

No Drill, No Fill...A Child Friendly Technique

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ABSTRACT

Everyone thinks that baby teeth don't matter because they are going to fall out anyway. But neglecting baby teeth can set a child up for lifelong dental trouble. It is difficult to manage children by using anesthesia, drilling and filling. Hence a child friendly technique was developed which is called Hall technique. The Hall technique is a method for managing carious primary molars where decay is sealed under preformed metal crowns (PMCs) without local anesthesia, tooth preparation or any caries removal. Indications, contraindications, steps of preparation, advantages, disadvantages and few studies are included in this study.

Keywords: Hall technique, Primary molars, Stainless steel crowns.

INTRODUCTION

Neglecting baby teeth affects the permanent teeth of the child which causes lifelong dental trouble. Even though milk teeth are temporary, they need to be taken care of as carefully as permanent teeth.

Fundamentally, non-cavitated lesions in primary and especially permanent teeth are managed: professionally by preservative non-invasive means, including fluoride varnish and sealants; and daily home toothbrushing using fluoride toothpaste where the aim is to arrest lesion progression so that restorations will not be necessary [1].

Cavitated lesions are managed by repairing tooth decay or caries with a filling. These can often need replacing multiple times during someone's lifetime, therefore the researchers tried to reinforce the natural regenerative capacity of teeth to repair larger holes.

Other than these methods, a novel method was developed to manage carious primary molars by placing preformed metal crowns without local anesthesia, caries removal or tooth preparation. It was named after Dr Norna Hall, a general dentist from Scotland, who developed and used the technique for over 15 years until she retired in 2006.

JASCO HALL TECHNIQUE

The Hall Technique is a method used to seal the decayed primary teeth without local anesthesia, tooth preparation or any caries removal.

- History

- Clinical examination
- Radiography
- Vitality testing of primary molars is unreliable.
- Instead, assess the vitality and viability of a dental pulp based on a thorough assessment, including:
 - A clinical assessment of the extent and activity of a carious lesion, to decide if there is likely to be pulpal involvement.
- Clinical signs or symptoms of irreversible pulpitis, or dental abscess
- Radiographic signs or symptoms of dental abscess
- Mobility of the tooth

INDICATIONS

Teeth with:

- Proximal (Class II) lesions, cavitated or non-cavitated
- Occlusal (Class I) lesions, non-cavitated if the patient is unable to accept a fissure sealant, or conventional restoration.
- Occlusal (Class I) lesions, cavitated if the patient is unable to simply accept partial caries removal technique, or a standard restoration.
- Radiographically, a clear band of dentine should be able to be seen between the carious lesion and the dental pulp.
- Restoration of fractured primary molars
- Developmental problems both localized or generalized like

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enamel hypoplasia, dentinogenesis imperfecta, amelogenesis imperfecta, MIH.

- In patients who are at high risk of developing caries i.e. patients who have to undergo general anaesthesia for dental treatment due to rampant caries.
- Extensive tooth tissue loss due to erosion, attrition or abrasion.
- As a support for some dental appliances e.g. space maintainers
- In patients with partially submerged primary molars in order to maintain the mesiodistal space [2].

CONTRAINDICATIONS

- Clinical or radiographic signs of pulpal involvement, or periradicular pathology.
- Insufficient sound tissue left to retain the crown
- Patient co-operation where the clinician can't be confident that the crown are often fitted without endangering the patient's airway.
- Patient at risk from bacterial endocarditis. In such situations, the tooth should be managed with a conventional restoration which would include complete caries removal
- Parent or child unhappy with aesthetics.
- Patient is known to be sensitive or allergic to nickel
- More than half of the root has resorbed and the primary tooth is close to exfoliation.
- Crowns that are so weakened they might be considered unrestorable with conventional techniques [2].

MATERIALS/INSTRUMENTS

- Mirror
- Probe/explorer
- Tweezer
- Separators
- Floss – Knotted for removing excess cement
- Gauze for airway protection
- Stainless Steel crown (checked for correct size)
- Luting cement
- GIC applicator

Preoperative Instructions:

- The child and parent should be fully briefed on the procedure.
- The child should be shown the crown.
- It is important that the child knows that during the procedure they may be required to bite down to help seat the crown correctly. They must also know that the cement may not taste nice but will not last long [2].

The practical aspects of fitting a Hall Crown:

Step 1.

Assessing the tooth shape, contact points/ areas and the occlusion

Step 2.

Protecting the airway

Step 3.

Sizing a crown

Step 4.

Loading the crown with cement

Step 5.

Fitting the crown and first stage seating

Step 6.

Remove the excess cement, check fit, and second stage seating

Step 7.

Final clearance of cement, check occlusion and discharge [2].

Points to remember

- Hall crowns should not be fitted to opposing (occluding) teeth at the same appointment.
 - However, if a primary molar on either side of the identical arch needs a Hall crown (or diagonally opposite, i.e. a maxillary left primary molar and a mandibular right primary molar), then these can (and ideally should) be fitted at the same appointment, as the patient will have two crowns fitted with just one episode of bite propping.
 - It is usually not possible to fit a crown using the Hall Technique to both primary molars in the same quadrant at the same appointment; adjacent primary molars requiring Hall crowns should have them fitted at separate appointments.
 - Any adjustment of the crowns was minimal, and was limited to re-moulding the crown margins in some cases with orthodontic pliers. The margins were not trimmed on any crowns.
 - Crowns will try to follow the path of least resistance, and so may tilt towards the “easier” of the contacts.
 - Concentrate on seating the crown through the tight contact, and therefore the easy one should lookout of itself.
 - If the crown doesn't seat sufficiently, then remove it using the excavator before the cement sets.
 - If the cement has set, a high speed hand piece can be used to section the crown through the buccal and occlusal surface, following which it can easily be peeled off.
 - If fitting crowns to second primary molars, particularly in the maxilla, before the first permanent molars are erupted, keep an eye out for the first permanent molars becoming impacted against the crown margin as they erupt.
 - If a primary molar fitted with Hall crown requires a pulp therapy, then this can be carried out through the crown without needing to remove it [2].
- ### Postoperative instructions:
- Instructions for a soft diet for the rest of the day.
 - Reassurance that any blanching will dissipate within a day and the occlusion will stabilize over the following weeks.
 - After the crown is fitted using the Hall Technique, the child may find that biting feels unusual. Patients and parents should be reassured that the occlusion tends to adjust to give even contact

on both sides within weeks.

- The gums may appear blanched and feel tight to the kid initially but will settle very quickly.
- The gum may also appear blue around the crown due to the metal placement under the gum.
- Avoid giving child sticky or chewy foods after the procedure as this may displace the crown.
- It is important that the kid still brushes the tooth to assist maintain the crown [2].

ADVANTAGES

- Patients report positive experiences during and after treatment
- 97% success rate³
- Very low failure rate
- Does not require local anesthetic or tooth removal (drilling)
- Lifespan is the same as that of an intact primary tooth/durability
- Provide protection to the residual tooth structure that may be weakened.
- The technique sensitivity or the danger of creating errors during application is low.
- Reduce the amount of tooth extraction and extensive treatment.
- Desensitizes children to dental procedures, acclimatizing them and building their confidence.

DISADVANTAGES

- Metallic appearance/aesthetics
- Cannot be used when tooth is only partially erupted.
- Failure may occur due to periodontal abscess or periradicular abscess if decay has progressed too far into the tooth for it to be arrested before reaching the pulp (failure rate around 3 per 100) [3].

For success, the Hall technique requires careful case selection, a high level of clinical skill, and excellent patient management. In addition, a full and effective caries preventive programme is necessary.

DISCUSSION

Apart from non-invasive techniques like resin infiltration [4], air abrasion [5] and electrically accelerated and enhanced remineralisation [6], Hall technique is a novel method and an alternative to conventional preparation to manage carious primary teeth.

The results of a 2013 systematic review showed that incomplete caries removal can be considered advantageous, and sealing caries results in clinical and radiographic signs of inactivation of the caries lesion with tertiary dentin [7]. In an in vitro study, SSCs placed with either the Hall technique or a traditional preparation all displayed microleakage, with statistically significantly greater microleakage values in the Hall-technique SSC group. This could be due to lack of patient's biting force to seat the crown, which may have affected adaptation [8].

The acceptability and outcome of the technique at 23 months was

recorded by Innes et al. The major clinical failures were irreversible pulpitis, dental abscess, loss of filling and radiographic signs of internal resorption. The minor failures were loss of filling, loss of crown, secondary caries and radiographic signs of caries progression [9]. Van der Zee et al measured the propping, occlusal interference and opening the bite after placement of crowns using the Hall technique and they observed that the overbite had equilibrated after 30 days [10].

Eventhough the studies declare that the occlusal contact re-establishes without any long term issue, the reason for some dentists not using the Hall technique is that it will increase the occlusal vertical dimension. Hall PMCs on second primary molars caused slightly more of an increase than Hall PMCs on first primary molars [11]. The qualitative findings support an overall positive reaction to the Hall Technique from the parents [12].

CONCLUSION

Hall Technique is being used as an alternative to conventional preparation and not as a primary treatment for all patients. It's not a "fit and forget" technique. Patients should be reviewed on a normal recall schedule, with radiographic examination in line with current recommendations, and the Hall Technique should be used in conjunction with a full preventive programme.

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