

Surgical Repair of Severe Varus Ankle Deformity with Osteoarthritis Using ViviGen® Cellular Bone Matrix

Case performed by: Ari Kaz, MD; Chicago, IL, USA

CASE STUDY

Varus ankle deformities can occur due to a variety of musculoskeletal and nervous system disorders.¹ Post-operative complications and poor outcomes have been observed with ankle arthroplasty in patients with severe angular deformity,² which suggests fusion may be a better approach. One bone-grafting option for fusion is autograft bone. Autograft bone can provide the osteoconductive, osteoinductive, and osteogenic properties needed for successful bone fusion; however, its retrieval can cause pain and morbidity at the harvest site.³ Even in cases in which autograft is desired, there is a limit to the amount that can be harvested without compromising the donor site. Allograft bone can be used as an autograft extender or even eliminate the need for a second surgery site altogether. One particular allograft, ViviGen, also provides all three properties necessary for bone fusion. ViviGen contains viable lineage-committed bone cells embedded in cortico-cancellous chips combined with demineralized bone particles or fibers. Preclinical studies involving porous ceramic scaffolds seeded with either osteoblasts or mesenchymal stem cells (MSCs) have suggested that bone cells may provide a higher degree of bone deposition than MSCs.^{4,5} Findings from these studies suggest that viable bone allografts may have greater relevance in cases where bone fusion is anticipated to be challenging.

The following describes the use of ViviGen to treat a severe varus ankle deformity with osteoarthritis.

Patient

49-year-old male.

Presented with a long-standing history of left ankle pain, instability, and varus deformity. Pre-operative x-rays showed ankle arthritis and significant varus deformity (**Figure 1**). The patient was otherwise in good health with the exception of taking over-the-counter medication that may increase the risk for developing osteopenia or osteoporosis.

Procedure

An ankle fusion was performed using proximal tibia bone graft and 10 cc of ViviGen as a bone-graft extender.

Results

Solid osseous union was noted approximately four months after surgery (**Figure 2**), demonstrating the capability of ViviGen as a bone-graft extender in an ankle fusion.

Conclusion

This case highlights the use of ViviGen as a bone graft to treat a severe varus ankle deformity.

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Figure 1. Pre-operative x-rays showed ankle arthritis and significant varus deformity.



Figure 2. Solid osseous union was noted approximately four months after surgery.

References

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