

# Sealant Efficacy in Permanent Molars with vs without Bonding Agent

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## PURPOSE

The aim of this clinical study is to evaluate the efficacy of sealants placed on permanent first molars using bonding agent versus without bonding agent. Assessment criteria include sealant retention, marginal integrity, and caries prevention.

## BACKGROUND

- Deep grooves of permanent molars are niduses for food and bacteria collection, difficult to clean with a toothbrush, and the surfaces least impacted by topical fluoride applications (2, 3).
- First permanent molars have the highest caries rate out of all permanent teeth (4).
- Sealants not only prevent the initial development of caries but can halt the progression of incipient, non-cavitated, pit and fissure lesions (3, 6, 11)
- The American Academy of Pediatric Dentistry (AAPD) recommends the use of pit and fissure sealants on both “sound” occlusal surfaces and “non-cavitated lesions”(3, 12)
- There is more recent evidence to support and not support the additional step of placement of bond, therefore, additional clinical research is still needed to evaluate the benefit of using bonding agents during sealant placement (3, 5, 16–20)

## METHODS

This split-mouth study included 148 children aged 5 to 13 years with four non-carious, fully erupted permanent first molars. All four permanent first molars were sealed in each patient using a dental isolation adaptor (Isovac®, Zyris, Inc., Santa Barbara, CA, USA) for isolation. The right molars were sealed utilizing a bonding agent prior to sealant application. The left molars only had sealant applied following acid etching. Sealant retention, marginal integrity, and caries incidence were assessed at each subsequent recall visit at 6, 12, and 18 months.

## RESULTS

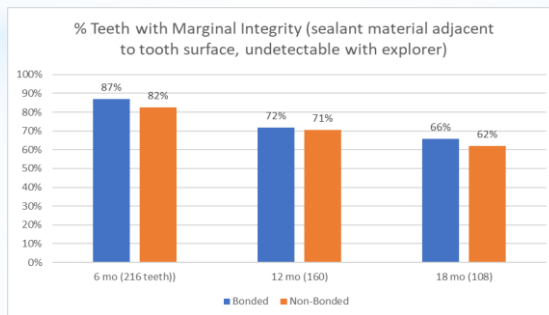
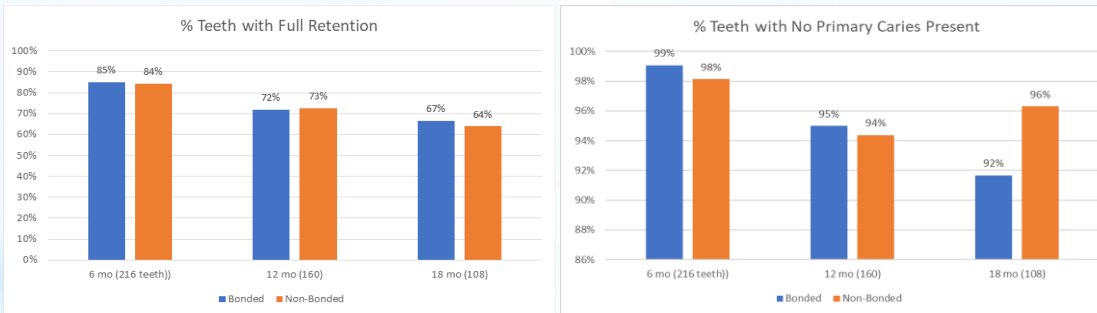
There was no difference sealant retention ( $P=0.78$ ), marginal integrity ( $P=0.67$ ) or caries prevention ( $P=0.17$ ) at an 18 month recall in teeth sealed with or without bond. At 6, 12, and 18 month recalls primary caries development for bonded and non-bonded teeth was low.

## CONCLUSIONS

Using a bonding agent before applying sealant on permanent first molars does not enhance sealant retention or marginal integrity. This study demonstrates clinical effectivity of sealants, both with and without bonding, in preventing caries in children with mixed and young permanent dentitions.

## LIMITATIONS

- Significant loss to follow-up resulting in smaller population sizes for the evaluations, lending to less power to the statistical findings. Not all patients are represented at all evaluation time points.
- This study also examined the use of only one type of adhesive system and sealant material which may differ in effectivity compared to other brands.
- Each practitioner was calibrated prior to placement of sealants, but this study was not blinded, and a kappa score was not generated.



## DATA ANALYSIS

Fisher's Exact two-tailed tests were used to compare the percentage of teeth with positive outcomes between bonded and non-bonded teeth, treating teeth as independent observations, with a significance level of  $P < 0.05$ . Data were analyzed using SAS v9.4 and MedCalc (MedCalc Software Ltd, Ostend Belgium).

## REFERENCES

