



RESEARCH ARTICLE

THE HALL TECHNIQUE

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ARTICLE INFO

Article History:

Received 28th August, 2019

Received in revised form

04th September, 2019

Accepted 14th October, 2019

Published online 21st November, 2019

Keywords:

Dental Caries,

PMC,

Hall Technique.

ABSTRACT

The high level of dental caries in the child population, with 55% of 5 year old children having visible decay into dentine and 16% having experienced dental extractions, imposes a considerable burden on children, their parents, and the dental team looking after them. Many children have to accept toothache as a part of normal daily life. Alongside the extensive untreated caries, there has been intense debate on whether restorative care provided in general dental practice is an effective way of managing children with dental caries in primary teeth. It is against this background of low levels of restorative treatment provision in Primary Care, and uncertainty as to the effectiveness of that treatment even if it is provided, that a novel, simplified method of using PMCs (Preformed Metal Crowns), the Hall Technique, has been investigated.³ This method uses PMCs, which are filled with glass-ionomer cement, and simply pushed onto the tooth with no caries removal, local anaesthesia or tooth preparation. Recently published audit data from Dr Hall's practice records has indicated that the technique might have similar survival rates to other, more conventional, restorative options currently being used in Primary Care.

INTRODUCTION

The high level of dental caries in the child population, with 55% of 5 year old children having visible decay into dentine and 16% having experienced dental extractions, imposes a considerable burden on children, their parents, and the dental team looking after them. Many children have to accept toothache as a part of normal daily life. Alongside the extensive untreated caries, there has been intense debate on whether restorative care provided in general dental practice is an effective way of managing children with dental caries in primary teeth (Kindelan, 2008; <http://www.dundee.ac.uk/tuith/Articles/rt03.htm>). There is evidence that restorations for primary teeth can be effective in terms of longevity, but very little of this evidence is derived from the Primary Care setting. In addition, there is no clear evidence that restorative management of dental caries is associated with a reduction in pain and sepsis experienced by children, although there is a suggestion this may be so. It is against this background of low levels of restorative treatment provision in Primary Care, and uncertainty as to the effectiveness of that treatment even if it is provided, that a novel, simplified method of using PMCs (Preformed Metal Crowns), the Hall Technique, has been investigated (Simple Push Filling Wins Crown In Battle Against Tooth Decay, 2007).

This method uses PMCs, which are filled with glass-ionomer cement, and simply pushed onto the tooth with no caries removal, local anaesthesia or tooth preparation. Recently published audit data from Dr Hall's practice records has indicated that the technique might have similar survival rates to other, more conventional, restorative options currently being used in Primary Care (Butani, 2005).

Background: The technique is named after Dr Norma Hall, a general dental practitioner from Scotland, who developed and used the technique for over 15 years until she retired in 2006. Preformed metal crowns (PMCs) have been used for restoring primary molars since 1950, and have become the accepted restoration of choice for the primary molar with caries affecting more than one surface, with a proven success rate as a restoration. Although popular with specialists, many clinicians find PMCs difficult to fit using the conventional approach, which requires the use of local anaesthetic injections and extensive tooth preparation. There is also an issue of potential damage to the adjacent first permanent molar when preparing a second primary molar for a PMC. For this, and other reasons, PMCs are not widely used in the UK, forming less than 1% of all restorations provided for children (Braff, 1975). A study was conducted on children between 5 - 9 years-of-age who had a carious primary molar in need of restoration. Eight dentists (four general dental practitioners and four hospital dentists) were asked to recruit 10 children each, and to attempt to fit one preformed metal crown for each child using the Hall technique. Patient, parent, and dentist acceptability of the technique was determined through questionnaire. The results revealed that seven dentists recruited 49 patients over

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the study period and successfully fitted crowns to 45 patients. All 45 patients found the technique acceptable and would be happy to have the technique used on them again. 44 of the parents were happy with the technique, with the one exception being a parent who objected to the colour of the crown. No patient returned with discomfort. All six dentists who successfully fitted crowns found the technique acceptable and would use it again (Dawson, 1981). Another general dental practice based, split mouth, randomized controlled trial (132 children, aged 3–10) was conducted in Scotland. General dental practitioners (GDPs, $n = 17$) placed conventional (Control) restorations in carious primary molars, and Hall Technique PMCs on the contralateral molar (Messer, 1988). Dentists ranked the degree of discomfort they felt the child experienced for each procedure; then children, their carers and dentists stated which technique they preferred. The teeth were followed up clinically and radiographically. 128 conventional restorations were placed on 132 control teeth, and 128 PMCs on 132 intervention teeth. Using a 5 point scale, 118 Hall PMCs (89%) were rated as no apparent discomfort up to mild, not significant; for Control restorations the figure was 103 (78%). Significant, unacceptable discomfort was recorded for two Hall PMCs (1.5%) and six Control restorations (4.5%) (Einwag, 1996). 77% of children, 83% of carers and 81% of dentists who expressed a preference, preferred the Hall technique, and this was significant. The Hall Technique was preferred to conventional restorations by the majority of children, carers and GDPs. After two years, Hall PMCs showed more favourable outcomes for pulpal health and restoration longevity than conventional restorations. The Hall Technique appears to offer an effective treatment option for carious primary molar teeth (Rahimtoola et al., 2000).

How to use hall technique in clinical practice: The Hall technique is can be used to manage primary molar teeth affected by dental caries. Other management methods are available. As with every treatment decision, clinicians should use their own clinical judgement in deciding which method is appropriate for their patient and themselves, with consent being obtained from the patient, and parent, for that treatment. Although apparently very simple, the Hall technique requires a confident, skilled approach from the operator if the crown is to be successfully fitted (van Bochove, 2006; Schriks, 2003; Innes, 2006; Evans, 2000). The technique will not suit every clinician, nor every child. In addition, there are some primary molars where, for a combination of reasons, even clinicians very familiar with the Hall technique cannot successfully fit a crown.



Orientation of gauze



Positioned in mouth



Elastoplast tape securing crown

For example, should these lower Ds become carious, their unusual morphology would complicate the fitting of a PMC of standard shape. A full history and clinical examination, including bitewing radiography, should be carried out.

- There should be no clinical or radiographic signs of pulpal involvement
- The tooth should have sufficient sound tissue left to retain the crown
- Patient co-operation should be such that the clinician should be confident that the crown can be fitted without endangering the patient's airway
- If the patient is at risk from bacterial endocarditis, the tooth should be managed with a conventional restoration

Instruments Required

Essential

- Mirror
- Straight probe
- To remove separators, if used, and to remove set cement following fitting
- Excavator
- To remove crown if necessary, and also useful for cement removal
- Flat plastic
- To load crown with cement
- Cotton wool rolls
- To wipe away cement

Useful

- Orthodontic biting stick can be useful in seating crowns
- Band forming pliers
- can be useful for adjusting crowns, particularly where the primary molar has lost length mesio-distally due to caries
- Gauze to protect the airway and wipe off excess cement or
- Elastoplast to secure the crown for airway protection

The procedure

Sit the child upright: A gauze swab square can be used to protect the airway by placing it between the tongue and the tooth where the crown is to be fitted. It should extend to the palate and round the back of the mouth in front of the fauces. Alternatively, use a clean piece of Elastoplast tape to secure the crown (see below). If you are not confident about being able to control the crown at all stages until it is cemented, then do not use the Hall Technique.

- You should aim to fit the smallest size of crown which will seat. Select one which covers all the cusps, and approaches the contact points, with a slight feeling of "spring back".
- Dry the crown, and fill with glass-ionomer luting cement, ensuring the crown is well filled, with no air inclusions
- If possible, the tooth should be dried prior to cementation, but otherwise there is no caries removal or tooth preparation of any kind. No local anaesthetic injection is given.
- If the cavity is large, some cement may be placed within it, just before placing the crown.
- Place the crown over the tooth. It is not always easy, and requires a committed, positive approach from the clinician.

The child needs to have complete confidence that you know exactly what you are doing; that what you are asking them to do is perfectly reasonable, and that it will not be uncomfortable.

There are two main methods of seating the crowns:

- The clinician seats the crown by finger pressure
- The child seats the crown by biting on it
- A combination of these two methods may be necessary or preferred.

Some clinicians will seat the crown with firm finger pressure alone. For mandibular teeth, a useful method is to place your thumb on the occlusal surface of the crown, with the four fingers of your hand placed under the border of the mandible to spread the force as you apply firm pressure with your

thumb. For maxillary teeth, the child's head may be supported by the back of the dental chair, or sometimes by placing your other forearm gently on the top of their head to balance the force applied by fitting the crown. It is crucial that the orientation of the crown relative to the tooth is checked either during, or immediately after, seating the crown. If it does not appear to be going on straight, then you must give the crown some physical encouragement to go in the correct direction. If it is not possible to seat it then it should be removed before the cement sets. With either technique, excess cement will be extruded from the crown margins, and the taste of this can upset children.

In anticipation of this, as soon as the crown is seated, the child should be asked to open their mouth, and the cement wiped off with a cotton wool roll held ready for this purpose. If a gauze swab has been used to protect the airway, this can be used to wipe away excess cement from the lingual/ palatal side of the tooth as it is being removed. If it is obvious that the crown has not seated, and finger pressure fails to seat it, then it should be removed immediately using the large excavator which you should have placed within easy reach. If you do not work swiftly, you may have to section the crown to remove it. Once excess cement has been removed, the child should be asked to bite firmly on the crown for 2-3 minutes, or the crown should be held down with firm finger pressure as an alternative. This is important, because the crowns can spring back a short way, sucking back the cement from the margins and potentially causing breaches in the seal. Remove excess cement, floss between the contacts

Advantages: The Hall Technique is a relatively simple technique that does not involve the use of local anesthetic and conventional crown preparation (Murray et al., 2003). Children will find it more convenient to the usual restorative procedures as they play an important role in placing it into the mouth and fixing it, and above all this can be used in developing countries and in dental treatments in war or disaster struck areas where large number of children require treatment with very less time and minimal instruments.

Disadvantages: The Hall technique could not be used on teeth with either obvious pulpal involvement clinically, or with insufficient tooth tissue remaining to retain the crown. Children play an important role in the placement of the crown as they have to bite it and guide it into the occlusion with suitable force, so it is not correctly done then chances of failure are high and many children complain about the metallic taste in the mouth after the placement of the crown.¹⁵ If the tooth is unrestorable by a conventionally fitted PMC, then it is probably not suitable for a Hall crown and if there are two adjacent teeth that require restoration it will be difficult to place the crowns in correct position.

Conclusion

The Hall technique would seem to be acceptable to a range of dentists, and their patients and parents because of the ease with which the technique is carried out.¹⁵ The use of this technique in providing treatment to the needy group is justifiable, however to include this into a part of a routine clinical practice more clinical trials are needed.

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