

MODIFICATION OF STAINLESS STEEL CROWN TO RESTORE A CHILD'S SMILE: A CASE REPORT

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ABSTRACT

Young children are very much aware of their appearance in 21st century. Children are becoming very conscious about their esthetics, because they live very much in an era of peer influence. Stainless steel crown (SSC) is a very useful treatment in child patients. They are mainly used following the endodontic treatment in deciduous molar. Stainless steel crowns have shown significant clinical success but its main drawback is unesthetic appearance. This is a case report of a child patient with Stainless steel crown, came to the department of Pedodontics and preventive dentistry with his mother after complete endodontic treatment and stainless steel crown in lower primary second molar. The tooth was clinically asymptomatic, but patient was not satisfied because the visibility of Stainless steel crown during smile had become embarrassing in front of his friends. So to satisfy the child, Stainless steel crown has been modified by chairside veneering to improve the esthetics and restore his smile.

KEY WORDS

Stainless steel crown, modification, veneering

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INTRODUCTION

Stainless steel crowns were introduced to paediatric dentistry by Rocky Mountain company in 1947 and made popular by W.P.Humphrey in 1950,¹ which proved to be a landmark to clinical paediatric dental practice.

Stainless steel crowns (SSC) are semi permanent restorations used to overcome various problems in day to day practice in pediatric dentistry. These are pre formed crowns fabricated to rehabilitate compromised primary and young permanent teeth.

It is mainly used in deciduous molars following endodontic treatment. Other common indications are the treatment of multisurface carious lesion, teeth with developmental defect, fractured teeth, etc. SSCs are clinically successful restorations in compromised primary molars, but main drawback is its unesthetic appearance^{2,3}.

Children are becoming much aware of their appearance in 21st century because they are very much in an era of peer influence⁴.

So to overcome the unesthetic appearance of Stainless steel crown, various modifications attempted to satisfy children as well as parents. These are cutting out the labial surface of the crown and filling with tooth-coloured material, such as composite or by using Pre veneered stainless steel crown as an esthetic option for the full coverage restoration⁵.

The current case-report follows the esthetic modification of SSC by cutting a window on labial surface and filling with a composite.

CASE REPORT

A 8 years old male patient came with his mother in the department of Pedodontics and Preventive Dentistry after complete endodontic treatment with Stainless steel crown in lower right 2nd primary molar. The child complained of visibility of the metal crown during smile which was displeasing in front of his friends (Fig 1, Fig 2).

So esthetic modification of stainless steel crown was planned to fulfil the esthetic demand of the child. As because stainless steel crown is already in place, so chairside open face or facial cut out modification was planned.

A window was prepared on buccal surface of the crown (Fig 3) to provide place for placement of composite. A thin margin of stainless steel crown was left at gingival part (Fig 4).

After composite shade selection, prepared window was



Fig 1. Visibility of metal crown During smile



Fig 2. Pre operative photograph of SSC in 85



Fig 3. Window preparation in 85



Fig 4. Etching in buccal window in 85



Fig 5. Application of bonding agent



Fig 6. Curing of composite resin



Fig 7. Immediate Post operative photograph



Fig 8. Post operative appearance of 85



Fig 9. Post operative smile showing improved esthetic



Fig 10. After 6 months follow up



Fig 11. After 12 months follow up

etched; washed and bonding agent was applied (Fig. 4, Fig. 5). Then selected composite resin was inserted and curing and finishing were performed with proper isolation (Fig 6). There was dramatic improvement of appearance and patient confidence (Fig 7, Fig 8, Fig 9).

The patient was extremely pleased with the esthetics of the restoration and had no postoperative complications.

Excellent result was displayed after 6 months (Fig 10) and patient was recalled at 12 months follow up (Fig 11).

Discussion

Several modifications and newer esthetic crowns have been presented to overcome the disadvantages of stainless steel crowns. These crowns were introduced to meet the increasing esthetic demands of patient as well as their parents. These modifications include open faced and veneered stainless steel crowns. Open faced stainless steel crowns have a window cut on facial surface wherein composite resin is bonded onto the tooth. In pre-veneered crowns (NuSmile primary crowns, Kinder crowns), esthetic composite veneers are retained onto stainless steel using variety of mechanical and chemical bonding approaches. Both these crowns have better esthetics than conventional stainless steel crowns⁶.

Hartmann CR and Helpin ML⁷ suggested that in children with rampant carious lesions, open-faced stainless steel crowns can be used. Although some esthetics is sacrificed, increased functional stability is added to these restorations.

Roberts C et al⁸ conducted the first study on resin-faced stainless steel crowns used for restoring primary anterior teeth and described the clinical performance of these crowns. He concluded that these stainless steel crowns have high rate of retention.

Main two advantages of open faced steel crown are⁹ improved esthetics and tooth structure is accessible for pulp testing.

Waggoner WF and Cohen H¹⁰ have described pre veneered stainless steel crown forms for primary incisors is an esthetic option for the full coverage restoration of broken down incisors.

However, their durability is compromised because of limited crimping. These crowns are also bulky so need more tooth reduction, expensive and lack natural appearance. One Comparative study on the microbial adhesion to preveneered and stainless steel crowns done by Waleed, et al. concluded that the thickness of the preveneered crown walls (0.7 to 1.7 mm) lead to more plaque accumulation and *S. mutans* adhesion to preveneered crowns was significantly higher than to SSC.

CONCLUSION

Open faced stainless steel crown is an easy chairside method of esthetic modification, which is cheap, easy to make and improves esthetics instantly. So this method can be used in day to day pediatric practice to satisfy esthetic demand of the patient as well as parents at reasonable cost.

REFERENCES

1. Veerakumar R, Pavithra j, Keerthana SG . Esthetic crown in paediatric dentistry: a review. International journal of innovations in dental sciences. 2017; 2:2.
2. Mittal GK, Verma A, Pahuja H, Agarwal S, Tomar H, Esthetic crowns in pediatric dentistry: a review. International journal of contemporary medical research. 2016;3(5):1280-1282.3. Abdulhadi BS, Abdullah MM, Alaki SM, Alamoudi NM, Attar MH. Clinical evaluation between zirconia crowns and stainless steel crowns in primary molars teeth. J Pediatr Dent 2017;5:21-7.
4. Babaji P, editor, Crowns in Pediatric Dentistry, 1st ed. Jaypee Brothers Medical Publishers, 2015, p. 72.
5. Yilmaz y., koçoğullari m. E., clinical evaluation of 2 different methods of stainless steel esthetic crowns, journal of dentistry for children-71:3, 2004
6. Chadha T, Yadav G, Tripathi AM, Dhinsa K, Arora D. Recent trends of Esthetics in Pediatric Dentistry. Int J Oral Health Med Res 2017;4(4):70-75.
7. Hartmann CR, Helpin ML. The open-faced stainless steel crowns: an esthetic technique. Asdc j. Dent. Child. 1983;50:31-3.
8. Robert c, lee jy, wright jt. Clinical evaluation of and parental satisfaction with resin-faced stainless steel crown. Pediatr dent. 2001;23:28-31.
9. Nagarathna c., thimmegowda u., basavarajendrappa c. R., and dr. Prasanna kumar bhat p. K., The utility of open-faced anterior stainless steel crown restoration among pediatric dentists as a lucrative esthetic option in primary incisors. World journal of pharmacy and pharmaceutical sciences, 2016;15(12): 1568-77.
10. Waggoner WF, Cohen H. Failure strength of four veneered primary stainless steel crowns. Pediatr Dent. 1995; 36-40.
11. Bin Alshaibah waleed M, El.Shehaby Fatma A, El.Dokky Norhan A, Reda Ala'a R, Comparative study on the microbial adhesion to Preveneered and stainless steel crowns. Journal of Indian society of Pedodontics and Preventive dentistry. 2012; 30: 3.