

## Nu Smile Restorative Dentistry Award: Research

### 1027 | Comparison of hall technique in occlusal and approximal carious lesions in primary molars

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**Background:** There is not much information on the clinical and radiographic success of the hall technique in occlusal and approximal carious lesion in primary teeth. The aim of this study is to compare the clinical and radiographic success of Hall Technique in occlusal and approximal carious lesions in primary molars.

**Method:** 100 primary molars with occlusal or approximal carious lesion in children aged 4–8 years were selected and divided into two groups ( $n = 50$ ). The carious lesion was treated as per the recommendations of the Hall Technique manual. The clinical and radiographic evaluation was done at 3-, 6- and 12-month follow-up by two independent blinded evaluators ( $k = 0.92$ ) using the modified Zurn and Seale criteria. Data were analysed, and a comparison of frequencies of clinical and radiographic outcomes between the groups at various time intervals was done using chi-square test. The scores at various time intervals were compared using ANOVA test, and  $P = 0.05$  was considered to be statistically significant.

**Results:** The mean clinical score in both groups at all time intervals was 1. There was no statistically significant difference in the mean clinical scores ( $P = 0.05$ ) at all time intervals. After 3 months, the mean radiographic score in both groups was 1. At the 6-month follow-up, 1 molar in each group showed an abnormal inter-radicular trabeculation. After one year, two molars in Group A and one molar in Group B showed abnormal inter-radicular trabeculation. However, there was no significant difference ( $P = 0.05$ ) in the mean radiographic scores of the two groups at all time intervals. Thus, both groups showed 100% clinical and radiographic success.

**Conclusion:** The clinical and radiographic success of Hall Technique is comparable in both occlusal and approximal carious lesion in primary molars.

### 399 | Adhesive interface on sound and caries-affected dentine of primary teeth

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**Background:** Nowadays, resin composites are still actual in paediatric restorative dentistry. Substrate, adhesive system types and etching time have a great influence on hybrid layer morphology which can affect resin composite performance. The aim of this study was to evaluate hybrid layer morphology on sound (SD) and caries-affected dentine (CAD) of primary teeth after different types of adhesive systems (AS) application.

**Methods:** Flat dentine surfaces from 40 primary molars were divided into 8 groups according to a substrate type (SD and CAD) and an adhesive system (OptiBond FL (OBFL), Optibond SoloPlus (OBSP), Single Bond Universal in etch&rins (SBUER) and self-etch modes (SBUSE)). Etching time for etch&rins AS was 15s. Composite buildups were constructed. After 24 hours of storage, cross-sectioning and sample processing resin-dentin interface morphology was assessed via scanning electron microscopy (JSM-6700F JEOL, Japan) in secondary electron mode. Statistical analysis was conducted with Kruskal-Wallis test and Mann-Whitney U test post hoc ( $P = 0.05$ ).

**Results:** The hybrid layer thicknesses ( $\mu\text{m}$ ) (mean  $\pm$  SD) were following:  $4.15 \pm 0.64$  (OBFL-SD),  $3.31 \pm 0.23$  (OBFL-CAD),  $1.04 \pm 0.21$  (OBSP-SD),  $1.44 \pm 0.31$  (OBSP-CAD),  $3.68 \pm 0.63$  (SBUER-SD),  $3.52 \pm 0.42$  (SBUER-CAD),  $2.85 \pm 0.81$  (SBUSE-SD),  $1.87 \pm 0.42$  (SBU-CAD). There were significant differences between SD and CAD groups for all types of AS. Morphological evaluation showed marked differences in the hybrid layer and resin tags formation on CAD: such as hybrid layer thickness decreasing, incomplete infiltration and resin penetration in dentinal tubules due to mineral deposits.

**Conclusion:** The etch&rins adhesives created the thickest hybrid layer with pronounced resin tags. Poor quality of hybrid layer on caries-affected dentin can decrease bonding stability in primary teeth.

## 1790 | Does rubber dam isolation increase the survival of composite restoration in primary molars? A 2-year cost-effectiveness analysis of a randomised clinical trial

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**Background:** The aim of this non-inferiority randomised clinical trial was to evaluate the survival of direct bulk-fill composite resin restorations in primary molars using different methods of isolation of the operative field: rubber dam isolation (RDI-local anaesthesia, use of dental clamp and rubber dam) and cotton roll isolation (CRI-cotton roll and saliva ejector). As a secondary outcome, a cost analysis was carried out.

**Methods:** Following ethical approval (#3.065.654) and trial registration (NCT03733522), ninety-three (93) 4- to 8-year-old children (174 teeth) with at least one dentine caries lesion without any pulp involvement were selected. All teeth were randomly allocated between the groups (RDI and CTI) and restored with bulk-fill composite resin by trained operators and evaluated by 2 independent blind examiners up to 24 months. The analysis for the primary outcome (restoration survival) was tested using two-sample non-inferiority test for survival data using Cox regression (non-inferiority/alternative hypothesis HR = 0.85; CI = 90%), and bootstrap linear regression analysis was used for cost analysis.

**Results:** After 2 years, 157 restorations were evaluated (drop-out = 9.7%) and the survival rate was RDI = 60.41% and CRI = 54.31% (log-rank  $P = 0.245$ ). The alternative non-inferiority hypothesis was accepted by the Cox regression analysis (HR = 1.33; 90% CI 0.88-1.99;  $P = 0.036$ ). RBI was 63% more expensive when compared to the CRI group, and multisurface restorations presented higher cost when compared to single surface restorations.

**Conclusion:** Cotton roll isolation proved to be non-inferior when compared to rubber dam isolation for composite restorations longevity in primary molars. Furthermore, the latest presented the disadvantage of higher cost and longer procedure time when compared to CRI.

## 1793 | The inhibitory effects of a bioactive restorative material on *S. mutans*: An in vitro study

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**Background:** This in vitro study aimed to examine the antibacterial properties of two different restorative materials, Activa™ BioActive Restorative™ (Pulpdent)© and Ketac™ Silver (3M) on *S. mutans*.

**Methods:** A strain of *Streptococcus mutans* (25175, MN 56303) was cultivated in Tryptic Soy Broth at 37°C for 48 hours. 100 µL of solution was put into 10-mL test tubes with soft agar and then transferred onto Petri dishes containing blood agar. After 4 minutes, 4 samples of each material were extruded onto a single Petri dish. Ketac™ Silver was extruded and left to harden for 4 minutes, while Activa™ was extruded and light-cured for 30 seconds. In total, 9 Petri dishes were used for each material. The samples were incubated for 48 hours at 37°C. A caliper was then used to measure the diameters of the possible zones of inhibition. This protocol was repeated 7 times.

**Results:** The tested samples of Activa™ produced inhibition zones ranging from 6 mm to 12.5 mm with an average of 8.1 mm (SD 1 mm). Ketac™ Silver produced inhibition zones ranging from 6 mm to 13 mm with an average of 8.5 mm (SD 1.2 mm). Neither material proved to have a clear statistical advantage over the other.

**Conclusion:** Based on our results, both materials seem to have similar potential in inhibiting *S. Mutans* growth.