Composite Restoration vs SSC Restoration of Primary Molars Following Conventional Pulpotomy

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Introduction

Primary molars with large carious lesions that affect the nerve require pulpotomy and subsequent restoration. Stainless steel crown (SSC) restorations are recommended as the treatment of choice for these teeth. It is assumed that there is less leakage in crowned teeth when compared to those restored with amalgam.1 Although highly effective, stainless steel crowns provide little in terms of esthetics.

Parents often ask if there is anything else that can be used to restore posterior teeth other than silver caps or silver fillings. In place of posterior amalgam restorations, resin-filled composites are often used and are an acceptable restorative material for primary molars. Berg and Donly recommended restoring primary molars with the “sandwich technique” using composite resin material.2 They maintain that this type of restoration is esthetically pleasing and also serves to preserve unaffected tooth structure.

A previous study by Holan et al. attempted to compare success rates of formocresol pulpotomy in primary molars restored with SSC and amalgam restorations.3 87% of the SSC restorations were successful after mean follow-up time of 28 months, compared to 80% success of the amalgam restorations after mean follow-up time of 26 months. Papathanasiou, Cruzon, and Gavin-Fairpo studied and compared survival rates of primary molar restorations after pulpotomy.4 The 5-year survival estimate value was 68% for the SSC, with a median survival time of 5 years. The 4-year survival estimate for the composite restoration was 40%, with a median survival time of 32 months. They found that the SSC had a low survival rate in the first 7-8 months, explained by cement failure. The study also stated that the composite restoration is a technique-sensitive procedure in which tooth isolation is very important and sometimes difficult to achieve in a highly uncooperative young patient. The majority of failed restorations were due to high incidence of marginal leakage around Class II restorations (58%) when compared to Class I restorations.

Purpose/Hypothesis

The purpose of this study is to determine whether posterior resin-based composite restorations following conventional pulpotomy is as effective as the stainless steel crown restoration.

Materials and Methods

Criteria

- children aged 2 to 10 years
- ASA I or well controlled ASA II
- primary 1st or 2nd molar requiring vital pulpotomy
- no clinical or radiographic signs of pathology

Types of restoratives techniques compared

- “Sandwich Technique” Resin
- Stainless Steel Crown
- pulpotomy
- ferric sulfate for hemostasis
- IRM
- glass ionomer base over IRM
- compomer restoration

- SSC
- stainless steel crown restoration.

Follow Up

- patients/restorations included in study evaluated 6 months post-treatment, clinically and radiographically
- success based on the following criteria:
  - clinical success
    1) absence of abscess/parulis/fistula, edema, and/or abnormal mobility
  2) absence of fracture of tooth or resin-based restoration
  - radiographic success
    1) absence of furcation/periapical radiolucency
  2) absence or fracture of tooth or resin-based restoration

Results / Discussion

- a total of 140 children were included in this study
- the average age of the patient in this study was 6.0 years
- there was no significant difference in age of children or location of tooth (upper vs lower) between treatment groups
- there was no difference in the proportion of success after six months follow-up between stainless steel crowns and composite resin restorations ($\chi^2 = 0.6$, Fisher’s exact test)
- the 2 resin-based restoration failures were attributed to inadequate isolation during treatment, which allowed for saliva contamination during placement of restoration, and were thus restored with SSC
- 2 of the failed SSC restorations developed an abscess, while the other 2 exhibited abnormal internal resorption, and were thus extracted
- longer follow-up intervals may be needed for definitive evaluation of long-term differences in restoration

Conclusion

- at the six month follow-up there was an equal number of failures in both types of restorations
- within the 6 month time frame our hypothesis was true that both restorations are equally effective

References


SSC Composite
Success %

<table>
<thead>
<tr>
<th>Number</th>
<th>SSC</th>
<th>Composite</th>
<th>Total</th>
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<tbody>
<tr>
<td>Average Age</td>
<td>5.93</td>
<td>6.12</td>
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<tr>
<td># Successes</td>
<td>93</td>
<td>41</td>
<td>132</td>
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<td>Success Rate %</td>
<td>95.9</td>
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Pre-Operative

Post-Operative Composite Restoration

Post-Operative Radiograph

Post-Operative Stainless Steel Crown Restoration

Caries

Operative

Post

Pre

Success Rate %