



Radial nerve transection associated with closed humeral shaft fractures: a report of two cases and review of the literature



Philipp Leucht, MD^{a,*}, Jessica H.J. Ryu, MD^b, Michael J. Bellino, MD^b

^aDepartment of Orthopaedic Surgery, New York University Langone Medical Center, Hospital for Joint Diseases, New York, NY, USA

^bDepartment of Orthopaedic Surgery, Stanford University School of Medicine, Stanford, CA, USA

Humeral shaft fractures make up approximately 3% of all long bone fractures,³ and about 10% of all humerus fractures are associated with injuries to the radial nerve.⁷ Fractures of the middle third of the humerus present with the highest incidence of nerve injury because the nerve lies immediately adjacent to the periosteum in this region.¹ Farther distally, the nerve pierces the lateral intermuscular septum, representing another frequent location of nerve damage. Recent studies have provided evidence that closed fractures are most commonly associated with radial nerve neurapraxia, whereas neurotmesis is more common in open fractures.⁴ From these studies, new guidelines have evolved that recommend conservative treatment for most closed humeral shaft fractures with radial nerve palsy. This recommendation also applies to patients with initially intact findings on neurologic examination who then experience a radial nerve deficit after manipulation of the fracture.¹¹

Here we present 2 cases in which patients sustained a closed, middle-third humeral shaft fracture with immediate radial nerve palsy. Both patients underwent operative fixation of the humerus fracture, one due to an ipsilateral forearm fracture and brachial plexus injury and the other due to a lower extremity fracture. Exploration of the nerve in these 2 patients revealed a complete transection of the nerve at the level of the fracture. Without the

accompanying injury, these 2 patients would have been prime candidates for nonoperative treatment in a functional brace, which might have resulted in bone union without radial nerve recovery.

Case report

Case 1

A 36-year-old man without significant past medical history was admitted to the orthopedic service after sustaining a left humeral shaft fracture (Fig. 1), a left both-bone forearm fracture, a left closed distal tibia fracture, and an anterior-posterior compression type 2 pelvic ring injury. Further injuries included a left brachial plexus injury with predominance of the inferior trunk.

After initial stabilization, the patient was taken to the operating room for reduction and application of an external fixator for the distal tibia fracture and closed reduction and percutaneous sacroiliac screw placement for the anterior-posterior compression pelvic ring injury. The left upper extremity injury was stabilized in a splint until the next day, when the patient was taken to the operating room again for an open reduction and internal fixation of the humeral shaft fracture and the both-bone forearm fracture. During the anterolateral approach to the humerus, the distal radial nerve was identified, and after provisional length and alignment of the humerus were achieved, the nerve appeared to lack the usual physiologic tension; therefore,

*Reprint requests: Philipp Leucht, MD, Hospital for Joint Diseases, New York University School of Medicine, 550 First Avenue, New York, NY 10016, USA.

E-mail address: philipp.leucht@nyumc.org (P. Leucht).

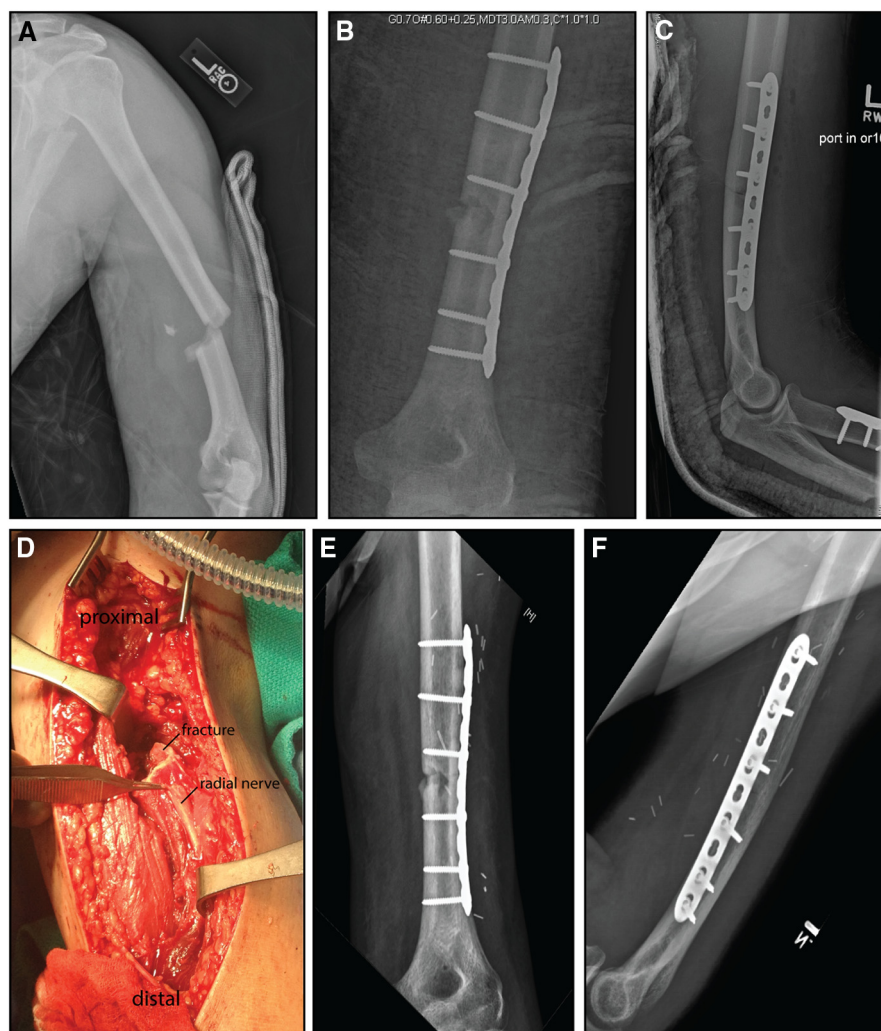


Figure 1 (A) Preoperative anterior-posterior radiograph showing a transverse humeral shaft fracture with moderate comminution. (B, C) Portable anterior-posterior and lateral radiographs taken in the operating room demonstrate anatomic alignment and fixation. (D) Intraoperative photograph demonstrating the radial nerve transection at the level of the fracture. (E, F) Radiographs at 3-month follow-up reveal a partially healed fracture with intact implants.

the decision was made to dissect farther proximally. During this dissection, the transection of the radial nerve was noted. At this point, the plastic surgery team was consulted, and because of the significant bruising and the inability to define the zone of injury, the decision was made to tag the nerve with a 5-0 Prolene suture (Ethicon, Bridgewater, NJ, USA) and to return at a later point for resection of the zone of injury and nerve grafting of the gap.

Three months later, the patient was taken to the operating room for a radial nerve exploration and grafting procedure with a sural nerve graft. Another 2 months later, he underwent a nerve transfer of the brachialis motor branch to the median nerve and a capsulodesis of the second through fifth metacarpophalangeal joints. At the 1-year follow-up, the patient exhibited some recovery of the radial nerve with a twitch of the brachioradialis and some wrist extension with gravity eliminated.

Case 2

A 65-year-old woman without significant past medical history presented to the emergency department after a car ran onto the sidewalk and hit a metal pole, which then struck the patient on the right arm. She complained of pain and deformity of her right upper extremity and pain in her right hip joint with inability to bear weight. Physical examination of her right upper extremity revealed a complete motor and sensory radial nerve palsy. Radiographs in the emergency department demonstrated a right, middle-third, transverse humeral shaft fracture (Fig. 2) and a right Garden I femoral neck fracture. Before this injury, the patient had no pain in her hip and was walking without assistive devices. She is right hand dominant and was not complaining of any neurologic issues before the accident.

Download English Version:

<https://daneshyari.com/en/article/4073337>

Download Persian Version:

<https://daneshyari.com/article/4073337>

[Daneshyari.com](https://daneshyari.com)