Novel Xenograft as a Salvage Strategy for Wound Reconstruction After Free Flap Failure

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BACKGROUND

Lower extremity trauma involving the tibia remains a reconstructive challenge, especially after free flap failure. Traditional salvage strategies such as repeat microsurgery or negative pressure wound therapy are often limited in patients with comorbidities, infection, or poor vascularity. Porcine-derived xenografts like XCellistem provide a biologically active scaffold that promotes rapid granulation tissue formation, potentially expediting skin graft readiness and reducing the need for additional complex reconstructions.

PURPOSE

This study evaluates the use of XCellistem as a salvage option for lower extremity wounds after free flap failure, focusing on its ability to promote granulation, enable timely skin grafting, and provide durable coverage as an alternative to repeat reconstruction or amputation.

METHODS

Two patients with failed anterolateral thigh free flaps for complex tibial wounds were included. After surgical debridement, XCellistem was applied in multilayered fashion using powder and gauze coverage, followed by Xeroform dressings and chromic sutures to secure placement. Wounds were managed with saline dressings and monitored until robust granulation tissue was observed. Once graft readiness was achieved, split-thickness skin grafting was performed. Patients were followed for at least six months to assess wound durability and functional outcomes.

RESULTS

Both patients demonstrated successful integration of XCellistem with progressive granulation tissue formation. In case 1, a 38-year-old male with a proximal tibial fracture achieved graft readiness by postoperative day (POD) 16 and underwent skin grafting the same day. In case 2, a 43-year-old male with necrotizing soft tissue infection required serial xenograft applications. Granulation was evident by postoperative week 2, with grafting performed at week 12. No major complications occurred. Both patients achieved durable wound coverage, resumed rehabilitation, and maintained stable soft tissue healing at 6-month follow-up.

Case 1

Figure 1: Proximal tibial wound following free flap failure with exposed bone and hardware.

Figure 2: Application of XCellistem xenograft to the debrided wound bed.

Figure 3: Robust granulation tissue formation on POD 16.

Figure 4: Stable graft take at 6 months post-op.

Case 2

Figure 5: Dorsal foot wound with exposed tendon and poor granulation.

Figure 6: Initial debridement of necrotic tissue prior to xenograft application.

RESULTS cont.

Figure 7: Early wound bed on POD 14 following XCellistem application.

Figure 8: Significant wound healing observed at 18 weeks.

Figure 9: Stable graft take and durable coverage 8 months.

CONCLUSIONS

XCellistem xenograft appears to be a promising salvage option for complex lower extremity wounds after flap failure. By accelerating granulation tissue formation, it enables timely skin grafting, reduces the need for repeat microsurgical reconstruction, and provides durable coverage. Larger prospective studies are warranted to confirm these early findings and expand its role in limb salvage protocols.

REFERENCES

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