

Stainless Steel Crown Sizing: Finding and Average Crown Size

Alex Ward D.M.D.¹ Cristina Perez, D.D.S. MS¹, Debora Scheffel, D.D.S., M.S., P.h.d¹



INTRODUCTION

The caries rate among school aged children has declined over the last few decades, but dental decay is still prevalent throughout this population.¹ Due to this, restorative approaches in treating these teeth are needed to prevent pain, infection, and premature loss of primary teeth. One option that has been used for decades are stainless steel crowns (SSCs).² SSCs are a heavily used restorative option for pediatric dental patients. They have around 90% overall success rate and hold up over time.³ Another reason for SSCs use is for the speed at which the procedure can be done. Behavior is a large component of pediatric dentistry and sometimes that requires completing procedures quickly. Since behavior and short length of procedure are both important, having a good understanding of SSC crown sizing can aid with helping complete a procedure quickly and efficiently.⁴

OBJECTIVE

The aim of this study is to establish an average SSC size for first and second primary molars cemented in two different scenarios: single or grouped teeth and evaluate if there is an association between the size of first and second molars.

MATERIALS AND METHODS

A chart review was carried out using the OR cases in UK Chandler OR completed by first year pediatric dental residents between July 1st 2022 to June 30th 2023 (IRB# 93265). The chart review occurred on patients between the ages of 3 to 8 years of age that had at least one crown cemented on first and/or second primary molars. A sample size of 26 teeth per group was found to give 80% power to detect a true difference in mean crown size of 1.0 unit. Crown sizes, tooth numbers, and the condition of adjacent tooth (single crown or grouped crowns) were collected, and the data was organized in a Microsoft Excel sheet. To ensure the privacy of charts reviewed, identifying information was not collected. Data regarding SSCs sizes for each tooth and the effect of the “condition of adjacent tooth” were analyzed by Fisher’s exact tests ($\alpha=0.05$).

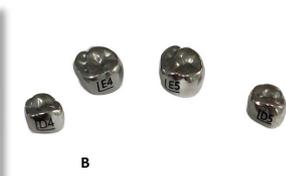


Figure 1. A. Single crown cemented on a lower first primary molar. B. Stainless steel crown sizes.

RESULTS

One hundred and two SSCs were cemented in the OR between July 1st 2022 and June 30th 2023. Fifty crowns were cemented on first primary molars while 52 crowns were cemented on second primary molars. The frequency distribution of each crown size by type of tooth is presented in Table 1. Fifty-two of the cemented crowns were placed on adjacent teeth, meaning both first and second molars in the same quadrant were treated with SSCs. The factor “condition of adjacent tooth” significantly affected the crown size of first molars (Fisher’s exact, $p=0.0450$). Crowns cemented on first molars adjacent to second molars that also received SSCs presented sizes larger (96.2% ranging between D4 and D6) (Figure 2) than those observed for single crowns (82.6% ranging between the sizes D3 and D5) (Figure 3). Similar effect was not observed for second molars, meaning the presence or absence of an adjacent crown did not influence the crown size of second molars (Fisher’s exact, $p=0.2779$) (Figures 4 and 5). No association was observed between the crown size of first molars and adjacent second molars (Fisher’s exact, $p>0.05$). However, in 57.7% of the cases the number of the crown size for second molars was 1 (26.9%) or 2 units (30.8%) lower than the number of the crown size for first molars.

Table 1. Crown sizes according to each type of tooth regardless of the condition of adjacent tooth.

TOOTH	CROWN SIZE						
	D2	D3	D4	D5	D6	D7	
1 ST MOLARS	2 (4%)	7 (14%)	11 (22%)	20 (40%)	11 (22%)	0 (0%)	
	E2	E3	E4	E5	E6	E7	
2 ND MOLARS	9 (17.3%)	9 (17.3%)	15 (28.8%)	10 (19.2%)	7 (13.5%)	2 (3.8%)	

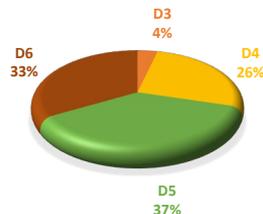


Figure 2. Distribution size (%) of grouped crowns cemented on 1st molars.

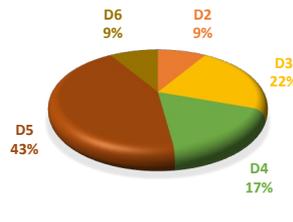


Figure 3. Distribution size (%) of single crowns cemented on 1st molars.

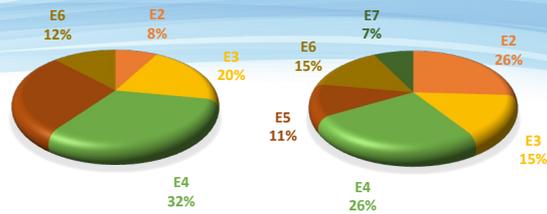


Figure 4. Distribution size (%) of grouped crowns cemented on 2nd molars.

Figure 5. Distribution size (%) of single crowns cemented on 2nd molars.

DISCUSSION

This study was able to identify the most frequent crown size range for each tooth and clinical scenario (single crown or grouped crown). Crowns placed on 1st molars when a crown is also placed on 2nd molar resulted in a size range D4-D6 crown being placed when the single crown range size was D3-D5. We suggest this could be due to operators being more conservative in the tooth prep by taking tooth structure away from 1st and 2nd molars equally. In cases where only one crown is placed, operators are trying to avoid iatrogenic damage to adjacent teeth and are more aggressively taking tooth structure away from the tooth getting treatment resulting in a smaller crown being placed. This study failed to statistically demonstrate that the crown size cemented on first molars can act as a predictor of the crown size for second molars. However, in around 60% of cases with adjacent crowns, 2nd molar crown sizes were 1 unit to 2 units lower than the first molar sizes. This information could guide the process of choosing the proper size when adjacent teeth are being treated.

CONCLUSION

The most frequent sizes observed for 1st and 2nd molars were D5 and E4, respectively. Crowns cemented on first molars adjacent to second molars that also received SSCs presented sizes larger (D4 and D6) than those observed for single crowns (D3 and D5). There was a trend that first molars that received crowns were 1 to 2 sizes larger compared to 2nd molars that also received crowns.

Authors

awarda301@uky.edu, cristina.perez@uky.edu, debora.scheffel@uky.edu

¹Department of Oral Health Science, Division of Pediatric Dentistry, University of Kentucky College of Dentistry