

# Stainless-Steel Crowns on Permanent Molars in Children with Intellectual and Developmental Disabilities

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## Introduction

Stainless-steel crowns (SSC) are often used as interim restorations for permanent molars with extensive caries or developmental defects in pediatric patients. They are typically replaced with definitive crowns after growth completion. Research on permanent tooth SSC in individuals with intellectual and development disabilities (IDD) is limited. This study evaluates the efficacy of stainless-steel crowns on permanent molars in children with IDD, compares results with children without IDD, and assesses race as a factor.

## Objective

The objective of this study is to evaluate presence of IDD and race as factors in SSC success or failure in pediatric patients.

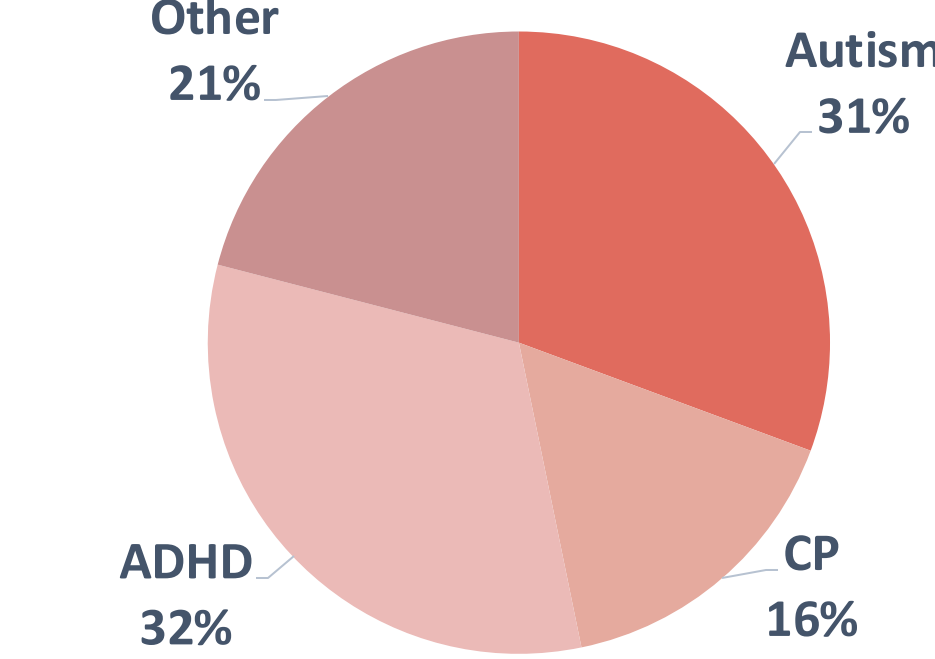
## Methods

A retrospective chart review analyzed 300 SSCs completed on permanent teeth on patients aged 6-15 years old (2008-2018). Of these, 268 SSCs (174 patients) fulfilled the inclusion criteria (initial placement of SSC on a molar with at least 1 year of follow up). The SSCs were identified as successes or failures via radiographic analysis (if available), clinical notes, and need for re-treatment or extraction. Successful restorations are considered those that remain intact and/or are replaced by a definitive crown upon growth completion. Failures included SSCs that required replacement, extraction, or exhibited signs of inflammation such as periapical radiolucencies, bone loss or persistent symptoms. Data on IDD diagnosis and race were collected to assess correlations with SSC outcomes. Chi-square analysis was used to determine statistical significance of the data.

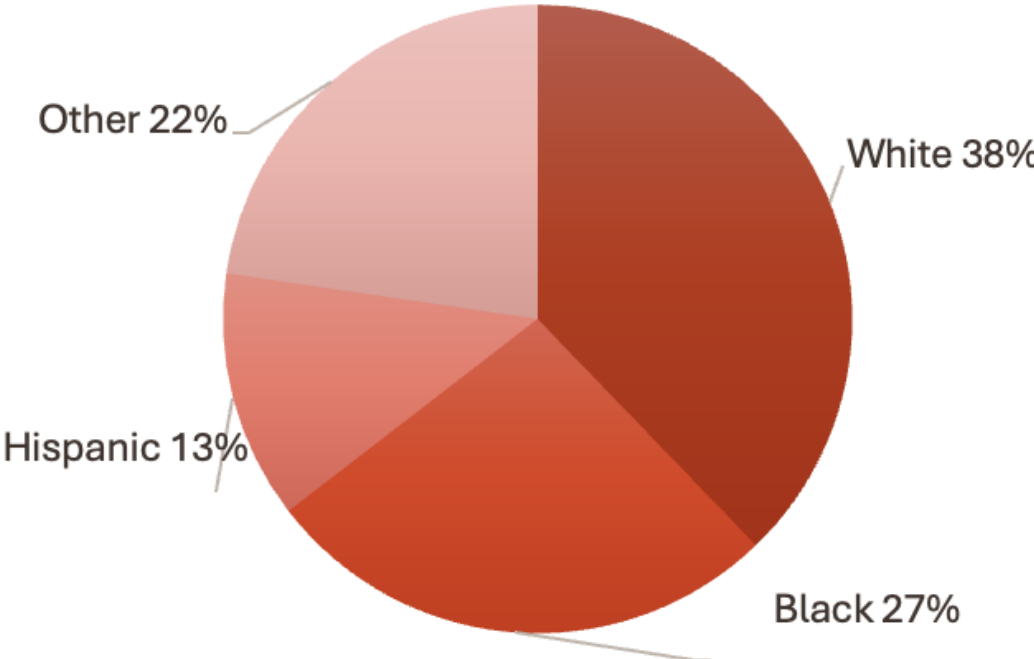
## Results

The overall success rate for all patients was 79.1% (CI: 95%). The mean ( $\pm$ SD) of crown duration in the success group was 4.78 ( $\pm$  2.85) years and 3.93 ( $\pm$  2.73) years for failures. The most common reason for failure was replacement. Upper molars had higher success rates than lowers.

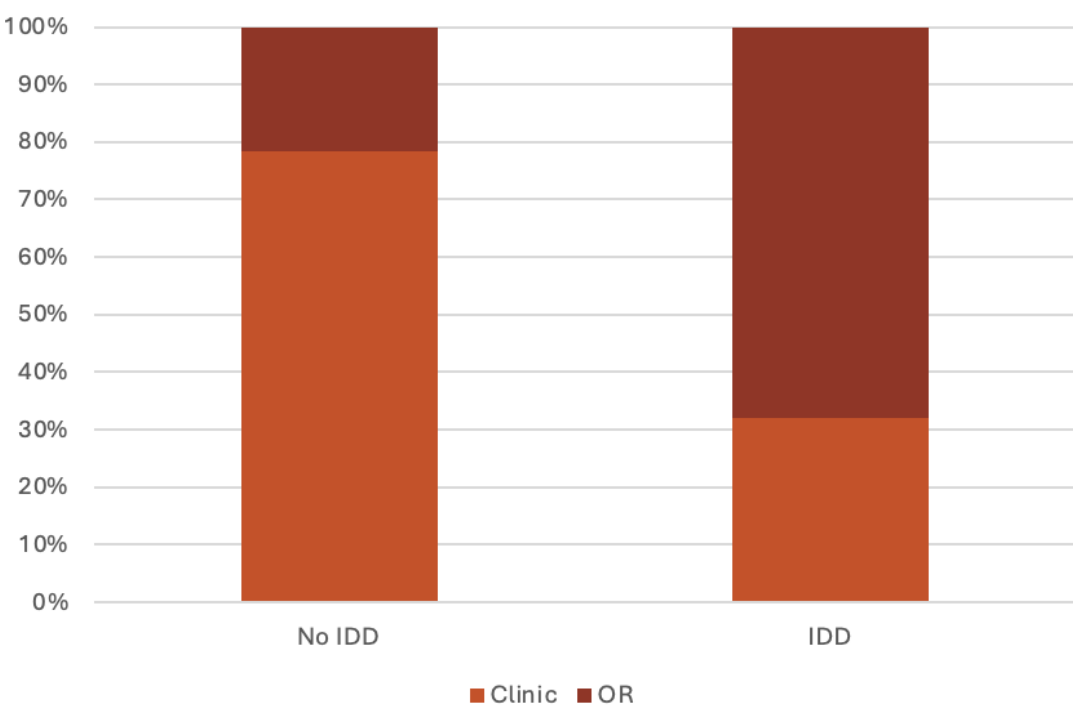
Total IDD Breakdown



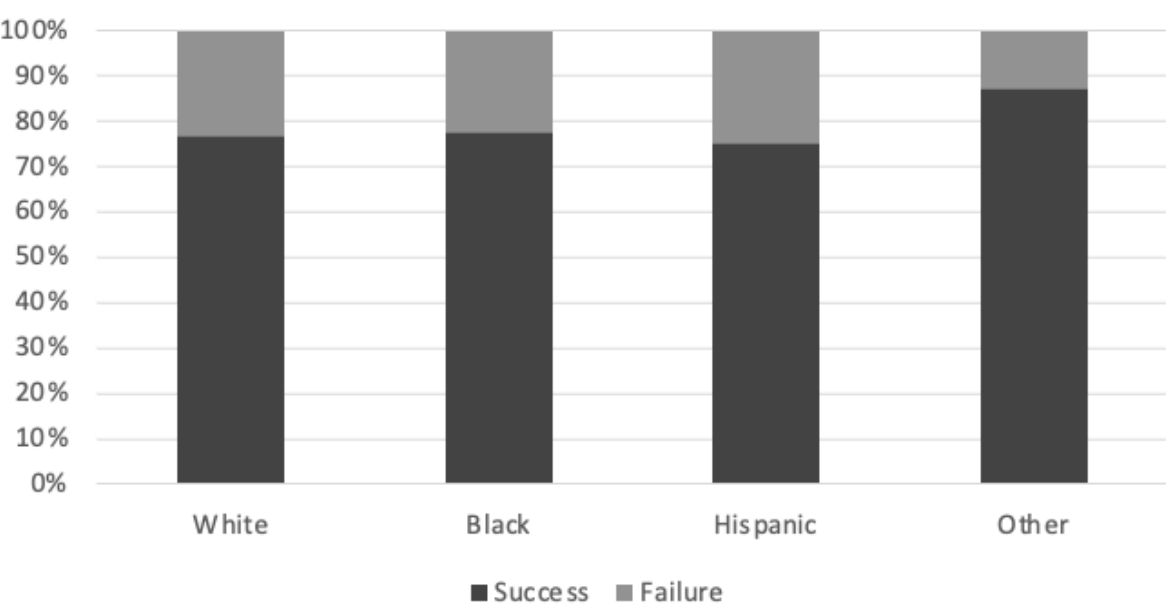
Racial Identity



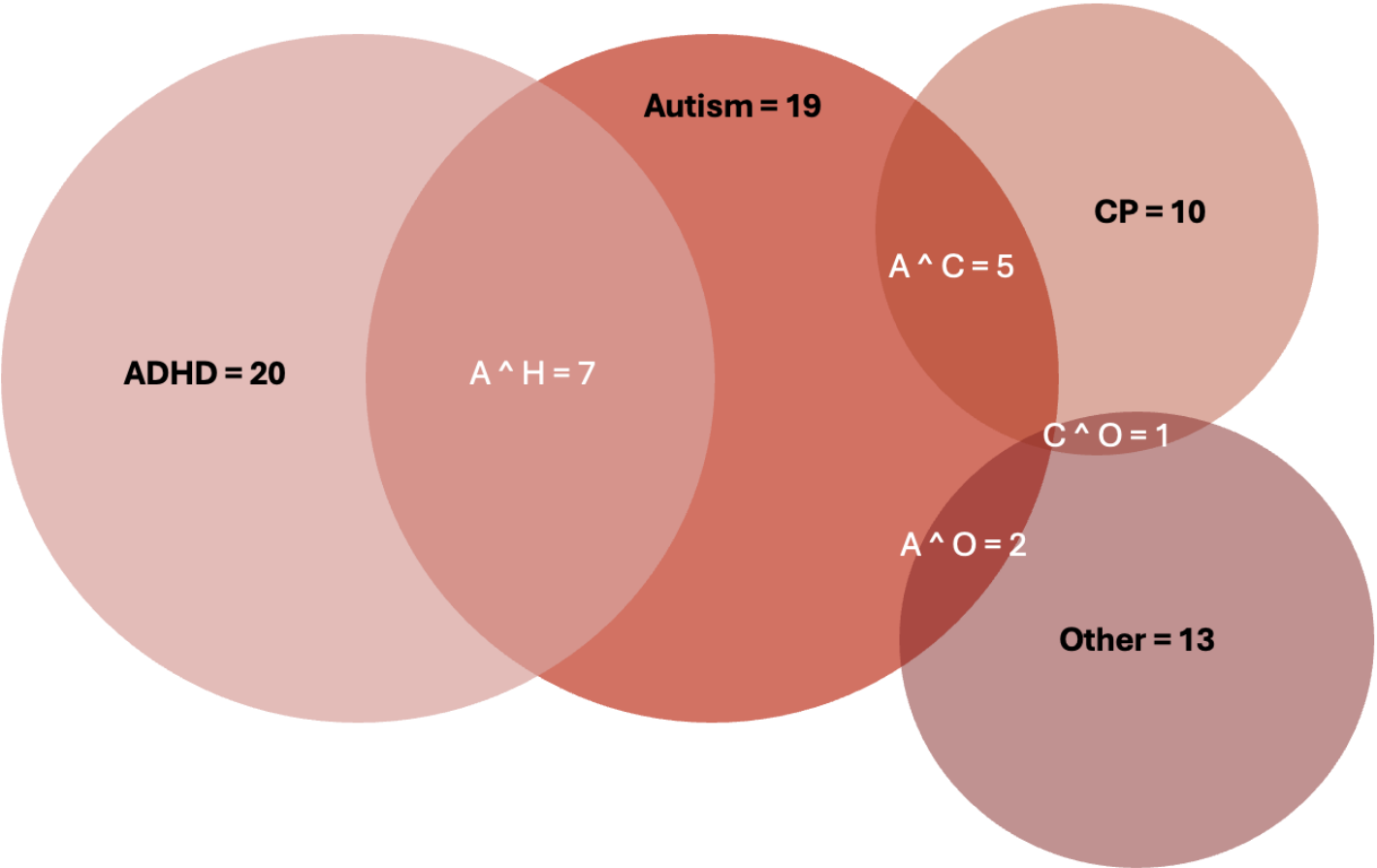
Treatment Setting and IDD Diagnosis



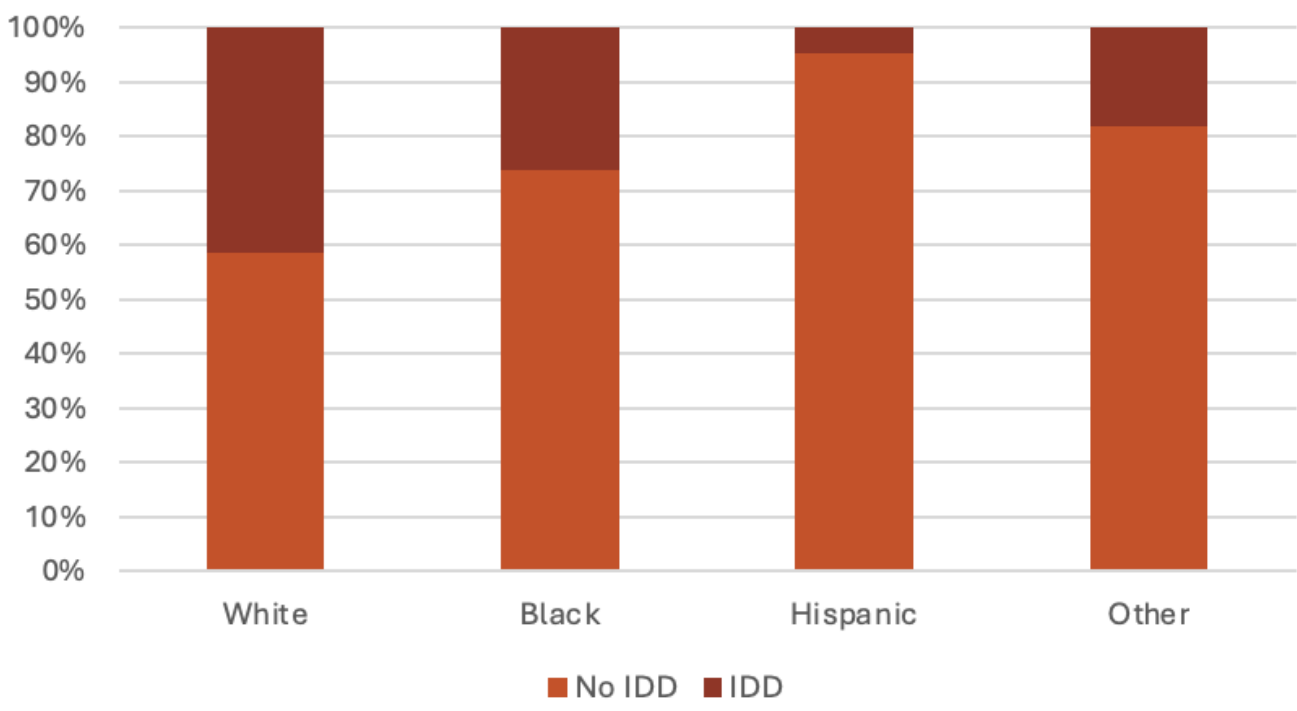
SSC Success and Race



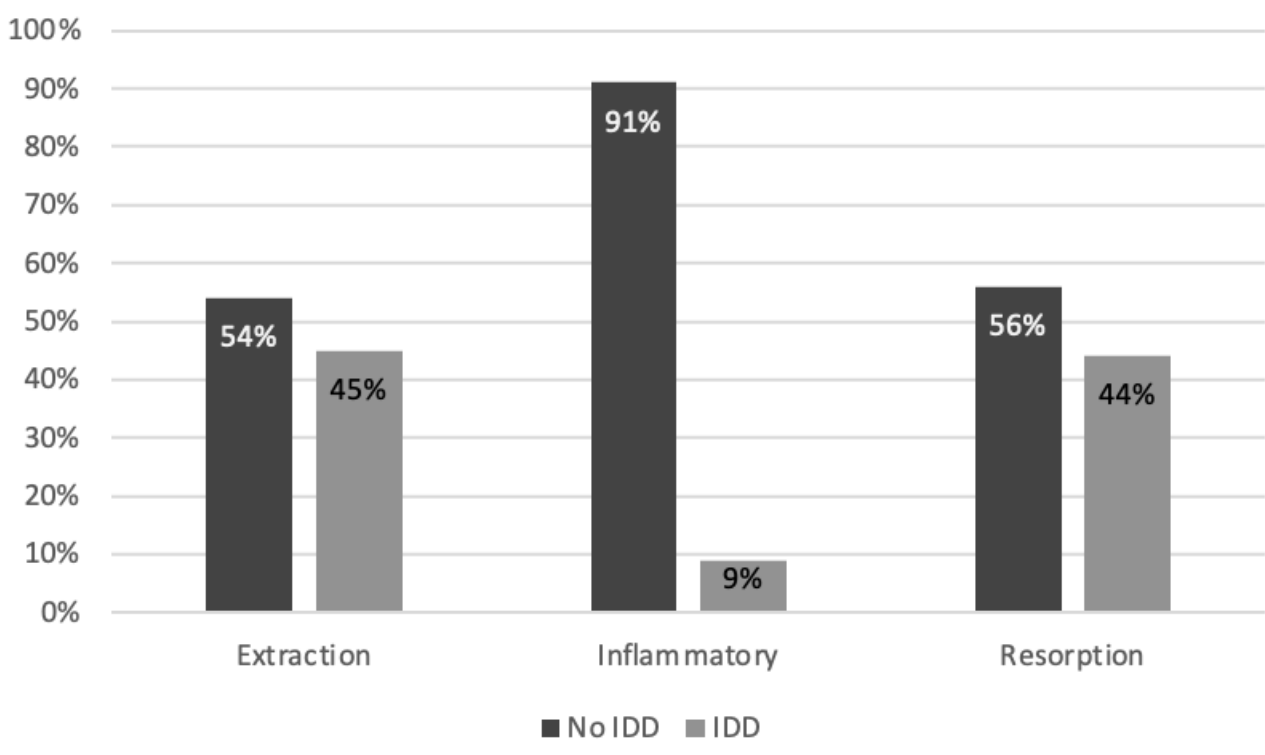
Overlaps of IDD Diagnoses



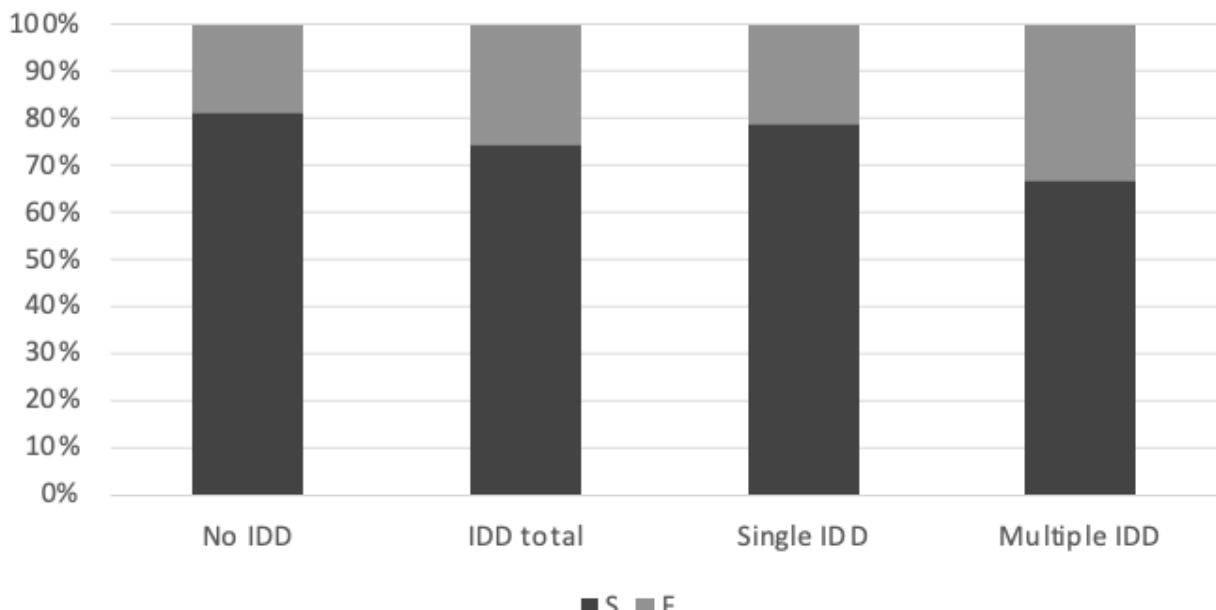
Race and IDD Diagnosis



Reasons for SSC Failure and IDD



SSC Success and IDD



## Results (Continued)

Among the 172 patients included in this study, 27.33% had an IDD diagnosis. Out of total IDD, 32% patients had ADHD, 31% Autism, 16% Cerebral Palsy, and 21% patients had another IDD. Thirty-two percent of patients with an IDD diagnosis had more than one IDD. Patient demographics were 38% White, 27% Black, 22% Other, and 13% Hispanic. IDD diagnoses in White and Black patients were higher compared to Hispanic and patients identifying to other or multiple races ( $p = 0.0027$ ). Patients with IDD are more likely to be treated in the OR (68%) versus no IDD patients (22%) ( $p < 0.0001$ ).

Out of the 268 SSCs placed, 212 succeeded (79%) and 56 failed. Thirty-one percent of these SSCs were placed on patients diagnosed with an IDD. Success rates: No IDD (81%), IDD total (74%), Single IDD (79%), and Multiple IDD (67%), with no significant difference (chi-square). Reasons for failure between patients with IDD and without IDD differed significantly. Inflammatory processes were ten times more commonly diagnosed in non-IDD patients ( $p$ -value  $0.0070 < 0.05$ ). No significant relationships were found between treatment setting and race, SSC success and IDD status, SSC success and Race, SSC success within different types of IDD, and treatment setting in IDD patients.

## Conclusions

The overall success rate of SSCs on permanent molars in children is 79.1%, regardless of IDD diagnosis, race, or treatment location. White and Black patients were more frequently diagnosed with IDD, possibly due to environmental and societal factors. Patients with IDD were more often treated under general anesthesia, likely due to behavioral concerns, limited cooperation, or co-morbidities making in-office treatment unsafe. Interestingly, inflammatory processes were more commonly observed in patients without IDD, potentially due to communication and behavioral challenges in IDD patients. SSC failure may be underreported as it relies on patient communication, cooperation during exams, and radiographic evaluations. Additionally, high rates of missed follow-ups may impact data representation and failure reporting. Further research is needed to optimize care, particularly for patients with IDD. Families may require additional support and information to navigate behavioral challenges, communication barriers, and co-morbidities affecting treatment and follow-up.

