

## Case Report

### Ledermix as Root Canal Medicament in Deciduous Teeth

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#### ABSTRACT

**Background:** Caries in a child's teeth can result in infection and affect the child's growth and development. Various types of dental care can be given to primary teeth, depending on the diagnosis and condition of each child. Cases of non-vital deciduous teeth and abscesses can be treated with pulpectomy treatment. One of the medicaments that can be given is Ledermix® paste. **Purpose:** This Case report describe the treatment of pulpectomy in non-vital primary teeth accompanied by apical periodontitis using Ledermix® paste. **Case:** This article explained a 8-years-old boy that had came to the Dental Hospital Universitas Padjadjaran with complaints of swollen gums and tooth pain in the right upper jaw since one week ago. The diagnosis, in this case, is pulp necrose with apical periodontitis. **Management:** Pulpectomy treatment was performed at the first visit and used Ledermix® Paste containing antibiotics and steroids as medicaments. At the second visit (1 week later), the patient had no complaints and examination of percussion (-) and palpation (-) so that the canal was filled and restoration was carried out. **Conclusion:** Ledermix® paste can be used as a root canal medicament in the case of pulp necrose accompanied by apical periodontitis in primary teeth.

#### INTRODUCTION

Apical periodontitis can occur if there are microorganisms in the root canal.<sup>1</sup> The use of intracanal drugs is important to maximize the success of root canal treatment. Ledermix® paste (Haupt Pharma GmbH, Wolftratshausen, Germany) is a commercially available intracanal drug, having an antibiotic component (demeclocycline calcium, which is a tetracycline derivative) and a steroid component (triamcinolone acetone) in its standard formulation. The presence of a steroid component helps in endodontic treatment by reducing post-treatment pain.<sup>2</sup>

#### CASE REPORT

A boy aged 8 years 9 months came to the Dental Hospital Faculty of Dentistry University Padjadjaran

Bandung, West Java, Indonesia with complaints that there were swollen gums and tooth pain in the right upper jaw since one week ago. Abnormalities in medical and dental history were not found. The patient's behavior before and after treatment is positive. Child plaque index is 1.2 (moderate).

An extraoral examination in patients found no abnormalities. The intraoral examination shows the child in the period of mixed teeth. Panoramic radiographic support is performed. The diagnosis for this patient was pulp necrose in teeth 54,55,64,65, 84 and 85. Tooth 55 was accompanied by an abscess which was the patient's chief complaint (Figure 1). Teeth 26, 36, and 75 were diagnosed with reversible pulpitis. Teeth 54, 65, 84 and 85 cannot be treated because caries had affected the root furcation and there is root resorption so that it is

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extracted and followed up with a space maintainer. Radiographic results showed that tooth 55 roots had not been resorbed and were examined for vitality (-),

percussion (+) and palpation (+) (Figure 3). The steps taken for this patient are explained below.



**Fig. 1:** An abscess was seen in the buccal mucosa of the tooth 55



**Fig. 2:** Dental caries at the mesio occlusal regio of 55 tooth



**Fig. 3:** Panoramic Radiography

### 1. Preparing tools and materials

Intraoral mirror, tweezers, sonde, excavator, cotton roll, cotton pellet, paper point, high-speed handpiece, round and endo access bur, endo needle, needle and syringe for root canal irrigation, plugger for filling, plastic instruments, chlorhexidine gluconate 0,2%, aqua dest, Ledermix® paste, Zinc oxide eugenol, Zinc Phosphate Cement and Glass Ionomer Cement (GIC).

### 2. Cleaning

Clean the cavity and open the pulp chamber with a high-speed round handpiece and bur on the tooth 55. Take necrotic tissue with endo needles and irrigation using 0.2% chlorhexidine gluconate and aqua dest. After all the root canals were cleaned, they were dried with paper points (Figure 4).



**Fig. 4:** Cavity and root canal preparation

### 3. Medicament application

Ledermix® paste is applied to all root canals, covered with cotton and stuffed with temporary restoration (Figure 5).



**Fig. 5:** Ledermix® medicament paste application

### 4. Second visit (1 week later)

Patient complaints (-), percussion examinations (-) and palpation (-). Re-cleaning was done to remove Ledermix® paste, re-irrigated with 0.2% chlorhexidine gluconate and Aquadest.

### 5. Root canal filling

Root canal filling after drying with paper points. Filling with Zinc Oxide Eugenol (ZOE), coated with phosphate cement and covered with glass ionomer cement (GIC) (Figure 6).



**Fig. 6:** Restoration with Glass Ionomer Cement

6. Control 1 week to see the condition of teeth 55 (Figure 7).



**Fig. 7:** Control 1 week after.

## DISCUSSION

Patients with dental caries in the mesio occlusal region of tooth 55 and reddish edema in the buccal mucosa. The case in this patient was pulp necrose accompanied by apical periodontitis caused by bacteria. The treatment plan is pulpectomy on tooth 55 using Ledermix® paste as root canal medicament.

Ledermix® was first developed by Schroeder and Triadan in 1960. Ledermix® paste is used commercially as a root canal drug that has an antibiotic component (demeclocycline calcium 3.2% which is a derivative of tetracycline) and a steroid component (triamcinolone acetonide 1%). Both of these components are mixed with polyethylene glycol base. This paste is a non-setting and water-soluble ingredient.<sup>3</sup> Triamcinolone acetonide is a potent corticosteroid that is very effective for eliminating or reducing inflammatory reactions. However, the topical use of steroids can decrease the body's defense mechanism that can provide bacterial access to the systemic circulation. Schroeder added broad-spectrum antibiotics that were effective against Gram-positive and Gram-negative bacteria to prevent bacterial invasion.<sup>4</sup> Demeclocycline is synthetic tetracycline. The mechanism of action is through interference with protein synthesis and also reduces bone resorption by inhibiting osteoclast and dentinoclast activity.<sup>5</sup>

This therapeutic component of Ledermix® can diffuse through the dentinal tubules and cementum to reach the periodontal and periapical tissues.<sup>3</sup> This active agent is released into the root canal system rapidly on the first day and decreases more and more. Heling and Pecht evaluated the effectiveness of Ledermix® in disinfecting dentinal tubules. The finding was that Ledermix® effective in reducing *Staphylococcus aureus* in the dentinal tubules after 7 days of incubation.<sup>6</sup>

Several studies on the effects of Ledermix® on periapex tissue had been carried out. In vivo research conducted by Pierce et al concluded that Ledermix® is an effective root canal drug for the treatment of inflammatory root resorption in traumatized teeth because Ledermix® has no detrimental effect on ligament periodontium tissue.<sup>7</sup> Bryson et al investigated the use of Ledermix® paste in avulsion dogs teeth showed that 59% of the root surface showed healing after replantation compared to if calcium hydroxide was used with a cure of only 14%.<sup>5</sup>

Ledermix® can be mixed with calcium hydroxide, a mixture of Ledermix® and calcium hydroxide made in a 50:50 ratio results in the release and diffusion of components of the Ledermix® paste which is longer so that the root canal drug can last longer in the root canal.<sup>8</sup> Thong et al also compare the effect of Pulpdent® and Ledermix® on healing and root resorption after replantation. The result is that periodontal ligament inflammation and root resorption are inhibited by calcium hydroxide and corticosteroids-antibiotics.<sup>9</sup>

After the second visit (1 week) there were no abscesses on the buccal and lingual mucosa, the patient had no complaints and the other oral examinations were no abnormalities. The filling uses Zinc Oxide Eugenol (ZOE) because of its absorbable. During the next visit, there were no abnormalities and the patient had no complaints. Patients are instructed to perform Oral

Hygiene Instruction (OHI) and control routines every 6 months.

### SUMMARY

Deciduous teeth can be treated with pulpectomy using Ledermix® paste as medicament which contains antibiotics that are effective in cases of apical periodontitis.

### ACKNOWLEDGMENT

The author declare no conflict of interests.

### REFERENCE

1. Möller AJ, Fabricius L, Dahlén G, Heyden G. Influence on periradicular tissues of indigenous oral bacteria and necrotic pulp tissue in monkeys. *Scandinavian Journal of Dental Research*. 1981; 89:475-84.
2. Ehrmann EH, Messer HH, Adams GG. The relationship of intracanal medicaments to postoperative pain in endodontics. *International Endodontic Journal*. 2003; 36:868-75.
3. Metzger Z, Basrani B, Goodis HE. Instruments, Materials, and Devices. In: Hargreaves KM, Cohen S, Berman LH, editors. *Cohen's Pathway of the Pulp*. 10 ed. Missouri: Mosby Elsevier, 2011, 253-55p.
4. Negm MM. Intracanal Use of a Corticosteroid-antibiotic Compound for the Management of Posttreatment Endodontic Pain. *Oral Surg Oral Med Oral Pathol*. 2001; 92:435-9.
5. Bryson E, Levin L, Banchs F, Abbott P, Trope M. Effect of immediate intracanal placement of Ledermix paste on healing of replanted dog teeth after extended dry times. *Dent Traumatol*. 2002; 18:316-21.
6. Heeling I, Pecht M. Efficacy of Ledermix Paste in Eliminating *Staphylococcus Aureus* from Infected Dentinal Tubuluse In Vitro. *Endod Dent Traumatol*. 1991; 7:251-4.
7. Pierce A, Lindskog S. The effect of an antibiotic/corticosteroid paste on inflammatory root resorption in vivo. *Oral Surg Oral Med Oral Pathol*. 1987; 64:216-20.
8. Abbott P, Hume WR, Heithersay GS. Effects of combining Ledermix and calcium hydroxide pastes on the diffusion of corticosteroid and tetracycline through human tooth roots in vitro. *Endod Dent Traumatol*. 1989; 5:188-92.
9. Thong Y, Messer H, Siar C, Saw L. Periodontal Response to Two Intracanal Medicaments in Replanted Monkey Incisors. *Dent Traumatol*. 2001; 17:254-9.