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Original Research

Endoflas, zinc oxide eugenol and metapex as root canal filling materials in primary molars

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ABSTRACT:

Background: To compare the root canal filling materials in primary molars such as endoflas, zinc oxide eugenol and metapex. **Materials & methods:** A total of 30 primary molars were enrolled. Children aged 5-9 years were selected. Teeth were divided into three groups of 10 in each based on the type of root canal filling material used. All the molars were evaluated clinically and radiographically at regular intervals of 3 and 6 months. Data was collected and result was analysed using SPSS software. Chi square test was done. $P < 0.05$ was considered as statistically significant. **Results:** Success rate of the materials was evaluated with radiographic and clinical evaluation done at regular intervals of 3, and 6 months. The overall success rate of zinc oxide eugenol and endoflas was 90% whereas 100% success was found in the case of metapex. **Conclusion:** Metapex showed higher success rate as a root canal filling material.

Keywords: deciduous molars, endoflas, metapex, zinc oxide eugenol.

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INTRODUCTION

Pulpectomy of primary teeth is indicated when the pulp tissue is irreversibly infected or necrotic due to caries or trauma. The treatment consists of extirpation of the pulp tissue, removal of organic debris with filing, and obturation of the canals with a suitable material. [1]Obturation with an optimum length, minimum voids, and a hermetic seal are necessary for successful endodontic treatment in primary teeth. However, the complexity of the root canal system and its resorption pattern in primary teeth might interfere with the ideal filling of the canal.[2,3]

Important requisites of a root canal filling material for primary teeth are that it should resorb at the same rate as the roots of a primary tooth. [4] It should be harmless to the periapical tissue and permanent tooth germ, resorb readily if pushed beyond the apex, be antiseptic, radioopaque, should not shrink, should adhere to the walls, not discolor the tooth, and must be easy to fill and remove, if required at any stage. [5,6] Calcium hydroxide, vitapex, and metapex have been extensively used as root canal filling material in primary dentition despite various drawbacks that are associated with these materials.

Endoflas paste has the advantage of having the resorption limited to the excess material, which has been extruded. Resorption of the material does not occur within the canal. [7] Thus, the material is neither resistant to resorption nor does it result in the hollow tube effect. The manufacturers of endoflas paste claims that it has a broad spectrum of antibacterial efficacy. The material is hydrophilic and can be used in mildly humid canals. It has the ability to disinfect dentinal tubules and hard-to-reach accessory canals that cannot be disinfected or cleansed mechanically. In addition, the components of the material can be removed by phagocytosis making it resorbable. [8] Despite the numerous advantages that endoflas has over zinc oxide eugenol, it is still not the most widely employed material for root canal filling in a primary tooth.

The addition of iodoform to calcium hydroxide containing pastes has received attention in the past. In contrast to zinc oxide eugenol, these materials are known to easily resorb from the periapical area and cause no foreign body reaction. [9] They also have potent germicidal properties. Premixed calcium hydroxide and iodoform paste (Vitapex and Metapex) are presently available as premixed syringe in the market. Hence, this study was conducted to compare the root canal filling materials in primary molars such as endoflas, zinc oxide eugenol and metapex.

MATERIALS & METHODS

A total of 30 primary molars were enrolled. Children aged 5-9 years were selected. Teeth were divided into three groups of 10 teeth each based on the type of root canal filling material used. All the molars were evaluated clinically and radiographically at regular intervals of 3and 6 months. Consent from patients parents was taken. Medical history was taken. Data was collected and result was analysed using SPSS software. Chi square test was done. $P < 0.05$ was considered as statistically significant.

RESULTS

A total of 30 primary molars were selected. Root canal filling materials were divided into 3 groups. On radiographic evaluation, a higher number of overfilled canals and voids were observed in teeth filled with Metapex. More number of under filled canals were seen with Endoflas and Zinc Oxide Eugenol. There was no significant difference between the 3 filling materials. Success rate of the materials was evaluated with radiographic and clinical evaluation done at regular intervals of 3, and 6 months. The overall success rate of zinc oxide eugenolwas 90% whereas 100% success was found in the case of metapex. The success rate for endoflas was 90%.

Table: success rate of filling materials

Time period	Success rate		
	Metapex (n = 10)	Endoflas	Zinc oxide eugenol
3 months	100%	90%	90%
6 months	100%	90%	90%

DISCUSSION

Pulpectomy since long has created a dilemma in the view of the clinician owing to the tortuosity of the canals of a primary molar. [10] Meticulous biomechanical preparation determines the success or outcome of root canal treatment in permanent teeth; however, the resorbable nature and antimicrobial properties of the filling material determine the success of pulpectomy in a primary tooth. Preparation of the root canal in a primary tooth is based mainly on chemical means rather than mechanical debridement.[11] Zinc oxide eugenol is the most commonly used material for pulpectomy of the primary teeth. [12] Zinc oxide eugenol does not meet all criteria required for an ideal root canal filling material. Various investigators have reported delayed resorption of extruded material, deflected or ectopic eruption of succedaneous tooth, anterior crossbite, and palatal eruption following zinc oxide eugenolpulpectomy. [13] Hence, this study was conducted to compare the root canal filling materials in primary molars such as endoflas, zinc oxide eugenol and metapex.

In the present study, a total of 30 primary molars were selected. Root canal filling materials were divided into 3 groups. On radiographic evaluation, a higher number of overfilled canals and voids were observed in teeth filled with Metapex. More number of under filled canals were seen with Endoflas and Zinc Oxide Eugenol. There was no significant difference between the 3 filling materials. A study by Pandranki J et al, evaluated and compared the success of endoflas as root canal filling material in infected primary molars with zinc oxide eugenol (ZOE).Primary molars with necrotic pulp in healthy, cooperative children were selected. Ethical clearance and informed consent was obtained. Standardized pulpectomy procedure was done and root canals were filled with either ZOE or endoflas. Further follow-up with clinical and radiographic evaluation was carried at 0, 3, 6, 12, and 24 months. The findings obtained were statistically analyzed using Chi-square test.Endoflas showed acceptable results as root canal filling material in primary molars even at 2-year follow-up, though overfilling of root canals led to low success rate compared to teeth with combined optimal and under fillings. There was no significant difference between the two materials ($P > 0.05$).[14]

In the present study, success rate of the materials was evaluated with radiographic and clinical evaluation done at regular intervals of 3, and 6 months. The overall success rate of zinc oxide eugenol was 90% whereas 100% success was found in the case of metapex. The success rate for endoflas was 90%. Another study bySubramaniam P et al, showed that several materials have been used to fill root canals of primary teeth. Traditionally, zinc oxide eugenol was used for the purpose, until the introduction of calcium hydroxide and iodoform based materials. Another root canal filling material that contains zinc oxide eugenol, calcium hydroxide and iodoform is commercially available as Endoflas. They evaluated and compared the efficacy of Endoflas, zinc oxide eugenol and Metapex as root canal filling materials.A total of forty-five primary molars from children aged 5-9 years were selected for a one stage pulpectomy procedure. Teeth were randomly divided into three groups of fifteen teeth each based on the type of root canal filling material used. All the molars were evaluated clinically and radiographically at regular intervals of 3, 6, 12 and 18 months. The observations were tabulated and statistically analyzed.Endoflas and zinc oxide eugenol showed 93.3% success, whereas a higher percentage of success was observed with Metapex (100%). Overfilling and voids were more commonly seen in teeth filled with Metapex.[15]

Fuks et al reported that 71% of teeth overfilled with Endoflas had pre-operative bone pathology. They suggested that pathological resorption of the bone and root apex can facilitate penetration of the paste

resulting in an overfilling. [7] According to Moskowitz et al, rate of success did not significantly relate to the extent of root canal filling nor the presence of a pre-existing radiolucent area. They emphasized that success depended on prevention of microleakage and placement of a permanent restoration as soon as possible after completion of root canal treatment. [8]

CONCLUSION

Metapex showed higher success rate as a root canal filling material.

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