

## Original Research

### Evaluation of root canal filling methods in primary teeth

<sup>1</sup>Dr Harees Shabir, <sup>2</sup>Dr Sanchit Kumar, <sup>3</sup>Dr Tshering Yangkila Bhutia, <sup>4</sup>Dr Mrinal Sharma, <sup>5</sup>Dr Ruchi Sharma

<sup>1</sup>MDS, Pediatric Dentist, Sunrise Dental Clinic, India;

<sup>2</sup>Reader, <sup>4</sup>MDS 2nd Year, Department of Pediatric and Preventive Dentistry, Bhojia Dental College, Baddi, Himachal Pradesh, India;

<sup>3</sup>MDS Student Third year, Bhojia Dental College, Baddi, Himachal Pradesh, India;

<sup>5</sup>MDS, Department of Prosthodontics and Crown and Bridge, Private Practitioner, India

#### ABSTRACT:

**Background:** To evaluate the root canal filling methods in primary teeth. **Materials & methods:** A total of 40 subjects were enrolled. Pulpectomy was performed. Obturation was done with 2 methods. The subjects were divided into 2 groups. Group 1, the obturation was done with pressure syringe and in group 2 obturation was done with lentulospiral technique. A complete history was taken. The results were analysed using SPSS software. **Results:** The presence of voids was considered. In group 1, the frequency of presence of voids was 25% whereas in group 2, voids were present in 60%. The p- value was significant as 0.004. The lentulo spiral technique showed more number of voids as compared to pressure syringe technique. **Conclusion:** Lentulospiral technique produced more voids.

**Keywords:** lentulospiral, deciduous teeth, obturation.

Received: 04 July, 2022

Accepted: 08 August, 2022

**Corresponding author:** Dr Harees Shabir, MDS, Pediatric Dentist, Sunrise Dental Clinic, India

**This article may be cited as:** Shabir H, Kumar S, Bhutia TY, Sharma M, Sharma R. Evaluation of root canal filling methods in primary teeth. Int J Res Health Allied Sci 2022; 8(5):8-10.

#### 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.<sup>1</sup> 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.<sup>2,3</sup>

In pediatric endodontics, zinc oxide eugenol is commonly used obturation material although it fails to meet the ideal requirements of an obturating material. Endoflas is a combination of three materials, i.e., zinc oxide eugenol, calcium hydroxide, and iodoform and has gained popularity in the recent past as an obturating material in primary teeth. The rationale behind incorporating these three materials into endoflas is to compensate for the disadvantage of one individual material with the advantages of the other.<sup>4</sup>

Aseptic root canal preparation and hermetic seal of the root canal system determine the success of pulpectomy procedure in necrotic primary teeth.<sup>5</sup> For an effective obturation, the technique plays a very influential role. Various obturation techniques have been described in the pediatric endodontic literature such as incremental filling technique and lentulospiral technique which are hand held or motor driven.<sup>6</sup> The main objective of pulpectomy procedure in primary teeth is to fill the root throughout its length without gross over extension or underfilling and to avoid the creation of voids or gaps in the paste.<sup>7</sup> The prognosis of pulp therapy in primary teeth depends on the quality of obturating material and obturation technique.<sup>8</sup> The syringe technique involves injection of the material into the root canals. In literature, syringe techniques such as mechanical syringe, endodontic pressure syringe, tuberculin syringe, insulin syringe, local anesthetic syringe, and NaviTip syringe have been used with zinc oxide eugenol with hardly any reports employing the use of endoflas with this technique.<sup>9</sup> All these syringe techniques make

use of a metal needle which may instill anxiety in a child thus altering the chair-side behavior and questioning the success of the procedure. Premixed syringe containing a mix of calcium hydroxide and iodoform paste (Vitapex and Metapex) is presently available in the market.<sup>10</sup> Hence, this study was conducted to evaluate the root canal filling methods in primary teeth.

## MATERIALS & METHODS

A total of 40 subjects were enrolled. Pulpectomy was performed. Obturation was done with 2 methods. The subjects were divided into 2 groups. Group 1, the obturation was done with pressure syringe and in group 2 obturation was done with lentulospiral technique. A complete history was taken. Consent from the parents was taken. After obturation, the radiographs were taken for the evaluation. Filling of the canals were evaluated using Chi- squared test. The results were analysed using SPSS software.

## RESULTS

A total of 40 root canals were done. They were divided into 2 groups on the basis of obturating techniques. The teeth were divided as 20 in each group. The presence of voids was considered. In group 1, the frequency of presence of voids was 25% whereas in group 2, voids were present in 60%. The p- value was significant as 0.004. The lentulo spiral technique showed more number of voids as compared to pressure syringe technique.

**Table: Distribution of voids in obturating techniques**

Techniques	Voids		p- value
	Present	Absent	
Pressure syringe	5 (25%)	15 (75%)	0.004*
Lentulo spiral	12 (60%)	8 (40%)	

\* : significant

## DISCUSSION

Successful endodontic therapy needs preparation of an aseptic root canal and sealing of the root canal system. The ideal biomechanical endodontic treatment for the root canals of primary teeth is hard to achieve due to their fenestrated and tortuous nature.<sup>11</sup> Hence, this study was conducted to evaluate the root canal filling methods in primary teeth.

In present study, a total of 40 root canals were done. They were divided into 2 groups on the basis of obturating techniques. The teeth were divided as 20 in each group. The presence of voids was considered. In group 1, the frequency of presence of voids was 25% whereas in group 2, voids were present in 60%. A study by Bawazir OA et al, evaluated in vivo 2 different obturation techniques (lentulo spiral mounted in a slow-speed handpiece and hand-held) in primary teeth. The study was carried out on 24 children (mean age = 6.71 years) who had received 50 single-visit zinc oxide and eugenol (ZOE) pulpectomies in primary molars. They found 64%

(16/25) optimal filling (if 1 or more of the canals having ZOE ended at the radiographic apex or up to 2 mm short of the apex) when the lentulo spiral mounted in the slow-speed handpiece was used. It also found a 96% (21/22) clinical success rate in the group obturated by the lentulo spiral mounted in a slow-speed handpiece vs 48% (12/25) optimal filling and a 92% (23/25) clinical success rate in the group obturated by a hand-held lentulo spiral.<sup>12</sup>

In present study, the p- value was significant as 0.004. The lentulo spiral technique showed more number of voids as compared to pressure syringe technique. Another study by Vashista K et al, to compare two methods of obturation in primary teeth by using lentulospirals and pressure syringe, radiographically. Sixty teeth in subjects with mean age of  $5.88 \pm 1.58$  years were obturated randomly using two different obturating techniques, i.e. group I: Thirty teeth obturated with pressure syringe, and group II: Thirty teeth obturated with lentulospiral. No statistically significant difference between the quality of obturation using pressure syringe or lentulospiral ( $p > 0.05$ ) was observed. They showed significantly higher number of voids for lentulospiral technique as compared to pressure syringe ( $p < 0.01$ ).<sup>13</sup>

Aylard and Johnson found that endodontic pressure syringe was superior for filling straight canals and lentulospiral was better for filling curved canals.<sup>14</sup> Another study by Sijeria P et al, root canals in 40 extracted deciduous maxillary incisors were instrumented with H-files to size 35 and volume of the canal measured using CBCT. The teeth were divided into four groups of 10 samples each and root filled by Lentulo spiral mounted on slow-speed hand-piece, NaviTip System, Bi-directional spiral and Combination method i.e. Lentulo spiral mounted on slow speed hand-piece followed by NaviTip syringe respectively, after that depth-of-fill for each group was checked. Then, the filled canal volume was measured using CBCT under "On Demand 3D AppTM Software". Further, the (POV), (PVV) was calculated. The four groups were comparable in canal volume. The overall percentage of obturated volume was 53%, 59.7%, 40.3% and 75.1%; the overall percentage volume of voids was 48%, 40.3%, 58.6%, 29.5%; optimally filled canals for each group was 80%, 60%, 30% and 90% respectively ( $p < 0.05$ ).<sup>15</sup>

## CONCLUSION

Lentulospiral technique produced more voids.

## REFERENCES

1. Guideline on pulp therapy for primary and immature permanent teeth. *Pediatr Dent.* 2016;38(6):280–8.
2. Guelmann M, McEachern M, Turner C. Pulpectomies in primary incisors using three delivery systems: an in vitro study. *J Clin Pediatr Dent.* 2004;28(4):323–6. doi: 10.17796/jcpd.28.4.j634167443m061n3.
3. Memarpour M, Shahidi S, Meshki R. Comparison of different obturation techniques for primary molars by digital radiography. *Pediatr Dent.* 2013;35(3):236–40

4. Rewal N, Thakur AS, Sachdev V, Mahajan N. Comparison of endoflas and zinc oxide eugenol as root canal filling materials in primary dentition. *J Indian Soc Pedod Prev Dent.* 2014;32:317–21.
5. Rodd HD. UK national clinical guidelines in paediatric dentistry. *Int J Paediatr Dent.* 2006;Suppl 1:15–23.
6. Bawazir OA, Salama FS. Clinical evaluation of root canal obturation methods in primary teeth. *Pediatr Dent.* 2006;28:39–47.
7. San S, Okte Z. Success rate of Sealapex in root canal treatment for primary teeth: 3-year follow-up. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod.* 2008;105:93–96.
8. Richard M, Simcock , Hicks ML. Delivery of Calcium Hydroxide: Comparison of Four Filling Techniques. *J Endod.* 2006;32(7):680–682
9. Memarpour M, Shahidi S, Meshki R. Comparison of different obturation techniques for primary molars by digital radiography. *Pediatr Dent.* 2013;35:236–40.
10. Nurko C, Ranly DM, García-Godoy F, Lakshmyya KN. Resorption of a calcium hydroxide/iodoform paste (Vitapex) in root canal therapy for primary teeth: A case report. *Pediatr Dent.* 2000;22:517–20
11. Barja-Fidalgo F, Moutinho-Ribeiro M, Oliveira MAA, de Oliveira BH. A systematic review of root canal filling materials for deciduous teeth: is there an alternative for Zinc oxide-Eugenol? *ISRN Dent.* 2011;367318
12. Bawazir OA, Salama FS. Clinical evaluation of root canal obturation methods in primary teeth. *Pediatr Dent.* 2006 Jan-Feb;28(1):39-47. PMID: 16615374.
13. Vashista K, Sandhu M, Sachdev V. Comparative Evaluation of Obturating Techniques in Primary Teeth: An in vivo Study. *Int J Clin Pediatr Dent.* 2015 Sep-Dec;8(3):176-80. doi: 10.5005/jp-journals-10005-1309. Epub 2015 Sep 11. PMID: 26628851; PMCID: PMC4647036.
14. Aylard SR, Johnson R. Assessment of filling techniques for primary teeth. *Pediatr Dent.* 1987;9(3):195–198.
15. Sijeria P, Bhartia R, Swamy Kv N, Kulkarni S, Singla S. Evaluation of Root Canal Filling in Primary Teeth by Volumetric Analysis: In Vitro Study. *Int J Clin Pediatr Dent.* 2018 Sep-Oct;11(5):386-392. doi: 10.5005/jp-journals-10005-1545. Epub 2018 Oct 1. PMID: 30787551; PMCID: PMC6379537.