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Comparative Evaluation Of Retention Of Stainless Steel Crowns And Figaro crowns in Primary Teeth-A Randomised Control Trial

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Abstract:

Aim:The purpose of this study was to compare the retention rates of two different pre-formedcrowns-StainlesssteelandFigaroforrestoringprimarymolars.

Materials and method: 20 children with 2 contra-lateral primary molars in the same arch requiringcrownswereselectedandrestoredwithSSCandFigarocrowns.Theretentionofthecrownswere evaluated at 3,6,9 and 12 months follow-up. Descriptive statistics and chi square test wereused for statistical analysis.

Results: 100% of the SSC were intact till 12 months follow up and none of the SSC showedchipping,largelossorcrownloss.InFigarocrowns25%and40%ofthecrownsdidnotreporttobe intact at 9 and 12 months follow up respectively and 5 crowns showed chipping at 9 and 12months.Howeverstatisticalsignificancewasnotnoted.

Conclusion:Figarocrownshaveanacceptableretentionrateasthatof SSCsandcanbeconsidered asanalternativetoaestheticpreformedcrowns.

Introduction:

Treating multi-surfaced decayed primary teeth is challenging for a paediatric dentist. With theintroduction of SSC by Humphrey in 1950, for many years , SSCs were used for treating multi-surfacecariousprimaryteeth.Sincethenfordecades,SSCshaveoutperformedtheotherrestorative materials in terms of cost, durability and longevity. (1,2,3) But SSCs has a metallicappearance which makes it unaesthetic and led to the search of new aesthetic and acceptablematerials.(1,2)

Zirconia crowns was introduced into paediatric Dentistry to overcome the pitfalls of SSCs.(4) Asystematic review published in 2020 stated that Zirconia crowns are better in terms of gingival,periodontal health, aesthetics and fractures.(5) But its high cost, technique sensitivity, low

gradeabrasionoftheopposingnaturaldentitionarefactorsthatcannotbeneglected.(6,7)Thisledto furthersearchofmaterialsthatareaesthetic,durableandcosteffective.FigaroCrownsseemedtoapromising aestheticandcost-effective replacementtoSSCs.(8)

Retention of the crown is an important clinical factor to be considered to declare its success. Inprimary teeth, the Retention of the crowns used depends on the tooth preparation and lutingcements used. A study conducted in 2020, shows no significant difference in the retention ofFigaro crowns at 3 months but a significant difference was noted at the end of 6 months.(8) To thebest of our knowledge there are no other RCTs existing in the literature that have compared theretentionrateofSSCsandFigarocrownsinprimaryteeth.HencetheaimofthepresentstudywastocomparetheRetentionofSSCsandFigarocrownsinprimaryteeth.

Materials and Method:

Study population

The study was conducted as a split mouth randomised control trial after approval from the ethicalcommittee. A total of 121 participants were screened , out of which 20 children fitting into theinclusion and exclusion criteria were selected. Healthy children between the ages of 4 and 7 yearsrequiring SSC in two contra-lateral Primary Second molars in the same arch were included in thestudy.Severelydamaged(lessthanonethirdofthecrownremaining)Primarymolar,primarymolarininfra-occlusion,primarymolarwithnoantagonisttoothwereexcludedfromthestudy.Also,parents/guardianwhorefusedtoparticipateinthestudywerealsoexcluded.

Sample size

Sample size was calculated from a pilot study with 90% power and arrived to a total sample of 40teeth.

Randomisation and allocationc once alment

Computergeneratedrandomisationsequencewasusedtoallocatethechildrentofirstreceive SSC or Figaro crowns. 1 week later, the other crown was placed on the contra-lateral side. Theallocation sequencewas concealedusing sealedenvelopes.

Informed consent and Blinding

Writteninformedconsentwasobtainedfromtheparents/Guardianspriortoenrollingthechildrento the study. Blinding was not applicable as the crowns were of different colours and henceneitherthe participantnortheoperatorwasblinded.

Study protocol

Asinglepaediatricdentistperformedtheproceduresforalltheparticipantstopreventoperatorbias. The selected tooth was anaesthetised and the caries removal was done. Pulp therapy ifneeded was done under Rubber Dam isolation. The subsequent restoration was done using GlassIonomer Cement. Following which the tooth preparation was carried out. Proximal and occlusalreductionwasdone.ThetoothpreparationforFigarocrownswassimilartoSSCs.SSCisselectedbyTrialander rormethod.Thecrownisthenadjustedtofitthetooth.Occlusionischecked and cemented using Type 1 GIC. (Fuji Plus;GC) In case of Figaro crowns, crown size waspre-selectedusingthetrialcrownsgivenbythemanufacturerpriortothetoothpreparation.Crown try in was ten carried out to assure proper seating of the crowns and was then cementedusing glass monomer cements.

Study Outcome and Followup

Thechildrenwerethenfollowedupat3,6,9,12monthspost-operativelytocheckfortheretentionof the crown.2 other evaluators who were not a part of this study evaluated the retention of thecrowns.Theretentionofthecrownwasevaluatedas1.Intactcrown,2.Chippedcrown,3.largeloss and 4. Crown lost. Intra-examiner agreement was evaluated using kappa statistics and wasconsidered to beexcellent. (k=0.95)

Statistical analysis

Data was collected and statistical analysis was done using SPSS software. Chi square test wasdonetofindoutthestatisticalsignificancebetweenthetwogroups.

Results:

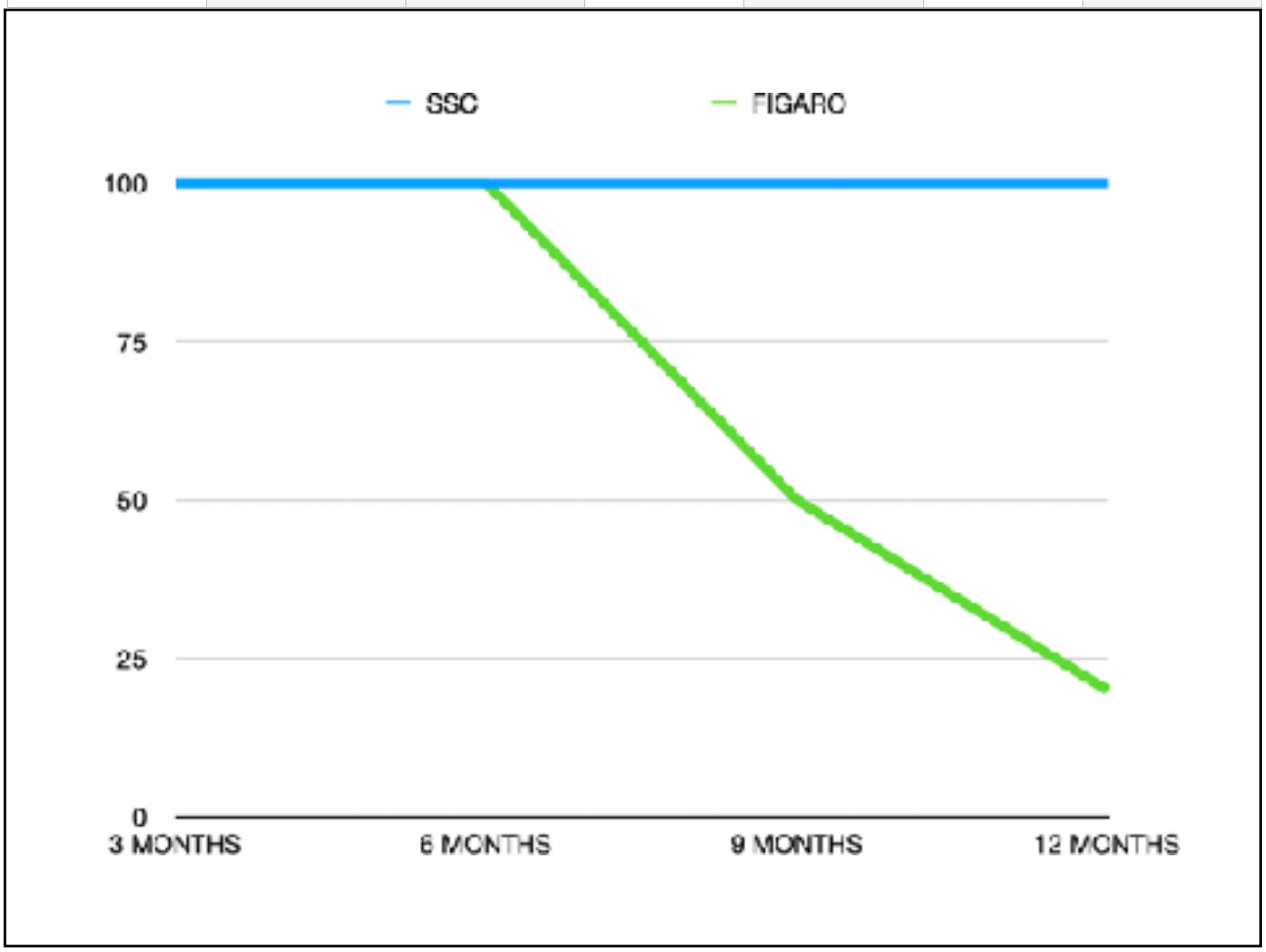
A total of 20 children with mean age of 5.75 $\pm$ 0.607 years participated in the trial. The retentionrates of SSC and Figaro crowns are depicted in table 1. No statistically significant difference wasnotedbetweenSSCandFigarocrownsat9and12monthsfollowupperiod.Overallretentionrates of thecrowns aredepicted inGraph 1.

Table1: Retention rates of the SSC and Figarocrownsat 3,6,9,12 months followup, p<0.05 Statistically significant.

OUTCOME	TIMEPERIOD	SSCn(%)		Figaron(%)		Pvalue
		Yes	No	Yes	No	
Intactcrown	3months	20(100%)	0(0)	20(100%)	0(0)	
	6months	20(100%)	0(0)	20(100%)	0(0)	
	9months	20(100%)	0(0)	15(75%)	5(25%)	0.341
	12months	20(100%)	0(0)	12(60%)	8(40%)	0.507
Chipped crown	3months	0(0)	20(100%)	0(0)	20(100%)	

	6 months	0(0)	20(100%)	0(0)	20(100%)	
	9 months	0(0)	20(100%)	5(25%)	15(75%)	0.341
	12 months	0(0)	20(100%)	5(25%)	15(75%)	0.341
Largelos s	3 months	0(0)	20(100%)	0(0)	20(100%)	
	6 months	0(0)	20(100%)	0(0)	20(100%)	
	9 months	0(0)	20(100%)	0(0)	20(100%)	
	12 months	0(0)	20(100%)	3(15%)	17(85%)	0.796
CrownLo st	3 m	0(0)	20(100%)	0	20(100%)	

	on ths					
	6 m on ths	0(0)	20(100%)	0	20(100%)	
	9 m on ths	0(0)	20(100%)	0	20(100%)	
	12 m on ths	0(0)	20(100%)	0	20(100%)	



Graph1: Overall Retention Rates of the SSC and Figarocrown sat 3,6,9,12 months.

Discussion:

Demand for aesthetic crowns is been increasing and the search for an alternate cost-effectiveaestheticcrownscontinues.OnesuchalternativeistheFigarocrowns-Fiberglasscrownscomposedofquartzintheformoffibremeshsheetsembeddedinaresin.Themanufacturerclaims Figaro crowns are metal-free, bisphenol free and autoclavable.(8) A systematic review onthe clinical success rates of preformed aesthetic crowns in primary molars concluded that zirconiacrowns are not an effective replacement to SSCs, however Figaro crowns can be a promisingreplacement to SSC.(9) But to the best of our knowledge there is only one RCT published withFigaro crowns, which makes the decision not reliable. (8) Retention being an important clinicalfactordeterminingthesuccessofcrownsinpaediatricdentalpractice,wewantedtocheckthe retention rates of the Figaro crowns with the traditional benchmark restoration-SSCs.The presentstudy was conducted as a split mouth trial as each participant will form their own control, thuspotential confounderscan beavoided. The results of the present study are little varying from the previous study published with only 6monthsfollow-up.Inthepresentstudy,at3and6monthsfollowup,boththecrownswerefoundto be 100% intact and only at 9 and 12 months, 25% and 40% of the Figaro crowns wereconsidered not to be intact respectively while all the SSCs were 100% intact. However in theprevious study published, at 3 months itself only 75% of the Figaro crowns were intact and at 6monthsonly38%ofthecrownswereintact.Howevertherewasnostatisticallysignificantassociation between the crowns and retention at 3 month follow up which is similar to the presentstudy.

With regards to chipping of crown, at 3 and 6 months follow up none of the crowns showedchipping, whereas in the previous study published 25%and 13% of the Figaro crowns showedchippingat3and6monthsrespectively.SimilarnolargecrownlosswasnotedwithFigarocrowns at 3,6,9 months, whereas in the previous study 50% of the Figaro crown showed largecrown loss at 6 months follow up which are completely contradictory to the results of the presentstudy.

Conclusion:

The findings of the present study shows that Figaro crowns have an acceptable retention rate asthat of SSCs and can be considered as an alternative to aesthetic preformed crowns in paediatricdentalpracticetosatisfytheaestheticdemandsofthepatientsandparents.

References:

1. RandallRC.Preformedmetalcrownsforprimaryandpermanentmolarteeth:reviewofliterature. Pediatr Dent.2002;24:489-500.
2. Seale NS. The use of stainless steel crowns. PediatrDent. 2001;24:501-5.
3. InnesNPT,RickettsD,ChongLY,KeightleyAJ,LamontT,SantamariaRM.Preformedcrownsfor decayed primarymolar teeth. CochraneDatabase Syst Rev.2015;12:CD005512.
4. KhatriA.Estheticzirconiacrowninpedodontics.IntJPedodRehabil2017;2:31-3.
5. AjayakumarLP,ChowdharyN,ReddyVR,ChowdharyR.UseofRestorativeFullCrownsMadewithZirconiainChildren:ASystematicReview.IntJClinPediatrDent.2020Sep-Oct;13(5):551-558
6. Abdulhadi BS, Abdullah MM, Alaki SM, Alamoudi NM, Attar MH. Clinical evaluation betweenzirconiacrownsandstainlesssteelcrownsinprimarymolarsteeth.JPediatrDent2017;5:21-7.
7. Walia T, Salami AA, Bashiri R, Hamoodi OM, Rashid F. A randomised controlled trial of threeaestheticfull-coronalrestorationsinprimarymaxillaryteeth.EurJPaediatrDent.2014Jun;15(2):113-8.
8. El-HabashyLM,ElMeligyOA.Fiberglasscrownsversuspreformedmetalcrownsinpulpotomizedprimarymolars:arandomizedcontrolledclinicaltrial.QuintessenceInt.2020;51(10):844-852.
9. Subramanian EMG, Aravind Kumar. S, KavithaSwaminathan. Evaluation Of Clinical SuccessOf Preformed Aesthetic Crowns In Primary Molars - A Systematic Review. Int J Dentistry OralSci.