Efficacy of Stainless-Steel Crowns on Permanent Molars in Children

Michelene Haught DMD, Areege Jendi DMD, Michael Sekula PhD, Timothy Followell DMD, Liliana Rozo DMD
University of Louisville School Of Dentistry

Introduction

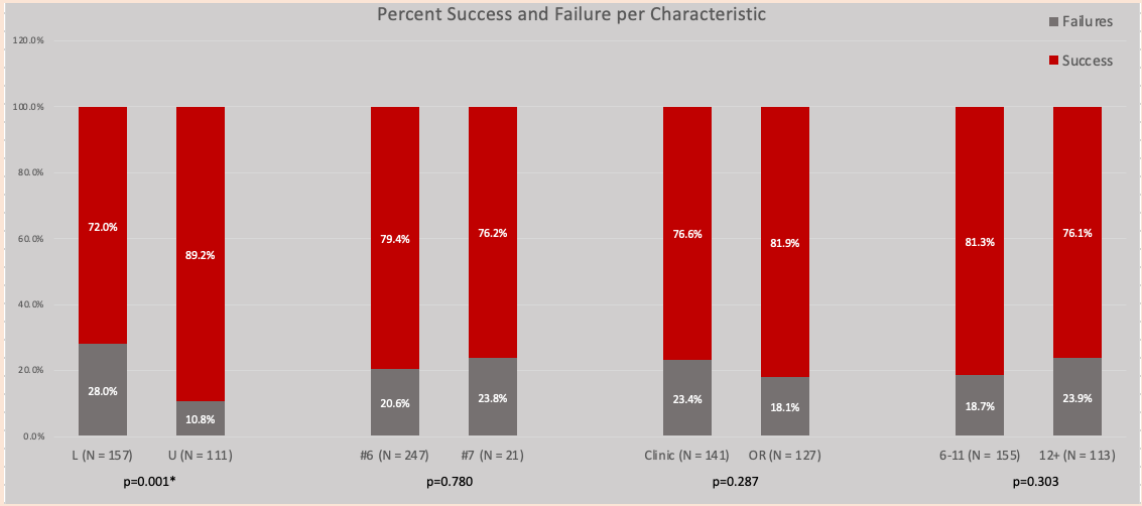
Stainless-steel crowns (SSC) are often used as an interim restoration in pediatric patients with permanent molars that have large multi-surface caries, pulp-treatment, or developmental defects. There is limited research concerning the efficacy and longevity of SSCs on permanent molars.

Objective

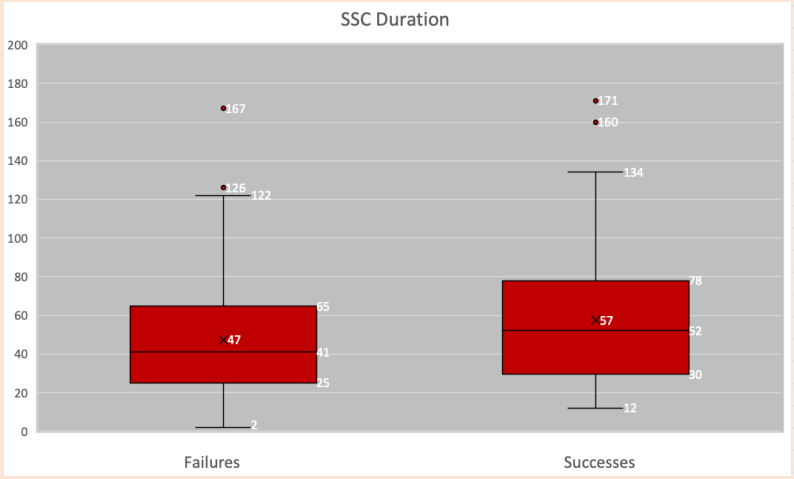
To increase clinical knowledge about the efficacy of SSCs used as an interim restoration on permanent molars in children.

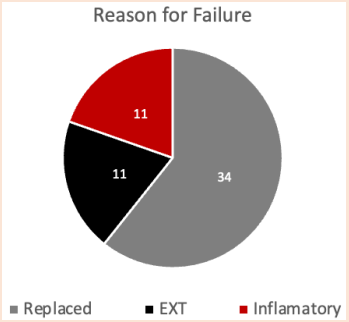
Methods

A retrospective chart review was conducted on SSCs completed on permanent teeth on University of Louisville School of Dentistry patients aged 6-15 years old, from 2008 through 2018. A total of 269 SSCs (174 patients) fulfilled the inclusion criteria (initial placement of SSC on a molar tooth with at least 1 year of follow up) and were included in the study. The SSCs were then graded as success or failure via analysis of radiographs (if available), clinical notes, and need for re-treatment, or extraction. Successful restorations are considered those that remain intact and/or are replaced by definitive full coverage crown when patient growth is complete. Failures are considered any restoration that resulted in replacement restoration, extraction, or exhibited inflammatory processes (such as periapical radiolucency, bone loss, persistent symptoms). Success and failure results were summarized by counts and percentages for the factors of jaw, molar, location type, and age range. Chi-squared tests were used for group comparisons. Duration and patient age were summarized with mean and standard deviation (SD) for both outcomes. A 95% confidence interval (95% CI) for success rate was determined using the normal approximation. Data analysis was performed in IBM SPSS Statistics (Version 29) with significance defined as $p < 0.05$.



Success and failure percentages for the factors of jaw (lower vs. upper), molar (#6 vs #7), location type (in-office clinic vs. OR), and age range(6-11years old vs. 12-15years old). Each factor was compared via chi- squared test, p-values displayed, significant difference denoted with *





Crown duration in months for success and failure groups

Results

The overall success rate in this study was 79.1% with a (95% CI: 74.2% - 83.8%). The mean ± SD of crown duration in the success group was 4.78 ± 2.85 years with a range of (1-14.4yr) and 3.93 ± 2.73 years in the failure group with a range of (2mo-13.9yr). The only significant difference was between the success rates of the jaw groups (upper 89.2%, lower 72.0%). The most common reason for failure was replacement (60.7%).

Conclusion

These results suggest the success rate of SSCs on permanent molars in children is 79.1% and is independent of clinic setting, patient age, and molar number. According to this study SSCs placed on upper molars have a higher success rate than lower molars.

Limitations:

Lack of consistent and thorough follow up, including radiographic. Multiple providers of differing skill level providing treatment. The data is from a single community (Patients of UofL). Some failures may be due to a failure of pulp therapy not SSC. Only one reason for failure was assigned, however in reality there is overlap.

Future Study

A prospective study with fewer variables and consistent thorough follow up. Starting at time of placement through the duration of the tooth/SSC, with evaluation at-least once per year. Including documentation and analysis of pre- and post-treatment diagnosis and prognosis.

Approval IRB Approval #23.0644 **References**

UNIVERSITY OF LOUISVILLE
SCHOOL OF DENTISTRY