



Type of study: systematic review and exploratory meta-analysis



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1. BACKGROUND

- Peri-implantitis is a plaque-associated inflammatory disease with progressive loss of supporting bone.
- Autologous fibrin matrices such as PRF, L-PRF, and CGF are used as scaffolds, membranes, or graft-binding matrices during reconstructive peri-implantitis surgery.
- Their independent additional clinical benefit remains uncertain.



2. OBJECTIVE

- Evaluate clinical, radiographic, implant-level, patient-reported, and safety outcomes of autologous fibrin matrices used in reconstructive surgical treatment of peri-implantitis.
- Assess whether quantitative synthesis of comparative outcomes is methodologically defensible.



3. METHODS

- PRISMA 2020 systematic review and exploratory meta-analysis.
- Databases: Embase, PubMed/MEDLINE, Litmaps, Scopus, Web of Science, and CENTRAL.
- Search updated to 24 July 2026.
- Eligibility: human reconstructive peri-implantitis studies using PRF, L-PRF, or CGF, minimum 6-month follow-up.
- Comparative and uncontrolled designs included.
- Risk of bias: RoB 2, ROBINS-I, and JBI case-series checklist.
- Certainty of evidence: GRADE.



4. EVIDENCE BASE / KEY NUMBERS

7



eligible reports

5



independent clinical cohorts

2



comparative trials pooled

Follow-up range:
6 months to 7 years

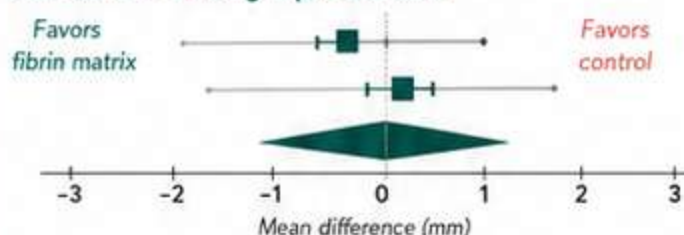
5. KEY FINDINGS

- ✓ Only two independent comparative trials permitted quantitative synthesis.
- ✓ Effect directions were inconsistent.
- ✓ PRF favored over flap surgery alone in a small split-mouth trial.
- ✓ CGF was not shown to be reliably superior to collagen membrane in the active-comparator study family.
- ✓ Uncontrolled studies reported clinically relevant within-group improvements, but multimodal protocols prevented isolation of a fibrin-matrix effect.
- ✓ No major safety signal specifically attributable to autologous fibrin matrices emerged.

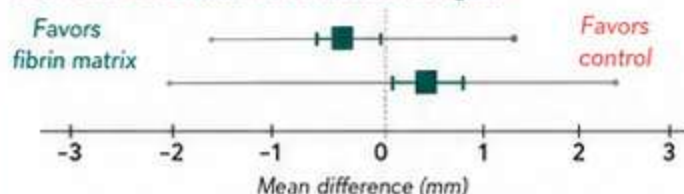


6. EXPLORATORY META-ANALYSIS (FOREST-PLOT SUMMARY)

Outcome A: Probing depth reduction

Pooled result:
MD 0.15 mm
(95% CI -1.10 to 1.39);
 $I^2 = 87.3\%$! Very high heterogeneity.
Estimates are imprecise.

Outcome B: Clinical attachment level gain

Pooled result:
MD 0.46 mm
(95% CI -1.54 to 2.46);
 $I^2 = 94.8\%$! Very high heterogeneity.
Estimates are imprecise.

7. CLINICAL FINDINGS / STUDY SNAPSHOTS

Study (Year)	Design	Intervention vs Comparator	Key Findings
Hamzacebi 2015	Comparative (split-mouth RCT)	PRF vs access-flap surgery alone	• Greater 6-month probing depth (PD) reduction and clinical attachment level (CAL) gain with PRF. Small split-mouth trial.
Isler 2018 / 2022 / 2025	Comparative family of RCTs	CGF vs collagen membrane	• No reliable superiority of CGF over collagen membrane. • Long-term recurrence and implant loss occurred in both groups.
Jia 2024	Uncontrolled cohort	Multimodal protocol with CGF	• PD reduction 2.93 mm; bone gain 2.51 mm. • Effect cannot be attributed specifically to CGF.
Martins 2026	Uncontrolled case series	L-PRF / xenograft block protocol	• PD reduction 4.53 mm; CAL improvement 4.50 mm. • Proof-of-concept only.



8. WHY THE EVIDENCE IS UNCERTAIN

- Only two independent comparative trials.
- Different fibrin products: PRF versus CGF versus L-PRF.
- Different comparators: no matrix versus collagen membrane.
- Different follow-up times.
- High statistical heterogeneity.
- Small samples and predominantly uncontrolled multimodal protocols.
- Risk of bias and imprecision.



9. GRADE SUMMARY

Outcome	Effect estimate (MD, mm)	Heterogeneity	Certainty
PD reduction	0.15 mm (-1.10 to 1.39)	I^2 87.3%	●○○○○ VERY LOW
CAL gain	0.46 mm (-1.54 to 2.46)	I^2 94.8%	●○○○○ VERY LOW



Downgraded for risk of bias, very serious inconsistency, indirectness, and imprecision.



10. CLINICAL IMPLICATIONS

- PRF, L-PRF, and CGF can be considered feasible components of reconstructive protocols.
- They should not currently be presented as evidence-based superior replacements for established reconstructive materials or methods.
- Treatment planning should prioritize defect morphology, decontamination, graft stabilization, soft-tissue closure, and maintenance.



11. RECOMMENDATIONS FOR FUTURE TRIALS

- 1 Prospective registration and adequate statistical power.
- 2 Standardized surgery, decontamination, and fibrin preparation protocols.
- 3 Clear reporting of tube material, centrifugation parameters, and matrix form.
- 4 Harmonized outcome definitions.
- 5 At least 3- to 5-year follow-up.



12. CONCLUSIONS

- 1 Autologous fibrin matrices can be incorporated into reconstructive peri-implantitis surgery.
- 2 Current pooled evidence does not demonstrate a reliable additional benefit for probing depth reduction or clinical attachment level gain.
- 3 Certainty of evidence is very low.
- 4 Well-designed randomized trials are needed before PRF, L-PRF, or CGF can be recommended as evidence-based replacements for established materials.



13. SELECTED REFERENCES

1. Hamzacebi, C. et al. Int J Periodontics Restorative Dent. 2015.
2. Isler, S.C. et al. Clin Implant Dent Relat Res. 2018.
3. Isler, S.C. et al. Clin Oral Implants Res. 2025.
4. Jia, Z. et al. 2024.
5. Martins, G. et al. 2026.