Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Fibrin Glue versus Sutures for Conjunctival Autograft Fixation in Primary Pterygium Surgery: A Systematic Review of Randomized Controlled Trials.

Dr. Sweety Kumari[1], Dr. Amith Kumar Pampalkar[2], Dr. Marru Pradeep[3]
[1]Assistant Professor, Department of Ophthalmology, Mediciti Institute of Medical Sciences, Ghanpur, Hyderabad, Telangana, India
[2]Assistant Professor, Department of Ophthalmology, CMR Institute of Medical Sciences, Medchal Road, Kandlakoya, Hyderabad, Telangana, India
[3]Comprehensive Fellow, Pushpagiri Vitreo Retina Institute, West Marredpally, Secunderabad, Hyderabad, Telangana, India

Abstract

Background:
Conjunctival autografting reduces recurrence after pterygium excision, but the graft-fixation technique may influence operative time, ocular comfort, graft stability, and postoperative complications.

Objective: To systematically synthesize randomized evidence comparing fibrin glue with sutures for securing conjunctival or limbal-conjunctival autografts in primary pterygium surgery.

Methods: This systematic review used a foundational evidence search of PubMed, Embase, Cochrane CENTRAL, Web of Science, and CINAHL conducted through 8 November 2024. An updated search covering 9 November 2024 to 12 July 2026 was performed in PubMed and ClinicalTrials.gov, supplemented by reference-list screening and forward-citation searching. Two reviewers independently screened records, assessed eligibility, and extracted data. Disagreements were resolved by consensus, with third-reviewer adjudication available. Randomized controlled trials comparing commercial or autologous fibrin preparations with absorbable or non-absorbable sutures after primary pterygium excision were eligible. Published random-effects estimates were retained because complete trial-level datasets were unavailable; therefore, no new meta-analysis was conducted.

Results: The foundational search identified 878 records. After removing 488 duplicates, 390 records were screened, 53 full-text reports were assessed, and 20 randomized controlled trials were included. The updated search identified no additional eligible direct-comparison trials. Recurrence favored fibrin glue, with an odds ratio for sutures versus glue of 2.46 (95% confidence interval, 1.06–5.69; P=0.035; I^2=0%). Operative time was 15.65 minutes shorter with glue, and postoperative day 1 pain was lower. Considerable heterogeneity was observed for operative time and pain outcomes. Subconjunctival hemorrhage was reported in both groups, but inconsistent definitions and assessment periods prevented quantitative synthesis.

Conclusion: This systematic review indicates that fibrin glue may reduce recurrence, shorten surgery, and improve early postoperative comfort compared with sutures. However, heterogeneity and inconsistent reporting limit certainty regarding the magnitude of benefit and complication risks.

Keywords: *pterygium; conjunctival autograft; fibrin glue; fibrin sealant; sutures; recurrence; operative time; pain; subconjunctival hemorrhage; randomized controlled trial.*
Submitted: *May 01, 2026* ***Accepted:*** *May 30, 2026* ***Published:*** *June 30, 2026*

Corresponding author: *Dr. Sweety Kumari*
Email: ***drsweetykumari2017@gmail.com***
Assistant Professor, Department of Ophthalmology, Mediciti Institute of Medical Sciences, Ghanpur, Hyderabad, Telangana, India

Introduction

Pterygium is a benign fibrovascular proliferation of conjunctival tissue that extends across the limbus onto the cornea. Its development is strongly associated with cumulative ultraviolet exposure, outdoor occupation, advancing age, and residence in regions with intense solar radiation. A global meta-analysis estimated a pooled prevalence of approximately 12%, with marked geographic variation related to latitude, occupation, ethnicity, and study

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

methods [1]. Progressive disease may cause irritation, tear-film disturbance, induced astigmatism, visual-axis encroachment, recurrent inflammation, restricted ocular movement, and cosmetic concern [2].

Surgical excision is indicated when the lesion causes visual impairment, progressive corneal extension, substantial astigmatism, persistent symptoms, recurrent inflammation, impaired motility, or unacceptable cosmesis. Bare-sclera excision is associated with a high recurrence rate and is no longer preferred as a stand-alone procedure. Conjunctival autografting has therefore become a standard reconstructive method because the graft covers the exposed sclera and restores a healthier conjunctival and limbal barrier.

The autograft must remain closely apposed to the recipient bed during early healing. Sutures provide reliable mechanical fixation, are inexpensive, and are widely available. However, suturing prolongs operative time and leaves knots, and suture ends on a highly innervated ocular surface, contributing to pain, foreign-body sensation, tearing, hyperemia, granuloma, focal inflammation, epithelial disturbance, and additional postoperative visits.

Fibrin glue reproduces the terminal phase of coagulation. A fibrinogen-containing component and a thrombin-containing component combine to form a fibrin clot that bonds the graft to the scleral bed. Adhesive fixation distributes force across the graft surface, avoids persistent foreign material, and can substantially reduce fixation time. Commercial products provide standardized composition and pathogen-reduction procedures. Autologous preparations avoid donor-derived proteins but require validated blood processing, sterility safeguards, reliable activation, and consistent application.

Earlier systematic reviews generally reported shorter procedures and better early comfort with fibrin glue [3-5]. The 2016 Cochrane review suggested lower recurrence and shorter operating time but rated the evidence as low certainty and noted a possible increase in graft-related complications [3]. A larger pairwise meta-analysis published in 2026 included 20 randomized trials and reported lower recurrence, shorter operative time, and less early postoperative pain with fibrin glue [6]. A subsequent network meta-analysis of 35 randomized trials found a favorable recurrence profile with commercial fibrin glue, whereas Vicryl performed well for graft stability [7].

Important uncertainty remains. Operative time and pain estimates are highly heterogeneous, graft retraction varies among trials, subconjunctival hemorrhage has been measured inconsistently, and commercial fibrin sealants cannot be assumed to perform identically to autologous fibrin preparations. This review was undertaken to consolidate the direct randomized comparison, identify recent evidence, clarify effect direction, and provide a balanced interpretation of efficacy, comfort, graft stability, safety, and resource implications.

Methods

Review design and reporting

This systematic review synthesized randomized controlled trials comparing fibrin glue with sutures for conjunctival autograft fixation in primary pterygium surgery. Reporting followed the PRISMA 2020 statement and relevant guidance in the Cochrane Handbook [8,9]. A two-stage evidence-identification approach was used. First, the complete randomized-trial set, study-flow counts, and published pooled estimates were obtained from the most recent comprehensive five-database review [6]. Second, a focused update was conducted after that review's search cutoff. The present manuscript is therefore an updated systematic synthesis and does not claim a duplicate de novo meta-analysis. Risk-of-bias appraisal and certainty assessment followed the RoB 2 and GRADE frameworks [10,11].

No separate protocol was prepared before the commencement of this updated synthesis, and the review was not prospectively registered. PROSPERO record CRD42024520625 is the registration of the source meta-analysis [6] and is not attributed to the present review.

Eligibility criteria

Eligibility was defined using the population, intervention, comparator, outcomes, and study-design framework shown in Table 1. The principal population comprised patients undergoing surgery for primary pterygium with conjunctival or limbal-conjunctival autografting. Direct randomized comparisons of commercial fibrin glue, fibrin sealant, or an explicitly prepared autologous fibrin product against absorbable or non-absorbable sutures were eligible.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Table 1. Eligibility criteria for the direct comparison

Domain	Included	Excluded
Population	Patients undergoing excision of primary pterygium with conjunctival or limbal-conjunctival autografting.	Recurrent pterygium only; mixed populations without separately extractable primary pterygium data.
Intervention	Commercial fibrin glue/sealant or an explicitly prepared autologous fibrin product.	Autologous whole blood without fibrin preparation; cyanoacrylate; no graft.
Comparator	Absorbable or non-absorbable suture fixation.	No comparator or a comparator unrelated to sutures.
Outcomes	Recurrence, operative time, pain/discomfort, graft retraction/displacement/loss, subconjunctival hemorrhage, inflammation, granuloma, infection, satisfaction, or other adverse events.	No prespecified clinical outcome relevant to fixation.
Design	Randomized or quasi-randomized comparative trial; the principal evidence base was restricted to randomized trials.	Single-arm studies, uncontrolled series, reviews, editorials, laboratory studies, or reports without usable clinical data.

Information sources and last search dates

The foundational review searched PubMed, Embase, Cochrane CENTRAL, Web of Science, and CINAHL from database inception to 8 November 2024, without language or publication-date restrictions [6]. Each of those five sources was last searched on 8 November 2024. The present update searched PubMed for reports published or indexed from 9 November 2024 through 12 July 2026. ClinicalTrials.gov was last searched on 12 July 2026. Reference lists of eligible reports and the 2026 network meta-analysis [7] were checked on 12 July 2026. Forward citation searches of the source meta-analysis [6] and key included trials were performed in Google Scholar on 12 July 2026.

The exact foundational database syntax was not re-executed by the present authors because the original search files and exported bibliographic library were not available. This limitation is stated explicitly rather than by reconstructing unverified search histories. The complete reproducible strategy used for the present update, including the PubMed string, registry query, citation-search procedure, filters, and date limits, is provided in Appendix 1.

Search strategy

The update combined controlled vocabulary and free-text terms for pterygium, conjunctival autografting, fibrin adhesive products, sutures, and randomized trials. The PubMed strategy used MeSH terms and title/abstract terms and applied a publication-date range of 9 November 2024 to 12 July 2026. No language, age, sex, country, or journal filter was applied. ClinicalTrials.gov was searched for interventional studies using the condition "pterygium" and the terms "fibrin glue," "fibrin sealant," "fibrin adhesive," and "suture." Reference and forward citation searches were conducted without date or language restriction. Search strings were not simplified after screening began.

Selection process

Two reviewers (SK and AKP) independently screened titles and abstracts identified in the update and independently assessed potentially eligible full texts. Each reviewer applied the prespecified eligibility criteria without knowledge of the other reviewer's decision. Disagreements were resolved by discussion and consensus; the third reviewer (MP) was designated to adjudicate unresolved differences. No machine-learning classifier, text-mining system, or other automation tool was used. Records were managed in a standardized Microsoft Excel screening sheet, and duplicate reports were identified manually using title, author, year, journal, and digital object identifier.

For the foundational evidence base, the reported PRISMA counts and 20-trial set were retained from the source meta-analysis [6]. The source review reported independent duplicate screening and selection. The present authors did not have access to its complete screening log;

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

therefore, report-level full-text exclusion citations could not be reconstructed independently.

Data collection process

Two reviewers (SK and AKP) independently extracted data into a piloted spreadsheet. Extracted entries were compared cell by cell. Disagreements were resolved by discussion, with the MP available for adjudication. Trial characteristics and clinically important outcomes were verified against accessible primary reports, indexed abstracts, and the source meta-analysis. Study authors were not contacted for missing or unclear information because the review used published aggregate data, and no new quantitative synthesis was planned. Unavailable information was recorded as "not reported" and was not inferred. The comparative reports used for trial-level verification are cited in sequence [12-24].

Data items

The extraction form included publication year, country, setting, study design, unit of randomization, number of participants and eyes, age and sex distribution, inclusion and exclusion criteria, pterygium type, graft type, and duration of follow-up. Intervention variables included commercial or autologous fibrin preparation, brand or preparation method, application technique, graft dimensions, inclusion of limbal tissue, Tenon removal, and hemostasis. Comparator variables included suture material, caliber, absorbability, number of stitches, and configuration. Outcome variables included recurrence definition and timing, total or fixation-specific operative time, pain or discomfort scale, assessment time, graft retraction, displacement, loss, dehiscence, subconjunctival hemorrhage, inflammation, granuloma, infection, epithelial healing, reoperation, satisfaction, and other adverse events. Funding source, conflicts of interest, trial registration, and missing outcome data were also extracted when reported.

When multiple time points were reported, recurrence at the longest comparable follow-up was prioritized, while pain and subconjunctival hemorrhage were retained at the reported postoperative time points. Commercial and autologous fibrin preparations were coded separately. Ambiguous denominators, unclear event definitions, or missing summary statistics were marked as not reported. No numerical value was imputed from an unsupported assumption.

Outcomes and effect measures

The primary outcomes were pterygium recurrence and operative time. For recurrence, the effect measure was the odds ratio (OR), oriented as sutures versus fibrin glue; an OR above 1.0 therefore indicates higher recurrence odds with sutures. Operative time was summarized as the mean difference (MD) in minutes, oriented as sutures minus glue; a positive value indicates longer surgery with sutures. Postoperative pain measured on different scales was summarized using the standardized mean difference (SMD), oriented as glue minus sutures; a negative value indicates less pain with glue.

For dichotomous safety outcomes, including subconjunctival hemorrhage, graft retraction, displacement, loss, granuloma, infection, and reoperation, the planned effect measure was an OR when definitions and time points were sufficiently comparable. Where events were sparse, definitions differed, or a verified pooled estimate was unavailable, results were presented as group-specific numbers and percentages or as a structured narrative synthesis. No pooled effect was calculated for subconjunctival hemorrhage in the present review.

Synthesis methods

Studies were grouped first by outcome: recurrence, operative time, day 1 pain or discomfort, graft stability, subconjunctival hemorrhage, and other complications. Within each outcome, clinical differences in fibrin product (commercial versus autologous), suture material, graft type, follow-up duration, recurrence definition, pain instrument, and assessment time were considered before interpreting pooled or narrative findings.

Because a complete independent trial-level dataset was unavailable, the published random-effects estimates from the source meta-analysis [6] were retained and were not recalculated. Effect directions were standardized for clinical interpretation. No data conversion, estimation of missing standard deviations, transformation of medians, continuity correction, imputation, or extraction from graphs was performed for the present synthesis. Trial-level binary data were reported only when explicit denominators were available in accessible reports.

Findings were presented in an evidence-selection flow diagram, eligibility table, full-text exclusion-accounting table, study-characteristics table, study-level risk-of-bias table for verifiable reports, subconjunctival hemorrhage table, summary-of-outcomes table, and GRADE summary. Forest plots were not regenerated because no de novo meta-

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

analysis was undertaken. Statistical findings were supplemented by a narrative interpretation of clinical heterogeneity and methodological limitations.

No formal subgroup analysis or meta-regression was conducted. The number of studies per outcome was limited, the complete trial-level dataset was unavailable, and post hoc subgrouping would have produced unstable estimates. Potential effect modifiers were explored qualitatively, including commercial versus autologous fibrin, suture material, operative-time definition, surgeon technique, follow-up duration, and outcome measurement.

Risk of bias assessment

Risk of bias was considered using the Cochrane RoB 2 domains: bias arising from the randomization process, deviations from intended interventions, missing outcome data, outcome measurement, and selection of the reported result [10]. Two reviewers independently assessed accessible reports and resolved disagreements by consensus. Surgeon masking was considered infeasible, while participant masking was often compromised because sutures can be felt or seen. Objective recurrence assessments were judged separately from subjective pain outcomes. The source review's complete 20-study RoB 2 forms were not available to the present authors; therefore, Table 4 reports study-level judgments only where sufficient information could be independently verified, and the limitation is stated.

Certainty of evidence

Certainty was evaluated using GRADE domains: risk of bias, inconsistency, indirectness, imprecision, and publication bias [11]. Review-level judgments were based on the published effect estimates, heterogeneity, event numbers, outcome characteristics, and available trial descriptions. Certainty was not upgraded on the basis of effect magnitude alone.

Sensitivity analysis

No independent sensitivity analysis was performed because the present review did not recalculate pooled estimates and did not possess a complete trial-level dataset. Consequently, leave-one-out analyses, alternative statistical models, and exclusion of high-risk trials could not be reproduced. This restriction is acknowledged when interpreting robustness.

Reporting bias assessment

Publication bias and selective reporting bias were not formally assessed in the present review. Funnel plots and regression tests were not generated because no new meta-analysis was conducted, and fewer than 10 verifiable studies contributed to several outcomes. Protocols and registry entries were unavailable for many older trials, limiting assessment of selective outcome reporting. This is treated as a limitation.

Results

Study selection

The foundational five-database search identified 878 records: 413 from Embase, 254 from Web of Science, 124 from PubMed, 54 from CENTRAL, and 33 from CINAHL. After the removal of 488 duplicate records, 390 titles and abstracts were screened, and 324 were excluded. Sixty-six reports were sought for retrieval; 13 could not be retrieved. Fifty-three full-text reports were assessed, 33 were excluded because the eligibility criteria were not met, and 20 randomized controlled trials were included in the direct-comparison evidence base [6]. The updated search through 12 July 2026 identified no additional eligible randomized trials directly comparing fibrin glue with sutures in primary pterygium autografting.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

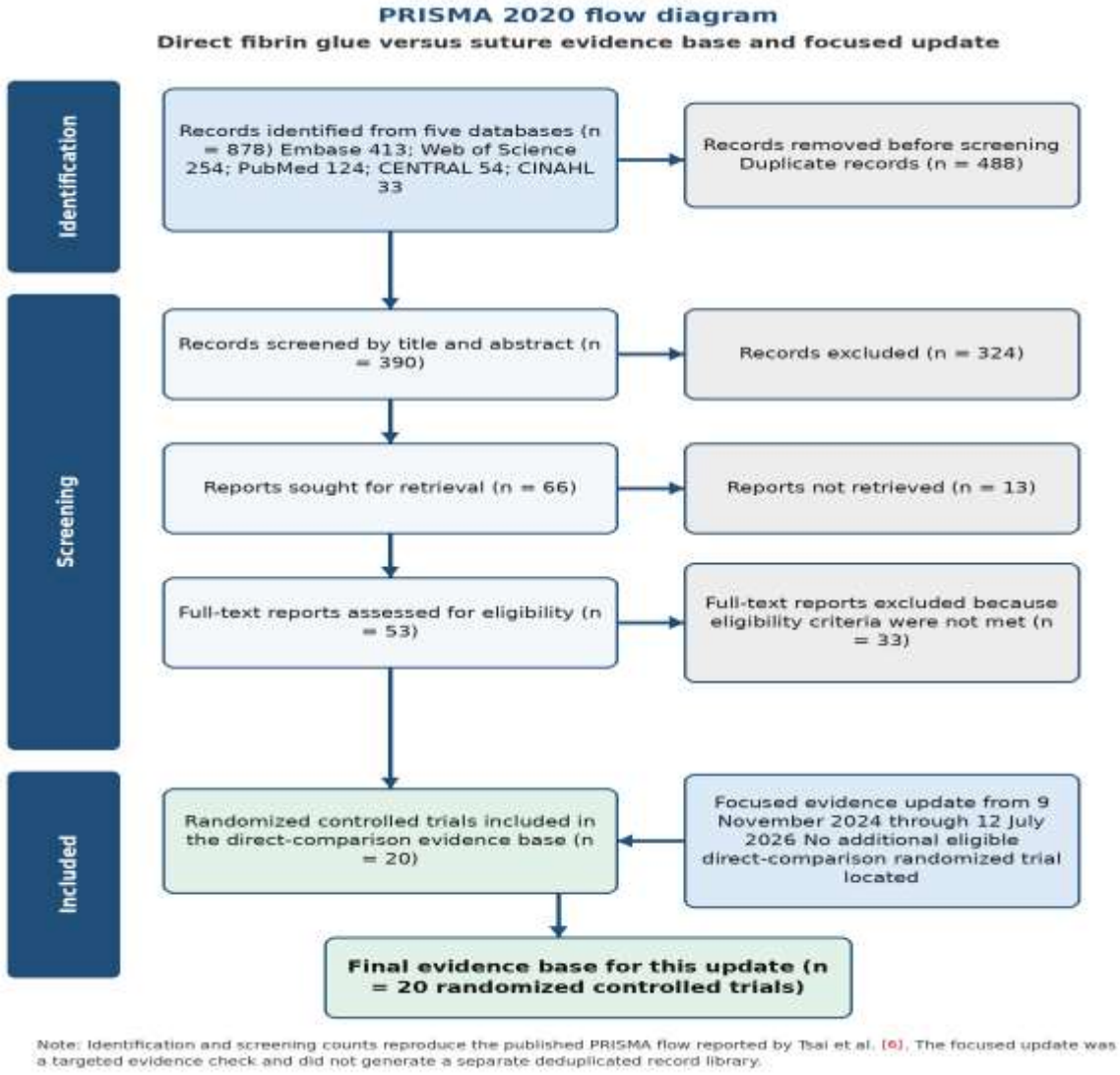

Figure 1. PRISMA 2020 flow diagram for the randomized-trial evidence-based and the focused update. Identification and screening counts reproduce the complete five-database flow reported in the source meta-analysis [6].

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Table 2. Full-text exclusions and retrieval limitations

Report or group	Stage	Reason or status
13 reports	Reports sought for retrieval.	Full text could not be retrieved in the foundational review; most were reported to be from regional or less accessible journals [6].
33 full-text reports	Eligibility assessment	Excluded because eligibility criteria were not met. The published source did not provide an article-level exclusion list accessible to the present authors; individual citations and reasons could therefore not be reconstructed without inventing information.
CTRI/2013/06/00376	Independently verifiable exclusion from an earlier Cochrane review	Randomized comparison of autologous blood versus fibrin glue without a suture comparator [3]. This record is shown for transparency and is not asserted to represent the complete 33-report source exclusion set.

Characteristics of the randomized evidence

The 20 trials were conducted in diverse ophthalmic settings and evaluated commercial fibrin sealants, autologous fibrin preparations, absorbable sutures, and non-absorbable sutures. Follow-up ranged from early symptom assessment to 12 months or longer. Surgical protocols differed in graft thickness, limbal tissue inclusion, Tenon removal, hemostasis, product preparation, suture material and configuration, postoperative medication, and recurrence definition. These variations can influence graft stability, postoperative inflammation, and recurrence.

Before each synthesis, contributing studies were considered in relation to these clinical characteristics and their overall methodological limitations. The accessible evidence was dominated by small, single-center trials, many of which incompletely reported allocation concealment or masking. Objective recurrence outcomes were generally less vulnerable to measurement bias than pain or discomfort outcomes.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Table 3. Representative characteristics of trials in the 20-RCT direct-comparison evidence base

Trial reference	Sample	Comparison	Follow-up	Clinically informative finding
[12]	22 participants	Commercial fibrin glue vs nylon sutures	2 months	Glue shortened surgery and improved comfort; one glue-treated eye had a subconjunctival hemorrhage.
[13]	65 participants	Fibrin glue vs Vicryl	Short term	Glue reduced surgical time and early symptoms; limited follow-up restricted recurrence assessment.
[15]	50 eyes	Fibrin glue vs Vicryl	12 months	Mean surgery time was approximately 16 vs 33 minutes; early comfort favored glue.
[16]	50 participants	Tisseel vs Vicryl	12 months	Mean surgery time was 12 vs 26 minutes; pain was lower on days 1 and 2.
[17]	40 eyes; 34 completed	Fibrin glue vs sutures	3 months	Observer-masked grading showed lower inflammation with glue and no significant difference in hemorrhage grade.
[18]	175 randomized; 137 completed	Fibrin adhesive vs sutures	12 months	Recurrence and operative time favored glue; incomplete follow-up affected precision.
[19]	58 eyes	Beriplast P vs silk sutures	6 months	Operative efficiency and comfort favored glue; one glue-treated eye had a hemorrhage under the graft.
[21]	Three-arm RCT	Glue vs sutures vs autologous blood	6 months	Graft retraction was uncommon in glue and suture arms; technique-related variation was evident.
[22]	89 participants	Evicel or Tisseel vs Vicryl	12 months	Both sealants shortened fixation; outcomes differed between glue products.
[23]	61 eyes	Autologous fibrin glue vs sutures	6 months	Pain favored autologous glue, but complete graft loss occurred in 10/33 glue-treated eyes and 0/28 sutured eyes.
[24]	60 participants	Fibrin sealant vs 10-0 polyamide sutures	6 months	Subconjunctival hemorrhage was absent with glue and occurred in 17/30 sutured eyes; graft retraction was more frequent with glue.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Risk of bias

The randomized evidence had recurring methodological constraints. Several older reports did not clearly describe sequence generation or allocation concealment. Surgeon masking was not feasible, and participant masking was often uncertain because sutures can be felt or seen. Recurrence was more objective than pain but remained sensitive to definition, masked adjudication, and follow-up duration. Missing follow-up and incomplete denominator reporting were concerns in some trials. Study-level judgments that could be independently verified are shown in Table 4; remaining judgments should be consulted in the source review's RoB 2 materials [6].

Table 4. Study-level risk-of-bias assessment for independently verifiable trial reports

Trial reference	Randomization process	Deviations from intended interventions	Missing outcome data	Outcome measurement	Selective reporting	Overall judgment
[12]	Some concerns: sequence/concealment incompletely described	Some concerns: masking is limited	Low: short follow-up complete	Some concerns for subjective outcomes	Some concerns: protocol unavailable	Some concerns
[13]	Some concerns: concealment unclear	Some concerns: masking is limited	Some concerns: short follow-up	Some concerns about symptoms	Some concerns: protocol unavailable	Some concerns
[15]	Some concerns: allocation details are limited	Some concerns: surgeon/participant masking infeasible	Low: complete 12-month follow-up reported	Some concerns for comfort outcomes	Some concerns: protocol unavailable	Some concerns
[16]	Some concerns: pre-allocated codes; concealment not fully detailed	Some concerns: masking is limited	Low: 94% follow-up	Low for masked/objective assessment; some concerns for pain	Some concerns: protocol unavailable	Some concerns
[17]	Some concerns: the allocation method is incompletely reported	Some concerns: participant masking is limited	Some concerns: 34/40 completed	Low: observer-masked photographic grading	Some concerns: protocol unavailable	Some concerns
[18]	Low: block-permuted randomization reported	Some concerns: masking is limited	High: substantial attrition in reported completion figures	Low for recurrence; some concerns for pain	Some concerns: protocol unavailable	High
[19]	Some concerns: randomization method unclear	Some concerns: masking is limited	High: post-randomization exclusions after graft loss	Some concerns	Some concerns: protocol unavailable	High

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/vw7trw33
Systematic Review Article

Trial reference	Randomization process	Deviations from intended interventions	Missing outcome data	Outcome measurement	Selective reporting	Overall judgment
[21]	Low: systematic random allocation reported	Some concerns: masking is limited	Low: complete follow-up reported	Some concerns for subjective outcomes	Some concerns: protocol unavailable	Some concerns
[22]	Some concerns: concealment details are limited	Some concerns: product/suture differences visible	Low: follow-up adequately reported	Low for recurrence; some concerns for symptoms	Some concerns: protocol unavailable	Some concerns
[23]	Some concerns: detailed sequence/concealment not fully available	Some concerns: surgeon unmasked	Low: group denominators reported	Low for graft loss; some concerns for pain	Some concerns: protocol unavailable	Some concerns
[24]	Some concerns: allocation details are limited	Some concerns: masking is limited	Low: follow-up reported	Some concerns for symptoms and hemorrhage ascertainment	Some concerns: protocol unavailable	Some concerns

Note: Judgments are review-level assessments based on accessible reports. They do not replace the complete outcome-specific RoB 2 forms of the source meta-analysis [6].

Pterygium recurrence

The recurrence synthesis included randomized trials with variable follow-up durations and recurrence definitions. Most reports had some concerns regarding allocation reporting, but recurrence was an objective outcome, and statistical heterogeneity was not detected. The pooled estimate favored fibrin glue: when expressed as sutures versus glue, the OR was 2.46 (95% CI 1.06-5.69; P=0.035; I^2=0%) [6]. Thus, recurrence odds were approximately 2.5 times higher with sutures in the analyzed trials. The confidence interval was wide, and its lower boundary was close to unity, indicating limited precision despite directional consistency.

Operative time

Contributing trials differed in whether they measured graft-fixation time or total operation time, the number and configuration of sutures, product preparation, graft dimensions, and surgeon experience. Overall risk of bias was usually characterized by some concerns, while inconsistency was the dominant limitation. Surgery was 15.65 minutes shorter on average with fibrin glue (95% CI 11.45-19.86 minutes; P<0.005) [6]. Heterogeneity was extreme (I^2=99.29%), indicating that the magnitude of time saved varied markedly across settings. No formal meta-regression or subgroup analysis was performed in the present review.

Postoperative pain and discomfort

Pain outcomes were vulnerable to performance and measurement bias because participants could often identify sutures, and trials used different scales, analgesic regimens, and assessment schedules. Day 1 pain was lower after fibrin-glue fixation, with an SMD of -1.32 for glue versus sutures (95% CI -2.11 to -0.52; P<0.001; I^2=90%) [6]. The standardized effect was large, but confidence in its exact magnitude was reduced by substantial inconsistency and incomplete masking. Trial reports also frequently described less foreign-body sensation, tearing, and early irritation with glue.

Graft retraction, displacement, and loss

Graft-stability outcomes were the least consistent. Some trials reported similar retraction rates, whereas others observed more retraction or displacement with glue. Residual Tenon tissue, graft thickness, recipient-bed

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

bleeding, uneven adhesive distribution, premature polymerization, inadequate edge apposition, eye rubbing, and timing of speculum removal may modify risk. The evidence, therefore, reflects both the fixation material and the technical protocol.

Commercial and autologous fibrin preparations should not be combined without qualification. In one recent randomized trial, complete graft loss occurred in 10/33 autologous-glue eyes and 0/28 sutured eyes [23]. The 2026 network meta-analysis also suggested a less favorable graft-failure profile for autologous fibrin than for Vicryl [7]. These results should not be generalized to standardized commercial sealants but demonstrate that preparation quality and application method materially influence stability.

Subconjunctival hemorrhage and other complications

Subconjunctival hemorrhage was assessed at different postoperative time points and was variously recorded as a binary event, a graded photographic outcome, or a descriptive complication. Group-specific findings are summarized in Table 5. Binary data available from three direct randomized reports showed 1/11 versus 0/11, 1/29 versus 0/29, and 0/30 versus 17/30 events for glue versus sutures [12,19,24]. A masked photographic trial found no statistically significant difference in hemorrhage grade at one week, one month, or three months [17]. These findings show that hemorrhage can occur in either group and that a single pooled proportion would be clinically misleading. The source meta-analysis described an overall narrative tendency toward more hemorrhage with sutures, but it did not provide a verified pooled OR [6].

Table 5. Subconjunctival hemorrhage findings reported in accessible direct-comparison trials

Trial reference	Glue group	Suture group	Assessment and interpretation
[12]	1/11 (9.1%)	0/11 (0%)	One glue-treated eye had a subconjunctival hemorrhage during the 2-month follow-up.
[17]	Exact event count not reported in accessible abstract	Exact event count not reported in accessible abstract	Masked grading showed no significant group difference at 1 week, 1 month, or 3 months.
[19]	1/29 (3.4%)	0/29 (0%)	Hemorrhage occurred under the graft in one glue-treated eye.
[24]	0/30 (0%)	17/30 (56.7%)	Postoperative hemorrhage was absent with glue and frequent with sutures.
Narrative synthesis	Events occurred in some glue-treated eyes	Events occurred in some sutured eyes and were high in one trial	Definitions and time points differed; no pooled OR was considered valid.

Other complications, including granuloma, graft dehiscence, edema, infection, epithelial defects, and reoperation, were reported inconsistently. The 2016 Cochrane review found a higher risk of one or more complications with fibrin glue, driven mainly by graft dehiscence, retraction, and granuloma, but certainty was low [3]. Minor self-limited hemorrhage should not be combined indiscriminately with graft loss, infection, or reoperation because these outcomes differ substantially in clinical importance.

Results of heterogeneity investigations

No formal investigation of heterogeneity was performed because the present review did not have a complete trial-level dataset and did not recalculate meta-analytic models. Qualitative exploration suggested that

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

operative-time heterogeneity could reflect surgeon experience, interrupted versus continuous suturing, number of stitches, adhesive preparation time, and whether total procedure time or fixation time was measured. Pain heterogeneity could reflect different scales, assessment times, postoperative medications, masking, and cultural differences in symptom reporting. Graft-stability heterogeneity could reflect product type, graft thickness, Tenon removal, bed hemostasis, and application technique. These observations are hypothesis-generating rather than formal effect-modifier analyses.

Sensitivity analysis

No independent sensitivity analysis was conducted. The robustness of the retained pooled estimates could not be reassessed by excluding high-risk trials, changing the statistical model, or performing leave-one-out analyses because individual study estimates and the full extraction dataset were unavailable. This limitation reduces confidence in the exact magnitude, but not necessarily the direction, of the major findings.

Reporting bias

Reporting bias could not be assessed reliably for each synthesized outcome. Funnel plots and small-study-effect tests were not generated because the present review did not perform a new meta-analysis, and several outcomes had fewer than 10 verifiable contributing studies. Selective reporting also remained difficult to judge because protocols or registry entries were unavailable for many older trials. The possibility of unpublished negative studies and selective complication reporting cannot be excluded.

Summary of synthesized outcomes

Table 6. Summary of direct-comparison outcomes

Outcome	Effect estimate	Heterogeneity	Direction	Interpretation
Recurrence	OR 2.46, sutures vs glue (95% CI 1.06-5.69)	I^2=0%	Favors glue	Probable recurrence reduction; estimate remains imprecise.
Operative time	MD 15.65 minutes longer with sutures (95% CI 11.45-19.86)	I^2=99.29%	Favors glue	Large directional saving; magnitude varies widely.
Day 1 pain	SMD -1.32, glue vs sutures (95% CI -2.11 to -0.52)	I^2=90%	Favors glue	Early comfort improves; exact magnitude uncertain.
Graft retraction	No stable, verified, pooled estimate	Marked clinical inconsistency	Uncertain	Technique, graft preparation, and product type are influential.
Subconjunctival hemorrhage	Group-specific counts and graded outcomes; no pooled OR	Definitions/time points inconsistent	Narrative tendency favors glue, but mixed findings	Events occurred in both groups; severity and timing should be reported separately.
Graft loss	Sparse events; important signal with autologous fibrin	Not applicable	May favor sutures in some protocols	Commercial and autologous products require separate interpretation.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

Certainty of evidence

Certainty was judged moderate for recurrence because randomized evidence showed a consistent direction, but the confidence interval was wide, and several trials had incomplete methodological reporting. Certainty was low for operative time and day 1 pain because of very high heterogeneity and, for pain, subjective measurement with limited masking. Certainty was very low for graft retraction and graft loss because definitions differed, events were sparse, and results conflicted. Certainty was low for subconjunctival hemorrhage because reporting was inconsistent, and no robust pooled estimate was available.

Table 7. GRADE summary of findings

Outcome	Best available estimate	Certainty	Reason for judgment
Recurrence	OR 2.46 for sutures versus glue	Moderate	Consistent direction and I^2=0%; downgraded for imprecision and reporting limitations.
Operative time	15.65 minutes shorter with glue	Low	Downgraded for extreme inconsistency and variation in timing definitions and technique.
Day 1 pain	SMD -1.32 favors glue	Low	Downgraded for inconsistency, subjective measurement, and incomplete masking.
Graft retraction or loss	Conflicting trial findings	Very low	Sparse events, variable definitions, product heterogeneity, and substantial imprecision.
Subconjunctival hemorrhage	Narrative evidence: events in both groups	Low	Inconsistent definitions, time points, severity grading, and absence of a verified pooled estimate.

Discussion

This systematic review of randomized evidence indicates a clinically coherent pattern. Fibrin glue probably reduces recurrence, consistently shortens surgery, and improves early postoperative comfort compared with sutures. The recurrence signal is statistically homogeneous, whereas the exact reductions in operative time and pain vary substantially across studies. Graft stability remains the principal counterbalancing uncertainty, particularly when autologous fibrin preparations are considered together with standardized commercial sealants.

The recurrence result is the most consequential efficacy finding. An OR of 2.46 for sutures versus glue indicates higher recurrence odds with sutures, but the confidence interval is broad. Recurrence is influenced by follow-up duration, definition, pterygium morphology, residual fibrovascular tissue, graft thickness, limbal tissue inclusion, postoperative inflammation, and surgeon technique. Trials ending at three or six months may miss later recurrence. Future studies should define recurrence as fibrovascular regrowth crossing the limbus onto the cornea and should report masked assessments at six and twelve months.

Several mechanisms may explain a recurrence advantage with fibrin glue. Adhesive fixation distributes force over a broad surface and avoids focal ischemia from tight sutures. It also removes a persistent source of mechanical irritation and inflammation. Rapid, uniform graft apposition may facilitate epithelial healing and restoration of the limbal barrier. These advantages can be lost when the graft contains excessive Tenon tissue, the adhesive is uneven, hemostasis is inadequate, or the graft edges are not fully opposed.

The average reduction of nearly 16 minutes is operationally important in high-volume ophthalmic services. Shorter procedures can reduce patient discomfort, surgeon fatigue, and operating-room occupancy. However, an I^2 value above 99% shows that the time benefit is highly context dependent. Economic analyses should measure the entire workflow, including product preparation, thawing, unused material, staff time, and postoperative visits, rather than recording only incision-to-closure time.

The pain result accords with ocular-surface physiology. Knots and exposed suture ends stimulate the conjunctiva and cornea with each blink, producing pain, foreign-body sensation, tearing, and hyperemia. Removing

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

this stimulus can improve early comfort. Yet the pooled SMD should not be interpreted as a universal clinical magnitude because pain instruments, measurement times, analgesic use, and masking differed. Future trials should use validated ocular-discomfort instruments and report clinically interpretable responder thresholds.

Subconjunctival hemorrhage requires cautious interpretation. It was not measured uniformly, and the accessible trials showed both glue-associated and suture-associated events. One trial reported a striking excess with sutures, whereas smaller trials recorded isolated events with glue, and a masked study found no difference in grade. This pattern suggests that bleeding control, graft-bed preparation, grading method, and observation time may be more influential than fixation material alone. Future studies should report the numerator and denominator for each group, the postoperative day, the anatomical extent, time to resolution, and whether intervention was required.

Graft stability illustrates the difference between material efficacy and procedural reliability. Glue must be applied in a thin, even layer while the bed is sufficiently dry to permit polymerization. Excess adhesive can create an irregular interface, while inadequate adhesive can leave unsupported edges. A thick graft contracts and retracts more readily. Sutures may offer greater resistance to early shear in restless patients, large grafts, or difficult recipient beds, but can also bunch tissue and intensify inflammation. The network meta-analysis captured this trade-off by favoring commercial fibrin glue for recurrence and Vicryl for graft stability [7].

Commercial and autologous fibrin products require separate clinical interpretation. Commercial sealants are standardized and processed to reduce transmissible-agent risk, although theoretical risk is not zero. Rare hypersensitivity reactions may occur, particularly with products containing aprotinin. Autologous fibrin avoids donor-derived proteins and may reduce material cost, but performance depends on blood collection, centrifugation, fibrin concentration, activation, sterility, and application technique. The high graft-loss rate reported in one autologous-fibrin trial indicates that low cost alone is not evidence of equivalence [23].

Adverse-event synthesis should preserve clinical meaning. A transient subconjunctival hemorrhage is not equivalent to graft loss, infection, or reoperation. Composite complication outcomes may obscure the direction of serious events [3]. Future reports should list each event separately, specify severity and management, and distinguish graft-edge retraction from complete graft loss.

Cost and access remain decisive. Sutures are inexpensive, stable in storage, and widely available. Commercial fibrin kits may be costly and can create wastage when one vial is used for a single eye. Direct costs may be partly offset by shorter operating-room occupancy, reduced early discomfort, and fewer suture-related visits. A trial-based cost-effectiveness analysis should include product acquisition, storage, preparation, wastage, theatre time, follow-up, complication management, and patient time away from work.

The evidence is most applicable to adults with primary nasal pterygium undergoing conjunctival or limbal-conjunctival autografting. Generalizability is weaker for recurrent disease, double-headed or very large lesions, pediatric patients, cicatricial conjunctival disorders, or combined ocular procedures. Surgeon experience is also an effect modifier. Fibrin glue may simplify graft placement, but inadequate dissection or apposition can negate its theoretical advantage.

Strengths and limitations

This review integrates the most recent pairwise randomized evidence with a subsequent network meta-analysis, standardizes effect directions, distinguishes commercial from autologous fibrin preparations, and gives graft stability and subconjunctival hemorrhage appropriate clinical emphasis. The revised methods now specify information sources and dates, the complete update strategy, independent screening and extraction, data items, effect measures, synthesis procedures, risk-of-bias approach, and handling of missing information. The PRISMA diagram is placed in the Results section, and outcome-specific evidence tables are provided.

Several limitations remain. The review did not reconstruct a new five-database bibliographic library or independently extract a complete 20-trial dataset. It used the validated trial set, screening flow, and pooled estimates from the most recent comprehensive meta-analysis and then conducted a focused update through 12 July 2026. The exact foundational database strings, complete report-level exclusion log, and full 20-study RoB 2 forms were not available to the present authors. Consequently, the manuscript should be interpreted as an updated systematic synthesis rather than a new quantitative meta-analysis. Formal subgroup, sensitivity, and reporting-bias analyses

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

were not possible. Several full texts in the source review were inaccessible, recurrence definitions varied, and operative-time and pain outcomes were highly heterogeneous.

Implications for clinical practice

For routine primary pterygium surgery with conjunctival autografting, commercial fibrin glue is a reasonable option when it is available, affordable, and familiar to the surgeon. It is particularly attractive when early comfort and operating-room efficiency are priorities. Sutures remain appropriate when fibrin products are unavailable, contraindicated, or prohibitively expensive, or when stronger early mechanical fixation is clinically desirable. Autologous fibrin preparations should be adopted only with a validated preparation protocol, sterility assurance, and outcome monitoring because their graft-stability profile may differ from commercial sealants.

Research priorities

Future randomized trials should use concealed allocation, masked recurrence adjudication, a standardized definition of corneal recurrence, and at least 12 months of follow-up. They should report both participants and eyes and account for the within-person correlation when bilateral cases are included.

A core outcome set should include recurrence at 6 and 12 months, total operative workflow time, validated pain and ocular-discomfort measures, graft retraction, displacement, complete loss, subconjunctival hemorrhage by standardized grade and postoperative day, granuloma, infection, reoperation, refractive change, satisfaction, and cost. Commercial products and autologous preparations should be analyzed separately. Product brand, preparation method, graft dimensions, Tenon removal, surgeon grade, suture material, postoperative treatment, and eye-rubbing precautions should be prespecified.

Large multicenter trials are more useful than additional small single-center comparisons. Embedded economic evaluations should quantify product wastage, operating-room time, additional visits, complication treatment, and patient-incurred costs. Rare safety events require prospective registries or coordinated post-marketing surveillance.

Conclusion

Randomized evidence supports fibrin glue as an effective method for conjunctival autograft fixation in primary pterygium surgery. Compared with sutures, it probably lowers recurrence, substantially shortens surgery, and reduces early postoperative pain and irritation. Confidence in the exact size of the time and pain benefits is limited by high heterogeneity. Subconjunctival hemorrhage occurs in both groups and cannot be summarized reliably without standardized time points and severity definitions. Graft retraction and loss remain technique-sensitive outcomes, and autologous fibrin preparations should not be assumed to be equivalent to standardized commercial sealants. Material selection should balance recurrence prevention, graft stability, comfort, surgeon experience, product safety, and local cost.

Declarations

Ethics approval and consent to participate

Not applicable. This review used data from published studies and did not recruit participants or access identifiable individual-level data.

Consent for publication

Not applicable.

Protocol registration and access

No separate review protocol was prepared, publicly posted, or prospectively registered. Therefore, no protocol document is available for access. PROSPERO record CRD42024520625 belongs to the source meta-analysis [6] and not to the present review.

Protocol amendments

Because no separate protocol was prepared, there were no protocol amendments after commencement. Methodological clarifications introduced during peer-review revision are described transparently in the revised Methods and Limitations sections.

Data availability

The standardized extraction form, extracted evidence tables, and study-verification sheet are not currently deposited in a public repository but are available from the corresponding author upon reasonable request. No participant-level dataset was generated. No analytical code was produced because the pooled estimates were not recalculated. The evidence underlying the review is available in the cited publications.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

Funding
No specific funding was received for this work.

Competing interests
The authors declare no competing interests.

Author contributions
SK contributed to conception, screening, data extraction, evidence appraisal, drafting, and revision. AKP contributed to screening, data extraction, verification, interpretation, and critical revision. MP contributed to adjudication, methodological review, interpretation, and final approval. All authors approved the submitted version and accept responsibility for the work.

Acknowledgements
None.

References
1. Rezvan F, Khabazkhoob M, Hooshmand E, Yekta A, Saatchi M, Hashemi H. Prevalence and risk factors of pterygium: a systematic review and meta-analysis. Surv Ophthalmol. 2018;63(5):719-735. doi:10.1016/j.survophthal.2018.03.001.
2. Shahraki T, Arabi A, Feizi S. Pterygium: an update on pathophysiology, clinical features, and management. Ther Adv Ophthalmol. 2021;13:25158414211020152. doi:10.1177/25158414211020152.
3. Romano V, Cruciani M, Conti L, Fontana L. Fibrin glue versus sutures for conjunctival autografting in primary pterygium surgery. Cochrane Database Syst Rev. 2016;12:CD011308. doi:10.1002/14651858.CD011308.pub2.
4. Pan HW, Zhong JX, Jing CX. Comparison of fibrin glue versus suture for conjunctival autografting in pterygium surgery: a meta-analysis. Ophthalmology. 2011;118(6):1049-1054. doi:10.1016/j.ophtha.2010.10.033.
5. Lan A, Xiao F, Wang Y, Luo Z, Cao Q. Efficacy of fibrin glue versus sutures for attaching conjunctival autografts in pterygium surgery: a systematic review with meta-analysis and trial sequential analysis of evidence. Oncotarget. 2017;8(25):41487-41497. doi:10.18632/oncotarget. 17195.
6. Tsai JHJ, Tan EJ, Au Eong JTW, George SM, Au Eong KG. Fibrin glue versus sutures for securing conjunctival autograft in primary pterygium surgery: a systematic review and meta-analysis. Am J Ophthalmol. 2026;283:313-323. doi:10.1016/j.ajo.2025.12.004.
7. Terres MT, Hira S, Ferreira de Avila M, Pereira EMM, Shamsher E, Wagner F, et al. Conjunctival autograft fixation in primary pterygium surgery: a network meta-analysis of randomized trials. Am J Ophthalmol. 2026;285:240-253. doi:10.1016/j.ajo.2026.02.005.
8. Page MJ, McKenzie JE, Bossuyt PM, Boutron I, Hoffmann TC, Mulrow CD, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. BMJ. 2021;372:n71. doi:10.1136/bmj.n71.
9. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, Welch VA, editors. Cochrane Handbook for Systematic Reviews of Interventions. Version 6.5. Cochrane; 2024.
10. Sterne JAC, Savovic J, Page MJ, Elbers RG, Blencowe NS, Boutron I, et al. RoB 2: a revised tool for assessing risk of bias in randomised trials. BMJ. 2019;366:l4898. doi:10.1136/bmj.l4898.
11. Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, et al. GRADE: an emerging consensus on rating the quality of evidence and the strength of recommendations. BMJ. 2008;336(7650):924-926. doi:10.1136/bmj.39489.470347.AD.
12. Uy HS, Reyes JMG, Flores JDG, Lim-Bon-Siong R. Comparison of fibrin glue and sutures for attaching conjunctival autografts after pterygium excision. Ophthalmology. 2005;112(4):667-671. doi:10.1016/j.ophtha.2004.08.028.
13. Bahar I, Weinberger D, Dan G, Avisar R. Pterygium surgery: fibrin glue versus Vicryl sutures for conjunctival closure. Cornea. 2006;25(10):1168-1172. doi:10.1097/01.ico.0000240087.32922.ee.
14. Jiang J, Yang Y, Zhang M, Fu X, Bao X, Yao K. Comparison of fibrin sealant and sutures for conjunctival autograft fixation in pterygium surgery: one-year follow-up. Ophthalmologica. 2008;222(2):105-111. doi:10.1159/000112627.
15. Karalezli A, Kucukerdonmez C, Akova YA, Altan-Yaycioglu R, Borazan M. Fibrin glue versus sutures for conjunctival autografting in pterygium surgery:

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

a prospective comparative study. Br J Ophthalmol. 2008;92(9):1206-1210. doi:10.1136/bjo.2008.139600.
16. Hall RC, Logan AJ, Wells AP. Comparison of fibrin glue with sutures for pterygium excision surgery with conjunctival autografts. Clin Exp Ophthalmol. 2009;37(6):584-589. doi:10.1111/j.1442-9071.2009.02105.x.
17. Srinivasan S, Dollin M, McAllum P, Berger Y, Rootman DS, Slomovic AR. Fibrin glue versus sutures for attaching the conjunctival autograft in pterygium surgery: a prospective observer-masked clinical trial. Br J Ophthalmol. 2009;93(2):215-218. doi:10.1136/bjo.2008.145516.
18. Ratnalingam V, Eu AL, Ng GL, Taharin R, John E. Fibrin adhesive is better than sutures in pterygium surgery. Cornea. 2010;29(5):485-489. doi:10.1097/ICO.0b013e3181c29696.
19. Yuksel B, Unal M, Onur I, et al. Comparison of fibrin glue and suture technique in pterygium surgery performed with limbal autograft. Int J Ophthalmol. 2010;3(4):316-320. doi:10.3980/j.issn.2222-3959.2010.04.09.
20. Cha DM, Kim KH, Choi HJ, Kim MK, Wee WR. A comparative study of the effect of fibrin glue versus sutures on clinical outcome in patients undergoing pterygium excision and conjunctival autografts. Korean J Ophthalmol. 2012;26(6):407-413. doi:10.3341/kjo.2012.26.6.407.
21. Sati A, Shankar S, Jha A, Kalra D, Mishra S, Gurunadh VS. Comparison of efficacy of three surgical methods of conjunctival autograft fixation in the treatment of pterygium. Int Ophthalmol. 2014;34(6):1233-1239. doi:10.1007/s10792-014-0013-y.
22. Zloto O, Greenbaum E, Fabian ID, Ben Simon GJ. Evicel versus Tisseel versus sutures for attaching conjunctival autograft in pterygium surgery: a prospective comparative clinical study. Ophthalmology. 2017;124(1):61-65. doi:10.1016/j.ophtha.2016.09.010.
23. Cioba C, Marafon SB, Fortes BGB, Cavalheiro MT, Fabris M, Michel G, et al. Autologous fibrin glue versus sutures for conjunctival autograft in primary pterygium: a randomized clinical trial. Int Ophthalmol. 2023;43(7):2371-2381. doi:10.1007/s10792-023-02635-z.
24. Vichare N, Choudhary T, Arora P. A comparison between fibrin sealant and sutures for attaching conjunctival autograft after pterygium excision. Med J Armed Forces India. 2013;69(2):151-155. doi:10.1016/j.mjafi.2012.09.002.

Appendix 1. Complete search strategy for the focused update

PubMed

Database last searched: 12 July 2026. Coverage: 9 November 2024 to 12 July 2026. No language, human, age, sex, or journal filters were applied.

(("Pterygium"[Mesh] OR pterygium*[tiab]) AND ("Fibrin Tissue Adhesive"[Mesh] OR "fibrin glue"[tiab] OR "fibrin sealant"[tiab] OR "fibrin adhesive"[tiab] OR "autologous fibrin"[tiab] OR Tisseel[tiab] OR Tissucol[tiab] OR Beriplast[tiab] OR Evicel[tiab]) AND ("Sutures"[Mesh] OR sutur*[tiab] OR Vicryl[tiab] OR nylon[tiab]) AND (randomized controlled trial[pt] OR controlled clinical trial[pt] OR random*[tiab] OR randomised[tiab] OR randomized[tiab] OR trial[tiab])) AND ("2024/11/09"[Date - Publication] : "2026/07/12"[Date - Publication])

ClinicalTrials.gov

Registry last searched: 12 July 2026. Study type filter: Interventional Studies. Status: all recruitment statuses. Condition/disease: pterygium. Other terms entered separately and in combination: "fibrin glue", "fibrin sealant", "fibrin adhesive", "autologous fibrin", and "suture". No country, age, sex, phase, funder, or result-status restriction was applied. Records were examined for a direct fibrin-versus-suture comparison with conjunctival autografting for primary pterygium.

Google Scholar forward citation search.

Website last searched: 12 July 2026. Exact-title searches were performed in quotation marks for the source meta-analysis [6] and key direct-comparison trials. The "Cited by" function was then screened for reports published or indexed after 8 November 2024. Searches were repeated using the combinations "pterygium" AND "fibrin glue" AND "suture" AND randomized, and "conjunctival autograft" AND "fibrin sealant" AND sutures. No language restriction was applied.

Student's Journal of Health Research Africa
e-ISSN: 2709-9997, p-ISSN: 3006-1059
Vol.7 No. 2 (2026): June 2026 Issue
https://doi.org/10.51168/sjhrafrica.v7i2.2831
Review Article

Reference-list checking

Reference lists of the source pairwise meta-analysis [6], the 2026 network meta-analysis [7], and all newly identified potentially relevant reports were screened manually on 12 July 2026. Titles were assessed for a direct randomized comparison of fibrin glue or an explicit fibrin preparation with sutures after primary pterygium excision and conjunctival autografting.

Foundational search transparency

The foundational review last searched PubMed, Embase, Cochrane CENTRAL, Web of Science, and CINAHL on 8 November 2024 [6]. Its exact database-specific strings and exported search files were not available to the present authors and were not re-executed. Consequently, the present manuscript reports the database names, date, restrictions, and source citation exactly as available, but does not present reconstructed strings as if they were the original executed strategies.

PUBLISHER DETAILS

Student's Journal of Health Research (SJHR)
(ISSN 2709-9997) Online
(ISSN 3006-1059) Print
Category: Non-Governmental & Non-profit Organization
Email: studentsjournal2020@gmail.com
WhatsApp: +256 775 434 261
Location: Scholar's Summit Nakigalala, P. O. Box 701432, Entebbe Uganda, East Africa