OsteoCentric TECHNOLOGIES

SLAC Wrist

UnifiMI Headless Compression System

Case Study | Dr. William Geissler

Patient History

The patient is a 62-year old male who works construction and does considerable heavy lifting. He presents with approximately 15 year history of right wrist pain. He remembers injuring his wrist when he fell from a ladder. He relates that particularly over the past 6 months the pain and swelling to the wrist has gotten dramatically worse. He complains of radial side wrist pain and swelling. He also complains of pain with gripping and lifting heavy objects. Physical exam at his visit showed dorsal radial swelling. He was very point tender over the radial scaphoid joint. Radial deviation was 0, ulnar deviation 10 degrees, wrist extension 30, palm reflection 20 degrees on exam. He was able to make a full fist. Tender over the dorsal scapholunate interval.

Figure 1: Posterior anterior radiograph demonstrating advanced SLAC wrist with degenerative change involving both the entire radio-scaphoid joint and the capitate lunate articulation.

Treatment

Surgical options were discussed including partial wrist fusion versus proximal carpectomy. Due to his job with recurring heavy lifting, he wanted to proceed with 4-corner fusion. A standard dorsal approach was made to the wrist. A standard 8cm dorsal excision was made to the wrist. Sharp dissection was carried down the level of fascia where thick skin flaps were elevated.

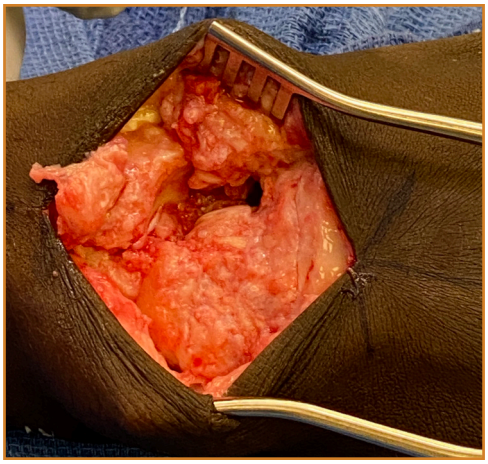

Figure 2: Intraoperative radiograph following excision of the scaphoid with advanced arthritis of the scaphoid facet of the distal radius.

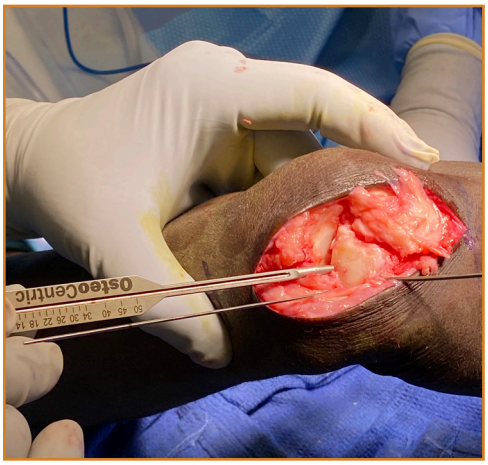

Figure 3: The articular cartilage has been denuded at the fusion site and the lunate has been reduced on to the capitate. The length of the proposed screw is measured with the osteocentric guide.

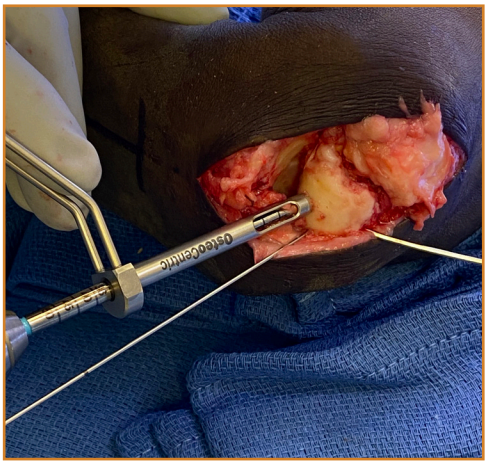

Figure 4: Utilizing the OsteoCentric cannulated drill, the lunate capitate interval is then drilled. The depth of the drill is the same length as what was measured with the guide.

The extensor pollicis longus was dissected through the third compartment and let free. The second and fourth dorsal compartments were opened exposing the dorsal capsule. The extensor digiti minimi was released as well. A radial based flap was made exposing advanced arthritis of the radial scaphoid joint (Fig.2). With the wrist in flexion, the scaphoid was excised. A joystick was placed in the lunate to control rotation. The articular cartilage was removed off the distal aspect of the lunate and triquetrum, and the proximal aspect of the capitate and hamate. Allograft bone graft was placed between the fusion sites.

The lunate was reduced onto the capitate. It is important not to leave the lunate in a DISI position which will decrease wrist extension. Some authors recommend over correcting the lunate in a slight VISI to facilitate increased wrist extension. It also important to not overcorrect the lunate radially onto the capitate and to place it anatomically in its position on the capitate. Guidewires are placed, one from the lunate into the capitate, the second from the lunate into the hamate and a third guidewire is placed from the triquetrum into the hamate. The length of the proposed OsteoCentric Headless Fasteners are measured (Fig. 3).

It is recommended that a fastener 4mm shorter than what is measured be utilized so the fastener can be inserted well up into the carpus, to decrease the chance of it backing out. Utilizing the OsteoCentric cannulated drill, the bone is drilled the same length as what is measured (Fig.4). The 3.9mm OsteoCentric fastener 4mm shorter of what is measured is then utilized over the guidewire and inserted into the carpus (Fig. 5, 6). Three 3.9mm OsteoCentric Headless Fasteners are placed (Fig.7). Fluroscopic views are then used to confirm placement of the fasteners both in the anterior posterior, and lateral planes (Fig. 8, 9). The dorsal capsule is closed along the ulnar aspect. The proximal distal aspect of the capsule are left free to help facilitate increased wrist flexion. The 2nd and 4th dorsal compartments are closed. The extensor pollicis longus is left free. The skin is closed and placed in a volar splint.

Follow Up

The patient returns at the 2 week mark for the sutures to be removed and placed in a removable splint. The patient is then placed in a physical therapy program for range of motion, strengthening and is encouraged to try to stay out of the splint as much as possible during the recovery period. Radiographs at the 3 month mark show solid consolidation at the fusion site (Fig.10, 11). The patient returned back to work full duty, at the 3 month mark. Grip strength at position 2 at the 3 month mark was 54 pounds, compared to 90 pounds of the opposite side. Lateral pinch was 13 pounds, compared to 23 pounds on the opposite side. The Mayo dash score was 60, and the quick dash was 41. Range of motion at the 3 month mark was 50 degrees flexion, 40 degrees extension, 90 degrees pronation, 70 degrees supination.

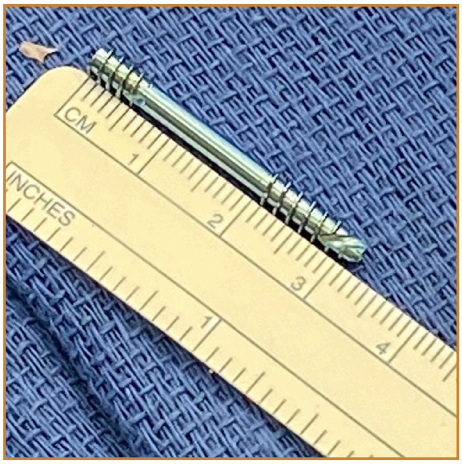

Figure 5: It is recommended that a fastener 4 mm shorter than what is measured will be inserted. In this manner, the fastener can be inserted well up the carpus to prevent backing out, and allow also for the compression at the fusion site.

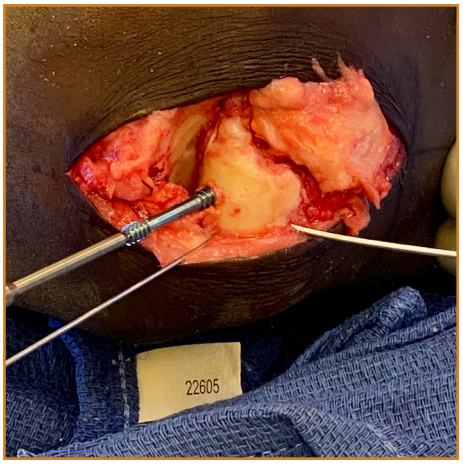

Figure 6: The OsteoCentric fastener is placed over the cannulated guidewire and is inserted from the lunate distally into the capitate.

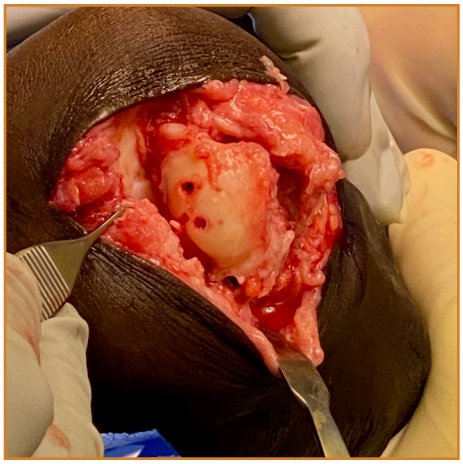

Figure 7: Three screws are placed. One from the lunate to the capitate, one from the lunate into the hamate, and third, from the triquetrum into the hamate. Notice the fasteners are inserted well up into the carpus to prevent any backing out and potentially injuring the articular cartilage of the distal radius.

Figure 8: Intraoperative fluoroscopic views showing the ideal placement of the fasteners in the carpus and well up into the proximal row to prevent any injury into the articular cartilage of the distal radius.

Figure 9: Intraoperative lateral fluoroscopic view showing ideal placement of the OsteoCentric fasteners well centered into the carpus.

Figure 10: Posterior anterior radiograph of the right wrist at 3 months showing good boning consolidation at the fusion site. The patient had minimal pain.

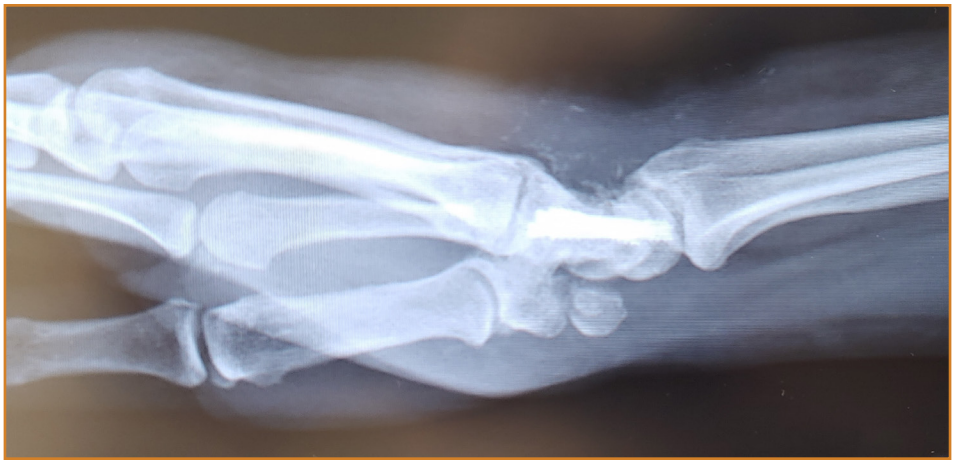

Figure 11: Lateral radiograph at 3 months demonstrating good boning consolidation at the wrist fusion site.

Clinical Advantages of Unifi*MI*

1. The implants Mechanically Integrated with all interfacing bones to create optimal compression and acute stability throughout the construct.
2. Cylindrical design of the compression fasteners allowed for optimal positioning of all three implants intraoperatively.
3. The OsteoCentric thread design also helps mitigate implant back out or advancement postoperatively.

The patient commented on the post-op limited pain and quick recovery throughout the PT process.

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UnifiMI An OsteoCentric Technology

75 West 300 N, Suite 150
Logan UT, 84321
Phone: 1-800-969-0639
info@osteocentric.com
osteocentric.com