

Smart Hall's Technique - An Innovative and Minimally Invasive Novel Option for Managing Carious Primary Molars-A Case Report

Paranjape MN*, Shah PP

ABSTRACT

Smart Hall's technique can be one of the options to arrest the progression of dental caries which involves the application of silver diamine fluoride (SDF) to carious molars and restoring them with Glass ionomer cement followed by placement of stainless steel crown. This case report describes the management of multiple carious primary molars using Smart Hall's technique in a 5-year-old patient who presented with a high dental anxiety. The treatment plan for this particular patient was divided into two phases (a) Preventive and (b) Restorative. SDF was applied to all carious molars and the teeth were restored using Glass ionomer cement followed by Stainless Steel crowns. The bite was initially raised after crown placement which settled gradually after a few weeks follow-up. This innovative approach of restoring primary molars using Smart Hall's technique negates the need for invasive treatment under local anaesthesia or general anaesthesia.

Keywords: Hall's technique, Minimally invasive, Primary molars, Silver diamine fluoride, Smart hall's technique

Asian Pac. J. Health Sci., (2023); DOI: 10.21276/apjhs.2023.10.2.10

INTRODUCTION

Dental caries in primary teeth is considered the most common oral disease of childhood.^[1] Recently, Silver diamine fluoride (SDF) is being used as a non-invasive treatment option for managing deep dentinal caries in primary teeth.^[2]

Despite the fact that preformed metal crowns are recommended as the optimum treatment for managing primary molars where caries includes two or more surfaces,^[3] they are not widely used by the dentists due to the difficulties in the technique and in the ability of children to accept invasive treatment that involves local anaesthesia and tooth preparation.^[4]

Because of limitations of Halls technique, Smart Halls can be one of the minimally invasive options for managing caries.

CASE DESCRIPTION

A 5-year-old young female patient reported to the Department of Pedodontics and Preventive Dentistry of Bharati Vidyapeeth Dental College and Hospital, Pune, with a chief complaint of decayed teeth in the upper and lower arch. Patient's medical history was non-significant. Patient's parents gave a history of their child holding food in the mouth for long period of time without swallowing.

Intraoral examination revealed multiple buccal cavitated lesions in the primary maxillary and mandibular molars with no pain and no clinical signs or symptoms of irreversible pulpitis or pulp necrosis [Figure 1a and b].

The available treatment options were discussed with the parents. As the patient presented with a high dental anxiety and had multiple carious lesions, the Smart Hall's technique was planned for this patient. A proper treatment plan was formulated which was divided into two phases. Quadrant dentistry was used in this case to adjust the occlusion.

Phase One – Preventive Phase

Diet analysis and counselling were done. Oral prophylaxis was performed. The whole procedure was carried out under strict

Department of Paediatric and Preventive Dentistry, Bharati Vidyapeeth Dental College and Hospital, Pune, Maharashtra, India.

Corresponding Author: Dr. Paranjape Madhura Nitin, Department of Paediatric and Preventive Dentistry, Bharati Vidyapeeth Dental College and Hospital, Pune, Maharashtra, India. E-mail: drmadhuraparanjape@gmail.com

How to cite this article: Paranjape MN, Shah PP. Smart Hall's Technique - An Innovative and Minimally Invasive Novel Option for Managing Carious Primary Molars-A Case Report. *Asian Pac. J. Health Sci.*, 2023;10(2):40-42.

Source of support: Nil.

Conflicts of interest: None.

Received: 01/05/2023 **Revised:** 11/05/2023 **Accepted:** 17/06/2023

aseptic precautions. The soft caries were excavated using spoon excavator (Osung no 17). SDF was applied on the primary maxillary right first molar, left first and second molar and mandibular right first and second molars. for 1 min with the help of an applicator tip [Figure 2]. Soft tissues were protected with petroleum jelly, to avoid direct contact with SDF solution. The patient was instructed to avoid eating and drinking for 1 h after the procedure. The patient was recalled after 1 week.

Phase Two- Restorative Phase

a. Patient gave no history of pain after SDF application and clinically there were no signs of irreversible pulpitis or pulp necrosis.

The occlusion was assessed, and orthodontic separators (blue) were used to create space proximally for placing a Stainless-steel crown by Hall's technique for carious primary mandibular right molars [Figure 3].

b. The patient was recalled after 3 days for removal of the separator. The interproximal area of the gingiva was inspected. Isolation using cotton rolls was maintained during the whole

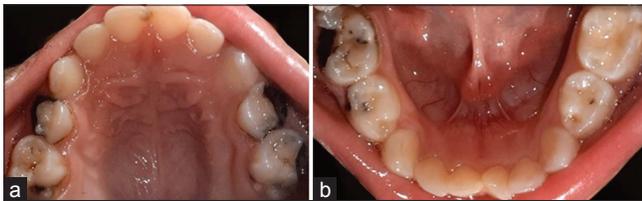


Figure 1: (a) Buccal cavitated lesions with 54, 55, 64, 65. (b) Buccal cavitated lesions with 84, 85



Figure 2: Carious lesion after application of SDF



Figure 3: Application of separators

procedure as the child presented with a high dental anxiety. The teeth were restored using glass ionomer cement (Fuji type IX).

Stainless steel Crowns (3M) were first placed in primary mandibular right molars) and then subsequently in primary maxillary right first molar and left maxillary molars.

Different sizes of crowns were selected.^[2-4] The smallest size which covers all the cusps and approached the contact points with a slight feeling of "spring back" was selected. The crown was loaded with Glass ionomer cement (Fuji type I) and was cemented. The excess cement was wiped off. Floss was passed through the interdental areas to remove the excess cement and final fit of the crown was checked.

First, the crowns were placed in the primary mandibular right molars [Figure 4]. After immediate placement of the crowns the bite was raised initially [Figure 5a and b]. The parents were given instructions that their child might feel slight heaviness on mastication. The child was recalled after 1 week. On intraoral examination, the bite was checked, and it was found to be settled



Figure 4: Placement of stainless-steel crowns with 84, 85



Figure 5: (a and b) Raised bite after immediate placement of SSC

[Figure 6]. In the same appointment orthodontic separators were placed in the maxillary right first molar, left first and second molars.

c. The patient was recalled after 3 days. The carious molars were restored with Glass ionomer cement (Fuji type IX) and crowns were then subsequently placed in the same way in the maxillary right first molar, left first and second molars to make the patient comfortable. The bite was raised after the crown placement. The patient was recalled after 2 weeks. On intraoral examination, the patient was having no pain and discomfort and the bite was also settled [Figure 7].

DISCUSSION

Caries is a chronic, multifactorial disease, which causes destruction and demineralization of hard tissues of teeth by acid production occurring from bacterial fermentation of food.^[5,6]

The historical approach for the management of dental caries consists of the removal of the diseased tissue and replacing it with a restorative material which is considered to be invasive.

Thus, there is a need to shift the caries management approach from a surgical approach to a more holistic approach.

Hall's Technique

In 2007 a new technique was introduced in Paediatric dentistry for managing early enamel and dentinal decay in the primary molars using a Stainless-steel crown. It was called Hall technique after UK-based Scottish dentist Dr. Norna Hall.

This technique involved no local anaesthesia, no drilling and took place in a child-friendly manner. SDF is an efficient, affordable, and effective cariostatic agent.



Figure 6: Bite settled after 1 week



Figure 7: Crowns were placed in upper and lower arches; patient was completely asymptomatic and the bite has settled

The main action of fluoride is related to the remineralization of the dental hard tissues.^[7]

The advantages of SDF it is economical, minimally invasive, ease of application which can improve the behaviour of the child and help the child to cope up with the dental treatment.

Rosenblatt *et al.* in 2009 evaluated the effectiveness of (SDF) to prevent caries when compared to fluoride varnish and concluded that SDF was more effective than fluoride varnish and may be a valuable caries-preventive intervention.^[8] Another study by Gao *et al.* in 2016 investigated the clinical effectiveness of (SDF) in arresting dental caries among children and concluded that 38% of SDF was effective in arresting dentin caries in primary teeth among children. The overall percentage of active caries that became arrested was 81%.^[9]

In this case report after application of SDF to the primary carious molars the teeth were restored with Glass ionomer cement.

After the placement of stainless-steel crowns, the bite was raised initially which resolved within a few weeks which was supported by a study by Innes *et al.* that the occlusion equilibrates rapidly, usually within a few weeks.^[10] There were no reported symptoms of occlusal dysfunction or Temporomandibular Disorders the Stainless-steel crowns also act in a same way as orthodontic appliances. The temporary change the vertical dentoalveolar growth, by a transient acceleration in lower facial height and fast eruption in the remaining teeth to reach even occlusal contacts for adaptation.

CONCLUSION

Smart Hall's technique can be a minimally invasive, economical option for arresting caries as well as restoring the molars with Glass Ionomer cement and placing stainless steel crown.

Copyright and Permission Statement

We confirm that the materials included in this chapter do not violate copyright laws. Where relevant, appropriate permissions have been obtained from the original copyright holder(s). All original sources have been appropriately acknowledged and/or referenced.

REFERENCES

1. Gaidhane AM, Patil M, Khatib N, Zodpey S, Zahiruddin QS. Prevalence and determinant of early childhood caries among the children attending the Anganwadis of Wardha district, India. *Indian J Dent Res* 2013;24:199-205.
2. Fayle S. UK national clinical guidelines in paediatric dentistry. Stainless steel preformed crowns for primary molars. Faculty of dental surgery, royal college of surgeons. *Int J Paediatr Dent* 1999;9:311-4.
3. Threlfall AG, Pilkington L, Milsom KM, Blinkhorn AS, Tickle M. General dental practitioners' views on the use of stainless steel crowns to restore primary molars. *Br Dent J* 2005;199:453-5.
4. Kidd EA. How 'clean' must a cavity be before restoration? *Caries Res* 2004;38:305-13.
5. Selwitz RH, Ismail AI, Pitts NB. Dental caries. *Lancet* 2007;369:51-9.
6. Keyes P, Jordan H. Periodontal lesions in the Syrian hamster. III. Findings related to an infectious and transmissible component. *Arch Oral Biol* 1964;9:377-98.
7. Gao S, Zhao I, Hiraishi N, Duangthip D, Mei M, Lo E, *et al.* Clinical trials of silver diamine fluoride in arresting caries among children: A systematic review. *JDR Clin Trans Res* 2016;1:201-10.
8. Rosenblatt A, Stamford T, Niederman R. Silver diamine fluoride: A caries "silver-fluoride bullet". *J Dent Res* 2009;88:116-25.
9. Gao SS, Zhang S, Mei ML, Lo EC, Chu CH. Caries remineralisation and arresting effect in children by professionally applied fluoride treatment-a systematic review. *BMC Oral Health* 2016;16:12.
10. Innes NP, Stirrups DR, Evans DJ, Hall N, Leggate M. A novel technique using preformed metal crowns for managing carious primary molars in general practice: A retrospective analysis. *Br Dent J* 2006;200:451-4.