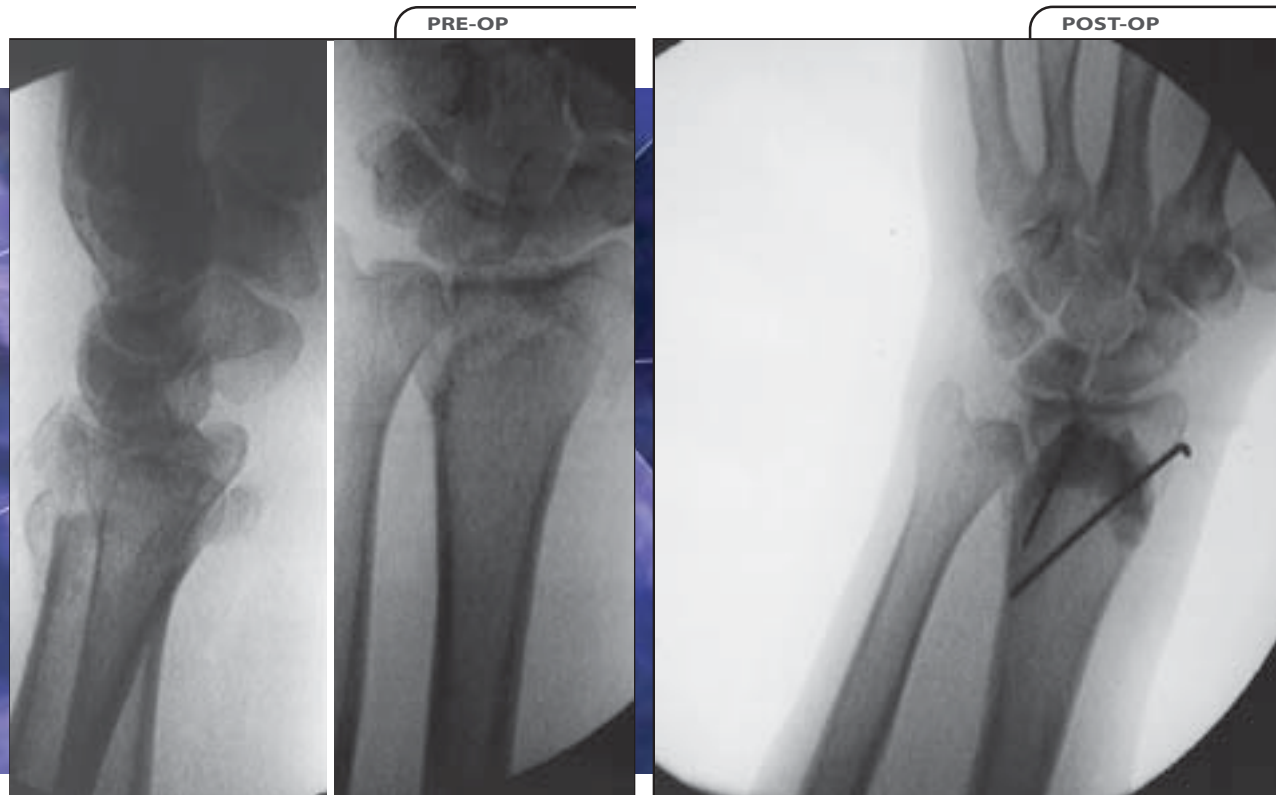


miniMIIG™ Minimally-Invasive Injectable Graft Closed Treatment Option For Managing Distal Radius Fractures

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INTRODUCTION

Distal radius fractures are the most common fracture in the upper extremity. Many occur in the elderly population with osteoporotic bone, making fracture management challenging. Alleged negligence in the management of these fractures is the most common source of medical malpractice claims against orthopaedic surgeons. This has stimulated advances in the treatment of these fractures over the past decade. A recent advance has been a closed treatment technique that combines external fixation or minimally-invasive internal fixation with an injectable, semi-structural and resorbable bone graft material. This case demonstrates the effective use of miniMIIG™ Minimally-Invasive Injectable Graft for closed treatment of a distal radius fracture.

PATIENT PROFILE

Patient is a 69-year-old male who fell four feet off a stepladder sustaining a comminuted dorsally displaced, volarly angulated intra-articular fracture of his left distal radius, and a displaced fracture of his ulnar styloid.

FINDINGS AT SURGERY

A sagittal plane fracture extended distally to the level of the scapho-lunate articulation. Subsequent to near anatomic reduction of the fracture with longitudinal traction in finger traps and closed manipulation, a very large bony deficit was visible. This was the type of deficit, which without bone grafting frequently results in loss of reduction and alignment of the fracture even subsequent to adequate fracture fixation and an appropriate period of immobilization.

SURGICAL METHOD

Preoperative planning is an important step when utilizing the MIIG™ Graft technique due to the fast setting nature of the material. When using the MIIG™ Graft, understanding the defect size, organizing all kit components (mixing and delivery) and ensuring pre-placement of the delivery cannula under fluoroscopic guidance are all important steps to ensure an easy and efficient surgical procedure.

Closed reduction and percutaneous pinning of the fracture was performed providing good reduction and provisional stabilization. A small incision was made, and a hemostat was used to spread the soft tissues. Using image intensification, the 4 inch, 8-gauge cannula with trocar was used to access the defect site. Fracture hematoma was aspirated from the fracture site to facilitate creation of a void for the bone graft material and to minimize the potential for soft tissue extravasation into the soft tissues outside the fracture.

Once prepared, the MIIG™ graft syringe was passed to the surgeon for attachment to the pre-placed delivery cannula. Proper placement was again checked under fluoro and injection started with steady thumb pressure. Approximately 5ccs of material were used to completely fill the compression defect. At this point the material was allowed to set (approximately 5 minutes), and the cannula removed. Fracture reduction and graft placement was confirmed under fluoro prior to closure. Closure was performed in standard fashion and the patient was immobilized with a dorsal/radial OCL fiberglass splint.

POST-OPERATIVE COURSE

It was noted on immediate post-operative fluoro (**Figure a**) that the material had extravasated into the soft tissues volarly. Due to the resorbable nature of MIIG™ Graft, the material was not removed, but closely monitored over the post-operative course.

At twenty-six days post-op (**Figure b**) the graft material in the soft tissues had almost completely resorbed. At the same time a transition in the area of compressive bone loss from bone graft material to bone was observed. The two percutaneous k-wires were therefore removed and the patient was placed in a fiberglass short arm cast.

At six weeks post-op (**Figure c**) the cast was removed. The patient demonstrated solid fracture consolidation. The MIIG™ Graft appeared to be completely resorbed and replaced by new bone.

DISCUSSION

No subsequent fracture fragment subsidence was noted upon pin removal with solid fracture consolidation evident. Additionally, graft material that had extravasated into the soft tissues resolved uneventfully over approximately four weeks. This very active, elderly gentleman has had an excellent outcome from both a symptomatic and functional standpoint. miniMIIG™ Minimally-Invasive Injectable Graft for closed treatment of distal radius fractures provides a safe, quick and efficient means of managing compressive bone loss.

