The Hall Technique: The novel method in restoring the carious primary molar that is challenging old concepts. A new tool in the general dentist’s toolbox?

By Dr. Iyad Hussein

Introduction

Primary molar dental caries in childhood is a disease of epidemic proportions that affects all modern societies. Despite a World Health Organization (WHO) pledge in 1981 to render 50% of 5-6 year old children caries free by 2000, many developing countries remain off target to date. In the UAE, a survey showed that less than 18% of 5 year old children were caries-free (2). In comparison, 45% of 6 year-old and 60% of 3 year-old children in Sweden were noted to be caries-free (3, 4) and recent surveys in England showed that 85% of 5 year old were free from obvious caries (5). The size of decay as a problem in a society is often expressed as “dmft” (decayed, missing & filled teeth) and is well established as the key measure of caries experience in dental epidemiology. The UAE regions dmft index ranged from 3.8 in Ajman to 6.6 in Dubai (2).

whilst the England dmft figure average was a mere 0.48 (5). This highlights countries/social inequalities where primary dental caries is concerned.

Conventional management of the carious primary molar

Primary tooth decay management represents a challenge for those who dentally care for children, whether they are general dental practitioners (GDPs) or specialists in paediatric dentistry. For the past 5 decades, the dental literature in the USA and Europe had advocated treating the deep carious primary molar in using the conventional “drill and fill” philosophy. That is, give local anaesthesia (LA) to the tooth, drill the carious tissue out (often after placing a rubber dam—Figure 1) using a high and slow speed drill (Figure 2), and fill the cavity with a restorative material (often a preformed stainless steel crown or SSC) after carrying out pulp therapy (Figure 5).

Although aesthetic crowns are available for primary teeth, they are very expensive and the SSC remains the crown of choice for the carious primary molar (6,7).

This relatively complex treatment is demanding for all parties involved; the dentist, the parent but especially the child. Even in very cooperative children the skills of a specialist paediatric dentist are often required to achieve such treatment. It is well known that the larger proportion of children patients go untreated (8). Whilst there may be GDPs with a special interest in children’s dentistry, many find managing such young children a major challenge, and many patients go untreated (8). Whilst all paediatric dentists agree that SSCs are the restorations of choice for multi surface caries in the primary molars (7), the conventional doctrine of their placement (i.e., using LA and drills) has been challenged by less invasive techniques such as the “biological approach” which is embodied by the “Hall technique” (8-10).

The Hall technique: “Sealing in” the caries

In 2007 a new technique took the paediatric dentistry world by storm. It recommended a simple way in managing early enamel and dentinal decay in the primary molar using a SSC; it was named the Hall technique (8). This technique involved no local anaesthesia, no rubber dam, no drilling and took place in a child friendly play manner. In essence there was no dental caries removal at all from the crown of the primary molar; it was named the Hall technique in a child friendly play manner. The Hall technique involves the removal of sugary substrate, thus altering the lesion’s bacterial plaque ultimately leading to the arrest of the caries process in the tooth. The Hall technique involves the

CARRIERE® MOTION™

CLASS II APPLIANCE

Simplicity, ease of use and patient compliance add up to fast, more predictable results. With its sleek, aesthetic and non-invasive design, the Motion Appliance shortens treatment time by up to four months.

Easier than Herbst®, simpler than Forsus®, and faster than elastics alone, the Motion Appliance can be a real game changer for your practice.

New Carriere® SLX® Bracket

Molar Ball & Socket

Fixed Cusp Pad with Hook

Sleek and Non-Invasive

Class II corrected in 3 months, 1 week

Total treatment time 3 months with SLX

OrthoOrganizers.com

© 2015 Ortho Organizers, Inc. All rights reserved.
Appointment 2:
For restoration with a SSC Hall technique: tooth 54 (distal carious lesion) with orthodontic separators mesially and distally on tooth intended to be restored for orthodontic separators mesially and distally. This dis- appears within the hour.

following simple steps that are usually carried out over a couple of 5 minute appointments

A - Hall technique:
Appointment 1:
1) Case selection: Diagnosing asymptomatic early enamel and dentine caries in a primary molar, clinically and radiographically (using bitewings). Bitewings may typically show proximal lesions that are not visible clinically but are diagnosed radiographically (Figures 4 a & b). There should be a clear radiolucency between the carious lesion and pulp of the tooth intended to be restored with the SSC Hall technique. There should be no signs or symptoms of pulpal pathosis; the lesion should be detected prior to the development of symptoms (See Table 1).
2) Fitting orthodontic separators: Placement of two elastic orthodontic separators mesially and distally on tooth intended for restoration with a SSC Hall technique (see Figure 5)

B - Hall Technique:
Appointment 2:
1) Removal of separators: After 5-5 days after the first appointment, the patient returns for the removal of the orthodontic separators. Space is created mesially and distally that will negate the need for crown preparation (see Figure 6)
2) Stainless steel crown selection and placement: The patient is set up in the supine position and the operator selects the correct SSC in terms of tooth number and size. After selecting the correct SSC, it is tried passively on the tooth to assure that it fits with gentle pressure applied to the SSC over the contact points but not completely through. For safety purposes the crown is stuck to the operator’s finger, while trying out the size, using an adhesive tape/eleastoplast. The SSC should not be too loose or too tight. The crown should “spring back” from the contact points while trying it on the tooth with this technique. After crown selection, the crown should then be filled with a self curing glass ionomer cement and positioned over and on the tooth. The operator then digitally presses the crown through the contact points so that the crown flexibly “clicks” on the tooth and fits snugly. The patient is then asked to bite on a cotton wool roll to finish off its correct positioning (see Figure 7). The excess of the glass ionomer cement is wiped off. The crown should be level with the occlusal plane and blanching of the gingivae will be noticed buccally and palatally indicating an adequate seal (see Figure 8). The patient may feel a little tightness, however that and the gingival blanching disappear within an hour at most (Figure 9). Equated to the tightness of a brand new pair of shoes around feet, it resolves spontaneously after a while. Occasionally the bite may be raised by a millimetre, however dento-alveolar compensations resolves this issue within a week or two.

Multiple SSCs using the Hall technique could be placed in one appointment over several appointments without any local anae-thesia or drilling (see Figure 10). It is possible to place two SSCs using the Hall technique in one appointment. This is possible in a) contra-lateral primary molars in the same arch, for example placement of two SSCs on upper 6s (teeth 55 and 65) or lower Ds (74, 84), b) Diagonal teeth in opposing arches, for example, placement of two SSCs on tooth 56 and 75, or placement of SSCs on 65 and 85.

C - Hall technique:
Follow up appointments:
All teeth treated with the Hall technique should be followed up clinically and radiographically (see Figure 11) following the same protocols as conventional treatments. The tooth should be assessed for pain, swelling and radiographically for signs of interradicular radio-lucency or root resorption.

Discussion
The Hall technique was named after Dr Norma Hall, a Scottish dentist who worked as a salaried GDP in a remote high dental caries risk area (Scottish Western Isles) north west of the UK. As she faced a high proportion of children with dental caries (drift of Scotland was around 2.54 at the time), and was not a specialist in paediatric dentistry, she thought “outside the box” and used SSCs to “seal in” dental caries with no preparation and no LA.

LA. This technique caught the attention of the team of paediatric dentists, dental caries and clinical researchers at Dundee Dental School in Scotland (11). They took an interest in Dr Hall’s novel work (she had audited her own work) as they were facing very high levels of dental caries themselves. Subsequently a pilot trial by Evans et al was published online in 2000 (11). This prospective case controlled study assessed 49 patients who were fitted with SSC crowns using the Hall technique from the patient, caregiver and dentist point of view. It was deemed a success as the study reported very high levels of satisfaction. In addition, the team of Dundee Dental School researchers shared their findings with The British Society of Paediatric Dentistry UK national conference meeting in Edinburgh (UK) in the same year (2000) to the awareness of its audience (the author of this paper was present that day and recalls the reaction). Because the initial reaction to this technique by other paediatric dentists in the UK was profound (12), the team of Dundee University researchers (Innes et al) undertook it upon themselves to investigate this technique by employing the most robust methods of evidence-based dentistry; namely a prospective randomized controlled clinical trial and first published their results in 2007 (8).

This study formed the pivotal event that made this technique a “school of thought” in paediatric dentistry by its own right. Because of its importance in this study, it will be discussed further below.

The 2007 study (8) was a prospective split mouth randomized control study that recruited 152 child patients aged between 5-10 all of whom had two matched dental carious lesions. Each child acted as his/her own control. The two lesions each child had were similar to the lesions highlighted in the example given above (Figure 4a); there were no clinical or radiographic signs of pulpal pathosis. One lesion was randomly treated using the Hall technique and the other was randomly treated conventionally (mostly by glass ionomer cements). Seventeen GDPs treated these patients under the auspices of the paediatric dentistry team at Dundee University.

Can You See Who’s Wearing Braces?
(Your patients can’t see them either)

NEW DAMON CLEAR2
Introducing the only 100% clear self-ligating bracket, now with 2x the rotational control* for meticulous finishing and faster treatment. An aesthetic solution for image-conscious adults and teens, Damon Clear provides the performance and control needed to treat a wide variety of cases with exceptional results.

Order your Damon Clear2 brackets today at ormco.com
SSCs placed with the traditional technique in dental practice (18). The criticism centered on the discrepancy between adolescents, and the conventional school of thought concerning the Hall technique in paediatric dentistry. For instance, a study by Machiulskiene V, Evans DJP, Foley, JI, Innes, NP, Pavitt, SH, Roughley M, Lamont T, Keightley A, Gardner A, Hussein I, De Souza N, Blair K, Innes NP, Pavitt SH, Hall, N. The technique manual showing the technique step by step is available online to be downloaded for free for those dentists who would like to use it in their practice (24).

Acknowledgement: The author would like to thank the patients and carers who consented to the use of the photos shown in this article.

References
1) World Health Organization.
2) Hall Technique: A user manual. Free download for those dentists who would like to use it in their practice. 2012;34:103
3) Roberts, RF and Attari N. Dental Tribune
7) Yalgnkaya Erdemci Z, Buruk Cehreli S, and Ebru Tirali R. Vitro Investigation of Marginal Fit and Microleakage using Three Different Luting Agents. Pediatric Dent 2014;36:298-300
8) Ludvig RH, Fantasia M, Vinson LA, Platt JP, Dean JD. The stability of stainless steel crowns placed with the Hall technique; A retrospective study. JADA 2014;145(12):1248-1255
10) Hall Technique: A user manual. Free download for those dentists who would like to use it in their practice. 2012;34:103
12) Roberts, RF and Attari N. Dental Tribune
13) Wyckoff RL, Hassab H and El-Nadeef MAI. Caries management: A pan-European consensus. However, the Hall technique in countries where the authors found that the Hall technique and 94% of SSCs placed with the traditional technique were used. The Hall technique was similar in its success outcomes to those SSCs placed conventionally. This interesting debate within the paediatric dental circle is still ongoing even as this article is being written, and the debate continues as an emotional one as it is scientifi c. However, the Hall technique is now becoming more prominent ones in dental curricula in 15 out of 16 dental schools in the United King- dom (19) and more than half of European paediatric dentistry postgraduates will consider using this technique in managing child patients (20). There had been some concerns that Hall SSCs open the bite after place- ment by 1 mm on average, but there was clinical evidence that the bite resolves itself with dento-alveolar compensation taking place. The bite returns to normal levels within a week (21, 22, 25). A recent abstract submission to the International Association of Dental Research highlighted that mild un- certainty of the crowned teeth takes place (22), and this contributed to the self correction of the high bite. This was based on a study that looked at the immediate post op/6 weeks follow up of SSC placement in 10 patients. The measurements were carried out using photos, clinical measurements, models and lasing SD evaluation. The bite had returned to normal levels after 2 weeks (22).

Indications for the Hall tech- nique
SSCs placed using the Hall tech- nique are not suitable for all children with crowns. There are selection criteria (21) that should be assessed before con- sidering this technique. These are summarized in Table 1. The dentist should consider the Hall technique as one of the available options if the patient is unrestorable with conventional techniques but not as a replacement for conventional methods.

Conclusion
Dental caries is an epidemic disease of childhood. While preven- tion is of essence, in a society where children are at risk of dental caries, its treatment can be challeng- ing especially in young children. The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9). Conclusion
The Hall technique is now becoming more popular as an alternative treatment for dental caries in children. However, The Hall technique is now becoming more popular as an alternative treatment for dental caries in children. However, this technique is not suitable for all children. It is a newly developed technique mainly for the management of carious primary molars but not as prevalent in younger children. Its treatment can be challeng- ing especially in young children. The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9). Conclusion
The Hall technique is now becoming more popular as an alternative treatment for dental caries in children. However, this technique is not suitable for all children. It is a newly developed technique mainly for the management of carious primary molars but not as prevalent in younger children. Its treatment can be challeng- ing especially in young children. The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9). Conclusion
The Hall technique is now becoming more popular as an alternative treatment for dental caries in children. However, this technique is not suitable for all children. It is a newly developed technique mainly for the management of carious primary molars but not as prevalent in younger children. Its treatment can be challeng- ing especially in young children. The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9). Conclusion
The Hall technique is now becoming more popular as an alternative treatment for dental caries in children. However, this technique is not suitable for all children. It is a newly developed technique mainly for the management of carious primary molars but not as prevalent in younger children. Its treatment can be challeng- ing especially in young children. The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).

The results were an outstanding favourable outcomes for pulpal health and restoration longevity in SSC placement compared to the conventional restorations used in the same study (9).