

# Success of Various Restorative Dental Treatments Completed Under General Anesthesia

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#### **Purpose**

This study aims to analyze the success rates of various dental procedures performed under general anesthesia. These procedures include restorative treatments, such as stainless steel crowns and anterior and posterior composite restorations, as well as pulpal therapies, including indirect pulp therapy and pulpotomies.

### Introduction

Tooth decay continues to be one of the most prevalent chronic conditions affecting the pediatric population today, despite numerous preventive efforts and measures.<sup>1</sup> Dental caries, if left untreated, can result in severe pain and associated infections, leading to various complications, including difficulties with speaking and eating.<sup>2</sup>

Although most dental care is provided in standard office settings using both non-pharmacological and pharmacological techniques, this environment is not always suitable for certain patients.<sup>3</sup> The decision to complete dental rehabilitation under general anesthesia (GA) depends on several factors, including the child's ability to cooperate, age, medical status, the extent of acute situational anxiety, and the scope of dental needs.<sup>3</sup>

Performing treatment under GA allows dental clinicians to work under optimal conditions, thereby theoretically improving the likelihood of successful outcomes.<sup>4–5</sup> Despite this, children who have undergone dental rehabilitation under GA often develop recurrent caries and new carious lesions, which may necessitate additional visits to the operating room (OR) for further treatment.

Studies have shown that the type of treatment modality is significantly associated with treatment outcomes. For example, one study found that procedures performed in the OR had a 3% failure rate for stainless steel crowns, compared to a 29% failure rate for amalgam or composite restorations.<sup>6</sup> Another study reported a 22% failure rate for pediatric strip crowns.<sup>7</sup>

Montefiore Medical Center Division of Pediatric Dentistry performs dental rehabilitation under general anesthesia for hundreds of patients annually; therefore, we are particularly interested in evaluating the success rates of dental procedures completed using this modality.

## **Study Design and Methods**

This is a retrospective chart review with the following inclusion criteria:

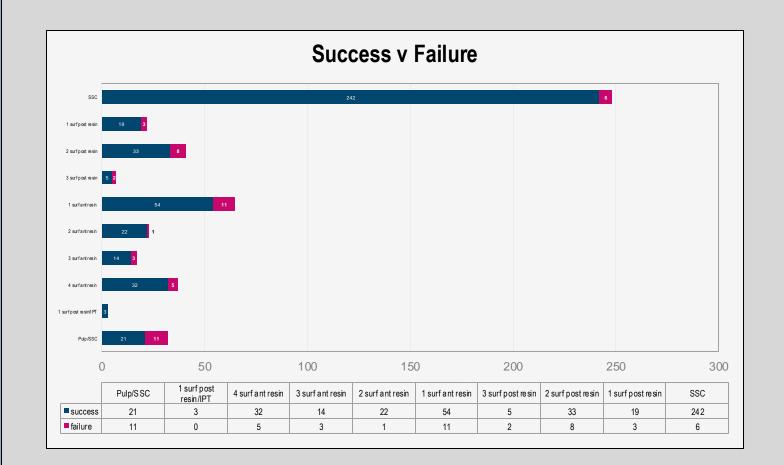
- Age: Patients 2-5 years old
- Procedure: Dental rehabilitation under general anesthesia (GA)
- Study Period: July 1, 2018 June 30, 2020
- Follow-up: Clinical and radiographic follow-ups completed within 3 years of the initial GA visit
- Health Status: ASA Class I (healthy, no systemic disease)
- Demographics: No exclusions based on gender, race, or ethnicity

A single reviewer collected data from the electronic dental records of patients treated in the operating room at Montefiore Medical Center (Bronx, NY). Follow-up visits were completed at one of the four Montefiore pediatric dentistry clinics. The following information was collected: (1) age, (2) gender, (3) ADA dental codes, and (4) radiographic analysis.

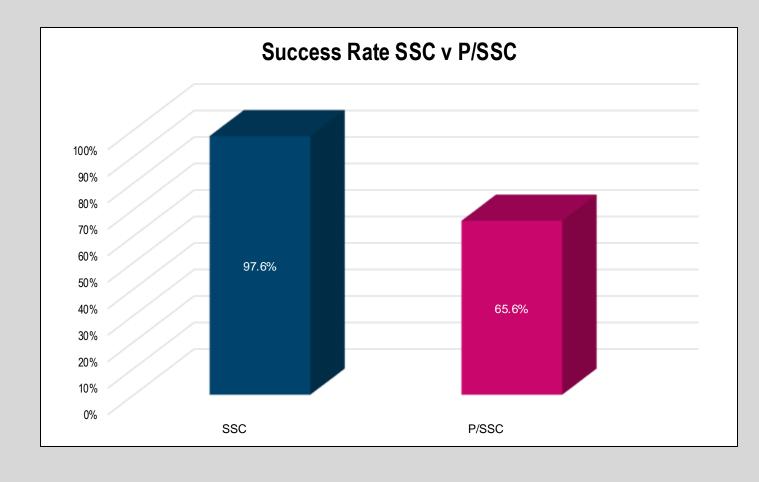
Treatment success was defined as not requiring re-treatment or extraction within three years of the initial procedure.

#### Results

A total of 55 patient records met the stated inclusion criteria and were included in the review. The average age of patients was 4.27 years. Of the 55 patients, 30 were female and 25 were male. Across these patients, radiographs were obtained for 495 teeth within three years of their initial dental procedure performed under general anesthesia.

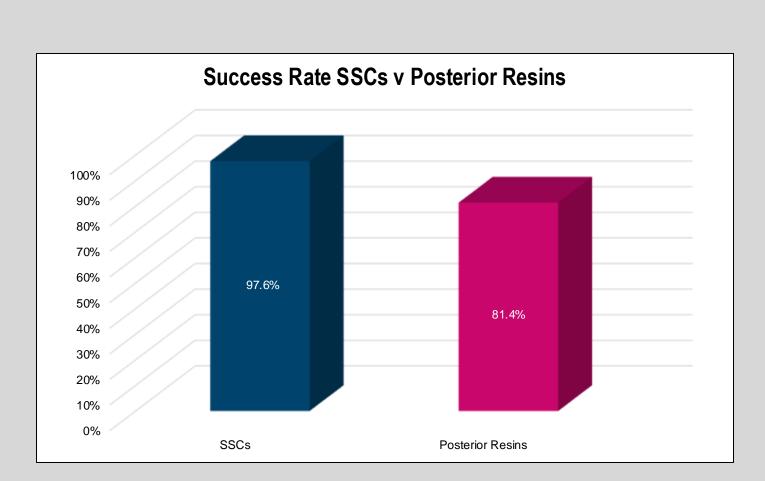


The figure above (Figure 1) illustrates the number of successes of each dental procedure investigated. Stainless steel crown (without therapeutic pulpotomy) was the most successful at 248 total successful outcomes.

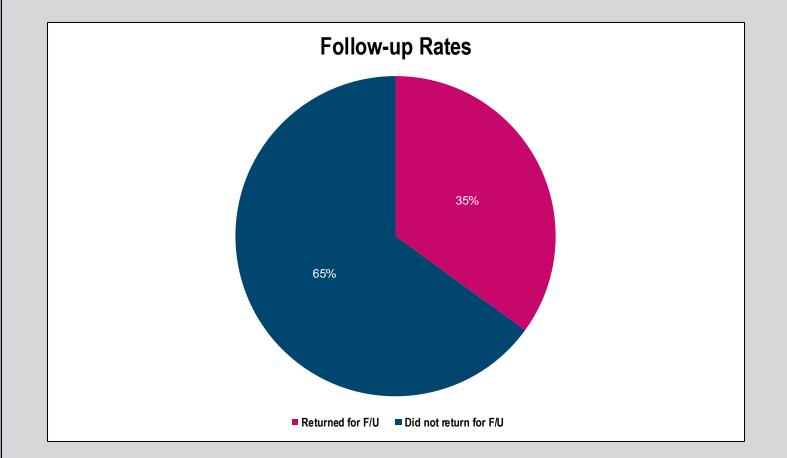


The figure above (Figure 2) illustrates the success rates of stainless steel crowns with and without therapeutic pulpotomy. Stainless steel crowns had a higher success rate of 97.6% while stainless steel crowns with therapeutic pulpotomies had a lower success rate of 65.6%.

# Results



The figure above (Figure 3) shows the success rates of stainless steel crowns and posterior resin restorations. As per the results, stainless steel crowns had a higher success rate (97.6%; 95% CI: 95.7%–99.5%), while resin restorations had a lower success rate (81.4%, 95% CI: 72.3%–90.5%. These results were statistically significant, p=0.001.



The figure above (Figure 4) illustrates the follow-up rates post dental rehabilitation under general anesthesia. Of the 157 patients under 6 years old with ASA I classification, only 55 patients (35.0%) returned for follow-up care within 3 years.

## Discussion

This study evaluated the success rates of several restorative procedures performed under general anesthesia, as well as the success rates of pulpal therapies, including indirect pulp caps and pulpotomies.

As evidenced by the results, stainless steel crowns had the higher success rate (97.6%; 95% CI: 95.7%–99.5%), while posterior resin restorations had a lower success rate (81.4%, 95% CI: 72.3%–90.5%). These differences were statistically significant (p = 0.001). Based on these findings, providers should consider full-coverage restorations such as stainless steel crowns over composite restorations due to their superior durability and longevity.

During the study period, 157 patients under the age of 6 with ASA I classification were treated in the operating room. However, only 55 of these patients returned for follow-up care. This significant drop-off highlights a major limitation of the study—the lack of follow-up care, which limited the data available for analysis and resulted in a relatively small sample size.

Low follow-up rates after dental treatment under general anesthesia have been reported in various previous studies. The time frame evaluated in this study included the onset of the COVID-19 pandemic, which likely contributed to the reduced rate of follow-up care. However, regardless of the pandemic, earlier studies have shown that patients often only return to the dentist if they experience pain or notice a defective restoration following treatment under general anesthesia.8

As providers, promoting regular follow-up visits and preventive care after treatment under general anesthesia should be a priority. Educating patients and their parents about the importance of routine dental recalls may help reduce the need for future operating room visits and encourage lifelong commitment to oral health.

## References

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