OTA Tip of the Month - January 2012

Provisional K - Wire Fixation of Complex Olecranon Fractures and Elbow Dislocations

Lisa K. Cannada, MD and Erik Nott, MD; Saint Louis University

Getting and maintaining that perfect reduction for a highly unstable elbow can be difficult, especially without a skilled surgical assistant. We have used this technique for complex cases of severe instability due to fracture and pure dislocation. Much like the treatment of other fractures, temporary stabilization with k-wires allows you to fix the fracture or repair the ligaments as needed without worrying about maintain anatomic reduction during the case.

The case presented was a highly unstable, comminuted olecranon fracture with radial head dislocation. (Figure 1) After making our approach to the olecranon, it was evident that the annular and lateral radial-collateral ligaments were completely ruptured as well, making the radial head highly unstable.

Obtaining a perfect lateral of the elbow is key to the case. The radial head was anatomically reduced to the capitellum and held with a 0.62 k-wire. (Figure 2) Holding the radial head in place stabilizes the elbow and helps you reestablish your length (much like fibula fixation for a pilon). The olecranon was then advanced distally, reduced anatomically to the trochlea and held in place with a k-wire as well. (Figure 2) Provisional fixation with k-wires provides sufficient stability to place a bridging olecranon plate with minimal difficulty maintaining anatomic reduction of the elbow or reduction of the fracture. (Figure 3)

Following fracture fixation or elbow reduction (for pure highly unstable dislocation cases), the k-wires can be left in place to hold the joints (radio-capitellar, ulno-trochlear, proximal radio-ulnar) reduced anatomically. Secondary stabilization procedures, either spanning external fixation or ligament repair/reconstruction can then be done and tensioned appropriately without worry of losing your reduction. (Figure 4) After secondary stabilization the pins can be removed and reduction reevaluated. (Bone graft was added after this x-ray was obtained.)

Figure 1

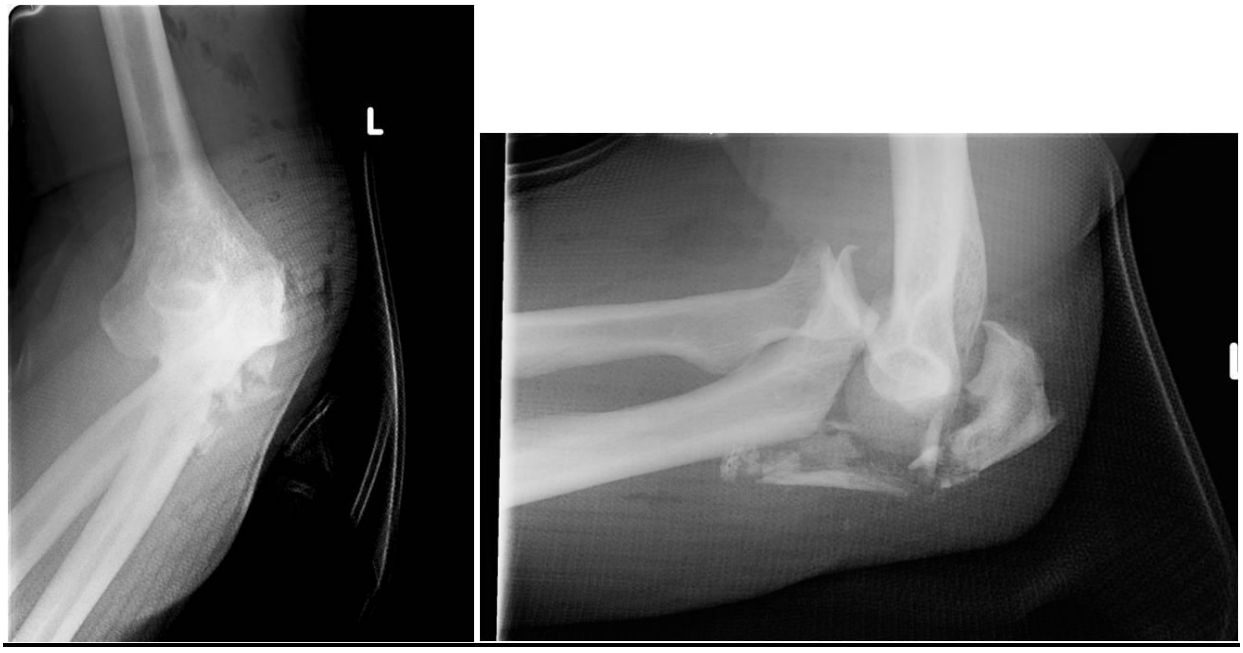

Figure 2

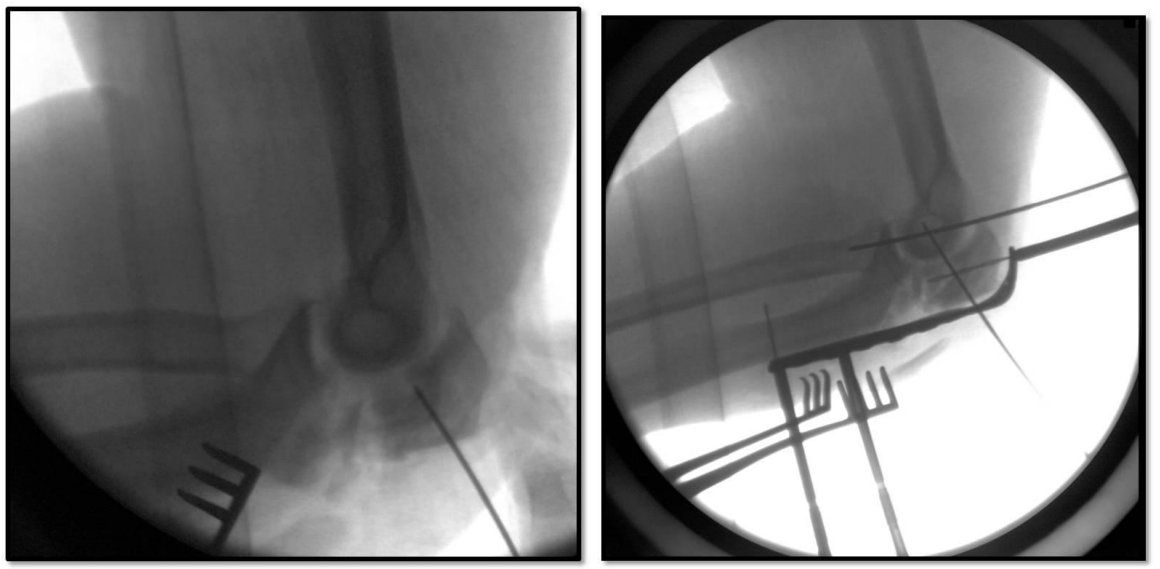

Figure 3

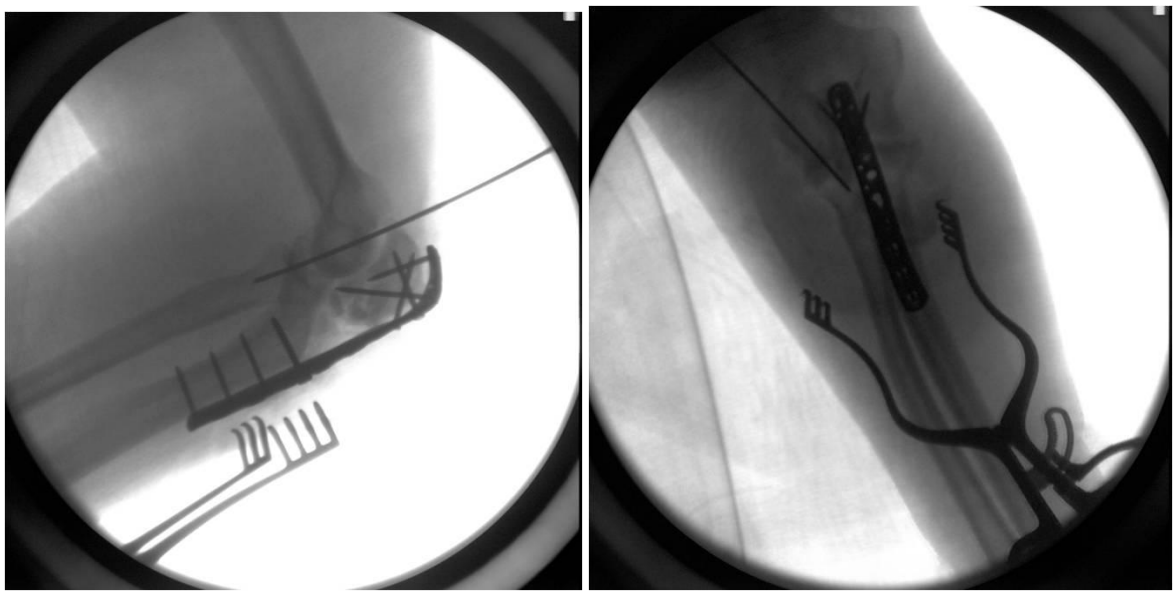

Figure 4