OPEN ACCESS
Global Journal of Research in Dental Sciences
ISSN: 2583-2840 (Online)
Volume 06 | Issue 05 | Sept. – Oct. | 2026
Journal homepage: https://gjrpublication.com/gjrds/
Research Article

Simplifying Occlusal Fissure Geometry for Caries Prevention: Evidence on Fissure Rounding, Widening, Plaque Retention and Clinical Research Priorities

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DOI: 10.5281/zenodo.22710787 **Submission Date: 20 July 2026 | Published Date: 11 Sept. 2026**

Abstract

Aims & Background: Deep and narrow fissures and pits are at risk for occlusal caries and plaque stagnation. Mechanical widening or rounding might in theory enhance cleanability, but there is a need for direct evidence of the preventive value and biological cost of intentional removal of sound enamel. The aim is to review the current evidence about the association of fissure geometry and plaque retention and caries and to evaluate if fissure rounding/widening is currently an evidence-based preventive strategy.

Materials and Methods: A structured PubMed-focused review identified human studies, RCTs, systematic reviews, guidelines and relevant mechanistic studies from 2017 to August 2026.

Results: Longitudinal and cross-sectional studies support deep/complex fissure morphology as a caries-risk marker, and 3D plaque mapping confirms that occlusal morphology contributes to plaque distribution. However, no eligible modern human trial was identified that isolated prophylactic fissure widening or rounding of sound teeth as the preventive intervention. In contrast, pit-and-fissure sealants and fluoride-based prevention are supported by multiple randomised trials and recent systematic or umbrella reviews.

Conclusion: Fissure simplification is biologically plausible but remains unproven as a stand-alone caries-preventive procedure. It should not be described as equivalent or superior to sealants without direct comparative trials. Future studies should quantify enamel removal, plaque accessibility, caries incidence, occlusal effects and adverse events and should use established prevention as the comparator.

Keywords: *Simplify tooth anatomy; Tooth geometry; Caries reduction; Deep fissure rounding; Pits and fissures; Widening fissures; Oral hygiene; Toothbrushing; Natural teeth; Plaque retention.*

Introduction:

Occlusal pits and fissures are clinically important because they not only have complex anatomy but they are also vulnerable early after eruption. Dental caries is still however a multifactorial, biofilm mediated disease and not a simple geometric defect [1-5]. Risk is modified by other factors such as frequent fermentable-carbohydrate exposure, fluoride balance, plaque accumulation, and previous disease and behavioural and socioeconomic factors [6-10]. This is where anatomy becomes relevant in this disease system as sheltered fissures can harbour plaque and may not be available for routine cleaning or for topical preventive agents.

The suggested topic set is to 'simplify' tooth anatomy by rounding and widening deep fissures to minimise plaque and caries. The engineering logic that underlies the thinking is understandable. A narrow V or I-shaped fissure may not be as easy for a toothbrush bristle to reach, whereas a wider and smoother fissure may be easier to clean. The question for science, however, is not whether a wider groove appears more inviting. Whether or not intentional removal of sound enamel results in a lasting reduction of clinically relevant caries, and does so at no more than the permanent biological cost, and is as effective as accepted non-destructive caries prevention.

The first part of this causal chain is supported by contemporary evidence. Deep fissures of first permanent molars were predictive of incident caries in a five-year cohort [18] and a clinical morphological study showed that patients with deep fissures had significantly more plaque and caries than those with shallow fissures [19]. The caries involvement is also higher in primary teeth with higher occlusal relief [20]. Three dimensional plaque mapping suggests that the distribution of plaque is associated with local and global occlusal morphology but that fissure depth alone is not a very good predictor of plaque accumulation [21]. A morphology review in 2026 also highlights the importance of fissure depth, width and shape in relation to retention of plaque and cleanability [44]. On the other hand, a 2023 digital morphology study did not show any statistical correlation between various occlusal parameters quantified in the limited retrospective sample of patients and caries prevalence [22]. The literature thus suggests that anatomy is a risk modifier and not a one-to-one geometric threshold.

The second and third links in the proposed chain are much less certain. There is strong recent evidence for pit and fissure sealants and fluoride-based prevention [23-36] but limited modern direct clinical evidence for preventive interventions involving widening or rounding of sound fissures alone. In this review, equivalence of anatomic risk and benefit from anatomic removal is therefore assumed and this is evaluated. It also suggests trial design that is able to test the hypothesis without producing outcomes.

Methods:

A structured, PubMed-focused search of literature published from January 2017 through 14 August 2026 was undertaken. Search concepts combined dental caries or occlusal caries with fissure morphology, fissure depth, fissure angle, tooth geometry, occlusal topography, plaque retention, fissure widening, fissure rounding, enameloplasty, fissurotomy, sealant, fluoride varnish, tooth-brushing and minimum intervention dentistry. Longitudinal human studies, randomised clinical trials, systematic reviews, umbrella reviews, evidence-based guidelines and consensus statements were given priority. Mechanistic imaging or in-vitro work was included only where necessary to clarify plaque distribution, cleaning or material behaviour and was not treated as proof of clinical prevention.

Publications older than ten years were excluded from the reference list. This is particularly relevant because much of the classic enameloplasty and fissurotomy literature predates the requested window. Those older studies cannot be used to claim contemporary clinical efficacy under the present inclusion rule. The primary question was whether widening or rounding sound deep fissures reduces plaque retention and incident caries in humans. Secondary questions addressed the consistency of morphology-risk associations, the evidence for accepted comparators, the biological cost of enamel removal and appropriate outcomes for a future trial. Since this was a critical evidence review rather than a registered systematic review, no pooled effect estimate was calculated. Numerical data were used only when directly reported in eligible contemporary studies and were labelled by source.

Evidence Linking Fissure Geometry, Plaque and Caries

The strongest direct support for the importance of fissure geometry comes from longitudinal and clinical observational data. Sánchez-Pérez et al. followed schoolchildren for five years and reported that deep fissures were associated with approximately threefold higher odds of caries development than shallow fissures (OR 3.15; $p=0.028$) [18]. This study is valuable because morphology preceded the outcome and caries was assessed repeatedly. Kilinc et al. examined permanent first molars clinically and reported significantly more caries-affected teeth and plaque accumulation among patients with deep pit-and-fissure morphology [19]. Kaskova et al. also reported that complex occlusal relief primary molars had the highest prevalence of caries [20].

Morphology alone does not account for the risk. In a study by Chen et al., fluorescence plaque imaging was integrated with a structured-light 3D model to demonstrate that plaque accumulation is related to both local and global surface morphology, and importantly, that fissure depth should not be used as the sole indicator to explain plaque content [21]. A separate retrospective analysis was performed to derive 3D measures such as slope, relief, orientation patch count, energy and fissure angles without any significant associations to caries status and severity in the studied sample [22]. The seemingly contradictory results do not contradict each other when morphology is considered as a part of a multivariable risk system. One specific geometric characteristic might increase risk in one population, but not in another where biological and behavioural factors are more important.

Evidence of risk-assessment supports this multivariable interpretation recently. Previous caries, visible plaque, enamel defects, fluoride exposure, feeding patterns, tooth-brushing, and socioeconomic and microbiome variables were identified as relevant predictors in a systematic review of children under 12 years old [17]. Modern consensus and guidelines also use lesion activity, cavitation, cleanability, and patient risk as the basis for intervention, not just a geometric feature [7-16]. Therefore, deep fissures can reasonably trigger intensified prevention, but the presence of a deep fissure does not by itself establish a need for irreversible widening.

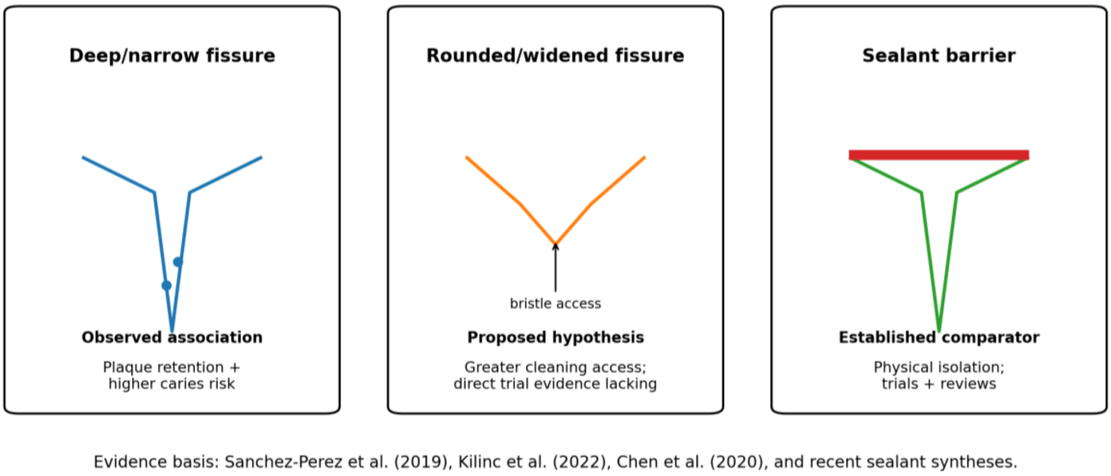

Figure 1. Conceptual comparison of natural deep fissure, experimental geometry simplification and an established sealant barrier. The middle panel is a hypothesis, not a demonstrated clinical effect. Based on Sanchez-Perez et al. 2019, Kilinc et al. 2022, Chen et al. 2020 and sealant evidence syntheses [18,19,21,23,24].

Table 1. Recent evidence relating occlusal morphology to plaque or caries risk

Study	Design	Exposure	Key finding
Sanchez-Perez et al., 2019 [18]	5-year longitudinal cohort	Deep vs shallow first-molar fissures	Deep fissures associated with incident caries; OR 3.15
Kilinc et al., 2022 [19]	Clinical cross-sectional study	Permanent first molar pit/fissure morphology	Deep morphology associated with more plaque and caries
Kaskova et al., 2023 [20]	Clinical morphology study	Primary molar occlusal relief	Complex relief more often affected by caries
Chen et al., 2020 [21]	3D plaque mapping	Local/global occlusal morphology	Plaque related to morphology; fissure depth not sufficient alone
Arch Oral Biol study, 2023 [22]	Retrospective 3D analysis	Quantified occlusal/fissure metrics	No significant morphology-caries association in limited sample

Mechanistic Rationale for Fissure Rounding and Widening

The proposed mechanism consists of two parts: (1) to reduce the sheltered stagnation zones and (2) to improve physical access for cleaning. The widening of a fissure could lead to an increase in the contact between the bristles and the surface if the fissure is less than the effective reach of the toothbrush filaments. This is in accordance with the general finding that designs of powered and manual toothbrushes vary in their ability to remove plaque [37-39]. These brushing trials, however, measure the overall plaque indices and cannot demonstrate that a natural fissure that is made larger prophylactically will be cleaned enough to prevent caries. Even if the groove is more open, there can be plaque if the local curvature, surface roughness, orientation or patient behaviour is not appropriate.

The 3D plaque study is particularly pertinent because it demonstrates that simple reasoning based on width may not suffice [21]. Local and global morphology were reflected on the occlusal surface from the plaque accumulation. Hence, the extension of one fissure segment may not affect other pits or groove branches. However, if it is removed unnecessarily, this will increase the overall exposed surface area. For the intervention to be considered successful it would be necessary to prove that the overall ecological impact was positive, and not just that the groove is wider.

The second mechanism is enamel preservation. The goal of minimum intervention dentistry is to preserve sound tissue, and only use operatively when it is not possible to keep it healthy in a conservative fashion [6-16]. This means that there is a higher evidentiary bar for prevention than for smoothing a flawed restoration or reaching a lesion that must be treated operatively. The quantity removed should be quantifiable, no dentine should be exposed, no sensitivity should occur, no cracks or clinically significant occlusal change should occur, and the surface should be smooth and cleansable. If these safety data are not available, the words 'minimally invasive' are a claim not a result.

Direct Evidence for Prophylactic Fissure Widening/Rounding

The structured search within the 2017-2026 time frame did not identify an eligible human randomised trial or longitudinal clinical study that evaluated sound deep fissures widened and/or rounded as a standalone intervention and incident caries as the primary outcome. The current research, however, examines the effect of natural morphology, the use of modern diagnostic techniques, sealant application, sealant preparation, and fluoride prevention or treatment of lesions. No direct modern trial was found, and the current evidence does not allow the estimation of a causal effect of fissure widening on the caries rate.

This is important because over the years, concepts like enameloplasty or fissurotomy are sometimes mentioned in the same breath as sealant placement. If the fissure is mechanically prepared prior to sealing, then the geometry change alone cannot be responsible for any reduction in caries, since the sealant is a known physical barrier. Likewise, a preparation method that enhances fissure sealant penetration or retention provides an answer to a materials issue, rather than to the question of whether the preparation of the widened fissure is preventive. Under the requested ten-year evidence rule, older laboratory and clinical reports cannot be imported to fill this gap.

As a result, there are three claims that should be avoided in a submission. First, it is not possible to declare that the enlargement of deep fissures 'guarantees' hygiene. The control of plaque depends on behaviour; there is no surface modification which will guarantee control of plaque. Second, it should not be stated that fissure rounding is an established alternative to sealants. Comparative evidence not yet produced. Third, even if it is proven that plaque is reduced in a short-term mechanistic study, this does not necessarily imply that caries will be prevented in the long term. Clinical endpoint is lesion incidence or progression.

Cleanability, toothbrush bristles and surrogate outcomes

In clinical toothbrush trials, powered and manual toothbrushes have been found to be different in overall plaque removal [37-39] and the recent laboratory-clinical study has investigated investigation of the effect of sealant surface integrity with different modalities of brushing [40] but do not measure penetration into a defined natural fissure before and after geometric modification. It is therefore insufficient to use overall improvement in plaque-index as a measure for the specific hypothesis. A future mechanistic study should localise plaque within the target fissure, preferably using standardised fluorescence imaging or other validated surface-specific means, and should quantify the geometry at the same visit [21].

The access to bristles is also not binary but dynamic. Whether a bristle touches a groove depends on the filament diameter, stiffness, tuft arrangement, brushing force and technique of the patient. A fissure that is wider at the entrance may still have inaccessible branches, and widening may not compensate for infrequent or ineffective brushing. That is why the suggested phrase 'guarantee teeth hygiene' is not scientifically valid. The effect of the intervention can be only speculated to be a positive increase in one aspect of mechanical access, and the clinical impact needs to be identified.

Use of surrogate endpoints should be based on a causal model. Short-term plaque reduction would substantiate the claim that geometry has an impact on stagnation; however, it would not demonstrate that demineralisation is prevented. An intermediate endpoint could be changes in quantitative light-induced fluorescence or another signal of lesion progression, but the patient-relevant endpoint is changes in incidence or progression of caries. Biological explanation for an intervention that has been shown to be beneficial for a surrogate but not for caries reduction is due to rapid recolonisation, persistent dietary challenge, residual inaccessible anatomy or loss of protective enamel.

The difference between natural and artificial teeth is also significant. Artificial posterior teeth can be manufactured with simplified occlusal forms to influence masticatory performance without sacrificing living tissue, and prosthodontic evidence examines how occlusal morphology affects chewing. Those findings cannot be transferred directly to natural teeth because natural enamel has biological value, can develop caries and cannot be replaced without initiating restorative maintenance. Artificial tooth form studies can be used to guide geometric measurement, but not to guide the preventive risk/benefit calculation for enamel removal.

What the Comparator Evidence Shows

Pit-and-fissure sealing has a substantially stronger contemporary evidence base. A 2024 overview of 25 systematic reviews concluded that sealants were generally superior or similar to other preventive approaches for preventing or arresting occlusal caries, while also noting variable methodological quality [23]. A separate umbrella review indicated that sealants were more effective than the absence of sealants for the prevention of caries in permanent molars, but that evidence for the effectiveness of sealants compared to fluoride varnish or ranking of materials was still limited [24]. Systematic reviews and meta-analyses also show the efficacy of fissure sealants and fluoride varnish in school children [25,26].

Randomised trials provide clinically useful benchmarks. Cabral et al. compared glass-ionomer-based sealing approaches in recently erupted permanent molars [27]. Muller-Bolla et al. evaluated fluoride-containing versus non-fluoride resin sealants in high-caries-risk patients [28]. Elkwatehy and Bukhari compared various sealant modalities [29] and Durmus et al., Khare et al., and Nardi et al. assessed clinical retention of sealants with different surface-preparation or material protocols [30-32]. These trials demonstrate that sealant efficacy depends on retention, isolation, material properties and technique, but they still provide actual patient-level evidence.

Fluoride is also a credible comparator. Rashed et al. synthesised sealant-versus-varnish trials [25]. In a large preschool RCT, Lam et al. found essentially identical proportions of primary second molars developing ICDAS>=4 dentine caries after 18-24 months with quarterly 5% sodium fluoride varnish (17.0%) and a single glass-ionomer sealant (17.1%) [34]. Their earlier report described the same trial program at shorter follow-up [33]. These findings should not be construed as an indication that all fluoride and sealant strategies are equivalent. They show that accepted conservative options can achieve measurable prevention and thus set the comparator standard for any new procedure.

Recent meta-analyses comparing hydrophilic and hydrophobic resin sealants have found broadly similar caries-preventive performance, with uncertainty about retention and evidence quality [35,36]. Additional contemporary trials address sealant performance in hypomineralised molars [41], and randomised work has evaluated sealing versus fluoride approaches for early enamel lesions [42]. Fluoride-varnish trials also continue to refine non-operative prevention [43]. Sealant research therefore continues to evolve, but it remains several evidentiary steps ahead of stand-alone fissure widening because clinical outcomes have been directly measured.

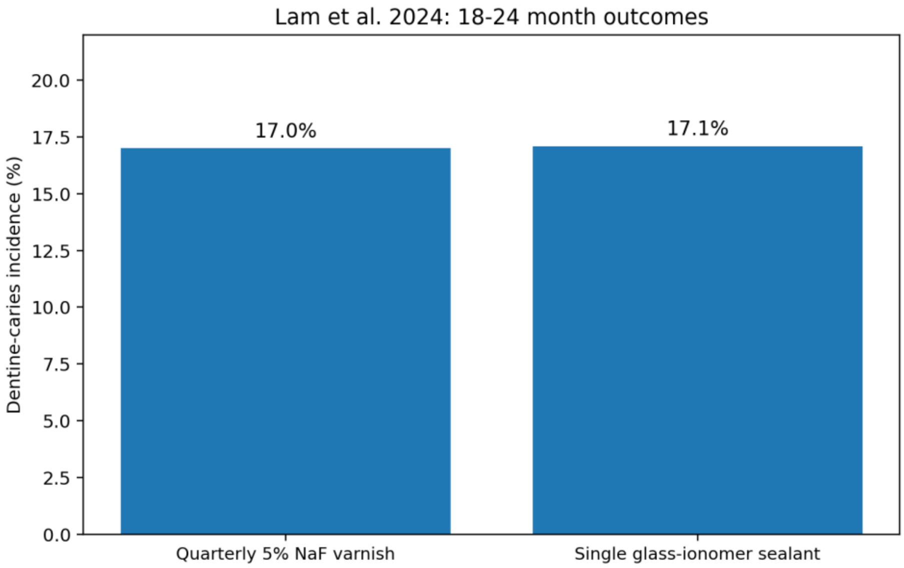

Figure 2. Author-generated plot from Lam et al. 2024 [34]: primary second molars developing ICDAS >=4 dentine caries at 18-24 months were 17.0% after quarterly 5% sodium fluoride varnish and 17.1% after a single glass-ionomer sealant. DOI: 10.1016/j.jdent.2024.105356. This is comparator evidence, not evidence for fissure widening.

Proposed Comparative Trial for Fissure Geometry Simplification

A future clinical trial should begin only after a prospective observational study confirms that a reproducibly defined fissure geometry independently predicts disease. Eligibility should be limited to patients at meaningful caries risk with fully erupted or sufficiently erupted molars, sound or non-cavitated fissures, and a pre-specified deep/narrow morphology documented by intraoral scan. Baseline data should include ICDAS status, lesion activity, plaque index, previous caries, fluoride exposure, diet, tooth-brushing, eruption stage and occlusal contacts.

A three-arm design would be scientifically informative: (1) individualised standard preventive care with an evidence based sealant when clinically indicated, (2) standard prevention plus a precisely standardised minimal fissure-rounding/widening procedure if there is genuine equipoise, and (3) an alternative non-operative approach (e.g. fluoride varnish) if it is guideline-concordant. When it is not appropriate to withhold a sealant in a high risk deep fissure, the trial should compare rounding with sealant versus sealant alone. This would assess if geometry modification is providing an additional benefit, but not prove that it is an alternative to widening.

The geometry intervention needs to be implemented. A digital workflow may be able to document fissure entrance angle, depth and volume prior to therapy and measure enamel volume removed following therapy. The protocol should not include preparation in the enamel, should not allow reduction of functional cusp contacts unless specifically stated, should require polishing and specify acceptable change in occlusal contacts. Operators must be calibrated and pre and post treatment scans checked by a central or blinded assessor.

Primary outcome is incidence or progression of caries at 24-36 months evaluated by ICDAS and/or bitewing radiographs if clinically indicated. Key secondary outcomes should be plaque at treated fissure, patient-reported sensitivity, enamel loss, cracks, occlusal symptoms, retreatment, subsequent sealant use, restoration, adverse events and cost. As more than one molar can be involved per participant, multilevel or generalised estimating equation models should be used in analyses. Unless there is a clinically acceptable margin and the harms are explicitly included, a non-inferiority framework would be inappropriate and equivalence would never be inferred from a non-significant superiority test.

A short-term plaque reduction might be used as a preliminary mechanistic endpoint, but a positive outcome would not be definitive. The clinical utility of the procedure is based on disease reduction that can be maintained without an inadequate amount of tissue loss.

Table 2. Proposed design elements for a direct comparative clinical trial.

Component	Recommended specification
Eligibility	Deep/narrow morphology defined by 3D metrics; sound or non-cavitated fissure; meaningful patient-level caries risk
Arms	Standard care +/- experimental geometry modification; consider sealant-alone vs modification-plus-sealant if withholding sealant is unethical
Standardization	Maximum enamel volume/depth; polishing protocol; no functional cusp reduction unless separately indicated
Primary outcome	Incident/progressing occlusal caries at 24-36 months
Mechanistic outcomes	Fissure plaque score, 3D accessibility metrics, retention of any sealant
Harms	Sensitivity, enamel loss, crack formation, occlusal-contact changes, retreatment/restoration
Statistics	Cluster-aware model; preregistered estimand; intention-to-treat; clinically justified non-inferiority margin if used

Ethical design, implementation and reporting

The irreversibility of the intervention should be a key factor in ethical design. The participant information sheet should include: Widening or rounding is experimental caries prevention and there is a stronger evidence base for current conservative options. Assent and parent permission are particularly important for children, as is minimising burden of the procedure. Thresholds of unexpected sensitivity, enamel defects, occlusal symptoms or need for excess restoration that would halt recruitment should be identified in a data-safety plan.

Care should be taken to prevent contamination between study arms during implementation. Clinicians who strongly believe in fissure preparation may be more likely to place unplanned sealants or to do extra grinding, while clinicians who are less enthusiastic may underperform. Fidelity can be documented through operator training, video/digital verification and centralised post-treatment scan review. Standard preventive recommendations should be the same among groups, with the exception of the randomised part, and other fluoride and restorative services should be documented as a time-varying co-intervention.

Both absolute and relative effects, with confidence intervals, should be reported in a publication, not just p-values. Both the number of teeth and the number of participants should be made obvious as the precision of tooth level analyses can be overrated if clustering is neglected. Even if rare, harms should be recorded in a table. When the study is underpowered for incidence of caries, it should be called feasibility or mechanistic research rather than evidence of preventive equivalence.

Discussion

The evidence leads to a restrained conclusion. Deep and deep narrow fissures are valuable caries risk indicators, and the distribution of plaque is affected by occlusal morphology [18-22]. The suggested intervention is thus biologically viable. However, Plausibility does not address the key clinical question: Does intentional removal of sound enamel from a vulnerable fissure lead to better long-term results than retention of the enamel with application of established preventive therapy. There were no contemporary clinical trials identified in this review that are eligible to answer that question.

This gap translates into practical consequences of terminology. An experimental geometric modification of the anatomy should be called 'simplified anatomy' and not as a hygiene warrant. The word 'minimally invasive' should be used only for a protocol that quantifies and minimises tissue removal, and is proven to be safe. The use of 'Alternative to sealants' should be restricted to use following direct comparative evidence for effectiveness, adverse-event profile, retreatment burden/durability. There are no evidence-based comparators other than sealants and fluoride-based interventions until then.

The review has limitations in its structured narrative design and in the use of the terminology in relation to fissure preparation. In order to conduct a publication-ready systematic review, a registered protocol, database specific strategies, duplicate screening, and formal risk of bias assessment would be required. However, the overall evidence is sufficient to support a research-priority paper: morphology-risk relationships are well documented in modern studies and there is extensive sealant evidence, but not of the individual preventive efficacy of widening/rounding sound fissures.

If a study was well-designed, it would be able to make a real contribution by testing a clear mechanistic hypothesis with contemporary digital geometry and clinically meaningful outcomes. However, what is required is not necessarily demonstration of the preparation being able to be done. It's proof that the treatment results are better for the patient than the loss of enamel.

Another unknown is the quality of the surface after modification. At one level, instrumented enamel might be smoother than the original fissure and at another level, it may have scratches or increased roughness, depending on the clinical significance of the finishing and polishing and the process of salivary pellicle formation. Post treatment surface quality should therefore also be measured in any mechanistic study in addition to the width and depth produced. The lack of standardization would mean that two operators might create geometrically similar fissures that would have different plaque-retentive properties, thus compromising the reproducibility.

Cost and acceptability should not be assumed but rather outcomes. Though a short grinding may seem cheap, it takes time for the clinician, equipment, possibility of sensitivity or restoration, and follow-up costs. Sealants also need to be installed and maintained using a technique. Therefore, a comparative economic analysis should include real chair time, retreatment and downstream care and not merely assume cost-effectiveness based on the price of materials. Patient and parent acceptability should be documented separately to clinical efficacy.

Sample size should also be representative of the likely frequency of the event in the well prevented population. In the absence of additional benefit of geometry modification, very large samples may be needed when the incidence of dentine caries is low in the standard preventive care. Adding more "real-life" high-risk patients can increase efficiency but can also decrease generalizability. Event rates and intra-patient correlation should be estimated by a pilot before a definitive sample-size calculation is undertaken and multi-centre recruitment may be required to achieve a precise answer.

Another design consideration is whether the fissures being treated are anatomically extreme or a wider range. Choosing the smallest/deepest fissure will give a more stringent mechanistic test and prevent unnecessary enamel removal in low-risk morphology, but the results would be limited to that subset of fissures. Pre-specified interaction analysis with a graded morphology scale might indicate if any treatment effect is restricted to an extreme geometric threshold. This analysis should be secondary, unless the study is powered specifically for heterogeneity of treatment effect.

Digital dentistry has the potential to make this research more reproducible than previous fissure-preparation research. Intraoral scans have the ability to capture baseline geometry, enable blinded central measurement and measure changes following intervention. But the accuracy of the scanner in very tight fissures has to be verified in turn, since optical access may be restricted in the very anatomy of interest. Prior to the use of a geometric threshold for trial eligibility, agreement between the measurements obtained by scan and a reference method should be assessed.

Finally, a future paper should separate prevention of lesion initiation from management of an existing initial lesion. Widening a sound fissure is primary prevention, whereas preparing a fissure containing an ICDAS 1-2 lesion enters the domain of lesion management. The acceptable amount of tissue removal, comparator and outcome may differ between these situations. Combining them without stratification could obscure whether apparent benefit reflects prevention in sound enamel or treatment of disease that was already present.

Conclusion:

Deep and complex occlusal fissures are associated with plaque retention and caries susceptibility, but recent evidence does not establish prophylactic fissure widening or rounding of sound teeth as an effective stand-alone caries-preventive treatment. No eligible 2017-2026 human clinical trial identified in this review directly compared this geometric intervention with accepted prevention using incident caries as the principal outcome.

Current evidence supports risk-based plaque and diet control, fluoride strategies and pit-and-fissure sealing while preserving sound enamel. Fissure simplification should therefore remain a research hypothesis. Future trials need to incorporate objective 3D morphology, quantify tissue removal, assess plaque and long-term caries outcome, assess occlusal and sensitivity harms, and directly compare with guideline concordant conservative care.

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Krimly, S. (2026). Simplifying Occlusal Fissure Geometry for Caries Prevention: Evidence on Fissure Rounding, Widening, Plaque Retention and Clinical Research Priorities. In Global Journal of Research in Dental Sciences (Vol. 6, Issue 5, pp. 7–15). https://doi.org/10.5281/zenodo.22710787