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Research Article

Pulp Diagnoses of Fractured Teeth Treated in a Trauma Project, in Temuco, Chile: Re-Evaluation after 5 Years

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Abstract

The aim present cross section study in order to determine vitality of teeth with coronary fractures. Furthermore, it relates to many clinical variables at the time of the urgency attention and later injuries which received treatment. Thirty-seven (37) tooth of twenty-two (22) patients had been taken care in a Trauma Project in the Clinic of Dental School of Universidad de la Frontera, Temuco, Chile.

Between 1996 and 1999 the patients had been assessed and had been treated with a diagnosis of dental fracture coronary. In 2004 a re-assessment has been made by clinical interview, clinical test and complementary test (radiographic, cold, percussion and electrical test). Therefore, an evaluation of the answers have been made by Visual Analogous Scale (VAS) in order to determine the pulp diagnoses: vital and necrotic teeth. The results have been compared with variables like: type of fracture, radicular maturity and combined injuries which had been observed at the time of the re-assessment, among others. In order to analyse the results, a statistical Software-STATA 7,0 Exact test of Fisher and T of Student-was applied. From thirty-seven (37) teeth, thirty-one (31 = 83.8%) were diagnosed vital teeth, not existing statistical differences when comparing vital teeth with type of fracture (p = 0,357), radicular maturity (p = 0,206).

Finally, we concluded there is no correlation between prognosis of normal pulp teeth and the analysed clinical variables.

Keywords: *Dental Trauma; Normal Dental Pulp; Prognosis; Dental Pulp Diagnosis; Dental Fracture; Dental Pulp Vitality Test*

Abbreviations

DT: Dental Trauma; DTT: Dental Trauma Treatment; DTP: Dental Trauma Project; VAS: Visual Analogous Scale; SD: Standard Deviation; VAS: Visual Analogue Scale of Pain

Introduction

Dental trauma treatment (DTT) aims to keep tooth or teeth in the mouth for function or aesthetic reasons, which could have been affected. Also, DTT wants to recover its morph-functional stability. Within this context, it is very important to diagnose and preserve the pulp vitality of the tooth or teeth which suffer dental trauma [1-4].

In order to achieve a correct dental pulp diagnosis a clinical interview, a dental clinical examination and complementary test are needed (cold test, percussion, electrical tests and periapical radiography) and follow-up over time of the clinical case [5-7].

Studies indicate prognosis teeth affected by DT are influenced by many factors such as:

- Stage of root development,
- Kind or type of fracture, others injuries associated at the time of trauma [8-10].

Materials and Methods

The present study intends to co-relate the variables with the diagnosis of pulpal survival in Dental Trauma Project (DTP) service, in Universidad de la Frontera, in Temuco, Chile. The data collect had been done between 1996 and 1999 and re-assessment was made in 2004.

There were 150 patients treated through the DTP. However, the universe of the investigation (non-probability sample) was thirty-seven (37) teeth of twenty-two (22) patients who were called, who met the inclusion criteria-crown fractures and without endodontic treatment.

Assessment protocols were done by:

- Clinical Interview, Dental Clinical Examination (colour, mobility, cavities, crown restoration) [11].
- Percussion test, electric sensibility test (Pulp-meter Vitality Scanner 2006, Analytic technology),
- Cold test sensitivity by Ethyl Chloride and measuring by Visual Analogue Scale (VAS) [12,13].
- Radiography examination (periapical central angle technique) were applied [12] and others lesions were written down would eventually influence in pulpal survival, such as cavities presence and failure or lost crown restorations or endodontic treatment at the time of re-evaluation. (Berman & Hartwell, 2011)

In order to re-assess sensitivity tooth suffered during DT, it had been applied tests to examine it. A contralateral healthy tooth control was selected (without DT or cavities). When patients had had first sensation, it was written down on the chart. The same procedure was selected when cold test was done using cotton soaked in Ethyl Chloride thermic cold test, electric test (Vitality Scanner 2006, Analytic technology) by Visual Analogue Scale (VAS) [14,15] and radiographic. If tooth had been diagnosed as vital teeth (dental normal pulp) showed some response to pulp tests (cold and electric) and did not show evident periapical radiolucency. On the other hand, non-pulpal survival (dental pulp necrosis) must fulfill non response requirements when stimulated, must evidence apical radiolucent (gold standard) or must show a radiopaque endodontic filling [16-18].

Results and Discussion

Statistical analysis

The study design was a cross-sectional. The statistical method was by explorative descriptive analysis. Clinical teeth variables were done through frequency charts, graphics and qualitative variable comparisons. Fisher test was done with a significance level of 5% with Statistical Software STATA 7.0.

The objective was to determine pulpal diagnoses after long-standing dental examination and treatment, crown fractures (CF) specifically.

From thirty-seven (37) teeth studied, thirty-one (31) teeth-equivalent to 83.8%-were diagnosed like normal pulp diagnosis. There are no significant statistical differences when comparing normal pulp teeth with type of fracture (p = 0,357), root stage development (p = 0,206).

Average lectures registered by Pulpometer (measurement between 0 to 99) were less in Control teeth in the same patient than in dental traumas. However, significant differences between these were not found.

Type	Quantity	Measurement	SD	p value
Control	37	36.739	9.719	0.270 (*)
Trauma Teeth	37	40.649	19.024	
Total	74	38.694	15.130	

Table 1: *Value of electrical test comparison between dental trauma and healthy contralateral control teeth. Measuring with Pulp-Meter (Vitality Scanner 2006, Analytic technology).*

(*): t of Student.

Significant differences were found between Pulpal Diagnosis Pulpal-meter Measurements (p = 0,00) and Pulpal Diagnoses Cold Test measured by VAS (p = 0,0036) in dental trauma.

The Cold test is very sensible to external factors contrary to electric test. Also, the use of Pulp-meter is more trustworthy in its lectures than the Cold one. The pulpal-meter is not very affected by subjectivity of perception and measurement of pain. Because of these facts we believe this test is a good complementary test in order to determine the diagnosis of normal pulp.

Type	Quantity	Measurement	SD	p value
Control	37	29.216	2.560	0.041 (*)
Trauma teeth	37	40.784	4.882	
Total	74	35	2.823	

Table 2: *Visual Analog Scale (VAS) values (by applying ethyl chloride) comparison between dental trauma and healthy control teeth.*

(*): t of Student.

VAS were less in control teeth. It was found significant differences in dental trauma (p = 0,041).

Statistically significant differences were found which would mean dental trauma would be more sensitive to thermal stimulation, in this case to cold.

Statistically significant differences were observed between the pulp diagnoses, at the time of re-evaluation dental trauma, and the VAS values in dental trauma in order to determine pulpal survival (normal pulp) or non-pulpal survival (necrotic pulp).

In general, VAS was very useful to determine normal ranks of pain for each patient. It is used is not described in no study we analyzed.

Statistically significant differences were found which would mean dental trauma would be more sensitive to thermal stimulation, in this case to cold.

Pulpal diagnostic	VAS value in trauma teeth			p value
	Average	SD	N Sample	
Necrosis	9.75	23.882	6	0.0036 (*)
Vital	46.790	27.077	31	
Total	40.783	29.694	31	

Table 3: *Cold test VAS value between different the pulp diagnoses, at the time of re-evaluation in the present study.*

(*): t of Student.

In this study, significant associations were not found between pulp vitality prognosis and dental clinical variables were analyzed.

Conclusion

We concluded there is no correlation between prognosis of normal pulp teeth and the analysed clinical variables (root stage development and combined injuries at the time of re-assessment, others). In addition, monitor patients with dental trauma is necessary.

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Conflict of Interest

None.

Bibliography

1. Blagojević D, et al. Pulp vitality preservation after traumatic dental injuries to permanent teeth. Med Pregl. 2013;66(3-4):149-152.

2. Bücher K, Neumann, C, Thiering E, Hickel R, Kühnisch. International Association of Dental Traumatology. Complications and survival rates of teeth after dental trauma over a 5-year period. Clin Oral Investig. 2013;17(5):1311-1318.

3. Ahn S, Kim Y, Park S. Long-term Prognosis of Pulpal Status of Traumatized Teeth Exhibiting Contradictory Results between Pulp Sensibility Test and Ultrasound Doppler Flowmetry: A Retrospective Study. J Endod. 2018;44(3):395-404.

4. Feiling B. Dental pulp response to traumatic injuries. A retrospective analysis with case report. Endod Dent Traumatol. 1996;12(1):1-8.

5. Bargrizan M, Ashari M, Ahmadi M, JR. The use of pulse oximetry in evaluation of pulp vitality in immature permanent teeth. Dent Traumatol. 2016;32(1):43-47.

6. Andreasen F, Kahler B. Diagnosis of acute dental trauma: the importance of standardized documentation: a review. Dent Traumatol. 2015;31(5):340-349.

7. Andreasen JO, AF. Traumatic dental injuries. A manual. Second edition. Copenhagen: Blackwell Munksagaard, 2003.

8. Soares A, Souza G, Pereira A. Frequency of root resorption following trauma to permanent teeth. J Oral Sci. 2015;57(2):73-78.

9. Vilela A, Soares P, de Oliveira F, Garcia-Silva T, Estrel AC, Versluis A. Dental trauma on primary teeth at different root resorption stages-A dynamic finite element impact analysis of the effect on the permanent tooth germ. Dent Traumatol. 2019;35(2):101-108.

10. Lima T, Silva E, Gomes B, Almeida J, Zaia A, Soares A. Relationship between Initial Attendance after Dental Trauma and Development of External Inflammatory Root Resorption. Braz Dent J. 2017;28(2):201-205.

11. Costa V, Goettems M, Baldissera E, Bertoldi A, Torriani D. Clinical and radiographic sequelae to primary teeth affected by dental trauma: a 9-year retrospective study. Braz Oral Res. 2016;30(1):S1806-83242016000100702.

12. Mejàre I, Axelsson S, Davidson T, Frisk F, Hakeberg M, Kvist TE. Diagnosis of the condition of the dental pulp: a systematic review. Int Endod J. 2012;45(7):597-616.

13. Dixon JS, BH. Reproducibity along 10 cm vertical visual analogue scale. Annals of the Rheumatic Diseases. 1980;40(1):87-89.

14. Rosas S, Paço M, Lemos C, Pinho T. Comparison between the Visual Analog Scale and the Numerical Rating Scale in the perception of esthetics and pain. Int Orthod. 2017;45(9):543-560.

15. Gillam D, Bulman J, Newman H. A pilot assessment of alternative methods of quantifying dental pain with particular reference to dentine hypersensitivity. Community Dent Health. 1997;14(2):92-96.

16. Glickman G, Schweitzer J. Universal Classification in Endodontic Diagnosis. Establishing a proper pulpal and periapical diagnosis is key to determining appropriate clinical treatment. The Journal of multidisciplinary care Decisions in dentistry (2016).

17. Hakeberg M, Kvist T, Norlund A, Mejàre I, Portenier I, Sandberg H, et al. Radiological diagnosis of periapical bone tissue lesions in endodontics: a systematic review. Int Endod J. 2012;45(9):783-801.

18. Berman L, Hartwell G. Diagnosis. In SH Cohen, Pathways of the pulp (11th edition). T. Louis: Mosby/Elsevier, 2011:2-39.

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