The “All Hall” case: A case report of maximum capacity use of the Hall technique in a single child patient

By Dr. Batool Ghaith, Dubai & Dr. Iyad Hussein, Dubai

Abstract
Managing the carious primary molar in children using the “Hall Technique” is a controversial but acceptable novel method. Restoring all eight carious primary molars in a single child by using this technique, however, has not been reported by those who advocate its use. We report a case in which the Hall technique was employed to maximum capacity, out with normal practice, to restore all Es and Ds in a three year old child (hence the name All Hall). Follow up showed no clinical or radiographic complications. This negated the need for unnecessary invasive treatment under local anaesthesia or general anaesthesia. In this article the concept of “All Hall” is introduced as a convenient and cost effective tool in the management of all carious primary molars in a single child. It is relevant to GDPs, working in busy practice environments, to avoid child lab treatments or GA referrals. The reader should understand that it is possible to restore eight carious primary molars in one child using the HT.

Introduction
The carious primary molar is a clinical problem reported, in the paediatric dental literature, to have several solutions. These management options range, historically starting from conventional surgical treatment involving the excision of caries (under local anaesthesia) and restoring the tooth and ending simply by managing the plaque’s biological environment employing minimal interventional techniques.

One example of the latter is the “Hall Technique or HT” which entails entombing the carious lesion by sealing it from the oral environment using a preformed metal crown (the stainless steel crown or SSC). The HT is usually prescribed to manage carious primary molars according to clear selection criteria and was developed in the UK as a child friendly treatment modality.

Although conventional restoration of all primary molars using SSCs has been the norm for many years, this had not been the same when using the HT. The operating manual of the HT stated that “Hall crowns are not a universal answer to managing all carious primary molars and the Hall Technique does not suit every carious primary molar in that child”. Therefore it became clear acceptable clinical practice, by those who advocate the use of the HT, not to restore all the primary molars in one child using this technique. In other words, restoring all carious Ds and Es in one single child, using the HT, was inadvisable. The reasoning behind this had not been clarified, but it may possibly be due to perceived concerns about the occlusion. The effect of the HT on the occlusion had been previously studied. The occlusion tended to suffer opening of the bite by 1.5mm on average, which later resolved due to possible dento-alveolar compansation or intrusion of the crowned tooth. The effect of the HT on the occlusion had been studied when one or two crowns were placed, however no study had shown the effect of restoring all Es and Ds in one child, on the occlusion.

We report a case whereas the HT was deployed to maximum capacity, contrary to the usual clinical doctrine, to restore all eight primary molars in one child. There were no known complications and the occlusion was deemed satisfactory. This case had been labeled the “All Hall” case.

Case report
A fit and healthy three year old boy (MF) attended with his father to the Department of Paediatric Dentistry at Hamdan Bin Mohammed College of Dental Medicine (HBMCMD) in Dubai Healthcare City, Dubai (UAE). The father was concerned...
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Figures 3 (a, b, c, d & e): Immediate post-treatment completion images. All Es and Ds were restored using the HT. Notice the good gingival status. Using the primary canines as a guide, opening of the bite is noted in Figures 3 (d & e). It became discernible with no astatic pain. No known trauma. Dr opted to manage TF conservatively as a ray showed no pathology. The patient by this time had no experience of LA, avoided GA and was gradually becoming cooperative.

Figures 4 (a, b, c, d & e): 9 months post-treatment. The patient had no complaints. The occlusion had equilibrated (note primary canines in Figures 4 b & d and compare to Figure 3 a, d & e). All Es and Ds remained asymptomatic. Good gingival health and oral hygiene were noted. As his cooperation improved plans are in place to monitor TF with a view to carry out pulp therapy in addition to restoring upper anteriors with composite strip crowns.

About ‘holes in his son’s teeth’. The father reported that MF suffered no pain whatsoever. After clinical and radiographic examination, MF was found to have multiple asymptomatic carious primary molar and incisor teeth fitting with the diagnosis of Severe Early Childhood Caries (S-ECC). Interestingly, MF’s eight carious primary molars (55, 54, 64, 65, 75, 74, 84 & 85) were free from symptoms of pain, and clinical and radiographic signs of pulpal pathosis. See Figures 1 (a, b, c & e) for clinical features, and Figures 2 (a & b) for radiographic findings.

He also had initial caries on 55, 52, 51, 61, 62 & 63. There was no known trauma history. His initial cooperation was categorized as “pre-cooperative”. MF’s behavioral scale was assessed to be negative initially but improved dramatically to positive behavior as treatment progressed. Treatment options for the carious primary molars that were discussed and explored with MF’s father were; prevention only, conventional restorative treatment using local anaesthesia (LA), the “Hall Technique” with no LA (and restorations of the upper primary incisors) or full mouth rehabilitation under general anaesthesia (GA). MF’s father was keen for his son to receive dental treatment in the dental chair rather than under GA due to many reasons including financial constraints (children’s dental GA is not routinely provided by a free public service available to everyone in the UAE as it is in the U.K for example). After sufficient consideration, the father consented for the HT as the child’s cooperation for LA was not forthcoming and he was adamant about avoiding GA.

Table 2. Sequence of appointments

<table>
<thead>
<tr>
<th>Appointment</th>
<th>Assessment, explanation, treatment options; OR if this fails, schedule recheck (see Table 1)</th>
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</thead>
<tbody>
<tr>
<td>Appointment 1</td>
<td>Examination, operative, explain treatment options. OR if this fails, schedule recheck (see Table 1)</td>
</tr>
<tr>
<td>Appointment 2</td>
<td>Two molars (lower molars) + SSC placed (if indicated). Two molars (upper molars) + SSC placed (if indicated)</td>
</tr>
<tr>
<td>Appointment 3</td>
<td>Repeat examination, sequence: SSC HT on the lower and upper 1 and 2</td>
</tr>
<tr>
<td>Appointment 4</td>
<td>Three molars (lower) + SSC placed (if indicated)</td>
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<tr>
<td>Appointment 5</td>
<td>Remove separators and assess SSC HT in 6 and 3</td>
</tr>
<tr>
<td>Appointment 6</td>
<td>Reexamine, assess SSC HT on upper arch and lower arch if required</td>
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Result 1: no setbacks. No complaints. Check occlusion and GA.

Result 2: no setbacks. No complaints. Check occlusion and GA.

Result 3: no setbacks. No complaints. Check occlusion and GA.

Result 4: no setbacks. No complaints. Check occlusion and GA.

Result 5: no setbacks. No complaints. Check occlusion and GA.

TREATMENT

A treatment plan was arranged on our postgraduate clinic (See Table 1). An extensive preventive programme was instigated to improve MF’s very poor oral hygiene in addition to diet assessment, analysis and advice. Over a period of two months and following the HT protocol, the child had all his eight primary molars fitted with SSCs and cemented with GIC. No LA was used. The molars were fitted with elasticated orthodontic separators in order to create space to prepare the teeth to receive the SSC a week later. Two molars were treated per appointment (see Table 2).

As per the standard Hall manual, the following principles were adhered to during treatment:

1) Compliance with the indications and contra-indications and selection criteria for the HT.
2) Assurance of the absence of any symptoms or signs of pulpal pathosis or sepsis (clinical or radiographic assessments).
3) Blue elasticated orthodontic separators were used and left in situ for one week (see Figure 1b & d) to create interdental spaces where required.
4) Two SSCs placed in a single appointment were never: a. In the same arch adjacent to each other (i.e. never in the same quadrant) b. On the same side in opposing arches
5) When two crowns were placed in a single appointment they were diagonally in opposing arches (for example 64 and 84).
6) Appointments were at least one to two weeks apart to allow the occlusion to settle. The appointments were short; no longer than 15-20 minutes.

The SSCs were crowned as per the schedule in Table 2. The patient also had simple excavation and GIC fillings and selection criteria for the SSC.

Table 1. The factors and selection criteria for the SSCs

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The SSCs were crowned as per the schedule in Table 2. The patient also had simple excavations and GIC fillings with a view to eventually receiving composite strip crowns.

Fig.4a
Fig.4b
Fig.4c
Fig.4d
Fig.4e

Fig.3a
Fig.3b
Fig.3c
Fig.3d
Fig.3e
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Figures 5 (a, b, & c) show the mouth immediately after completion of treatment. The bite appeared open and was initially raised by approximately 1-1.5 mm.

The patient was followed up three, six and nine months later. He, nor his parents, had any complaints whatsoever. There were no issues with the occlusion, symptoms or signs of pulpal pathosis or sepsis affecting the molars. The bite had completely recovered. See Figures 4 (a, b, c & d) for the parents' satisfaction in reaching a positive outcome without residual pain due to the use of GA, which was very high. Post op radiographs (Figures 5 a & b) showed satisfactory placement and no recurrence of caries.

Long term treatment plan: 1. Continue follow up at 3 months intervals of all Es and Ds clinically.
2. Close monitoring of tooth 51 for any pulpal involvement. If pulpectomy or extract if symptoms.
3. Re-evaluating radiographs every 6 months to monitor all Es and Ds. Interval to increase if caries risk status changed.
4. Restore remaining upper anterior teeth with composite strip crowns once cooperation allows.
5. Reinforce preventive measures (oral hygiene, diet, professional topical fluoride varnish application 4 times/year.

Discussion
In 2007 a new technique took the paediatric dentistry world by surprise12. It recommended a simple way in managing early enamel and dentinal decay in the primary molar using a SSO; it was named the Hall technique (HT) after UK based Scottish dentist Dr. Norna Hall started using this method13. The HT involves using 3% nitric acid, no rubber dam, no drilling and took place in a child friendly, plane manner. No dental caries removal took place at all.

The HT relied on sealing caries in situ cutting off its supply of sugary substrate, therefore changing the lesion's bacterial plaque and resulting in the arrest of the caries process in the tooth. The HT was confirmed as a mainstream modality in treating carious primary molars after a prospective split mouth randomized control study was conducted showing very high success rates of the HT after two and five years. There were mixed international reactions to the development of the HT in paediatric dentistry circles with many advocating such a treatment method14,15 while others opposed it completely. At the time of writing this article, this healthy debate was still in progress16. It is important to note that there is no consensus about the fact that SSOs are the restorative materials of choice in multi-surface caries affecting primary molars. The disagreement lies in the method used to apply them.

This report showcased treated caries in primary molars that were treated using SSOs, although other options such as complete carious lesions or isolated carious restorations, partial caries removal or even non restorative caries treatment (NBT) were possible.

MF was a good candidate for the HT, as his molars were carious, asymptomatic, had no signs of inflammation or sepsis, or no clinical or radiographic signs of pulp involvement as it was extracted. The indication and indication and had a good amount of tooth structure for crown retention. In other words, the molar lesions were “captured” before they became pulpally involved and the treatment was effective as it sealed the under the crown without local anaesthesia, tooth preparation or caries removal. Priority was given to tooth 84 as it had the deepest lesion compared to the rest. MF accepted the minute occlusal changes after capping of each HT crown. The occlusion clinically appeared to have been established itself in a very short time (see Figures 5 & 4 using the primary canines as indices) and this was always checked before proceeding with the next phase.

Managing the upper anterior teeth after treatment restorations would have been impossible in this case due to the child's lack of cooperation. Therefore, temporization of open cavities with GIC was a very good decision to introduce the child to dental procedures. It was also advantageous as it allowed the progression of caries, reducing the chance of sepsis and pain, reducing the oral load of plaque and a good source for fluoride. Composite strip crowns will be considered as an alternative if cooperation allowed. Coincidently the patient's 51 became discoloured, albeit asymptomatic. Although no history of trauma was elicited in this case due to the HT, it is possible. The dark persistent discoloration in the patient's 51 may be due to the different caries management methods for primary molars. Since the tooth is asymptotically clinically and in the absence of any history of trauma, it can be considered as a non-susceptible tooth (Figure 5 c), it was decided to keep under close review. Parents were aware that this tooth may require future treatment; a pulpectomy or extraction.

As for the Es and Ds, the patient was followed up for ninth months. The treatment was completed. He remained clinically free of symptoms and became a patient who enjoyed attending our clinic. They will remain under observation in the long term. Plans are in place to manage his upper anterior teeth as outlined above.

Conclusion
This case is an “All Hall” case where maximum capacity of the HT was used in one single child. The HT is one tool in our toolkit available to dentists in the fight against dental caries17.

Although well designed trials are in place to support the HT, this case highlights the importance of treating eight carious primary molars in one child, with no to medium term complications. The HT is achievable using the HT. The lesions need to be “caught” prior to any pulpal involvement.

It may be of interest to GDPs and primary care dentists, rather than specialists in paediatric dentistry, who deal with the majority of carious primary molars. The HT is a suitable modality for the GDP environment, hence this case report.

References
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