Avoiding Dorsal Soft-Tissue Problems with Olecranon Plating

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Purpose: This study evaluated a cohort of proximal ulna/olecranon fractures suitable for plating. Plates were inserted laterally or medially on the ulna to decrease soft-tissue complications typically associated with dorsally placed implants as well as to enhance the moment of inertia loading of the construct. By not using the standard dorsal plating method, we sought to avoid the soft-tissue concerns of a subcutaneous plate along the dorsal ridge of the ulna. Furthermore, with the plate at approximately 90° to the arc of motion and loading, the moment of inertia of the plate loading is improved.

Methods: This is an method efficacy cohort study with a single surgeon performed at a Level II trauma center. The technique utilized medial or lateral placement of plates along the proximal ulna, placing the plate below the dorsal ridge (not directly under the skin). The same indications for the normal dorsal plating were used. When needed, a small pocket was created under the triceps to accept a bent (blade-like) portion of the plate below the triceps tendon. The technique was used on 33 consecutive patients with a retrospective review. Demographic data used included age, sex, OTA fracture classification, and type of plate. Outcome parameters were postoperative range of motion, healing, infection, associated injuries, use of a hinge fixator, instability, associated morbidity, and removal of hardware.

Results: Of 33 patients (19 male, 14 female) patients, 31 were available for follow-up. Mean age was 50 years (range, 22-92) with a mean follow-up time of 10 months (range, 3-18 mo). Nine fractures were open, none of which required any soft-tissue coverage procedures. Implants used included 3.5-mm reconstruction plates, 3.5-mm locking compression plates and when appropriate mini-fragment plates. Out of 33 patients, 32 went on to fracture union. Range of motion was calculated as mean extension of 14.8° (range, 0°-50°); flexion 119.5° (80°-135°). The one failure was in a patient with an open B1.3 pattern and 30 pack-year history of smoking and noncompliance. He was treated with hardware removal and a spacer and medullary screw. He was subsequently lost to follow-up. Six patients had supplemental hinged external fixation to allow better soft-tissue management and treatment of ligamentous instability. There were no fixator failures, extensor mechanism dysfunctions, neurological lesions, or irritation from the hardware, and none of the patient population requested/required hardware removal.

Conclusion: Medial and lateral placement of proximal ulna plates allows for adequate fracture treatment with the benefit of avoiding the issues noted with dorsal plating. Historically, subcutaneously placed plates and those on the dorsal ulna have had a small but notable need for hardware removal. Medial and lateral plating allowed for adequate fracture fixation without the need for hardware removal. Also, a biomechanical advantage is due to the strongest cross-sectional moment of inertia of the plate being more optimally oriented. We feel that this series demonstrated acceptable performance of plates placed medial or lateral along the proximal ulna.