KEY PROCEDURES

TENSION-BAND WIRE FIXATION OF OLECRANON FRACTURES

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Abstract

Olecranon fractures account for approximately 20% of fractures of the proximal part of the forearm¹. Clinicians may consider nonoperative management for elderly low-demand patients², whereas operative fixation is recommended for active patients with a displaced fracture. Tension-band wire (TBW) fixation is commonly employed for simple isolated stable displaced fractures of the olecranon (type IIA according to the Mayo classification)³⁻⁵. In contrast, plate fixation is thought to provide superior outcomes for unstable comminuted olecranon fractures. Biomechanical principles of the TBW construct are based on the hypotheses of absolute fracture stability, exploiting functional limb movement, and converting tensile forces into compression through the actions of the triceps and brachialis. The surgical goals are to restore articular congruity, provide stable reliable fixation, and allow early mobilization to minimize joint stiffness. In a recent prospective randomized trial comparing plate fixation with TBW in 67 active adult patients, we found no difference between groups with respect to either patient or surgeon-reported outcome measures⁶. The overall complication rate was higher following TBW fixation, with implant removal required for 1 in 2 patients. However, it may still be the preferable procedure given that the more serious issues of infection and revision surgery occurred exclusively following plate fixation.

The key steps of the procedure are (1) preoperative planning with careful assessment of radiographs; (2) positioning the patient supine and gaining exposure with a posterior longitudinal direct midline incision, raising lateral and medial fasciocutaneous flaps, and developing subperiosteal dissection in the interval between the flexor carpi ulnaris and extensor carpi ulnaris to visualize the fracture; (3) visual reduction maintained with a pointed reduction clamp, with joint congruity confirmed with an image intensifier if needed; (4) creation of the TBW construct with 2 parallel 1.6-mm Kirschner wires passed longitudinally from the proximal fragment into the distal part of the ulna, engaging the anterior cortex with care, and a 1.2-mm flexible cerclage wire placed through a transverse tunnel 3 to 4 cm distal to the fracture, passed

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posterior to the 2 Kirschner wires, and secured in a figure-of-8 configuration; (5) appropriate tensioning of the construct followed by trimming and burial of the wire ends; (6) layered wound closure according to surgeon preference; and (7) a postoperative protocol consisting of application of an above-the-elbow synthetic bandage, which is worn for 10 to 14 days, and gentle active mobilization under physiotherapy supervision. We advise against heavy lifting for at least 6 to 8 weeks and do not routinely remove implants unless they are symptomatic.

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