Surgical Repair of a Closed Distal Radius Fracture with Carpus Dislocation using PliaFX® Prime

Case performed by R. Yoon, MD; Livingston, NJ, USA

CASE STUDY

Distal radius fractures are prevalent, comprising nearly 17% of all fractures.[1] Malunions are the most common complication following such fractures, typically owing to conservative treatment via closed reduction and casting.[2] Although conservative treatment has been the traditional mainstay for distal radius fractures, increased complication rates have led to wider use of surgical treatment options, as appropriate, often employing bone grafting. Among the many available grafting options, LifeNet Health has developed PliaFX Prime to provide optimized handling capabilities, undiluted osteoinductive potential,[3-9] and a hospitable scaffold and void filler for cellular attachment[3,10] — all using 100% allograft bone fibers without synthetic or xenograft carriers. These long, interconnected cortical bone fibers are optimally demineralized using LifeNet Health's patented PAD® technology and provide a surface that is rough enough to promote cellular attachment, yet contiguous enough to promote cell spreading and intercellular connection. The optimized handling of PliaFX Prime comes from the length and width of the fibers, which are designed to promote malleability, while microhooks allow the fibers to interlock, thereby maintaining the graft's shape and ensuring retention at the implant site.

The following describes the use of PliaFX Prime to assist in filling a void when surgically repairing an intra-articular closed distal radius fracture with carpus dislocation, performed from a dorsal approach:

Patient

- 39-year-old
- Work-related fall
- Closed injury, neurovascularly intact
- Dorsally-based fracture with dislocation of carpus dorsally within the fragments

Procedure

- First placed external fixation to achieve proper length and alignment
- Using dorsal approach, opened up the fragment and elevated with a Freer and void packed with 2.5 cc PliaFX Prime, then held with wires
- Fixed/buttressed with two plates

Results

- External fixation removed at 4 weeks postoperative
- At 3 months postoperative, patient had full range of motion and had returned to work

Conclusions

- Patient regained early function and motion as well as grip strengthening, allowing him to return to work at 3 months after reliable healing

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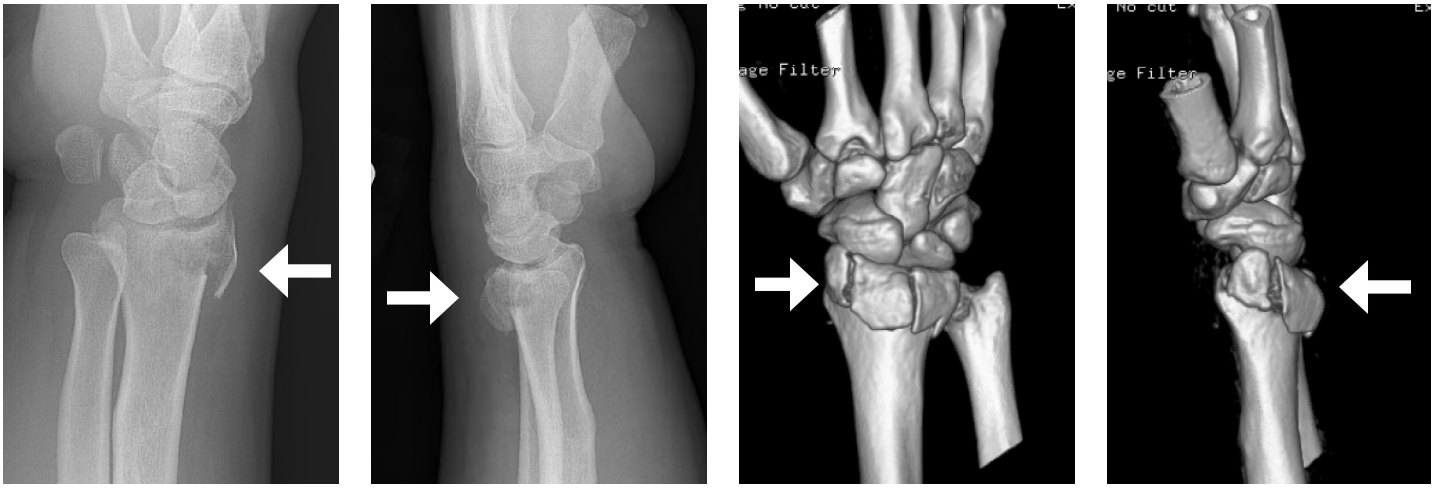

Figure 1.
Presenting AP and lateral radiographs and 3D computed tomography (CT) scans showing intra-articular distal radius fracture (arrows) with carpus dislocation. Note, with the carpus moving dorsally with the dorsal fragments, a void can be expected once reduction is performed (similar to a tibial plateau fracture).

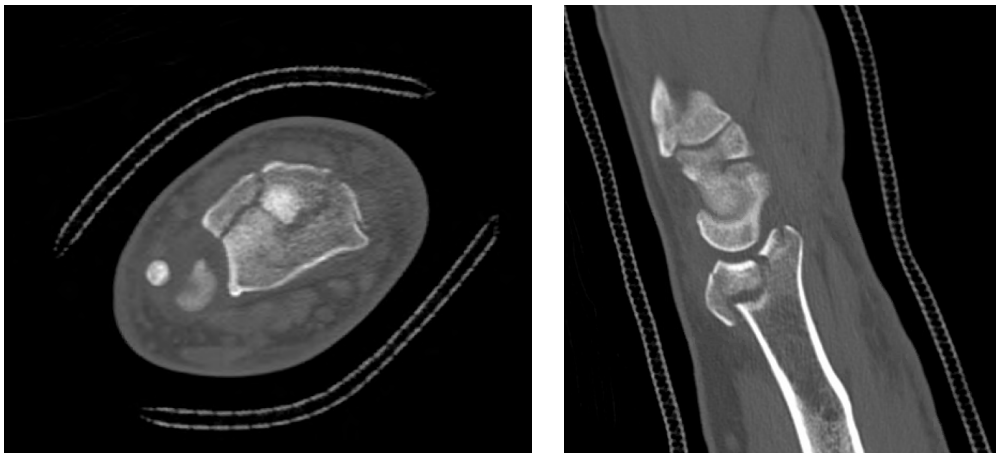

Figure 2.
Presenting cross-section and lateral CT scans showing closed distal radius fracture with carpus dislocation. Here on the sagittal, one can see where a reduction will leave a bony void behind, ideal for filling with PliaFX Prime.

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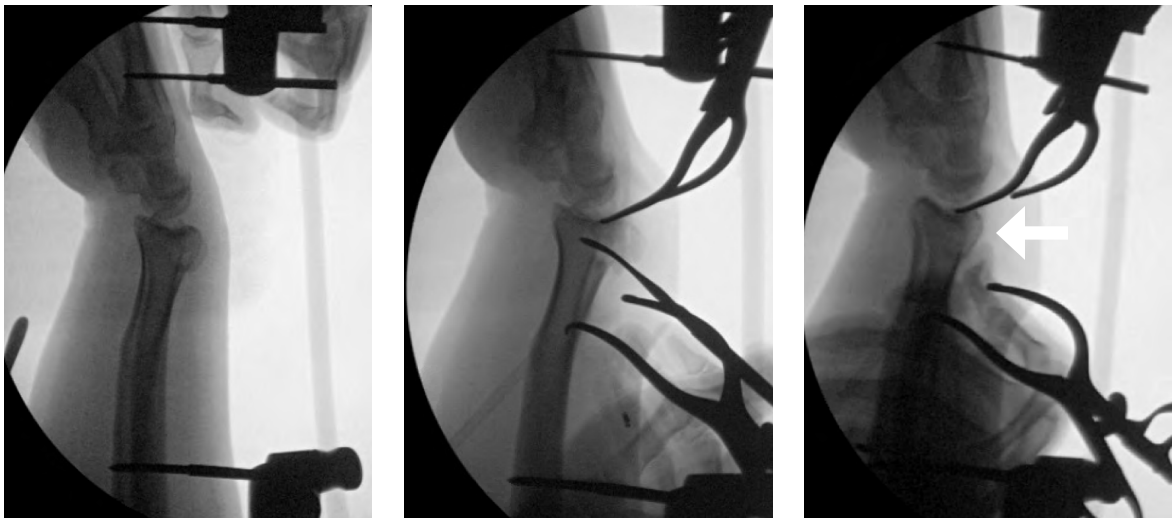

Figure 3.
Live fluoroscopic images showing step-wise approach where external fixation is placed first in the radius and second metacarpal in order to obtain and maintain the reduction/carpal alignment. A dorsal approach is performed and, 'opening the hood' of the dorsal fragment, a Freer elevator is used to further elevate the articular surface. The bony void is filled with PliaFX Prime (arrow) and then the 'hood is closed'.

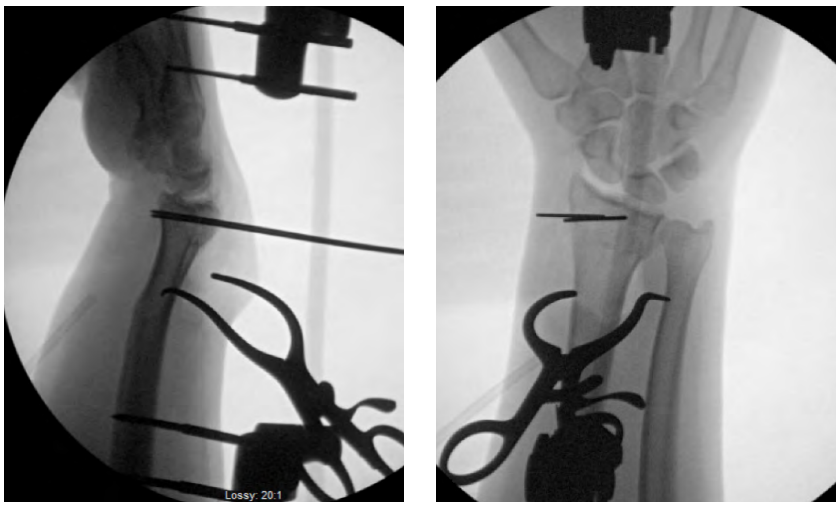

Figure 4.
The reduction is maintained with K-wires.

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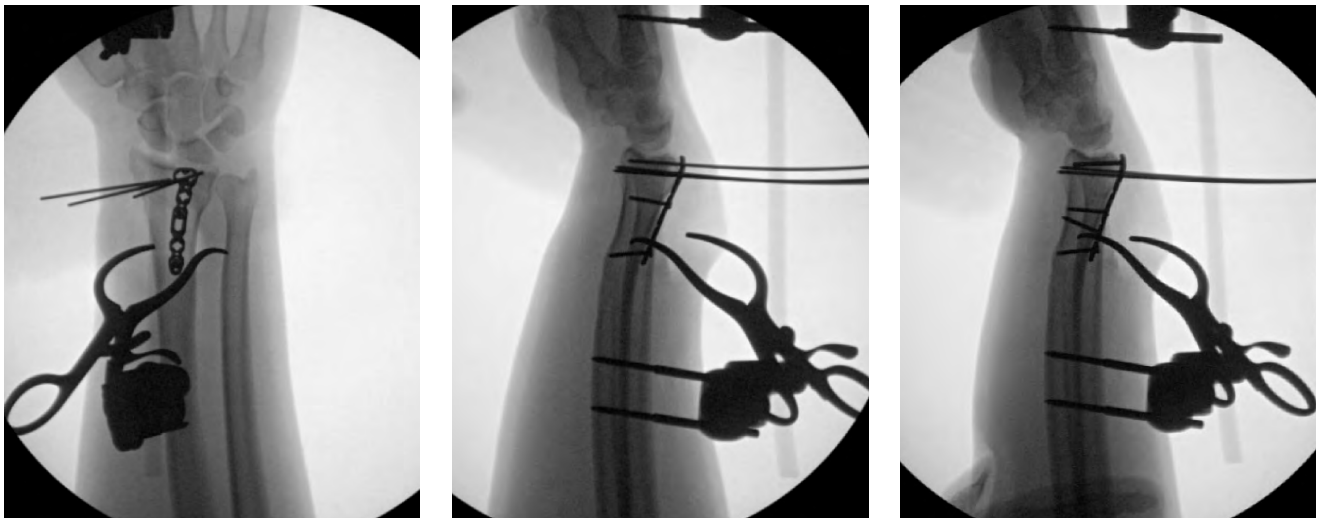

Figure 5.
Utilizing the wires as a guide for screw trajectory and plate placement, a non-locking screw placed at the apex of the fracture works in buttress mode and then the construct is completed.

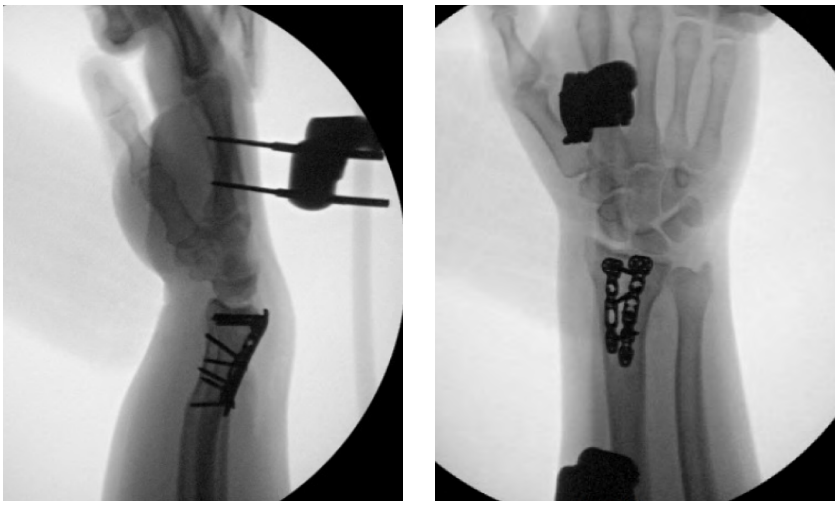

Figure 6.
The external fixator is left on for 4 weeks to further support the bony reduction in addition to the soft tissue disruption caused by the carpal dislocation.

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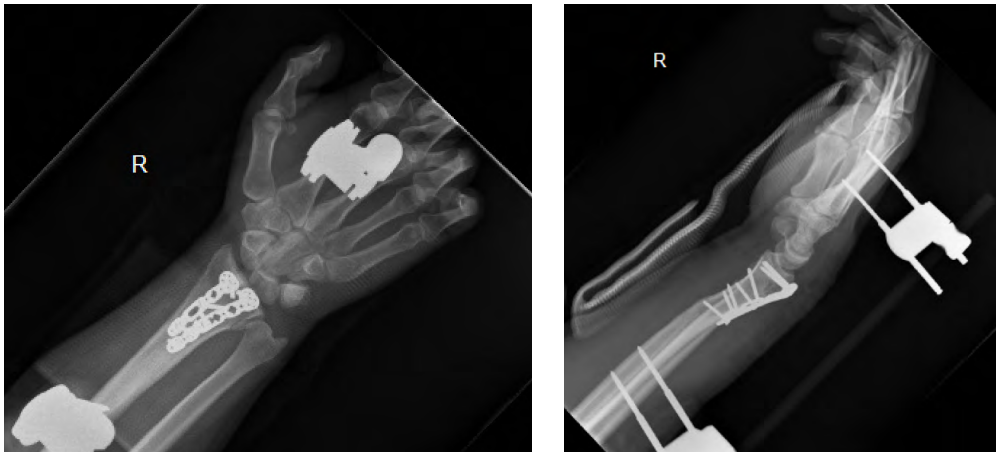

Figure 7.
Perioperative radiographs noting appropriate length, alignment, and rotation.

Figure 8.
At 4 weeks, the external fixator is removed noting a stable carpus and fracture. Note no movement with extension and flexion (performed under live fluoroscopy).

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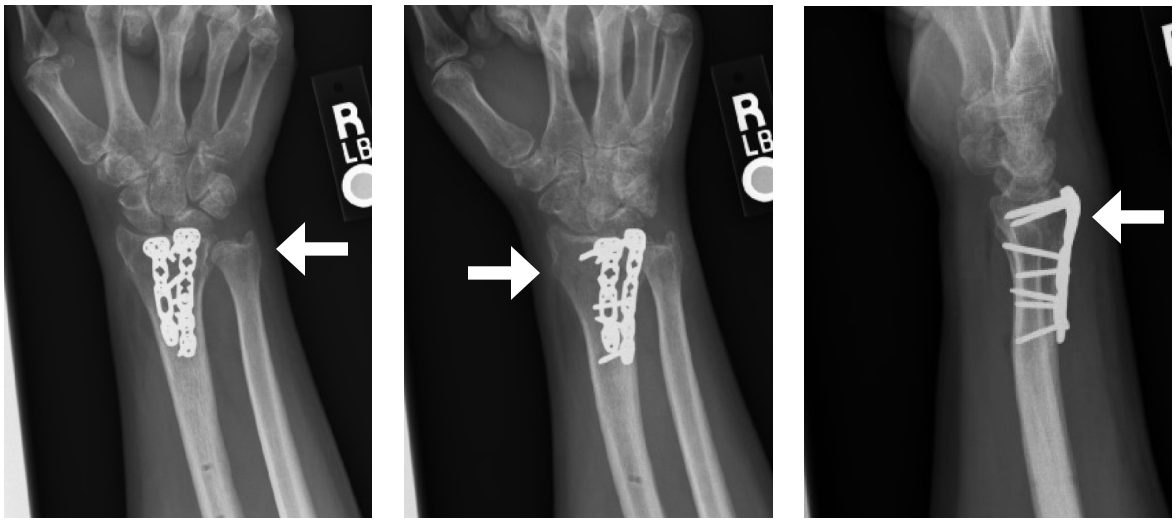

Figure 9.
Radiographs at 3 months postoperative noting fully healed fracture (arrows).

Results from case studies are not predictive of results in other cases. Results in other cases may vary.
Please refer to the instructions for use for a complete list of indications, contraindications, warnings and precautions.

References

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