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 (1), many developing countries remained 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 olds 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 (3). 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 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. That is, give local anaesthesia, no rubber dam, no drilling and take place in a child friendly play manner. In essence there was no dental caries removal at all from 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 carie removal at all from 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 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 primary molar using a SSC; it was named the Hall technique (8).

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 primary molar using a SSC; it was named the Hall technique (8).

For the past 5 decades, the dental literature in the USA and Europe had advocated treating the deep carious primary molar using the conventional “drill and fill” philosophy. That is, give local anaesthesia (LA) to the child by injection to anaesthetise the tooth, drill the carious tissue out (often after placing a rubber dam-Figure 1) using a high and slow speed drill (Figure 2), restore the primary tooth 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 (9). 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 child patients are seen in the general dental practice (GDP) services rather than secondary dental services (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).
is stuck to the operator’s finger, the SSC over the contact points with gentle pressure applied to the tooth to assure that it fits and the operator selects the coronal and placement: The patient

2) Stainless steel crown selection

need for crown preparation (see Figures 6a & b). There should be a clear

B - Hall Technique:

A - Hall Technique: Appointment 1:

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Figure 4: The Hall Technique: Case selection: Figure 6: The Hall Technique: tooth 34 with sufficient space after orthodontic separa-

Figure 8: The Hall Technique: One week later. The SSC is level with the occlusal plane and no blanching or pain. The

Figure 9: The Hall Technique: Inmedi-
atate post op: The SSC is fully cemented on tooth 34. The excess cement is removed. Some blanching is noticed buccally and palatally. This disappears 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 radio-

graphically (using bitewings). Bitewings may typically show approximal lesions that are not visible clinically but are diag-

dosed radiographically (Figures 4 a & b). There should be a clear radiolucency band 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 5-3 days the patient returns for the removal of the orthodontic separ-

ators. Space is created mesially and distally that will negate the need for crown preparation (see Figure 6)

2) Stainless steel crown selec-

tion and placement: The patient is sat up in the supine position and the operator selects the cor-

rect SSC in terms of tooth num-

ber 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 safely purposes the crown is stuck to the operator’s finger, while trying out the size, using an adhesive tape/elastoplast. The SSC should not be too loose or too tight. The crown should “spring back” from the contact points while trying on the tooth at the time of insertion. 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 press the crown through the contact points so that the crown flexibil-

ly “clicks” on the tooth and fits snugly. The patient is then asked to bite on a cotton wool roll to finish off its correct position-

ing (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 or not less (Figure 9). Equated to the tightness of a hand new pair of shoes around feet, it resolves spontaneously after a while. Occasionally the bite may be raised by a milli-

metre, however dento-alveolar swellings 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 West-

ern Isles) north west of the UK. As she faced a high proportion of children with dental caries (dental Scotland was around 2.54 at the time), and was not a special-

ist in paediatric dentistry, she thought “outside the box” and used SSCs to “seal in” dental car-

ries with no preparation and no anaesthesia or drilling (see Figure 10). The technique caught the attention of the team of paediatric dentists/clinical researchers at Dundee Dental School in Scot-

land (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. Sub-

sequently a pilot trial by Evans et al was published online in 2000 (11). This prospective

case controlled study assessed 49 pa-

tients 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 satis-

faction. In addition, the team of Dundee Dental School researchers shared their findings with The British Society of Paediat-

ric Dentistry UK national con-

ference meeting in Edinburgh (UK) in the same year (2000) to the astonishment of its audi-

ence (the author of this paper was present that day and recalls the reaction). Because the ini-

tial reaction to this technique by other paediatric dentists in the UK was profound (12), the team of Dundee University research-

ers (Innes et al) undertook it upon themselves to investigate this technique by employing the most robust methods of evi-

dence-based dentistry; namely a prospective randomized con-

trolled clinical trial and first pub-

lished 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 of this study, it will be discussed further below.

The 2007 study (8) was a pro-

spective 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 le-

sions highlighted in the example given above (Figure 4a); there were no clinical or radiographic signs of pulpal pathosis. One le-

sion was randomly treated using the Hall technique and the other was randomly treated conven-

tionally (mostly by glass iono-

mer cements). Seventeen GDPs treated these patients under the auspices of the paediatric den-

tistry team at Dundee University.

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The results were an outstanding success rate of 98% for the Hall technique compared to the control restorations 85% (in terms of major failures, pain due to pulpitis, etc.). Furthermore, the GDC concluded that “The Hall Technique was preferred to conventional restorations by the majority of children, parents and GPs.” After two years, Hall PMCs showed more favorable outcomes for pulp health and restoration longevity than conventional restorations. This was a retrospective clinical study performed in Dundee. Hall PMCs showed a better outcome than the control restorations in the first year follow up in the same study (9).

### Table 1. Indications and contra-indications of the Hall technique.

<table>
<thead>
<tr>
<th>Indication</th>
<th>Contra-indication</th>
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<tbody>
<tr>
<td>Tooth decay</td>
<td>Loss of tooth structure</td>
</tr>
<tr>
<td>Gross caries</td>
<td>Severe tooth mobility</td>
</tr>
<tr>
<td>Severe pain</td>
<td>Presence of a fracture</td>
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#### Acknowledgement

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

### References

5. Oral health survey of three-year-old children 85% (in terms of major failures, pain due to pulpitis, etc.). Furthermore, the GDC concluded that “The Hall Technique was preferred to conventional restorations by the majority of children, parents and GPs.” After two years, Hall PMCs showed more favorable outcomes for pulp health and restoration longevity than conventional restorations. This was a retrospective clinical study performed in Dundee. Hall PMCs showed a better outcome than the control restorations in the first year follow up in the same study (9).

#### Conclusion

Cavitation is an emotional disease of childhood. While pre- vention is of essence, in a society where sugar consumption is on the rise, their treatment can be challenging especially in young children. The dentist should consider the Hall technique as one of the available methods for certain carious primary molars but not as a replacement for conventional methods.