

Resin Sealants vs Conventional Composite Restorations for Dentinal Lesions on Deciduous Teeth: CAT Summary

Hayeon Min, Damian Rendon, Sophie Zhu, Sabeen Khalid, Maryam Ejaz, Svetlana Tikhonova, Amal Idrissi, Janati
Faculty of Dental Medicine & Oral Health Sciences, McGill University, Montréal QC

CLINICAL PROBLEM

- About 514 million children in the world are living with untreated caries in deciduous teeth (WHO, 2022) [1].
- Less costly and less invasive approaches to the treatment of caries of deciduous teeth - while maintaining good success outcomes - have been of strong interest to dentists.

CLINICAL QUESTION

In children with dentin caries located in the outer half of dentin and without pulpal involvement, to what extent do sealants (SL) compared with conventional composite (CC) affect restoration success rate and caries arrest within at least 12 months follow-up?

Def. Success rate (Tedesco et al., 2018): “the survival of treatment (no need of repair) or the success of treatment (treatment appears satisfactory, no clinical signs or symptoms of pulpal pathology or caries arrested)”

EVIDENCE SEARCH

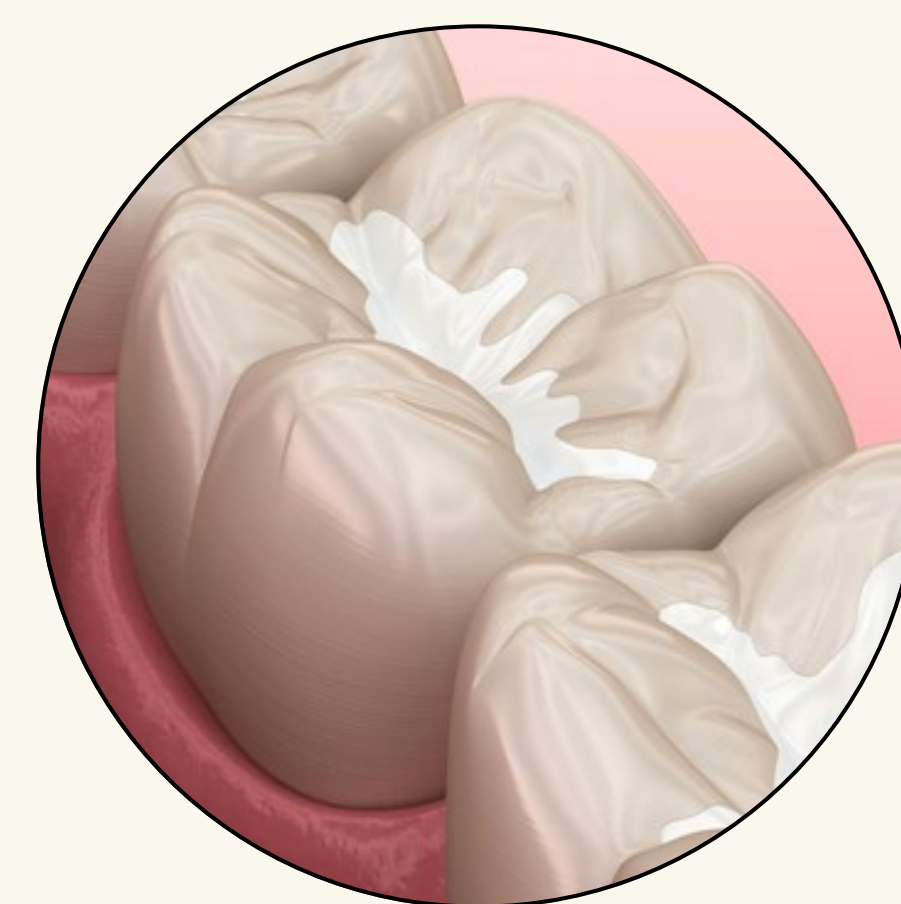
Search date: March 24, 2024
Keywords: Dentin caries, Outer dentin, Composite restoration, GIC, Sealants, Pediatric.
Filters: Systematic review, meta-analysis, RCT
Date restriction: 2014 to 2024
PubMed yield: 15 articles before restrictions → 5 results after restrictions
Additional search: Google Scholar, TRIP databases, ADA EBD website
Selected studies: Tedesco et al., 2018, Systematic Review and Network Meta-Analysis (2 RCTs addressed clinical question: Borges et al., 2012; Hesse et al., 2014)

Acknowledgement

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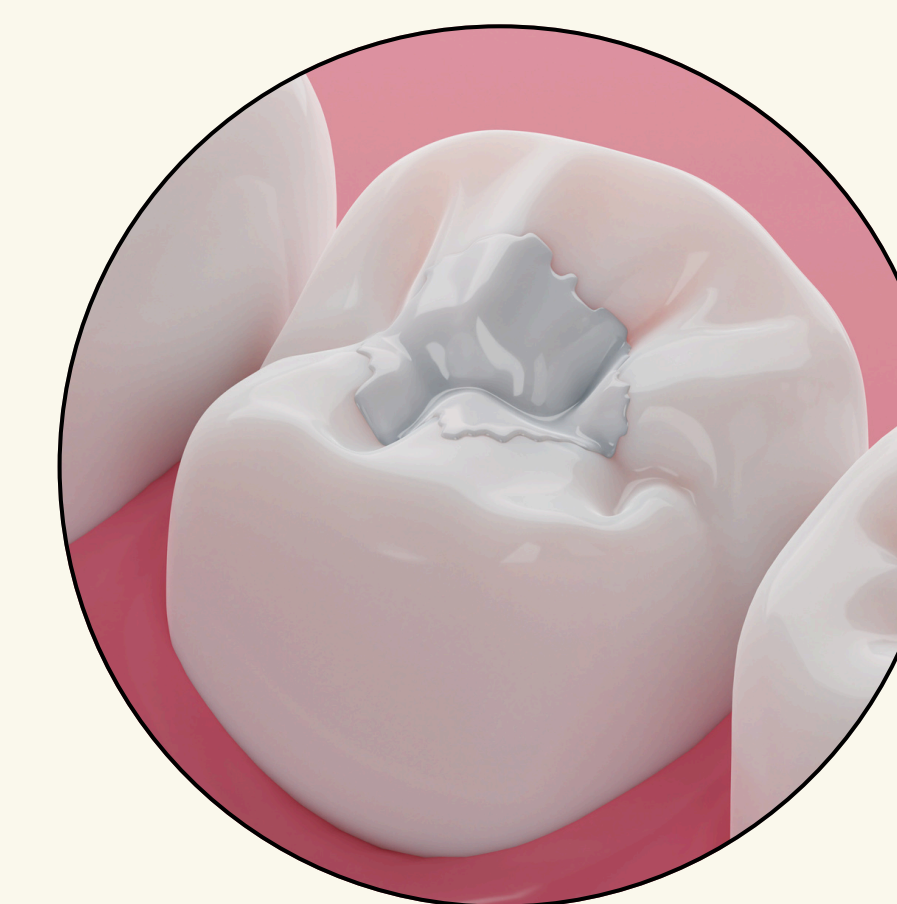
CLINICAL BOTTOM LINE

- **Tedesco et al., 2018, Systematic review** : caries lesion arrestment (CLA) is the more important outcome, as it is the main objective of restorative treatments [2]
- **Tedesco et al., 2018, Systematic Review and Meta-analysis:** no clinically meaningful difference in CLA between conventional composite restorations and resin sealants at 1 year follow-up
- Resin sealants can be a favourable option for minimally-invasive, simple, and cost-effective approach to the restorative treatment for children.



Resin sealants

VS



Conventional composite

Image sources:
<https://www.istockphoto.com/photo/molar-fissure-dental-fillings-medically-accurate-3d-illustration-of-dental-concept-gm1225928188-3610208630dy>
https://www.canva.com/design/DAGAecE2JNc/aSz_hU8zsN0zyAXysHTu5w/edit?fbclid=IwZXh0bgNhZWQCMTAAR086TR00mO05-b752yInVR-kesOo5xu9FjXL9q8A50NZIAHrVKzSFHglI_aem_AQAluy72w0BChandjgfvWcExDbxZ8qQ8yNdnR3JGdvxQu0LTyk00CHy12ogfGds69zLj_NdXdKoo9ssChywrPY

RESULTS

N = 66, 4-9 years old children, follow up 6 to 18 months

Caries lesion arrestment (CLA), SL vs CC:

RD = 1.8% (CI 95%: -3.6%; 7.2%)
 1.8% greater in the resin sealants group: not statistically significant, clinically meaningful, or clinically decisive

Restoration success rate (SR), CC vs SL:

RD = 16% (CI 95%: 4.8%; 29.6%)
 16% greater in the conventional composite group; statistically significant, clinically meaningful, but not clinically decisive

*Risk of control for SR: 80%, at 1 year follow-up
 Risk of control for CLA: 90%, at 1 year follow-up
 Difference threshold: 15%*

STRENGTHS

Tedesco et al., 2018

- Rigorous search strategy
- No time or language restrictions
- Two independent reviewers with a third reviewer
- PRISMA diagram
- Summary tables
- Outcomes clearly stated, defined, and justified.
- Cochrane Handbook for Systematic Reviews of Interventions.
- ROBINS-I risk of bias tool.
- GRADE criteria.

LIMITATIONS

Tedesco et al., 2018

- No MeSH terms were used
- Risk of Publication Bias is uncertain
- SES of study participants was not reported
- Only two included studies were focusing on the outer ½ of the dentine caries lesion.
- The risk of bias for RCT was unclear: baseline imbalance, allocation concealment, blinding, and loss of follow-up were unclear.

APPLICABILITY

- Primary (CLA) and secondary outcome (SR) relevant for dental practitioners and parents
- Population age group and lesion severity are relevant
- Socioeconomic status, caries disease risk factors, cost of intervention, water fluoridation and the healthcare system in Canada differ from Brazil
- Both treatment options are readily available in North America
- Sealants are less invasive and time consuming when treating pediatric population. However, more follow-ups and sealant replacements may be required compared to the composite resin restorations

References

1. Management-Screening, Diagnosis and Treatment (MND). (2022, November 18). Global oral health status report: towards universal health coverage for oral health by 2030. <https://www.who.int/publications/i/item/9789240061484>
2. Tedesco, T. K., Gimenez, T., Floriano, L., Montagner, A. F., Camargo, L. B., Calvo, A. F. B., Morimoto, S., & Raggio, D. P. (2018). Scientific evidence for the management of dentin caries lesions in pediatric dentistry: A systematic review and network meta-analysis. *PLoS one*, 13(11), e0206296. <https://doi.org/10.1371/journal.pone.0206296>