Success of Stainless Steel Crowns on Permanent First Molars in Pediatric Patients Ages 6+

Kamy Mehta, DDS and Amanda Pinder, DDS
NYU Langone Hospitals-Advanced Education in Pediatric Dentistry, Tucson, AZ
Department of Plastic Surgery

NYU Langone Dental Postdoctoral Residency Programs

INTRODUCTION

- Chrome steel crowns were introduced in 1950
- Today, stainless steel crowns are used for restorations of primary and permanent teeth for caries, hypoplastic lesions, fractures, or as an attachment for appliances and space maintainers
- AAPD reference manual indicates that SSCs can be used for extensive caries on young permanent tooth, uncertainty of retention of a sedative restoration, pts who must delay cast crowns due to financial considerations, extensively broken down endodontically treated teeth, interim restoration for fracture teeth involving multiple cusps, or full coverage necessity due to hypoplastic nature of tooth
- Permanent SSCs are similar to primary; however, they differ in anatomical variation, extent of preparation, degree of eruption, time of procedure, and longevity of restoration
- Previous studies have shown SSC superiority in both durability and longevity compared to amalgam/composite restorations in primary teeth
- Few studies discuss permanent teeth SSCs compared to other treatment options

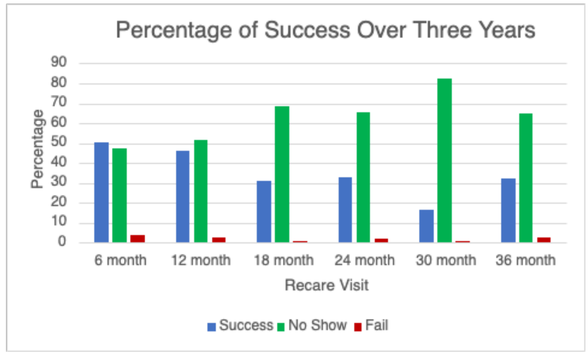
PURPOSE

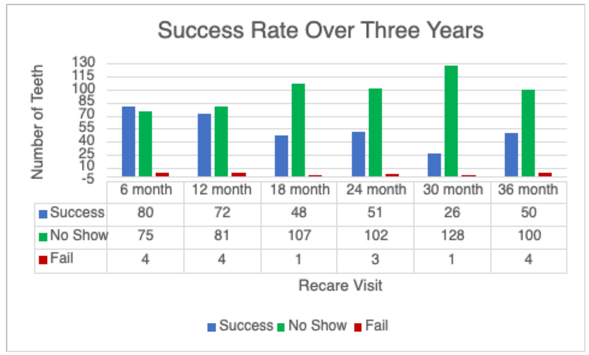
The purpose of this study aims to evaluate the radiological outcome of stainless steel crowns placed on permanent first molars for patients above the age of six. The study evaluates each SSC at six month recall intervals over three years regardless of treatment modality (N2O, Oral Sedation, GA) or ASA status.

METHOD

- Electronic dental records of patients at El Rio Community Health Center whose permanent first molars were treated with stainless steel crowns from July 1, 2010 to June 30, 2019 were reviewed
- Data was obtained and analyzed for each patient in regards to age at the time of placement, gender, ASA status, tooth in question, reason for treatment, treatment modality, Frankl score, and radiographic reason for failure (if any)

FIGURES





RESULTS

- 159 teeth were treated and evaluated from 2010-2019
- Both a chi-squared analysis and t-test were performed for categorical and continuous variables respectively
- Mean age was 11.9 years; 56.6% were female and 43.4% were male
- Majority were ASA I (62.9%), and 32.1% were ASA II and 5% were ASA III.
  - **ASA status had a significant p-value (<0.001) at 12 month recare visit**
- SSCs were placed on 78 endodontically-treated teeth (49.1%), 52 on carious teeth (32.7%), 27 on hypoplastic teeth (17%), and 2 on failing, existing SSCs (1.3%)
- No anxiolytic agents were used on 67 teeth (42.1%), 66 teeth were treated under N2O (41.5%), 19 were treated under general anesthesia (11.9%), and 7 teeth were treated under oral sedation (4.4%)
  - **Treatment modality had a significant p-value (<0.001) at 18 month recare visit**
- Average Frankl score was 3.8 for participants not treated under GA

CONCLUSIONS

- There was an association between ASA status and success of SSCs at the 12 month recall status ($p<0.001$).
- There was an association between treatment modality and success of SSCs at 18 month recall status ($p<0.001$).
- There was no association between SSC status and gender, tooth description, or Frankl score in the three year period.
- Lack of follow-up care was very high ranging from 47% to 82.6% over three years
- In each of the six recall visits, the success rate was still over 92%.
- **SSCs on permanent teeth are an adequate treatment option for teeth that are carious, hypoplastic, RCT-treated, or fractured.**

REFERENCES

[1]McDonald RE, Avery DR. *Dentistry for the child and adolescent, 10th ed*. St. Louis: Missouri; 2016. pp. 197-198
[2]Carranza F, Newman M, et al. *Clinical periodontology*. Philadelphia: W.B. Saunders Co; 2012.
[3]Croll TP. Permanent molar stainless steel crown restoration. *Quintessence International* 1987; 18(5): 313-321
[4]Discepolo K, Sultan M. Investigation of adult stainless-steel crown longevity as an interim restoration in pediatric patients. *Int J Paediatric Dent*. 2017;27(4):247-254. DOI: 10.1016/s0300-5712(03)00136-2.
[5]Titley K, Farkouh D. Paediatrics: the stainless steel crown—an underused restoration in paediatric dentistry; *Oral Health*. 2001;91(7):50-53
[6]Zagdwon AM, Fayle, SA, Pollard MA. A prospective clinical trial comparing preformed metal crowns and cast restorations for defective first permanent molars. *Eur J Paediatric Dent.* 2003;4(3):138-142.
[7]Roberts JR, Sheriff M. The fate and survival of amalgam and preformed crown molar restoration placed in a specialist paediatric dental practice. *Br Dent J.* 1990; 169(8):237-244
[8]Sigal AV, Kin BH, Sigal MJ, Titley KC, Andrews PB. Stainless steel crowns as a restoration for permanent posterior teeth in people with special needs. A retrospective study. *Journal of the American Dental Association*. 2020; 151(2):136-144
[9]Felemban O, Alagi H, Aloufi W, Meligy OE. Success rate of stainless-steel crowns placed on permanent molars among adolescents. *International Journal of Clinical Pediatric Dentistry.* 2021; 14(4):488-491.
[10]Jones, E., Shi, L., Hayashi, A. S., Sharma, R., Daly, C., & Ngo-Metzger, Q. (2013). Access to oral healthcare: The role of federally qualified health centers in addressing disparities and expanding access. *American Journal of Public Health*, *103*(3), 488–493. https://doi.org/10.2105/ajph.2012.300846

Funding by NYU Langone Hospitals, Department of Plastic Surgery