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, 15% of 6 year old and 80% 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 5.8 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 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 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).

The Hall technique: “Sealing in the caries”

In 2007 a new technique took the paediatric dental 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 carious lesion in situ cutting off its supply 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

Turn CLASS II INTO SIMPLE CLASS I PATIENTS
For safety purposes the crown rect SSC in terms of tooth number is sat up in the supine position and placement: The patient need for crown preparation (see Figure 6).

B - Hall technique:

1) Removal of separators: After orthodontic separators are removed, the patient returns for the first appointment. This is possible in: a) contra-lateral primary molars in the same arch, for example placement of two SSC on upper 55 and 65 or lower Ds (74, 84); b) Diagonal teeth in opposing arches, for example, placement of two SSC on tooth 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, sinuses, swelling and radiographically for signs of interradicular radioopacity or root resorption.

Discussion

The Hall technique was named after Dr. Norman Hall, a Scottish dentist who worked as a salaried GDP in a remote high dental caries risk area (Scottish Wester Ross) north west of the UK. As she faced a high proportion of children with dental caries (dmft of 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 caries with no preparation and no I.A. 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. Sub- sequently 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 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 paedi- atric 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 SSCs, compared to the control root restorations 85% (in terms of major failures). Due to promising results for two years, further studies concluded that "The Hall Technique was preferred to conventional restoration by practitioners and patients due to the shorter treatment time, easier chair side preparation, less pain, less need for nitrous oxide use, and children's improved acceptance of the technique." However, the authors acknowledged that further studies are needed to confirm these findings.

Conclusion

Dental caries is an epidemic disease of childhood. While prevention is of essence, in a society where prevention is often as emotional as it is scientific. However, the Hall technique is now becoming more popular because it can be used formally in the undergraduate curricula in 13 out of 16 dental schools in the United Kingdom (9) and more than half of European paediatric dentistry postgraduates will consider using this technique in managing child patients (10). There have been some concerns that Hall SSCs open the bite after place measurement by 1 mm on average, but there is clinical evidence that the bite resolves itself with dento-axial 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 Dental journal (1999), Sweden. Part III--A longitudinal clinical study and the relevance of the Hall technique. The crown could be fitted with minimal inconvenience to the child in a friendly way. This will negate the need for LA injection, rubber dam and the carrying out of the restorations. A study is asked to compare Figures 8 (a & b) to Figures (11a) and (11b) while the other did not have any for the SSC placed at the clinical guidelines in Paediatric Dentistry: Stainless steel preferred crowns for primary teeth. International Journal of Paediatric Dentistry 2008; 18 (Supplement 1):1–9. 3) Innes NF; Evans DJP, and Stirrups DR, The Hall technique; a randomised controlled clinical trial of a novel method of managing carious primary molars in general dental practice: acceptability of the technique and outcomes at 2 months. BMC Oral Health 2007, 7:18. Available online at http://www.biomedcentral.com/1472-6831/7/18 4) Innes NF; Evans DJP and Stirrups DR. The Hall Technique for Management of Carious Primary Molars. Randomized Controlled Trial, 5-year Results. J Dent Res 90(6):1442–1449, 2011. 5) Kiff, E. Should Deciduous Teeth be Restored? Reflections of a General Practitioner. Dent Update 2012; 59:150–166. 6) Evans, DJ, Southwell, C, AP, Foley, J, Innes, NF, Pavitt, SH, and Hall, N. The Hall technique: a pilot trial of a novel use of pre-formed metal crowns for managing carious primary teeth. Tuith Online, December 2000. Available online at http://dental.dundee.ac.uk/tuith/Articles/r05.htm 7) Roberts, RF and Attari N. The wide gull. Letter to the BJD, June 2006 8) Santamaria RM, Innes NPT, Machiulskiene V, Evans DJP and Splinter CH. Caries Management Strategies for Primary Molars: 1-Yr Randomized Control Trial Results. Accepted for publication in International Journal of Dentistry Research 2014. 9) Santamaria RM; Innes NPT, Machiulskiene V, Evans DJP and Splinter CH. Caries Acceptability of Different caries management strategies for primary molars in a RCT. (Accepted for publication in the International Journal of Paediatric Dentistry). 10) The Magazine of the American Academy of Pediatric Dentistry Online. Available http://www.pediatricdentistrytoday.org/2015/ September/XLI5/5/news/arti
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