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

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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 treat a single child patient by using this technique. In other words, restoring all the primary carious 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.1

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.2

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 current 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.3 The occlusion tended to suffer opening of the bite by 1.5mm on average, which later resolved due to possible dento-alveolar compensation4 or intrusion5 of the crowned tooth. The effect of the HT on the occlusion had been previously studied.6,7 The occlusion was deemed satisfactory.

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 (HBMCDM) in Dubai Healthcare City, Dubai (UAE). The father was concerned about perceived concerns about the occlusion. The effect of the HT on the occlusion had been previously studied.8 The occlusion tended to suffer opening of the bite by 1.5mm on average, which later resolved due to possible dento-alveolar compensation9 or intrusion10 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.

Table 1. Treatment plan

1. Pre-treatment care plan
2. Restorative treatment plan
a. Restore the permanent anterior teeth with stainless steel crowns using the total Evan Crown (TEC) technique
b. Restore the permanent posterior teeth using stainless steel crowns
III. Conclusion
The “All Hall” case is a historical first, in that it entombs all the carious primary molars in one child, contrary to the usual clinical doctrine to avoid complications and tooth loss. It is introduced as a convenient alternative to the usual surgical treatment, 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. It is introduced as a convenient alternative to the usual surgical treatment, 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.
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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 pulp pathosis. See Figures 1 (a, b, c, & d) 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 behavioural scale was assessed to be negative initially. His father reported that MF 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 UK 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.

Treatment
A treatment plan was arranged on our postgraduate clinic (See Table 1). An extensive preventative 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 protocol5, the child had all his eight primary molars fitted with SSCs and cemented with GIC. No LA was used. The molars were fitted with elastomeric 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 manual3, the following principles were adhered to during treatment:
1) Compliance with the indications and contra indications and selection criteria for the HT: Assurance of the absence of any symptoms or signs of pulpal pathosis or sepsis (clinical or radiographic assessments).
2) Blue elastomeric orthodontic separators were used and left in situ for one week (see Figures 1b & d) to create interdental spaces where required.
3) 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
4) When two crowns were placed in a single appointment they were diagonally in opposing arches (for example 64 & 84).
5) 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 crowns were placed as per the schedule in Table 2. The patient also had simple excavation and GIC restorations of the upper primary incisors (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 UK 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, clean-up, explore &amp; treat</th>
<th>Assessment, clean-up, treat</th>
<th>Assessment, clean-up, initiate treatment options</th>
<th>Assessment, clean-up, explore treatment options</th>
<th>Assessment, clean-up, initiate treatment options</th>
</tr>
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<tbody>
<tr>
<td>1a &amp; b</td>
<td>Pulps evaluated: 55, 54, 64, 65, 75, 74, 84 &amp; 85</td>
<td>Pulps evaluated: 55, 54, 64, 65, 75, 74, 84 &amp; 85</td>
<td>Pulps evaluated: 55, 54, 64, 65, 75, 74, 84 &amp; 85</td>
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<td>Pulps evaluated: 55, 54, 64, 65, 75, 74, 84 &amp; 85</td>
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<tr>
<td>2a &amp; b</td>
<td>No cavities: fly space to prepare the teeth to receive the SSC</td>
<td>No cavities: fly space to prepare the teeth to receive the SSC</td>
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<td>No cavities: fly space to prepare the teeth to receive the SSC</td>
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<tr>
<td>3a &amp; b</td>
<td>Stainless steel crowns placed</td>
<td>Stainless steel crowns placed</td>
<td>Stainless steel crowns placed</td>
<td>Stainless steel crowns placed</td>
<td>Stainless steel crowns placed</td>
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| 4a & b      | Restorative treatment using local anaesthesia (LA), “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 UK 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.

References
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Figures 5 (a, b, c & d) show the mouth immediately after completion of treatment. The bite appeared open and was initially raised by approximately 1.5-1.5 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. Symptomatic cavities were no issues with the occlusion, symptoms or signs of pulpal pathosis, no dental caries, no drilling sensation, no issues with the occlusion, or sensitivity to the tooth. There was no filling, no radiographic evidence of caries progression, no sign of restorations, partial caries removal or even non restorative caries treatment (NBT®) was evident.

MF was a good candidate for the HT, as his molars were carious, asymptomatic, had no signs of pulpal involvement or sepsis, or no clinical or radiographic signs of pulp involvement or sepsis. On examination, he had a good amount of tooth structure for crown retention. In other words, the molar lesions were “captured” before they became pulpally involved; pH was effective as it sealed the undercuts 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 cementation of each HT crown. The occlusion clinically appeared to have established itself in a very short time (see Figures 5(a) & 5(b) using the primary canines as indicators), and this was always checked before proceeding with the next phase.

Managing the upper anterior teeth becomes a challenge as the treatment strategy would have been impossible in this case due to the patient’s lack of cooperation. Therefore, temporization of open cavities with GIC was a basic requirement to introduce the child to dental procedures. It was also advantageous for controlling the progression of caries, reducing the chance of sepsis and pain, reducing the oral plaque load 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 child’s lack of cooperation. The case was a persistent caries colic and microleakage using GIC. The HT was used in one single visit to manage his upper anterior teeth.

“Hall crowns are not a universal answer to managing all carious primary molars and the Hall Technique does not replace every carious primary molar in that child”

Discussion

In 2007 a new technique took the paediatric dentist world by surprise. 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 (HT) after UK based Scottish dentist Dr. Norma Hall started using this method. The HT involved using a SSC, no rubber dam, no drilling and took place in a child friendly, plan manner. No dental carious lesions 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 arresting 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 method while others opposed it comprising a treatment method9,10,11 while others opposed it completely.

At the time of writing this article, this healthy debate was still in progress. It is important to note that there is currently no scientific consensus about the fact that SSCs 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 showed treated case comparisons of GDPs and specialists in paediatric dentistry which had used single treatment methods in introducing to general dental practitioners (GDPs) and specialists in paediatric dentistry a simplified non-invasive treatment that eliminated the need for treatment under LA and avoided a dental GA in a very young child. A situation which is not so far in practice on a daily basis.

This case has been a great challenge due to important factors which were: the patient’s young age, anxiety, the number of molars involved, pre-cooperation, the limited financial resources available in the UK. It was a non-cooperative patient with general anaesthesia and the scepticism that other dentists had of the HT. However, the parents’ dedication to attend to multiple appointments, motivation and great support to their child made it successful. Modelling techniques had worked sufficiently and build up MF’s dental anxiety, where he observed and learned appropriate behaviour from his parents and sister. Separation anxiety is very common at this age and having the parent or his sister around was helpful. MF had a high risk dental caries status, his primary molars were treated using SSCs, although other options such as complete caries removal, partial caries removal or even non restorative caries treatment (NBT®) were possible.

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 a toolkit available to dentists in the fight against dental caries12.

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

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

References

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