The Outcomes of Strip Crowns Placed in Clinic and Operating Room

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PURPOSE

The goal of this study was to compare the success and failure rates of resin crowns placed in clinic and the operating room. This 3-year retrospective study was a chart review of patients seen in UPMC Children's Hospital of Pittsburgh from the dates of 7/7/2017 – 12/31/2020.

INTRODUCTION

The resin composite strip crown is an esthetic treatment option for decayed primary incisors where full coverage is preferred. Some indications include: caries on multiple surfaces, extensive cervical decalcification, lesions that involve the incisal edge, pulp-therapy treated teeth, and uncooperative patients where a class III restoration cannot be placed. However, the procedure for placing them is technique sensitive and may result in failures especially on uncooperative patients. Common failures include fractured resin, crown debonding, recurrent decay, and trauma. Resin crowns can be placed using multiple modalities such as nitrous, oral sedation, general anesthesia, or without sedation depending on the patient's behavior. Studies have shown varying clinical success rates over a 1.5 – 3 year period ranging from 51% to 88%. These failures result in additional treatment and if the patient was sedated, adds increased risk of adverse outcomes. This study aims to help clinicians determine which modality to use by comparing the success rates of resin crowns placed in the dental clinic and operating room.

METHODS

Inclusion criteria**:** Children with primary or mixed dentition treated in the UPMC Children's Hospital of Pittsburgh dental clinic.

Exclusion criteria**:** Previous endodontically treated teeth, previous restoration, Hx of SDF application to teeth, Hx of trauma to teeth, and patients must have had a follow-up with CHP dental clinic at least once yearly since resin crowns were placed.

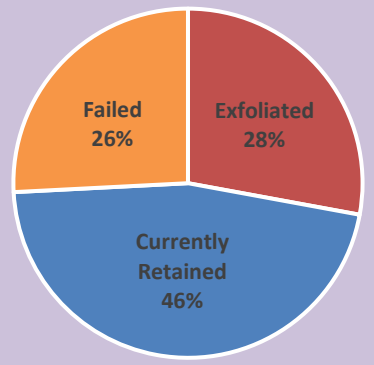
Definition of "success" in this study – Retention of resin crown from time of placement until exfoliation without repair, replacement, or extraction.

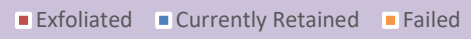
Group A – Resin crowns placed in clinic. Sedation modality, isolation, and Frankl score recorded.
- Group A1 – Resin crowns that lasted until exfoliation.
- Group A2 – resin crowns that are currently retained.
- Group A3 – resin crowns that needed repaired, replaced, or extracted.

Group B – Resin crowns placed in the operating room. The sedation modality is general anesthesia and mouth prop and gauze used for all isolation.
- Group B1 – Resin crowns that lasted until exfoliation
- Group B2 – Resin crowns that are currently retained.
- Group B3 – Resin crowns that needed repaired, replaced, or extracted

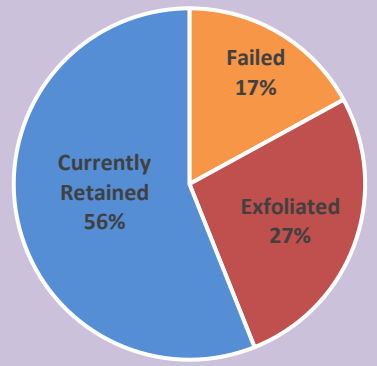
Data was analyzed using Chi-squared test and resulting p-values were determined.

Group A Dental Clinic





Group B Operating Room



RESULTS

Group A Clinic Failures consisted of 52 patients and 87 resin crowns that needed repaired, replaced, or extracted. Average age at time of placement was 4.24 years of age. Sedation modalities were recorded: 44 Verseds, 2 Demerols, and 6 Nitrous appointments. Frankl Scores were recorded: F1 – 17 patients, F2 – 15 patients, F3 – 13 patients, F4 – 7 patients. Isolation was recorded: Isodry - 23, Mouth Prop - 29. Breakdown of teeth repaired, replaced, or extracted was recorded: 8 repaired, 42 replaced, 31 extracted, 6 planned repair/replace or extract. Causes for repair, replacement, or extraction were recorded: Dental abscess – 14 teeth, Recurrent Decay – 37 teeth, Fractured Resin Crown – 3 teeth , Crown Debonded – 28 teeth, Overretained – 3 teeth, Trauma – 2 teeth. How long resin crowns lasted before needing repaired, replaced, or extracted: Mean: 1.34 years, Median: 1.3 years, Mode: 1.3 years, Standard Deviation: 0.67. P-values for sedation modality and Frankl scores associated with resin failures were >0.05 and not statistically significant. P-value for isolation was 0.029 and statistically significant.

Group B Operating Room Failures consisted of 286 patients and 148 resin crowns that needed repaired, replaced, or extracted. Average age at time of placement was 3.88 years of age. A breakdown of teeth repaired, replaced, or extracted: 27 repaired, 37 replaced , 74 extracted, 10 planned repair/replace/extract. Causes for repair, replacement or extraction included: Dental abscess – 34 teeth, Recurrent Decay – 79 teeth, Fractured Resin Crowns – 9 teeth, Crown Debonded – 14 teeth, Overretained – 1 tooth, Trauma – 11 teeth, 9.5% debonding — of failures; 1.6% debonding of total teeth. Resin crown longevity before needing repaired, replaced, or extracted was: Mean: 1.83 years, Median: 1.86 years, Mode: 1.2 years, Standard Deviation: 0.61

DISCUSSION

The success rate of resin crowns placed in clinic was 74% over a 3-year period. The success rate of resin crowns placed in the operating room was 83% which was similar to other studies. In the clinic group A there seemed to be no statistical significance between the sedation type and resin failures. There was also no statistical significance between Frankl Scores and resin failures. There was, however, statistical significance in the type of isolation used. The results indicate that using Isodry isolation results in less failures of resin crowns when compared to a mouth prop and gauze. Resin crowns placed in the operating room were 9% more successful than those placed in the clinic. While there is not a significant difference between these success rates, it may be beneficial to treatment plan resin strip crowns in the operating room on uncooperative patients who cannot tolerate proper isolation.

CONCLUSIONS

1. Using Isodry isolation results in less failures of resin strip crowns when compared to a mouth prop.
2. Resin crowns placed in the operating room had a higher success rate than those placed in the dental clinic.
3. Consider performing resin crowns in the operating room when proper isolation cannot be achieved.

REFERENCES

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