

Introduction

Large carious lesions on young or hypoplastic permanent teeth are often restored with protective restorations, but these teeth are more prone to fracture and recurrent decay. Other types of treatment modalities for large carious lesions on permanent teeth include stainless steel crowns; however, stainless steel crowns (SSC) require excessive removal of healthy tooth structure. This study aims to analyze factors associated with the success and failure of protective restorations with bands as an alternative for vulnerable permanent molars.

Materials & Methods

This exploratory and retrospective study reviewed electronic dental records from the UCLA Children's Dental Clinic. The inclusion criteria included permanent molars with hypoplastic or deep carious lesions ($\geq 50\%$ of dentin thickness). The study included 120 permanent molars: 73 with protective restorations alone and 47 with protective restorations and bands (PR&B). Chisquared tests identified associations related to the longevity of dental restorations and bands. Parsimonious test was used on the dataset to identify significant associations.

Lifespan of Protective Restorations with and without Permanent Molar Bands

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A total of 1,002 patient clinical records were screened, of which 47 patients had orthodontic bands and 73 patients had large protective restorations without bands. After applying the exclusion criteria, 882 patients were excluded from the study. The mean age of the patients with protective restorations with bands (PRwB) was 12.09 years (SD=2.44), while the mean age for those with protective restorations without bands (PRwoB) was 10.29 years (SD=2.75). A statistically significant difference was observed when comparing the longevity of PRwB to PRwoB, indicating that PRwB had a longer survival time. Potential factors influencing the median survival of protective restorations – including comorbities, hypomineralization status, restorative material, and the number of walls affected – were analyzed using Cov Proportional hazard regression model (Figure 1). From these analyses, both the presence of orthodontic bands (PRwB vs. PRwoB HR = 0.29, 95% CI: 0.013, 0.61, P=0.001) and the extent of caries (75% vs 25%, HR= 2.46, 95% CI: 1.35, 4.47, P=0.003) were found to be significantly associated with the restoration survival

(p=0.0012 and p=0.0033, respectively)(Figure 2).

Etiology of failure to survive for both PRwB and PRwoB was recorded. The most common reason for failure of PRwB was due to missing band (14.9%), while PRwoB did not survive due to recurrent decay (56.2%) (Figure 3).



Results

N of Walls (as 1 unit increase)

Extent of Caries (75% vs 50%)

Restoration Material (Comp vs RMGI)

Hypomineralization (Y vs N)

Comorbidity (Other vs. Healthy)

Comorbidity (Kidney transplant, Seizures vs. Healthy)

Comorbidity (DiGeorge vs. Healthy)

Comorbidity (Autism w/wo Other vs. Healthy)

Comorbidity (Asthma vs. Healthy

Age (as 1 unit increase)

Group (PRwB vs wo/B)

Extent of Caries (75% vs. 50%)

Group (PRwB vs woB)

This study aimed to explore the factors associated with survival rates of PRwB vs PRwoB. Overall, the only factors that were significantly associated with a difference in survival of PRwB vs PRwoB were the presence or absence of orthodontic bands and the extent of caries. Some limitations to this study was the lack of consensus when describing bands and variability between notes in the EHR. Further research is needed to determine if placing an orthodontic band on permanent molars with large restorations is a viable treatment modality for increasing longevity of the restorations.

Defective Restoration Missing Band

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Conclusion