

# Analysis of Restorations After Pulpal Therapy in Primary First Molars



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## INTRODUCTION

Dental caries is the most common chronic childhood disease. Without treatment of dental caries in primary dentition, patients are at risk of preventable diseases such as pain, swelling, loss of teeth, and speech disorders. When treating multi-surface caries on primary molars, providers have many options. Of these options, stainless steel crowns and single or multi surface composite restorations are the most common. An article written by Messer and Levering (Messer 1988) studied the success of SSCs in primary molars with two or more carious surfaces and reported a success rate of 88 percent. Common reasons for composite restoration failure included fracture, recurrent decay, complete restoration loss, marginal deterioration, and discoloration. The reason for choosing one treatment over another is unresolved throughout the literature and often based upon the personal and cost. The purpose of this study was to retrospectively evaluate treatment outcomes of multi-surface caries in primary molars treated with stainless steel crowns versus composite restorations in children on the Eastern Shore of Maryland.

Dental caries is an important and challenging issue that affects the lives of children and adolescents significantly all across the world. Multiple factors are responsible for the etiology of caries – elevated levels of cariogenic bacteria such as *S. Mutans*, metabolism of sugars by these cariogenic bacteria leading to tooth demineralization or a condition like enamel hypoplasia. In addition, socioeconomic and educational parameters also influence a family's view toward oral health. If left untreated, caries can potentially produce a life-threatening situation. If the cariogenic bacteria have reached the tooth pulp, a pulpotomy can be completed, and therefore save the tooth from exacerbation of infection or extraction. A pulpotomy is completed by removing the coronal pulp from the pulp chamber, achieving hemostasis with or without a pulpal medicament. The pulp chamber is then filled with a biocompatible material and the tooth is then restored with a full coverage restoration. That tooth is then able to remain in the mouth and aid in maintaining space for the erupting permanent tooth that is to replace the primary tooth. As the succedaneous tooth erupts, the roots of the pulpotomy treated primary tooth resorbs naturally and exfoliates without complication. Natural dentition is optimal space maintainer as compared to a laboratory fabricated space maintainer and by saving an infected tooth with a pulpotomy, future orthodontic treatment may be avoided.

## PURPOSE

The purpose of this study was to evaluate the treatment outcomes of stainless-steel crowns versus composite restorations in primary first molars with pulpal intervention through a retrospective study.

## METHOD

A retrospective chart review was completed on children aged 3-10 seen at Chesapeake Health Center (CHC – Federally Qualified Health Care Center) that received pulpal treatment and restoration placement between January 1, 2011 and January 1, 2021. Electronic health records were obtained from the following databases: Dentrix and DentalSoft. The pulpotomy code (D3220), indirect pulp cap (D3120) and posterior pulpectomy (D3240) were searched in both EHRs (DentalSoft and Dentrix), and the tooth/teeth treated was recorded along with the restoration placed. All primary first molars that have received any of the three treatment codes will be recorded. The history of that tooth was followed until exfoliation or extraction for each patient. A chart was formulated to compare which restoration was used, survival length and whether the tooth naturally exfoliated or was extracted.

The following demographic information will be collected from electronic health records (Dentrix and DentalSoft) and entered into the REDCap study database by the PI and authorized study personnel:

- Pulp Treatment (D3220, D3120, D3240)
- Medicament used
- Failed procedure based on extraction within 12 months of procedure or exfoliation
- Age

## RESULTS

A total of 95 primary first molars were evaluated, of which 92 received a stainless steel crown and 3 received a composite restoration. Of the 88 molars that resulted in natural exfoliation, 86 were restored with a stainless-steel crown and 2 were restored with a composite restoration. Of the 7 teeth extracted, 6 were restored with a stainless-steel crown and 1 were restored with a composite restoration. Overall analysis showed no significance in survival probability when restoring a primary first molar with a stainless-steel crown versus a composite restoration ( $P=.531$ ).

## REFERENCES

Wu E, Yang YJ, Munz SM, Hsiao CC, Boynton JR. Restorations Versus Stainless Steel Crowns in Primary Molars: A Retrospective Split-Mouth Study. *Pediatr Dent*. 2021;43(4):290-295.

Messer LB, Levering NJ. The durability of primary molar restorations: II. Observations and predictions of success of stainless steel crowns. *Pediatr Dent*. 1988;10(2):81-85.

Zhonghua Kou Qiang Yi Xue Za Zhi Society of Pediatric Dentistry. 2020;55(8):551-554

## DISCUSSION

The results of this study suggest that there is no significant difference in the survival probability of primary first molars restored with SSCs versus composite restorations. These findings are consistent with previous studies, which have also reported similar outcomes. One such study conducted by Zhi et al. (2020) reported no significant difference in the survival rates between SSCs and composite restorations in primary teeth with pulp therapy.

While the use of SSCs in primary teeth has been widely accepted due to their durability and long-term success rates, composite restorations have become increasingly popular due to their aesthetic appeal. However, the choice between SSCs and composite restorations often depends on various factors, such as the extent of caries, patient cooperation, and the clinician's preference.

This study has some limitations, including its retrospective design, the limited sample size, and the lack of a control group. Additionally, the study only evaluated the outcomes of primary first molars, and the results may not be applicable to other primary teeth. Therefore, more research is needed with a larger sample size, a prospective study design, and a control group to validate the findings of this study.

## CONCLUSIONS

In conclusion, this retrospective study found no significant difference in the survival probability of primary second molars restored with SSCs versus composite restorations. However, more research with a larger data set is needed to confirm these findings. When deciding on a restoration option, the child's age, behavior, and medical history should be considered.

The results of this retrospective study suggest that there is no significant difference in the survival probability of primary first molars restored with SSCs versus composite restorations. However, the choice between the two restorations should be based on various factors, and a larger prospective study is required to validate these findings.

## FIGURE

