

# Endodontic Treatment of Primary Molars with Antibiotic Paste: A Report of 38 Cases

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**Objective:** This study presents 38 cases of primary molars with necrotic pulps treated with antibiotics-based paste. **Case report:** The technique consisted of necrotic tissue removal of the pulp chamber, using spoons excavators and low speed drills. Pulp cavity was washed with saline solution and dried with sterile cotton balls. Then an antibiotic paste composed of chloramphenicol, tetracycline, zinc oxide and eugenol – CTZ paste – was inserted at the entrance of root canals. Patients were evaluated clinically and radiographically at different times. The criteria that defined clinical success were the lack of periapical abscess and mobility compatible with chronological age. Radiographic assessments consisted in absence of radiolucency in the region of root bifurcation and pathological bone resorption. **Conclusion:** There were 100% and 93% of clinical and radiographic success, respectively. The results suggest that the CTZ paste is an optional therapy for pulp of primary molars.

**Key words:** pediatric dentistry, primary teeth, pulpectomy, root canal filling materials.

## INTRODUCTION

Factors that hinder the conventional chemical-mechanical preparation of primary molars with necrotic pulps during endodontic treatment are the microbiological and morphological complexity of root canals and the lack of cooperation from children<sup>1,2</sup>. Because of these limitations, many children with primary teeth with necrotic pulps suffer early extractions<sup>3</sup>.

Alternative techniques which call for necrotic tissue removal of the pulp chamber, the location and clearance of root canal entries, and the insertion of antibiotic pastes were developed to enable the implementation of pulp therapies for clinicians who treat children as well as simplify the technique for less experienced collaborators.

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This type of intervention is based on sterilization and periapical tissue repair<sup>4</sup>.

In 1964 and 1967, Cappiello<sup>5,6</sup> recommended the use of an endodontic paste consisting of chloramphenicol, tetracycline, zinc oxide and eugenol (CTZ paste) for the treatment of primary teeth with necrotic pulp. The CTZ paste is biocompatible<sup>7</sup>. However, studies are needed to verify the clinical success of the treatment.

The objective of this study is to present a series of cases of primary molars treated with CTZ paste.

## Case Report

From March 2010 to December 2014, 46 endodontic treatments in primary mandibular molars with CTZ paste were performed for 38 children at the Pediatric Dentistry Clinic of the Federal University of Piauí (UFPI, Teresina, Piauí, Brazil). Caretakers signed an authorization form that allowed their images and information registered in medical records to be published in scientific journals. For this study, we selected 28 children, aged between 4 and 10 years and 38 primary lower molars (Table 1). The other 10 patients did not return for scheduled appointments.

Children were evaluated clinically and radiographically at 3-6 months, 7-12 months, 13-24 months and 25-36 months after endodontic treatment.

All teeth treated with CTZ paste had necrotic pulp, clinically evidenced by abscess, radiographic evaluation or both of the radiolucent area by the inter-root region before treatment. Primary mandibular molars were selected due to ease of radiographic distinction of dental structures.

**Table 1: Distribution of cases according to gender, age and tooth**

Variables	n	%
Gender*		
Male	16	64.0
Female	12	36.0
Age (years)*		
5 – 6	18	64.3
7	4	14.3
> 7	6	21.4
Tooth**		
74	07	18.4
75	13	34.2
84	09	23.7
85	09	23.7

\*n = 28 \*\*n = 38

The following protocol was adopted for treatment with CTZ paste: initial periapical x-ray, anesthesia, rubber dam isolation, caries removal with spoon excavators and low speed drills, removal of the pulp chamber ceiling using spherical drills at high speed, access and clearance of root canals with explorer number 5, pulp chamber irrigation with saline dried with sterile cotton balls, insertion of CTZ paste at the entrance of the root canal with sickle probe number 5, exert pressure on the CTZ paste with sterile cotton balls, isolation of the CTZ paste with thin layer of gutta-percha stick, tooth restoration with the appropriate material for each case and final periapical x-ray.

The powder for CTZ paste was manipulated, micronized and provided in capsules of 250mg pharmaceutically manipulated (Tersina, Piauí, Brazil), comprising 62.5 mg of chloramphenicol, 62.5 mg of tetracycline, 125 mg of zinc oxide, so that any portion of the dust present in the same proportion 1: 1: 2 components. Upon use, the powder was dispensed in a sterile glass plate and handled with eugenol (Biodinâmica®, Ibiporã, PR, Brazil) with the aid of a metal spatula to obtain a consistency similar to toothpaste.

Clinical evaluation was performed by a previously trained and calibrated examiner and when there were doubts, a second trained and calibrated evaluator was also consulted. The kappa index was 0.98 intraexaminer and 0.92 extraexaminers. Teeth that had no symptoms, abscess or mobility incompatible with chronological age at the evaluated times were considered clinical successes.

Radiographs were taken on the same days as the clinical evaluations. Positioners for periapical film were used and the revelation was manual. The radiographic evaluations were performed by a professor of dental radiology, previously trained and calibrated with kappa index = 0.89. The success of endodontic treatment was evident if there was regression of radiolucency in the inter-root region and absence of pathological root resorption.

For all 38 teeth that had presented with an abscess, pain or pathological mobility, data indicated that the adopted endodontic treatments showed clinical success of 100% (Table 2). Within the parameters of success, 95.8%, 100%, 93.5% and 93.5% of primary mandibular molars treated with CTZ paste showed radiographic success at the evaluation times of 3-6, 7-12, 13-24 and 25-36 months, respectively (Table 2 and Figure 1).

**Table 2: Clinical and radiographic evaluation according to the teeth and monitoring ranges**

Primary lower molars (n)	Monitoring ranges (meses)	Clinical success		Radiographic success	
		Success (%)	Failure (%)	Success (%)	Failure (%)
48	3 – 6	100.0	0	95.8	4.2
46	7 – 12	100.0	0	100.0	0
46	13 – 24	100.0	0	93.5	6.5
43	25 - 36	100.0	0	93.5	6.5

## DISCUSSION

The goal of endodontic intervention is to neutralize the action of microorganisms in the root canal system<sup>1,8</sup>. Treatment is considered successful when there is regression of clinical signs and symptoms and radiographic evidence of bone tissue apposition in areas that show pathological lesions suggestive of radiographic images<sup>9</sup>.

The teeth evaluated in this case report showed no adverse signs or symptoms after completion of treatment with CTZ paste. When clinical assessment was associated with radiography, there was a high percentage of success. The causes of radiographic failures need to be further examined in other studies.

The term “lesion sterilization and tissue repair” (LSTR) is used to refer to endodontic therapies using combinations of drugs to eliminate or minimize the amount of microorganisms present in the tooth’s root canal system with necrotic pulps without prior chemical-mechanical preparation<sup>10-11</sup>.

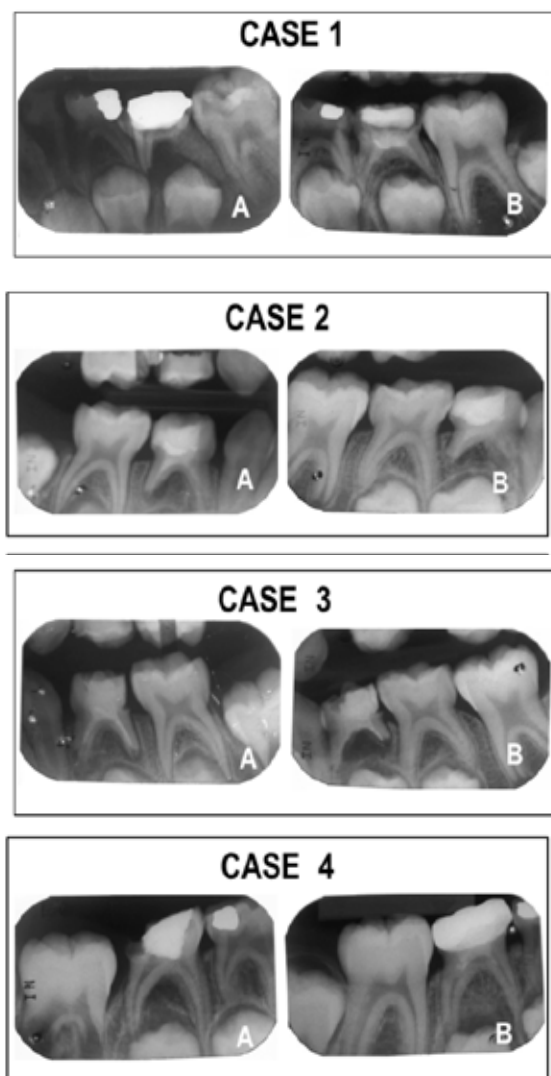
The CTZ paste, previously advocated in the development of this concept, follows the same principles of LSTR. This paste consists of broad-spectrum and bacteriostatic antibiotics<sup>12,13</sup>. Zinc oxide has a low absorption rate when used in pastes to fill the root canals of primary teeth, and eugenol also has antimicrobial action<sup>14</sup>.

In this report, the CTZ paste showed equivalent clinical and radiographic results superior to those demonstrated by 3Mix paste in previous studies<sup>15,16</sup>. Other studies using calcium hydroxide, zinc oxide and eugenol, and Vitapex® paste as root canal material filling for primary teeth showed similar clinical and radiographic success but less than that observed in this study<sup>17,18</sup>.

Considering the peculiarities inherent to root anatomy of primary molars and the lack of cooperation from many children, conventional endodontic treatments become complex and unworkable in many situations. The use of CTZ paste is an alternative technique for use in these situations.

In conclusion, endodontic treatment of primary mandibular molars with necrotic pulps using the CTZ paste showed excellent clinical and good radiographic results.

**Figure 1: Case 1 - Initial radiograph (A) obtained after the procedure and final (B) performed 24 months after the intervention. Radiolucent lesion stabilization occurred in tooth furcation area 75. Case 2 - Initial radiograph (A) obtained after the procedure and final (B) performed 27 months after the intervention. Radiolucent lesion progression occurred in tooth furcation area 84. Case 3 - Initial radiograph (A) obtained after the procedure and final (B) performed 36 months after the intervention. Radiolucent lesion was maintained in the tooth furcation area 74. Case 4 - initial radiograph (A) obtained after the procedure and final (B) performed 30 months after the intervention. Radiolucent lesion regression occurred in the furcation region of tooth 85.**



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