

Comparative Analysis: The Regenerative Potential of Amnion-Chorion and Collagen Membranes in the Treatment of Peri-implantitis Defects

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INTRODUCTION

Peri-implantitis is an inflammatory condition that leads to progressive bone loss and is a major cause of late implant failure. Regenerative approaches based on guided bone regeneration (GBR) have shown variable outcomes, largely dependent on membrane selection.

Collagen membranes are the clinical gold standard due to biocompatibility, ease of handling, and predictable resorption, but they remain biologically passive, serving mainly as mechanical barriers. In contrast, amnion-chorion membranes (ACM), derived from human placental tissue, contain bioactive molecules such as PDGF, TGF- β , VEGF, and anti-inflammatory cytokines that promote angiogenesis, cellular proliferation, and wound stabilization.

OBJECTIVE

To conduct a comparative analysis of collagen and amnion-chorion membranes by highlighting their key biological and clinical differences and evaluating the potential advantages of each in guided bone regeneration.

REFERENCES



COMPARISON

Feature	Collagen Membrane	Amnion- Chorion Membrane (ACM)
Source	Porcine or bovine collagen	Human placental tissue (amnion + chorion)
Primary Role	Passive GBR barrier	Barrier + biologically active scaffold
Biologic Activity	None (biologically passive)	Growth factors (PDGF, TGF- β , VEGF), anti-inflammatory cytokines
Angiogenesis	Limited	Enhanced neovascularization
Soft Tissue Healing	Standard wound coverage	Promotes epithelialization and soft tissue maturation
Inflammation Modulation	Minimal	Anti-inflammatory and anti-fibrotic effects
Handling	Easy, familiar	Thin, pliable; delicate when wet
Space Maintenance	Moderate (depends on thickness/fixation)	Limited inherent rigidity
Resorption	Predictable enzymatic resorption	Natural biologic integration
Clinical Evidence	Extensive long-term evidence; gold standard	Growing evidence base; fewer long-term RCTs
Cost	Lower	Higher

Membranes



Collagen Membrane



Amnion Chorion Membrane

RESULTS

Current evidence indicates that ACM provides enhanced cellular activity, early vascularization, and potentially improved regenerative outcomes compared to collagen membranes. These advantages may contribute to superior healing dynamics and clinical results in peri-implant regenerative therapy.

CONCLUSION

Collagen membranes remain the current clinical standard due to their predictable handling and resorption characteristics. Amnion-chorion membranes provide additional biological properties, including the presence of growth factors and anti-inflammatory effects, which may support soft tissue healing and regenerative outcomes in peri-implantitis treatment. Further controlled clinical studies are needed to establish clinically proven outcomes.