

## Original Research

### Retrospective study of sodium hypochlorite pulpotomies in primary molars

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#### ABSTRACT:

**Background:** The philosophy of primary tooth pulpotomy is to remove the inflamed or infected coronal pulp tissue and cover the pulp stumps with a therapeutic agent. Sodium hypochlorite (NaOCl) is a biocompatible material that is an effective hemostatic agent and is nonirritating to the exposed pulpal tissue. Hence; the present retrospective study was undertaken for assessing sodium hypochlorite pulpotomies in primary molars. **Materials & methods:** Data records of a total of 50 patients were obtained. Only those patients were enrolled which underwent pulpotomy procedures with sodium hypochlorite and in which complete data records were obtained. Based on radiographic evaluation based on data of clinical variables, success and failure rate was analysed. Data of subjects with presence of any other oral pathologic lesion were enrolled. All the results were recorded and analysed by SPSS software. **Results:** Clinical success was seen in 96 percent of the patients while clinical failure was seen in 4 percent of the patients. Radiographic success was seen in 90 percent of the patients while radiographic failure was seen in 10 percent of the patients. **Conclusion:** Sodium hypochlorite pulpotomies in primary molars have excellent prognosis.

**Key words:** Pulpotomy, Primary, Molars.

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#### INTRODUCTION

The philosophy of primary tooth pulpotomy is to remove the inflamed or infected coronal pulp tissue and cover the pulp stumps with a therapeutic agent. The success mostly depends on correct diagnosis of pulp status. However, other factors such as control of pulpal bleeding after coronal pulp amputation, the choice of base material used, restoration, and microleakage also contribute to the outcome.<sup>1,2</sup>

Pulpal hemorrhage control is an indispensable step in pulpotomy procedures. Some studies have indicated that if the hemorrhage is not controlled, the blood clot forming on the pulp surface could prevent intimate contact between the pulp tissue and the capping material, which may result in a chronic inflammatory response.<sup>3, 4</sup> Sodium hypochlorite (NaOCl) is a biocompatible material that is an effective hemostatic agent and is nonirritating to the exposed pulpal tissue. It was commonly used as an irrigant in endodontic

treatment of permanent teeth since 1920. It has a significant effect in controlling the bleeding of the pulp and can thus be expected to inhibit the formation of a fibrin clot. Furthermore, it helps in disinfection of the canals and removal of dentin chips.<sup>4- 6</sup> Hence; the present retrospective study was undertaken for assessing sodium hypochlorite pulpotomies in primary molars.

#### MATERIALS & METHODS

The present retrospective study was undertaken for assessing sodium hypochlorite pulpotomies in primary molars. Data records of a total of 50 patients were obtained. Only those patients were enrolled which underwent pulpotomy procedures with sodium hypochlorite and in which complete data records were obtained. Based on radiographic evaluation of evaluation based on data of clinical variables, success and failure rate was analysed. Data of subjects with

presence of any other oral pathologic lesion were enrolled. All the results were recorded and analysed by SPSS software. Student t test was used for evaluation of level of significance.

## RESULTS

In the present study, a total of 50 patient's data records were analysed. Clinical success was seen in 96 percent of the patients while clinical failure was seen in 4 percent of the patients. Radiographic success was seen in 90 percent of the patients while radiographic failure was seen in 10 percent of the patients.

**Table 1:** Clinical prognosis on follow-up

Clinical Prognosis		Value
Success	Number of patients	48
	Percentage	96
Failure	Number of patients	2
	Percentage	4

**Table 2:** Radiographic prognosis on follow-up

Radiographic Prognosis		Value
Success	Number of patients	45
	Percentage	90
Failure	Number of patients	5
	Percentage	10

## DISCUSSION

Pulpotomy in primary dentition is defined as 'a clinical process of removing the coronal inflamed pulp', while the remaining root pulp is covered with a pulp medicament that is ideally life compatible, bactericidal, and capable of creating a biological seal and that allows the physiological process of root resorption. The 'gold standard' for pulpotomy treatment in deciduous teeth is formocresol. It was introduced in 1904 by Buckley to treat nonvital permanent teeth, and then it became a popular pulpotomy medicament for primary teeth. Currently used 1 : 5 dilution of Buckley's formocresol has a formula of 19% formaldehyde, 35% cresol, 15% glycerine, and water.<sup>6-10</sup> Sodium hypochlorite (NaOCl) seems to be a suitable alternative for FC. Used for over four decades as the most popular endodontic irrigant available, it has been shown to be a very good antimicrobial and hemostatic agent, two important factors in primary teeth pulpotomy.<sup>6-8</sup> Hence; the present retrospective study was undertaken for assessing sodium hypochlorite pulpotomies in primary molars.

In the present study, a total of 50 patient's data records were analysed. Clinical success was seen in 96 percent of the patients while clinical failure was seen in 4 percent of the patients. Salem GA et al evaluated the clinical and radiographic outcome of pulpotomy treatment in deciduous molars using 2.5% NaOCl, 5% NaOCl, and Buckley's formocresol. A total of 60 primary molars teeth of 30 children aged 5-9 years were selected for the study. The selected

teeth were randomly distributed into three groups treated by 2.5% NaOCl, 5% NaOCl, and formocresol. Pulpotomy was carried out using the three medications, and the teeth were restored with stainless steel crowns. The clinical and radiographic evaluations were performed at 3 and 6 months postoperatively. At the 3-month follow-up, 100% of the pulpotomy medicaments were clinically successful. At the 6-month follow-up, all pulpotomized dentitions in 2.5% NaOCl and formocresol were clinically successful. In 5% NaOCl group, gingival inflammation was observed in two teeth. Regarding the radiographic findings, at the 3-month follow-up, all pulpotomized teeth in 2.5% NaOCl group were successfully treated. Radiographic changes were seen in 5% of the teeth in the 5% NaOCl group and 5.5% of teeth in the formocresol group. At the 6-month follow-up, radiographic changes were seen in 6% of the teeth in 2.5% NaOCl group, 11% of the teeth in 5% NaOCl group, and 12.5% of the teeth in formocresol group. No significant differences were found in the clinical and radiographic outcomes among the three groups ( $P > 0.05$ ). There is no difference in the clinical and radiographic finding of pulpotomized molars using 2.5%, 5% NaOCl, and formocresol.<sup>10</sup>

In the present study, Radiographic success was seen in 90 percent of the patients while radiographic failure was seen in 10 percent of the patients. Li TY et al evaluated the clinical and radiographic success rate of 5% NaOCl pulpotomy in primary molars. A retrospective research of patient records was conducted to evaluate the clinical and radiographic success rate of 5% NaOCl pulpotomy in primary molars. A total of 147 NaOCl primary molar pulpotomies in 52 patients were included in the study. Clinical success rates at 6 months, 12 months, and 24 months were 100%, 97%, and 97%, respectively. Radiographic success rates at 6 months, 12 months, and 24 months were 99%, 89%, and 77%, respectively. Internal root resorption was the most common radiographic pathologic finding. The clinical and radiographic success rate for NaOCl pulpotomies is comparable with formocresol and ferric sulfate pulpotomy success rates reported in previous studies.<sup>11</sup>

## CONCLUSION

Sodium hypochlorite pulpotomies in primary molars have excellent prognosis.

## REFERENCES

1. Stanley HR. Conserving the dental pulp—Can it be done? Is it worth it? *Oral Surg Oral Med Oral Pathol* 1989;68:628-39.
2. Waterhouse PJ. Formocresol and alternative primary molar pulpotomy medicaments: A review. *Endod Dent Traumatol* 1995;11:157-62.
3. Kitasako Y, Inokoshi S, Fujitani M, Otsuki M, Tagami J. Short-term reaction of exposed monkey pulp beneath adhesive resins. *Oper Dent* 1998;23:308-17.

4. Tunc ES, Saroglu I, Sari S, Gunhan O. The effect of sodium hypochlorite application on the success of calcium hydroxide pulpotomy in primary teeth. *Oral Surg Oral Med Oral Pathol Oral RadiolEndod* 2006;102:e22-6.
5. Percinoto C, de Castro AM, Pinto LM. Clinical and radiographic evaluation of pulpotomies employing calcium hydroxide and trioxide mineral aggregate. *Gen Dent* 2006;54:258-61.
6. Vargas KG, Packham B, Lowman D. Preliminary evaluation of sodium hypochlorite for pulpotomies in primary molars. *Pediatr Dent* 2006;28:511-7.
7. Hafez AA, Cox CF, Tarim B, Otsuki M, Akimoto N. An in vivo evaluation of hemorrhage control using sodium hypochlorite and direct capping with a one-or two-component adhesive system in exposed nonhuman primate pulps. *Quintessence Int* 2002;33:261-72.
8. Demir T, Cehreli ZC. Clinical and radiographic evaluation of adhesive pulp capping in primary molars following hemostasis with 1.25% sodium hypochlorite: 2-year results. *Am J Dent* 2007;20:182-8.
9. Hilton TJ. Keys to clinical success with pulp capping: A review of the literature. *Oper Dent* 2009;34:615-25.
10. Watts A, Paterson RC. Pulpal response to a zinc-oxide eugenol cement. *IntEndod J* 1987;20:82-6. 11.
11. Salem GA, Farouk YM. Clinical and radiographic evaluation of testing different concentrations of sodium hypochloride as vital pulpotomy treatment in primary teeth: a randomized controlled trial. *J Arab Soc Med Res* 2017;12:106-11
12. Li TY, Chuang LC, Tsai AI. A retrospective study of sodium hypochlorite pulpotomies in primary molars. *J Dent Sci.* 2016;11(3):261-265