



## Use of Mechanized Instrumentation for Endodontic Treatment in Deciduous Teeth

Raquel M Viana Hissa<sup>1</sup>, Fernanda Hecksher<sup>2</sup>, Bruno César Ladeira Vidigal<sup>3\*</sup> and Mário Sérgio Fonseca<sup>4</sup>

<sup>1</sup>Specialist in Pediatric Dentistry, PUC Minas, Brazil

<sup>2</sup>PhD in Endodontics - Unigranrio, Brazil

<sup>3</sup>PhD Professor, Newton Paiva, Brazil

<sup>4</sup>Professor, University of Itauna, Brazil

\*Corresponding Author: Bruno César Ladeira Vidigal, PhD Professor, Newton Paiva, Brazil.

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### Abstract

**Introduction:** Mechanized instrumentation in primary teeth has been studied for the increasing technology and innovation employed in rotary and reciprocating instruments used in the biomechanical preparation of root canals with the aim of increasing the success rates of endodontic treatment in deciduous teeth.

**Objective:** The present study aims to describe a clinical case using the Mtwo rotary instrumentation system in primary teeth.

**Conclusion:** The Mtwo system used in this study proved to be efficient in formatting the root canal and obturation with iodoform paste was able to fill the entire root canal of the instrumented tooth, reducing the symptoms reported by the patient.

**Keywords:** Endodontic Treatment; Primary Tooth; Mechanized Instrumentation

### Introduction

Pulpectomy in deciduous patients is the treatment of choice in the presence of irreversible pulpal involvement, with the objective of maintaining the dental element until the moment of its exfoliation [1]. The success of endodontic treatment depends on the reduction or elimination of microorganisms in the root canal system and for this it is necessary to use chemical substances with specific properties and the use of endodontic instruments [2]. Mechanical chemical preparation in Pediatric Dentistry can, in most cases, be a challenging process due to the anatomical complexity of the dental elements [3] and the time spent during treatment, especially when instrumentation is performed manually [1,4,5].

Although manual instrumentation is widely used in primary teeth, limitations regarding root canal cleaning, possible formation errors such as steps, perforations, dentin compaction and instrument fracture have been reported [6-9]. Another factor of considerable relevance is related to the preparation time, several studies

observed a considerable increase in clinical time when manual instrumentation was compared to mechanized instrumentation. The duration of the consultation is a crucial factor for the cooperation and adherence of the pediatric patient to the treatment [5,6,7,9,10].

The initial studies focused on the use of mechanized instrumentation in deciduous children were carried out [11] where it can be observed that the motor-driven instruments promoted a format similar to the conduit and with a considerable reduction in working time, the latter variable being relevant for the correct execution and success of the proposed treatment in Pediatric Dentistry [8,12-14].

In this context, the objective of this work was to describe a clinical case using mechanized instrumentation in the primary dentition.

### Case Report

A two-year and eight-month-old male child, accompanied by his parents, attended the Pediatric Dentistry Clinic at PUC Minas. Dur-

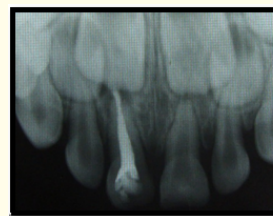
ing the anamnesis, her mother reported that her son had suffered trauma at school and had a “complaint of pain”, the main reason for seeking dental treatment. The child was healthy, with no systemic changes. Radiographically, a radiolucent apical lesion associated with the apex of tooth 51 was observed. After clinical and radiographic evaluation, it was possible to confirm the diagnosis of pulp necrosis in tooth 51 and the proposed treatment plan involved endodontic and restorative treatment.

The procedures were performed under local anesthesia Alpha-caine 1:100,000 - 2% lidocaine with adrenaline 1:100,000 (brand name). After the coronal opening was performed with a 1011 spherical bur (brand) at high speed and under refrigeration, absolute isolation and initial irrigation with 1% sodium hypochlorite (brand) was performed. An initial exploration of the canal with a C-Pilot #10 hand file (VDW, Munich, Germany) up to 1 mm short of the length of the tooth on the radiograph was performed and then instrumentation with the rotary files of the Mtwo system (VDW, Munich, Germany) was started. using files 15.05, 20.06 and 25.06 2 mm short of working length. At each change of file, irrigation with 1% sodium hypochlorite was performed.

For obturation, the entire conduit was filled using an iodofomed paste (Lenzafarm, Belo Horizonte, Brazil). After complete filling of the canal and cleaning of the pulp chamber using a sterile cotton ball soaked in 70° alcohol, the mouth of the canal in its cervical third was sealed with Coltosol (Coltene, Rio de Janeiro, Brazil) and the access cavity was restored with resin. composite (Opallis - FGM). After completion of treatment, a final radiograph was taken for evaluation (Figure 1). The parents were instructed on the importance of monitoring the case and after one week, the patient came for an appointment and found that the clinical signs and symptoms of inflammation were absent.

## Discussion

There is a wide variety and constant introduction of new engines and instruments on the market, all of which are viable and effective in root canal preparation, attracting more and more professionals. Mechanized instrumentation in deciduous teeth can be a viable alternative in pulpectomy of deciduous teeth since it has been shown to be effective, in addition to the reduced instrumentation time and more conical preparation, which favors filling.



**Figure 1:** A final radiograph was taken for evaluation.

Since the use of rotary and reciprocating instruments represent additional positive aspects, improving the final results when used properly [5,8,12,15].

Nickel Titanium alloys have brought greater flexibility to the instruments, leading to safer preparations, with fewer alterations to the original canal anatomy. One of the greatest developments in endodontic preparation is the development of mechanized instrumentation by continuous movement, which allowed more centered preparations, good disinfection, greater convenience for the operator as it is driven by a motor and shorter execution time than manual techniques. However, more recently, Ni-Ti files have been developed by reciprocal mechanized movement, where the file advances in the canal through a rotational angle of greater amplitude in the clockwise direction and the dentin is cut at a smaller rotational angle in the anti-clockwise direction. time. So cyclic fatigue resistance is better in reciprocal motion compared to continuous rotational motion [9,10,15].

However, further studies are necessary, since there are no clear guidelines and protocols for the proper technique in the preparation of deciduous teeth, and the use of protocols for permanent teeth in deciduous teeth can lead to lateral perforation on the inner surface of the root [5,8,12].

## Conclusion

Mechanized instrumentation (rotating and reciprocating) has advantages compared to the manual technique, especially with regard to shorter working time and greater increase in taper in the cervical and middle thirds of the preparation, facilitating the introduction of filling pastes. Regarding cleaning capacity, mechanized

instrumentation was similar to manual. So that the rotary mechanized instrumentation used in this study proved to be efficient. However, there are no guidelines and protocols especially for the preparation of deciduous teeth and further studies are needed.

### Conflict of Interest

No conflict of interest exists.

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