

KNOWLEDGE OF GENERAL PRACTITIONERS DENTIST ABOUT THE EMERGENCY MANAGEMENT AND TREATMENT OF HORIZONTAL ROOT FRACTURE IN CURITIBA, BRAZIL

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ABSTRACT

The prognosis of traumatized teeth in general and of horizontal root fracture in particular depends on prompt and appropriate treatment. Management of traumatic injuries may be a challenge to the non-specialized dentist, as they may occur when dentist are least prepared for it. The objective of this study was to investigate the knowledge of general practitioner dentist about the emergency management and treatment of horizontal root fracture in Curitiba, Brazil. A group of 59 professional were interviewed. The questions were related to knowledge of how to treat traumatic horizontal root fracture. The results suggest that the level of knowledge on the management of horizontal root fracture of the general practitioners dentists in Curitiba is adequate.

Keywords: root horizontal fracture; emergency management.

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INTRODUCTION

Horizontal root fractures are characterized by the rupture of the hard structures of the root, that is, those that envelope the dentin and cement, separating the tooth into two segments: apical which generally does not suffer displacement, and coronal, which in the majority of cases is displaced [1, 10].

This type of trauma is more frequent in the anterior portion of the maxilla, affecting the incisors and more frequently, teeth with complete rhizogenesis [9]. Root fractures can be located in the coronal, middle or apical portion. Fractures are more common in the middle portion and rare in the cervical third.

Root fractures can be diagnosed by means of information from clinical and radiographic exams. At first, it is possible to note a normal or extruded crown. Sensitivity to palpation and/or percussion allows the traumatized tooth to be identified, but it does not identify the fracture. When it is located in the cervical third, mobility is revealing, in the middle third there is increased mobility and in the apical third it is practically normal [2].

The radiographic exam is essential, because in addition to either confirming the hypothesis suggested as a result of a clinical exam, or not, when a fracture is detected by the radiograph, it will be possible to locate it and obtain information about the number of fractures; and their type - simple, multiple or comminuted fracture. The radiographic image obtained depends on the angle of the fracture and the incidence of the central X ray beam. The combination of these two factors can facilitate identification or hide the fracture [10].

Professional assistance may be generally obtained from general practitioner dentist; however the management of traumatic injuries, mainly horizontal root fractures may be a challenge. The purpose of this study was to investigate the knowledge of general practitioner dentists from the Municipal Health Network in Curitiba about the emergency management and treatment of horizontal root fracture.

MATERIALS AND METHODS

The target population was practitioner dentist from the Municipal Health Network in the city of Curitiba, Brazil. The dentists were randomly selected from a list of 600 registered professionals. Professionals registered as specialists in Oral and Maxillofacial Surgery or Endodontics were excluded. A total of 200 professionals were sent a postal questionnaire. A pre-paid return envelope was included with each questionnaire and all responses kept anonymous. A reminder was sent to each dentist 1 month after the initial letter. After approval of the Research Ethics Committee of PUCPR (CEP PUCPR 700/07), an open questionnaire, divided in two parts, was used. The first part consisted of questions on professional data, including training

background. The second part consisted of nine questions related to knowledge of how to treat horizontal root fracture. The correct responses were determined by a combination of experts' knowledge and evidence in the accepted literature. The returned questionnaires were coded and analyzed. Results were expressed as a percentage of respondents for each question.

RESULTS

A total of 59 questionnaires were returned. All respondents were general practitioners. One of the questions in the first part was how the respondents were trained in or informed about management of horizontal root fracture. Thirty seven (62.7%) did continual education courses on their own initiative after graduation in dentistry; 14 (23.7%) were self-educated by reading books and scientific articles on the dental trauma emergency care; and 8 (13.6%) had only information during their education at Dental School. The results are summarized in the Table 1.

DISCUSSION

Root fractures of permanent teeth with an incidence of between 0.5 to 7% of traumatic lesions are rare in teeth with incomplete root formation due to the resilience of the alveolar bone [2, 3, 4, 5, 8, 11] since impact at this stage would cause avulsion.

Immediate treatment of horizontal root fractures consists of reduction, rigid splinting and occlusal adjustment [3, 4]. In this study, in horizontal root fractures without displacement of the coronal third, 33.9% performed rigid splinting and clinical and radiographic control. Constant clinical and radiographic vigilance is important to assess the development of pulp response to aggression [13, 15]. In horizontal root fractures with extrusion of the coronal third only 25.42% immediately reduced the fracture with rigid splinting.

Rigid splinting is recommended when there is mobility of the coronal third to favor healing among the fractured fragments. When there is no mobility of the coronal portion of the fracture no type of splinting is necessary [4, 6].

As regards the time splinting should remain in place, 23.73% answered that the time depends on the position of the fracture. Root fracture of the cervical third needs to be splinted for a longer time than a fracture of the middle third [4, 6, 14]. Depending on the location of the fracture and consequent variation in the mobility of the coronal third, longer or shorter periods of splinting are necessary [4].

To the question about whether the position of the fracture interferes in prognosis, 94.92% agreed and 61.03% stated that the more apical it was, the less contamination there was. The more apical the fracture was, the less chance there was of the pulp tissue necrotizing [11, 13].

■ **Table 1** – Questions and answers about the emergency management and treatment of horizontal root fracture.

Questions	Answers	Number/percentage
1) Root fracture without coronal displacement	– Clinical and radiographic control	11 (18.64%)
	– Endodontic treatment of both of the thirds	4 (6.78%)
	– Endodontic treatment of the coronal third	2 (3.39%)
	– Rigid splinting (mobility) clinical and radiographic control	20 (33.9%)
	– Semi-rigid splinting (mobility) clinical and radiographic control	22 (37.29%)
2) Root fracture with extrusion of the coronal third	– Removal of the coronal third	10 (16.95%)
	– Immediate repositioning and semi-rigid splinting	24 (40.68%)
	– Immediate repositioning and rigid splinting	15 (25.42%)
	– Removal of both of the thirds	4 (6.78%)
	– Did not answer	6 (10.17%)
3) In cases of root fracture	– Semi-rigid splinting in all cases	3 (5.08%)
	– Rigid Splinting in all cases	4 (6.78%)
	– Semi-rigid splinting with mobility or repositioning of the coronal third	32 (54.24%)
	– Rigid splinting with mobility or repositioning of the coronal third	20 (33.9%)
	– No type of splinting	0
4) Splinting time	– 2 weeks	28 (47.46%)
	– Depends on the fracture position	14 (23.73%)
	– 1 month	6 (10.17%)
	– 2 months	11 (18.64%)
5) Pulp tissue without displacement of cervical third	– Pulp necrosis, perform endodontic treatment	5 (10.17%)
	– No contamination, vital pulp, no endodontic treatment	43 (72.88%)
	– No contamination, vital pulp, with endodontic treatment	8 (13.56%)
	– State of the pulp does not interfere in the fracture repair	2 (3.39%)
6) Pulp tissue with displacement of cervical third	– Pulp necrosis, perform endodontic treatment	24 (40.68%)
	– No contamination, vital pulp, no endodontic treatment	25 (42.38%)
	– No contamination, vital pulp, with endodontic treatment	7 (11.86%)
	– State of the pulp does not interfere in the fracture repair	1 (1.69%)
	– Did not answer	2 (3.39%)
7) Pulp necrosis of coronal third	– Endodontic treatment of the coronal third and apical removal	10 (16.95%)
	– Endodontic treatment of the coronal third and apical control	22 (37.29%)
	– Endodontic treatment of both of the thirds	26 (44.07%)
	– Tooth removal	0
	– Did not answer	1 (1.69%)
8) Fracture position	– Interferes in prognostic	56 (94.92%)
	– Does not interfere in prognostic	2 (3.39%)
	– Did not answer	1 (1.69%)
9) Fracture position and contamination	– The more apical, the less contamination	36 (61.03%)
	– The more cervical, the less contamination	10 (16.95%)
	– There is no relationship	12 (20.34%)
	– Did not answer	1 (1.69%)

With regard to the behavior of the pulp tissue when there is no coronal displacement, 72.88% affirmed that if there was no contamination the pulp could remain vital. Fracture repair or cure depends on two conditions: damage to the pulp and bacterial invasion. If there is no bacterial contamination and the fragments are united or close to each other, repair can occur; this consists of the formation of a dental callus between the two fragments [1, 2].

When the coronal third was displaced, 42.38% agreed that if there was no contamination after repositioning and splinting, the pulp could remain vital. In horizontal root fractures with coronal mobility and/or

displacement, repositioning and splinting must be performed, as well as follow-up of the state of the dental pulp.

In cases of pulp tissue rupture, revascularization of the coronal area must occur before the fracture heals. The exact nature of this process is not yet known. Therefore it is suspected that two events may occur: invasion of cells from the apical pulp or cellular invasion coming from periodontal ligament. Depending on the source of cells that penetrate the affected area, fracture cicatrization will occur through union with a hard tissue or by means of interposition of conjunctive tissue (periodontal ligament), respectively [1].

If pulp necrosis is found in the coronal third, 37.29% performed endodontic treatment of the coronal third and radiographic control of the apical third. When pulp necrosis occurs, this must be detected and treated as soon as possible because repair does not occur without endodontic treatment.

In the majority of cases of pulp necrosis occurring, it only happens in the coronal third while in the apical the pulp can remain vital [7, 12].

Long term success will be identified by the absence of clinical and radiographic signs which prove pathological alterations. If clinical and radiographic alterations are noted in control consultations, this implies the need for new clinical procedures [1].

CONCLUSION

The dentists interviewed adopted the most indicated procedures in cases of horizontal root fracture with or without displacement of coronal fragment, although lack of knowledge have been found as regards the type and time of splinting to use.

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