

Salvage of Failed Wrist Arthroplasty Using Vivigen® Cellular Bone Matrix

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CASE STUDY

As the number of failures associated with wrist arthroplasties increases, a new and reliable approach is needed for successful salvage using arthrodesis.¹ Co-morbidities, such as rheumatoid arthritis, can further increase the risk of complications with this procedure.² One option for achieving arthrodesis 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 The use of allografts can avoid these downsides. 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 as well as demineralized bone particles or fibers. Preclinical studies involving seeding of porous ceramic scaffolds have suggested that bone cells may provide a higher degree of bone deposition than mesenchymal stem cells (MSCs).^{4,5} Such findings may have relevance in cases where bone fusion has presented a unique challenge.

The following describes the use of Vivigen in a challenging salvage of a failed wrist arthroplasty case.

Patient

66-year-old female

Patient with rheumatoid arthritis presented after undergoing two previous total wrist arthroplasties. The initial wrist arthroplasty lasted approximately 12 years, and the second lasted seven years. The patient strongly desired wrist fusion rather than another attempt at a temporary wrist arthroplasty.

Procedure

The previous total arthroplasty was removed (**Fig. 1**), which left a large bony defect (**Fig. 2**). While a humeral or femoral head allograft could be placed to fill this bone deficit, successful union using a pre-contoured wrist fusion plate can be obtained with good bone contact. The large bone defect was filled with 10 cc of Vivigen (**Figs. 3, 4**). A neutral wrist fusion plate was then placed on the dorsal aspect. (**Fig. 5**) Fluoroscopic view showed excellent bone contact and placement of the Vivigen graft.

Results

Solid healing was achieved approximately three months from surgery. The final radiograph showed no loosening of the implant (**Figs. 6, 7**).

Conclusion

The patient was asymptomatic and very satisfied with her wrist fusion as compared to another attempt at wrist arthroplasty. Arthrodesis using Vivigen was successful in inducing bone fusion following a failed arthroplasty procedure in an older patient with rheumatoid arthritis.

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Figure 1.

Lateral radiograph demonstrating marked instability and loosening of the total wrist arthroplasty implant.

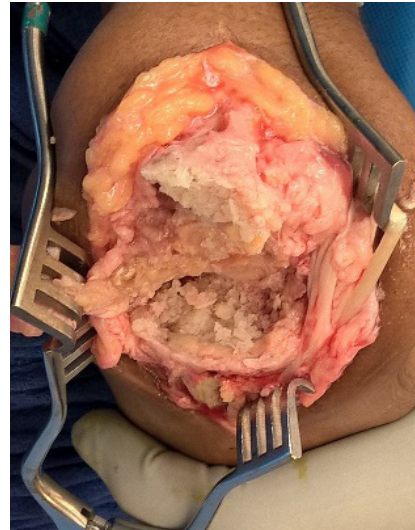


Figure 2.

Intraoperative image showing the extensive bone loss following removal of the total wrist arthroplasty implant.

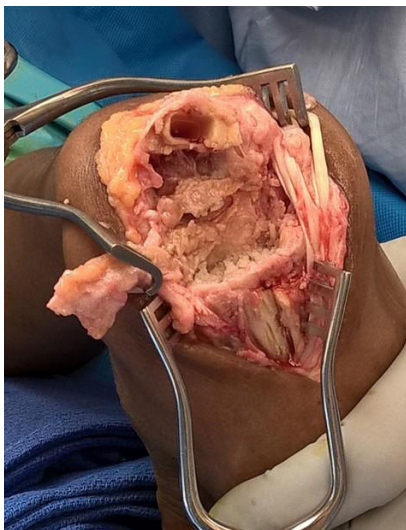


Figure 3.

Intraoperative image showing ViviGen filling the extensive bone defect of the distal carpus.

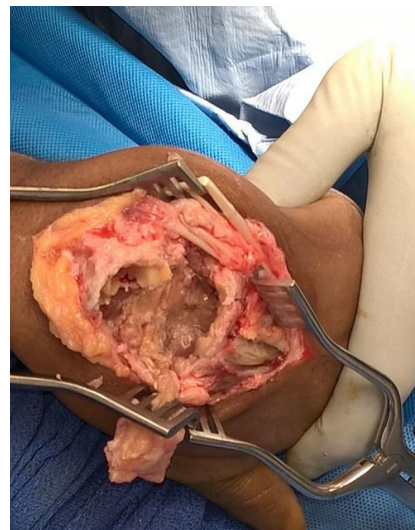


Figure 4.

Intraoperative image showing ViviGen filling the large defect of the distal radius following removal of the arthroplasty implant.

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Figure 5.

Intraoperative image showing excellent bone contact with ViviGen in stabilization with a wrist fusion plate.



Figure 6.

Anterior-posterior radiograph three months post operatively showing excellent alignment of the hand in relation to the forearm with a wrist fusion plate.



Figure 7.

Lateral radiograph at approximately three months postoperative shows excellent fusion at the site with ViviGen. There was no loosening of the implant.

References

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