The Hall Technique

A minimally invasive method of treating caries in pediatric patients

A shift to minimally invasive treatment

It’s now known that caries is a biofilm disease, and carious lesions are the result of a dysbiosis (an imbalance in the biofilm) whereby net demineralization exceeds remineralization—and surgical intervention alone does not stop the disease process.

Systematic reviews and meta-analyses demonstrate that complete caries removal is not necessary for caries management in an otherwise healthy, asymptomatic tooth. Instead, controlling the biofilm and placing a sealed restoration is preferred for caries management. This minimally invasive approach is particularly advantageous for young, apprehensive patients, who may otherwise require sedation for traditional surgical interventions. An evidence-based, minimally invasive treatment option for the management of severe early childhood caries is the Hall technique.
The Hall technique

Dr. Norna Hall was a general practice dentist working in a region with a high level of caries in Scotland. In 1997, an audit discovered she was placing stainless steel crowns at a higher-than-average rate. Hall also was placing them in an unconventional way—without local anesthesia or tooth preparation, simply sealing the carious lesions under the crown with a glass ionomer cement, thereby cutting them off from their “fuel” (i.e., dietary carbohydrates) and arresting them.

To her surprise and delight, the clinical outcomes were similar to conventional crown placement and well accepted by her patient population. And so the Hall technique was born. Since that time, four randomized control trials have been published that demonstrate the efficacy of the Hall technique for caries management in pediatric patients.1-5

Presenting to the parent

When introducing the option of the Hall technique to a parent, I say this: “What would happen to you if I dropped you in a tank of cement? Would you live or would you die?” I usually get a look of wide eyes, followed by a laugh, then a response, “Die.”

To which I reply, “Correct. So, when I seal the cavities’ bugs under a crown in cement, they’re also starved of the fuel needed to survive, and they arrest and die.”

I also explain that the efficacy of the Hall technique is equivalent to the traditional surgical, i.e., drill-and-fill approach, each with a small margin of failure. However, the Hall technique has an added benefit in that it eliminates the need for shots and drills, which could require sedation for their child to tolerate the treatment. With proper informed consent, I have found the technique is well accepted by parents and well tolerated by patients.

Contraindications

• Clinical symptoms of irreversible pulpitis or dental abscess.
• No clear band of dentin between the carious lesion and the pulp.
• Radiographic evidence of pulpal exposure or periradicular pathology.
• Unrestorable, inadequate tooth structure for crown retention.
• Children whose airway cannot be managed safely.

Benefits

• Patient-centered care.
• Quicker to complete.
• Proven efficacy by randomized control trials.
• Minimal intervention is favorable to the pulp.
• Reduced anxiety/stress for the child patient, parent and dentist.
• No need for local anesthetic or tooth preparation.
• No soft-tissue damage.
• No accidental lip or tongue biting.

Case presentation

A 5-year-old girl presents with extensive yet asymptomatic caries in her mandibular left first primary molar (Fig. 1).

Informed consent is reviewed with the patient’s mother and treatment options were discussed, including no treatment; silver diamine fluoride; extraction; or a prefabricated stainless steel crown, placed with either traditional surgical preparation or the noninvasive Hall technique.

The patient’s mother opted for the Hall technique because it would involve minimal tooth preparation and no need for local anesthetic or sedation.

The technique

1. Place orthodontic separators into the mesial and distal contacts to create space for the crown. You may use orthodontic pliers, or thread two pieces of floss through the separator, pull them in opposite directions to stretch the band, and then slide it into the contact. If the patient has open contacts or primate space, it may not be necessary to place separators (Figs. 2a–2d).
2. After approximately two days to one week, remove the separators and clean gross debris with plain pumice, then rinse (Figs. 3a, 3b and 4).
3. Protect the patient’s airway by positioning the child slightly upward, drape a 4x4 gauze across the back of the throat, and/or use a rolled piece of adhesive medical tape to adhere the SSC to your gloved finger.
4. Select the crown and crimp or adjust as needed to have a “snap” fit and good marginal adaptation (Figs. 5a–c).
**Fig. 1:** Asymptomatic severe early childhood caries.

**Figs. 2a–2d:** Orthodontic separators are placed into contacts with pliers or floss.

**Figs. 3a and 3b:** After approximately two days to one week, the orthodontic separator(s) are removed, and you may see the space that has been created between the teeth.

**Fig. 4:** Clean the tooth with plain pumice.

**Figs. 5a–5c:** Select the appropriate size crown and try it on while protecting the patient’s airway using either gauze or medical tape, or having the child seated slightly upright.
Figs. 6a–6c: Fill the crown with a glass ionomer cement or resin-modified glass ionomer cement such as FujiCem2 or new FujiCem Evolve, which has the advantage of an automix tip and may be tack-cured for zirconia crowns.

Fig. 7: Seat the crown with firm finger pressure and have the patient bite down.

Figs. 8a and 8b: Clean off the excess cement by flossing and rinsing.

Figs. 10a–10c: Two weeks postoperative. Notice the healthy gingival tissue and the bite has self-corrected.

Fig. 9: Notice the bite is lightly open immediately postop.

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The parents of this 5-year-old patient traveled 2,500 miles from the Northern Territory of Canada so Dr. Jeanette MacLean could treat him with the Hall technique in Arizona, in lieu of general anesthesia.

Because the Hall technique is usually performed on molars, the stainless steel crowns are not a big deal aesthetically—this patient has two in place.

5. Fill the crown with a high-quality glass ionomer or resin-modified glass ionomer cement (Figs. 6a–6c).
6. Seat the crown with firm finger pressure, or use a bite stick and have the patient help by biting down firmly on a cotton roll (Fig. 7).
7. Clean the excess cement with wet gauze, water spray and flossing the contacts (Figs. 8a and 8b).
8. The patient’s bite may be slightly opened by approximately 1mm and will self-adjust over the next one to two weeks via intrusion of the crowned tooth and opposing tooth, as well as supereruption of the adjacent teeth7–8 (Figs. 9 and 10a–10c).

The controversy

There remains some controversy regarding this technique in the U.S., often stemming from lack of awareness of the randomized control trial evidence for Hall crowns or the systematic reviews and meta-analyses that have demonstrated that complete caries removal is not necessary for caries management.9–10 Members of the International Caries Consensus Collaboration, Drs. Innes, Frencken and Schwendicke, summed it up best in their 2016 article:

“The failure to follow new evidence is not limited to dentists who are ‘out of touch,’ do not undertake continuing professional development, or have been practicing for many years; in some countries and some schools, new dentists are still taught to remove all infected carious tissue, and it is actually not possible to pass professional examinations without demonstrating this. The reasons underlying this failure to translate evidence into clinical practice are many and complex.

“The ‘don’t know’ could be due to general ignorance (perhaps remedied with an appropriate educational intervention) or the more problematic willful ignorance, where the subject chooses not to learn more about a topic (perhaps because it challenges his or her current beliefs).” 11

The big picture

While the Hall technique is not for every patient nor every tooth, it is an evidence-based procedure that is an extremely advantageous option for managing severe early childhood caries. This minimally invasive approach allows the provider to increase access to care and improve the patient experience while reducing cost and risk.

References: