7	91.7

Note: * $p < 0.05$

RESULTS

Among first-year undergraduates, 23.4% of the answers were graded as 0, 15.7% as 1, 18.91% as 2 and 41.0% as 3 (TABLE 1); among last-year undergraduates, 14.48% of the answers were graded as 0, 5.94% as 1, 18.16% as 2 and 62% as 3 (TABLE 2).

DISCUSSION

All dental surgeons should be scientifically and technically prepared for the treatment and long-term follow-up of tooth avulsion, by carrying out the recommended procedures with proper quality^{5,6} they may have to treat a patient with dentoalveolar trauma at any time, regardless of their field of expertise.⁷

In the United Kingdom, college students and dental surgeons were assessed as to their knowledge on the emergency care of dentoalveolar traumas to permanent incisors and on the difficulties of their management. The answers revealed that respondents had poor knowledge of the emergency care of dentoalveolar traumas.⁸

In the present study, the first question concerned the most appropriate management in case of tooth avulsion. Sixty percent of first-year undergraduates answered that calming the child and parents down, stopping the bleeding and asking for the avulsed tooth was the most correct option. Only 6.2% did not know what to do. Most last-year students (91.7%) answered that this was the most correct option, showing excellent knowledge on this issue.

The knowledge of first-year and last-year students was poor with regard to the storage of the avulsed tooth. As this is one of the major prognostic factors for the management of avulsion, results showed that first-year undergraduates (15.4%) stated that the replantation of the avulsed tooth was the most appropriate option, but only 35% of last-year students agreed to this statement. The results obtained for the knowledge of first-year students, which show that 53.8% of them do not have enough knowledge of this topic, are similar to those found in a previous study of a lay population, where 54% of respondents did not have sufficient knowledge of the issue⁹. This result was different from that obtained from the study performed in the UK with dental students and dental surgeons, in which the knowledge on the storage and handling of the avulsed tooth was adequate.⁸

The length of time the tooth is out of the socket was assessed through question 3. In the present study, 23.1% of first-year undergraduates did not know that time is a crucial factor for success after tooth replantation. This result was similar to that of the lay population, in which 25% did not know or did not believe that time plays a key role.⁹ Fifty-five percent of last-year students chose the correct option. Regarding time, the study undertaken in the UK also yielded a low mean.⁸

The management of a patient who arrives at a dental practice without bringing along the avulsed tooth was discussed in question 4, and 72.3% of first-year students and 51.7% of last-year undergraduates answered that the bleeding should be stopped, the socket should be sutured and the patient should be referred to a qualified professional. This demonstrates that general practitioners are not prepared to deal with these patients and that they believe a qualified professional can do that more appropriately.¹⁰

Question 5 asked about the cleaning of the avulsed tooth after it is found. Among first-year undergraduates, 81.5% mentioned that the tooth should be carefully handled by its crown and that it should be washed with delicate jets of water or saline, whereas 90% of last-year students shared the same opinion. This is an excellent result because when the tooth is minimally handled and treated in a quick and efficient way, the prognosis is better, preventing functional, esthetic and psychological sequelae.

If replantation is done immediately, what type of splint should be used? First-year students (21.5%) were not prepared to carry out this procedure. However, 63.3% of last-year students chose the correct option. Only 38.5% of first-year undergraduates considered giving the patient antibiotics and tetanus vaccine, compared to 81.7% of last-year students. The retention time of a replanted tooth required for the prevention of pulpal necrosis was poorly known by first-year undergraduates (13.8%) and also by last-year students (31.7%).

Dentoalveolar traumas occur quite frequently among children and adolescents. High rates of violence, transit accidents, and sports practice contribute to these traumas². This type of injury and its consequences to adjoining teeth and structures cause esthetic, functional, psychosocial and therapeutic damage and have been regarded as a public health issue, increasingly affecting a large percentage of the population. In countries where prevention of tooth decay is successful, dental injuries are a major oral health problem among young individuals^{11,12}. Question 10 assessed the psychosocial impact of dental injury as a public health problem. The mean values for first-year and last-year undergraduates were 49.2% and 53.3%, respectively.

The final results for all the questions showed that first-year undergraduates have poor knowledge of tooth avulsion, with rates of 41.0% for score 3, 18.91% for score 2, 15.7% for score 1 and 23.4% for score 0. This result is similar to those obtained by a previous study performed with parents and surrogates of pediatric patients treated in the same Brazilian setting, who also showed a poor level of knowledge⁹. Last-year undergraduates had low mean values, considering the fact that they are about to go into the job market. The mean values were 62% for score 3, 18.16% for score 2, 5.94% for score 1 and 14.48% for score 0. Another study,

which assessed the knowledge of dental surgeons on the immediate treatment of dentoalveolar traumas, revealed a low level of knowledge, and showed that those with a professional experience of less than 10 years answered the questions more accurately than those with greater experience¹³. Knowledge, emergency care and perception of difficulties surrounding tooth injuries were assessed among English dentists. The conclusion is that dental surgeons had insufficient knowledge on the treatment of dentoalveolar traumas.¹³

In another study, 87 dental surgeons were interviewed about the emergency care of dentoalveolar traumas. Most interviewees were scientifically and technically prepared to treat the patients. It should be a dental surgeon's responsibility to seek knowledge in this field and to convey it to the community, acting as an educational agent in order to prevent these injuries.¹⁴

The scores of first-year undergraduates were similar to those of lay persons, considering the results of a previous study⁹. With regard to last-year students, they were expected to have a better performance, since they exercised clinical practice in endodontics, pediatric dental care, surgery and traumatology, which include the management of tooth avulsion both in theory and practice. However, their scores were very below expectations and slightly above the results obtained by lay persons, considering the results of a previous study⁹. This finding is indeed worrying as last-year undergraduates should be better prepared to enter the job market.

CONCLUSION

There is a need to improve the knowledge of dental students of the guidelines for the emergency management and treatment of tooth avulsion.

ACKNOWLEDGEMENTS

Financial support: Conselho Nacional de desenvolvimento Científico e Tecnológico (CNPq).

REFERENCES

- CARVALHO, R.G. de. Estudo epidemiológico dos pacientes atendidos no projeto de trauma dental em 7 anos. 2007. 101f. Dissertação (Mestrado em Odontologia) - Escola de Odontologia, Universidade do Grande Rio "Prof. José de Souza Herdy", Duque de Caxias, RJ, 2007.
- Brown, C.J. The management of traumatically intruded permanent incisors in children. *Dent. Update, Guildford*, v.29, n.1, p.38-44, 2002.
- SOARES, J.M. et al. Reimplante dental: fatores determinantes do prognóstico. 2000. 79f. Monografia (Especialização em Endodontia) - Faculdade de Odontologia, Universidade Federal de Minas Gerais, Belo Horizonte, 2000.
- COHENCA, N.; FORREST, J.L.; ROTSTEIN, I. Knowledge of oral health professionals of treatment of avulsed teeth. *Dent. Traumatol., Copenhagen*, v.22, n.6, p.296-301, 2006.
- MARZOLA, C. Transplantes e reimplantes. 2.ed. São Paulo: Pancast, 1997.

6. MAGINI, R.S.; CENSI, J.C.; BIANCHINI, M.A. Reimplante intencional para tratamento de fissura longitudinal: relato clínico após acompanhamento de 1 ano. *R. Bras.Odontol.*, Rio de Janeiro, v.54, n.5, p.297-302, 1997.
7. ALVES, D.F. Filosofia do reimplante dentário. *Odontol. Mod.*, São Paulo, v.24, n.1, p.24-25, 1997.
8. KOSTOPOULOU, M.N.; DUGGAL, M.S. A study into dentists' knowledge of the treatment of traumatic injuries to young permanent incisors. *Int. J. Paediatr. Dent.*, Oxford, v.15, n.1, p.10-19, 2005.
9. SANTOS, M.E.S.M. O conhecimento de pais ou responsáveis sobre avulsão de dentes permanentes. 2006. 107f. Dissertação (Mestrado em Odontologia) - Faculdade de Odontologia, PUCRS, Porto Alegre, 2006.
10. HU, L.W.; PRISCO, C.R.; BOMBANA, A.C. Knowledge of Brazilian general dentists and endodontists about the emergency management of dento-alveolar trauma. *Dent. Traumatol.*, Copenhagen, v.22, n.3, 113-117, 2006.
11. CARRASCOZ, A. et al. Epidemiologia e etiologia do traumatismo dental em dentes permanentes na região de Bragança Paulista. 2002. Disponível em: <<http://www.odontologia.com.br/artigos.asp?id=143>>. Acesso em: 22 jan. 2009.
12. OLIVEIRA, M.G. de et al. Parent and caretaker knowledge about avulsion of permanent teeth. *Dent. Traumatol.*, Copenhagen, v.23, n.1, p.203-208, 2009.
13. HAMILTON, F.A.; HILL, F.J.; MACKIE, I.C. Investigation of lay knowledge of the management of avulsed permanent incisors. *Endod. Dent. Traumatol.*, Copenhagen, v.13, n.1, p.19-23, 1997.
14. SENES, A. de M. Avulsão dentária : a comunidade e o cirurgião-dentista sabem o que fazer? 2001. Dissertação (Mestrado em Cirurgia e Traumatologia Buco Maxilo Facial) - Universidade Camilo Castelo Branco, Campinas, 2001.