

## Assessment of success of root canal therapy in primary molars

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### Abstract

**Background:** One of the primary objective of root canal therapy is to retain every primary tooth as a fully functional component in the dental arch. To fulfil this major goal, vital pulp therapy through pulpotomy is the most widely accepted technique for treating primary teeth with irreversible inflammation affecting the pulp chamber. Hence; we planned the present study to assess the success of endodontic therapy in primary molars.

**Materials & Methods:** The present study included assessment of the success of root canal therapy of primary molars. A total of 150 paediatric patients were selected for the present study that fulfilled the inclusion and the exclusion criteria. After meeting the exclusion and inclusion criteria for the selection of the teeth, a total of 85 teeth were selected for the present study. Patients were asked to return every 6 months for recall examinations. RCT was considered successful if clinically the tooth was painless, presenting healthy surrounding soft tissues. All the results were recorded and analyzed. **Results:** Success and failure number for amalgam restorations was 47 and 2 respectively. For composite restorations, 4 restorations were successful while only 1 restoration was failure. In case of over-filled and under-filled restorations, 30 and 18 restorations were successful while 10 and 2 restorations failed respectively. **Conclusion:** Higher attention should be given to the paediatric patients of less than 5 years of age as they are more prone for the development of carious lesions.

**Key words:** Molar, Primary, Root canal therapy

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### INTRODUCTION

To retain every primary tooth as a fully functional component in the dental arch to allow for proper mastication, phonation, swallowing, preservation of the space required for eruption of permanent teeth and prevention of detrimental psychological effects due to tooth loss is the main objective of pulp therapy in the primary dentition.<sup>1-3</sup> To fulfill this major goal, vital pulp therapy through pulpotomy, which refers to surgical removal of the entire coronal inflamed pulp leaving the vital radicular pulp intact within the canals, is the most widely accepted technique for treating primary teeth with irreversible inflammation affecting the pulp chamber.<sup>4,5</sup> However, in cases of irreversibly inflamed and necrotic radicular canals, a successful pulpotomy cannot be achieved, and a partial or total pulpectomy is indicated.<sup>6</sup> Hence; we planned

the present study to assess the success of endodontic therapy in primary molars.

### MATERIALS AND METHOD

The present study was conducted in the paediatric wing of the hospital and included assessment of the success of root canal therapy of primary molars. Ethical approval was taken from institutional ethical committee and written consent was obtained after explaining in detail the entire research protocol. For the present retrospective analysis, collection of the study material was done from the data record room of the dental hospital from 2010 to 2014. A total of 150 paediatric patients were selected for the present study who fulfilled the inclusion and the exclusion criteria. These patients had at least one molar with RCT with a total of 190 primary molars. Endodontically

treated primary molars were included in the 'study group' if fulfilled the following requirements:

- had radiographic follow up time of more than 6 months,
- had high quality radiographs that showed the apex of the roots,
- presented sufficient data in the patients' records.

After meeting the exclusion and inclusion criteria for the selection of the teeth, a total of 85 teeth were selected for the present study. RCT has been performed in primary molars with irreversible pulpitis determined as continues bleeding exceeding 5 min with dark to purple blood colour, or pulp necrosis. In vital teeth a pulpotomy was performed in cases were bleeding stopped within less than 5 min with pink blood colour. Those teeth are not part of this study.

#### Assessment of endodontic therapy

Patients were asked to return every 6 months for recall examinations, in which the root treated molars underwent clinical and radiographic evaluation. RCT was considered successful if clinically the tooth was painless, presenting healthy surrounding soft tissues and no increased mobility, and radiographs showed decrease or no change in pre-existing pathologic radiolucent defects. The treatment was considered failure when pre-existing radiolucent defects had grown in size or new defects appeared. All the results were analyzed by SPSS software. Chi square test and student t test was used for the assessment of level of significance. P-value of less than 0.05 was taken as significant.

#### RESULTS

**Table 1** shows the comparative evaluation of success rate of different restorations. Success and failure number for amalgam restorations was 47 and 2 respectively. For composite restorations, 4 restorations were successful while only 1 restoration was failure. For stainless steel crown and temporary restorations, number of successful restorations was 5 in each case. **Table 2 and Graph 1** shows the comparative evaluation of success rate of extent of fillings. In case of over-filled and under-filled restorations, 30 and 18

restorations were successful while 10 and 2 restorations failed respectively.

#### DISCUSSION

Although preventive measures have reduced caries, premature loss of pulpally involved primary teeth remains a common problem.<sup>7</sup> The resultant mesial drift of the permanent teeth frequently leads to malocclusion. Retention of the pulpally involved primary tooth to preserve arch space is preferable to space maintenance if the tooth can be restored to normal function and is free of pathology.<sup>8</sup> The characteristics of the ideal root filling material were described earlier. Several root canal filling materials for primary teeth have been introduced.<sup>9</sup> Hence; we planned the present study to assess the success of endodontic therapy in primary molars.

In the present study, we observed that no statistically significant difference occurred in between the rate of success of root canal therapy and the extent of root canal fillings. However, under-filled fillings showed a higher probability of increased success rate of endodontic therapy in primary molars. Moskovitz M et al retrospectively analyzed the success of root canal treatments in primary infected molars using Endoflas F.S as a filling material. They analyzed the 382 records of root canal treated primary molars of which 174 teeth with high quality radiographs and sufficient data comprised the 'study group'. The technique for root canal treatment in one visit is described. Treatment was considered success if clinically the tooth was asymptomatic and radiographs showed decrease or no change in pre-existing pathologic radiolucent defects. In the total pulpectomy group there was a statistically significant difference between mandibular teeth presented with a periapical lesion prior to the treatment compared to maxillary teeth. This difference was not significant in the study group. Decrease in post treatment radicular radiographic defects was statistically significant more in the maxilla compared to the mandible. The success rate of teeth restored with a permanent restoration (stainless steel crown or amalgam filling) was statistically significant higher than those teeth left with a temporary filling. There was no statistically significant difference between

success rate and the extent of root canal filling material. Rate of success was not statistically different depending on pre-existing radiolucent area prior to RCT. From the result, they concluded that Endoflas F.S. can be used as an alternative root canal filling material for primary teeth.<sup>11</sup>

<sup>12</sup>Subramaniam P et al 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. There was no significant difference between the three root canal filling materials.<sup>13, 14</sup>

Guelmann M et al determined if immediate placement of a stainless steel crown (SSC) after emergency pulpotomies in primary molars would result in a better outcome when compared to different temporary restorations. Records of 94 emergency pulpotomies in primary molars performed at a university pediatric graduate dental clinic between July 2001 and June 2004 were analyzed. Pulpotomized teeth were temporarily restored with a zinc oxide eugenol-based temporary restoration (IRM) covered with Ketac Molar or with a permanent restoration (SSC). The time interval between emergency and definitive treatment or recall, age, gender, tooth type, and arch were the variables analyzed in the study. Success was determined by record (progress notes and radiographs) verification of SSC placement in case of a temporary restoration and by confirmation of crown presence during recall exam. Superior clinical success was obtained when emergency pulpotomies were restored with SSC when compared to IRM only or IRM and Ketac Molar combined. Statistical significance was obtained in favor of SSC when survival analysis

was performed. No statistically significant difference was found for any of the other variables. Immediate placement of an SSC tended to improve the chances for success when emergency pulpotomies are performed.<sup>15</sup>

## CONCLUSION

From the above result, the authors concluded that higher attention should be given to the paediatric patients of less than 5 years of age as they are more prone for the development of carious lesions. However, future studies are recommended.

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