KEY PROCEDURES

OPEN REDUCTION AND INTERNAL FIXATION OF BOTH-BONES FOREARM FRACTURES*

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Published outcomes of this procedure can be found at: *J Bone Joint Surg Am.* 1975 Apr;57(3):287-97, *J Bone Joint Surg Am.* 1992 Aug;74(7):1068-78, and *J Bone Joint Surg Am.* 2007 Dec;89(12):2619-24

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Abstract

Compared with closed reduction or older fixation methods, open reduction and compression plate fixation has dramatically improved the outcomes of displaced diaphyseal forearm fractures. However, the procedure can be technically demanding, with implant choice, surgical approach, accuracy of reduction, and sufficient fracture stability to allow early postoperative motion all having been shown to affect outcome.

The procedure is performed with the following steps:

1. The patient is positioned supine on the operating room table with the arm on a hand-table and a tourniquet applied to the upper arm.
2. After skin preparation and draping, a longitudinal incision is made over the volar aspect of the forearm between the flexor carpi radialis tendon and the radial artery, centered over the radial fracture site.
3. The interval between the flexor carpi radialis and the radial artery is developed, and, depending on the location, the deeper musculature is reflected from the bone adjacent to the fracture site, which is debrided of hematoma, irrigated, and cleaned.
4. The fracture is reduced and is provisionally fixed with a Kirschner wire, or lag screw if possible. A small-fragment compression plate that provides at least three bicortical screws proximal and distal to the fracture is selected and is applied with one screw each proximally and distally.
5. After provisional fixation of the radius, a similar process is carried out for the ulna, with use of an approach along the subcutaneous border between the flexor carpi ulnaris and extensor carpi ulnaris. Then the forearm is carefully examined clinically and radiographically to ensure accurate reduction of the fractures and motion/stability of the elbow and wrist.

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6. The remainder of the screws are inserted, the fascia of the forearm is not closed, and a standard closure of subcutaneous tissue and skin is performed.

Open fractures of the forearm can typically be treated with irrigation, debridement, and immediate fixation. A volar approach is preferred over a dorsal approach for most radial fractures to minimize the risk to the posterior interosseous nerve. Anatomic reduction, especially restoration of the radial bow, is critical for restoration of motion and function. Bone-grafting is rarely indicated, even in comminuted fractures. A rapid return to function, union rates of $\geq 95\%$, restoration of forearm strength and stability, and low complication rates have been reported in multiple studies of this technique.

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