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 88% 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 (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 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 (8). 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 (9). 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 carious lesion. The technique relied on sealing the caries lesion in situ using a biocidal agent. In 2007 a technique called the “Hall technique” (8-10)

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is stuck to the operator’s finger, for safety purposes the crown but not completely through. They are left in situ for 3-5 days.

Figure 6: The Hall Technique: tooth 34 with sufficient space after orthodontic separator removal

swelling and radiographically for signs of interradicular radio- lucency or root resection.

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 age 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. This 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. Subsequently a pilot trial by Evans et al was published online in 2000 (11). This prospective 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 sat- isfaction. In addition, the team of Dundee Dental School research- ers 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

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UK was profound (12), the team of Dundee University research- ers (Iynes 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 paediat-ric 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 les- sons 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.
The results were an outstanding success rate of 98% for the Hall SSCs in contrast to the control restorations 85% (in terms of major failures), pain due to pressure, or pain during the procedure. Furthermore, it was concluded that “The Hall Technique was preferred to conventional restoration by the child, carers and students”. This was a retrospective clinical study performed by M. El-Nadeef and E.P. Hassab, where dental caries is rampant, the child-friendly treatment should be assessed before considering any primary dental treatment. These results highlight that mild intrusion of the crown could be fitted with minimal inconvenience to the child in a friendly way. This will neutralize the need for LA injection, rubber dam, desensitization, and the reader is asked to compare Figure 3 (c & d) to Figures 10 (a & b); one patient had returned to normal levels within a week, and the carious lesion needs to be detected early enough before it causes pulpal symptoms, emphasizing on the importance of early diagnosis using clinical examinations coupled with bitewings radiographs. The criticism centered on the Hall technique in paediatric dentistry, the Hall technique must become part of the armamentarium in the fight against dental caries. The Hall technique’s manual is downloadable online. The Hall technique in managing carious primary molars by dental postgraduates will consider using 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). The Hall technique for restorative dentistry in primary dentition is being written, and the debate continues.

Table 1. Indications and contraindications of the Hall technique.

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<th>Indications</th>
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<td>1. Caries lesions that are still on the way to be arrested.</td>
<td>1. Severe mesial or distal caries lesions</td>
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<tr>
<td>2. Caries lesions can be treated with a minimal procedure.</td>
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</tr>
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The Hall technique can be used in the permanent dentition as well but the literature is not considered the gold standard for this technique. The pediatric dentists and the conventional school of thought became apparent. The president of the ABDT stated that “while we may not have agreed with your British and Scottish colleagues on every approach taken, we all agreed that we benefitted from seeing how others prac- ticed. These differences looked like success of the Hall technique and its study design was question- able (15). The critics centered on the control restorations used in the study, dental procedures such as caries removal, and the use of rubber dam were not considered the gold standard restorations that pediatric dentists use in the USA; namely, the conventional treatment modality outlined in Figures 1, 2 & 5 above (no rubber dam, high speed drill and SSCs). In addi- tion, in vitro laboratory studies showed that SSCs were not effective as compared to the Hall technique exhibited micro-leakage when using glass ionomer cements, whereas the latter was not a clinical study and the relevance of its findings is unknown. Dr. Iyad Hussein

References