

MALUNITED FRACTURE OF THE DISTAL ENDS OF THE RADIUS AND THE ULNA CORRECTED BY OBLIQUE RESECTION OF THE DISTAL END OF THE ULNA

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A FRACTURE that involves the distal ends of the radius and the ulna is one of the most common fractures that the general practitioner, the general surgeon, or the orthopedist is called upon to treat. If good function of the wrist joint is to be obtained, satisfactory reduction of the fracture must be accomplished. Good function of the traumatized wrist joint depends on four conditions: (1) restoration of normal length to the shortened radius, (2) correction of the dorsal angulation of the distal radial fragment, (3) relocation of the deviated distal radial or ulnar fragment, and (4) restoration of a normal, anatomic relationship between the radial-ulnar articulation. Failure to accomplish this last condition alone will cause progressive, traumatic changes that lead to loss of function of the wrist joint; and motion, particularly pronation and supination, may be severely limited.

The purpose of this paper is to: (1) illustrate, through a case presentation, the functional disability that may result at the wrist from a malunited fracture of the distal end of the ulna; (2) emphasize the value of distal ulnar resection to restore adequate function of the wrist joint, particularly pronation and supination; and (3) point out the value of making an oblique osteotomy resection of the distal end of the ulna in order to preserve the ulnar collateral ligament and thereby prevent instability of the wrist joint.

Report of a Case

A 39-year-old missionary nurse sustained a fracture of the distal end of the left radius and ulna in an automobile accident in June 1956. On the day of injury, a closed reduction was performed under general anesthesia and the fracture was immobilized for six weeks in a circular forearm cast that extended from the midpalmar crease to below the elbow. Ten months after reduction, all motions of the left wrist were normal except pronation, which was 60 degrees, and supination which was from 10 to 15 degrees. Roentgenograms of the left wrist revealed an apparently malunited fracture of the distal ulna and a healed fracture of the distal radius (Fig. 1). On May 9, 1957, resection of the distal end of the ulna was performed (Fig. 2). One month following surgery, the patient had full pronation of the left wrist, having gained 30 degrees of pronation



Fig. 1. Roentgenogram showing malunited fracture of the distal end of the left ulna and a healed fracture of the distal end of the radius. The length of the radius has been preserved.



Fig. 2. Roentgenogram after an oblique osteotomy resection of the distal end of the left ulna. This operation preserves the ulnar collateral ligament, and thereby prevents instability at the wrist joint.

(Fig. 3). She had 60 degrees of supination, an increase of 45 degrees of motion (Fig. 4). All other wrist motions still were normal.

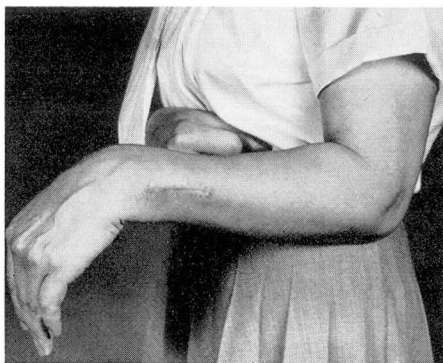


Fig. 3. Photograph showing full pronation four weeks after oblique resection of the distal end of the left ulna.

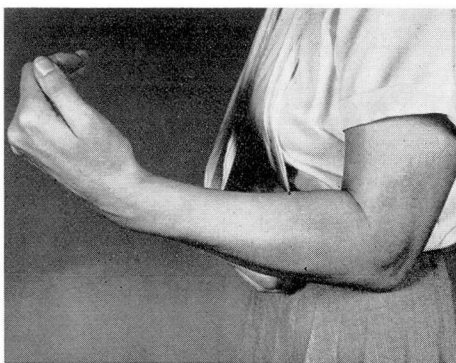


Fig. 4. Photograph showing 60 degrees of supination four weeks after distal ulnar resection.

Discussion

When a fracture of the distal end of the radius or of the distal end of the radius and the ulna malunites, traumatic changes frequently occur at the radial-ulnar articulation. The sequelae are pain and limited motion of the wrist joint. Loss of optimal pronation or supination is a severe functional disability that to a great extent can be corrected by resection of the distal end of the ulna.

Boyd and Stone¹ in 1944 reported the results of resection of the distal end of the ulna as performed by various members of the Campbell Clinic. Of the 22 resections performed, in no case was motion of the wrist joint worsened. In fact, motion of the wrist, particularly pronation and supination, was improved in all.

Where there is shortening of the radius with a prominent ulnar styloid process, resection of the distal end of the ulna greatly improves the cosmetic appearance of the wrist. Resection of the ulnar styloid process in the absence of radial shortening alters the appearance of the wrist, but this is of little cosmetic importance. The muscle power in the hand and wrist may be only slightly decreased, following resection of the distal end of the ulna.

The success of distal ulnar resection in restoring function to the wrist joint, in large measure depends on how long the malunion has existed. Resection of the distal end of the ulna which is performed within 12 months of malunion, produces better functional results than does resection performed a year or more after the initial injury.

Summary

Malunited fractures of the distal end of the radius and the ulna commonly cause functional disability of the wrist joint.

Resection of the distal end of the ulna is a relatively simple surgical procedure. It will increase motion of the wrist joint, particularly pronation and supination, if it is performed soon after malunion of the distal ends of the radius or the ulna.

Reference

1. Boyd, H. B., and Stone, M. M.: Resection of distal end of ulna. *J. Bone & Joint Surg.* **26**: 313-321, April 1944.