

Reconstructing an Unstable Medial Elbow Complicated by Medial Epicondyle Non-union : Case Report

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Reconstruction of the medial support system of the elbow joint was performed after dislocation in a 54-year-old man with pseudoarthrosis at the medial epicondyle of the humerus. The patient fell and dislocated the elbow. Although it was manually reduced, the medial side of the elbow remained extremely unstable. The medial epicondyle of the humerus had an old pseudoarthrosis and the bone fragment of the medial epicondyle was dislocated at the level of the humeroulnar joint. Because conservative therapy would result in an unstable medial side of the joint, an unique method for reconstruction of the medial support system of the elbow was performed. The tendon of the palmaris longus muscle was placed between the dislocated bone fragment of the medial epicondyle and its original position of the humerus. A good result was obtained.

Key words : Reconstruction, Pseudarthrosis, Medial epicondyle of the humerus

INTRODUCTION

Almost no standard has been established for the treatment of adult pseudoarthrosis of the medial epicondyle of the humerus. The reconstruction of a damaged medial support system in patients with pseudoarthrosis has not been reported. The medial support system of the elbow can become unstable after traumatic elbow dislocation with old pseudoarthrosis. The tendon of the palmaris longus muscle can be used for reconstruction at the site of pseudoarthrosis without removing the bone fragment.

CASE REPORT

A 54-year-old man fell and sustained a dislocation fracture of the left elbow joint. He had sustained an injury to the left elbow joint at age 5. He was doing well without any complication. Although it was reported as a fracture of the left medial epicondyle of the humerus, no details were available.

Physical examination revealed pain at rest, motion pain, and tenderness, swelling, and a flexion / valgus deformity of the left elbow joint. The range of motion of the joint could not be determined because of

pain. No neurologic defects were noted. Radiographic examination revealed lateral dislocation (Fig. 1a, 1b). This was reduced under general anesthesia on the day of admission. The postreduction radiographs showed good alignment of the elbow joint. However, a fracture of the medial epicondyle of the humerus was discovered. The bone fragment of the medial epicondyle was dislocated medial and anterior to the humeroulnar joint (Fig. 2). Stress radiographs showed 60-degrees of cubitus valgus (Fig. 3) and markedly unstable medial support system. Therefore, it was determined that conservative therapy alone would not be adequate.

OPERATION PROCEDURE

An arcuate incision was made along the medial epicondyle. The cubital tunnel was disrupted. The ulnar nerve showed normal. The bone fragment of the medial epicondyle, together with the medial collateral ligament and pronator and flexor muscles, was dislocated to the humeroulnar joint distal to the original position of the medial epicondyle. The fragment and the ulnar side of the humeroulnar joint formed a portion of

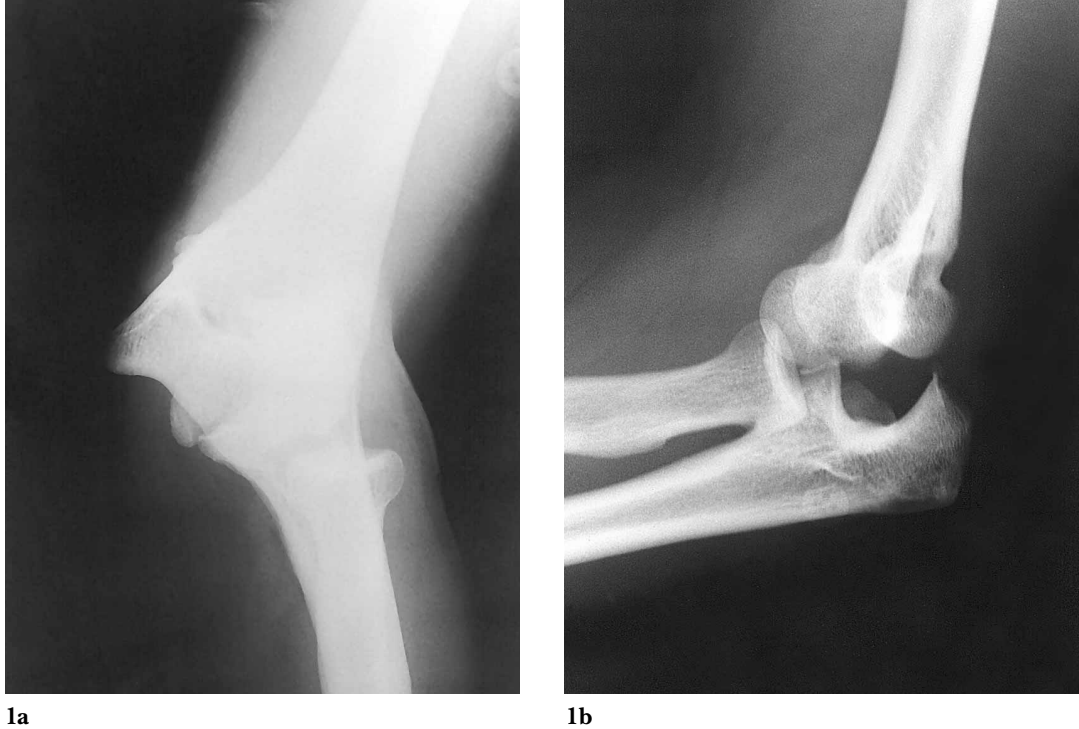


Fig. 1 Radiographs showing lateral dislocation of the elbow. (1a) Antero-posterior view and (1b) lateral view.

the cartilaginous surface of the joint. The bone fragment could not be reduced to its original position because of shortening of the ligament and muscles. Therefore, the medial support system was reconstructed: First, holes were made in the peripherally dislocated bone fragment and in the humerus at the fracture line. A figure-of-eight of palmaris longus tendon was used to anchor the bone fragment like a sesamoid bone (Fig. 4).

The elbow was immobilized in a plaster splint in 90 degrees of flexion for 2 weeks. Rehabilitation to increase the range of motion was begun when the splint was removed. The clinical findings after 25 months included flexion of 135 degrees and extension limitation of 5 degrees. Medial instability was no longer observed, and no pain was reported. Radiographs showed the elbow joint to have set well without abnormal change of the bone fragment of the medial epicondyle (Fig. 5).

DISCUSSION

Although detailed information regarding

the patient's history was not available, it is possible that the childhood injury to the left elbow joint caused a Watson-Jones type II fracture of the medial epicondyle of the humerus, or a type IV fracture reduced to a type II fracture. The fracture resulted in pseudoarthrosis, which was left untreated. The new injury caused a type IV fracture through the fragile medial support system of the left elbow joint.

Various methods have been proposed to treat acute Watson-Jones type IV fractures of the medial epicondyle of the humerus with dislocation of the elbow joint. Patrick [2] and Watson-Jones [5] have recommended conservative therapy. However, complications of this therapy have been reported, including pseudoarthrosis, joint instability, pain, ulnar neuroparalysis, and limited range of motion. Wilkins [6] and Peterson [3] have reported that surgery is indicated when the bone fragment of the medial epicondyle is dislocated for more than 5 mm even after reduction.

In the present case, the bone fragment of the fractured medial epicondyle of the



Fig. 2 Postreduction radiograph showing good alignment of the elbow joint and a fracture of the medial epicondyle of the humerus. The bone fragment of the medial epicondyle is dislocated medial anterior to the humeroulnar joint.



Fig. 3 Stress radiographs showed 60-degrees of cubitus valgus.

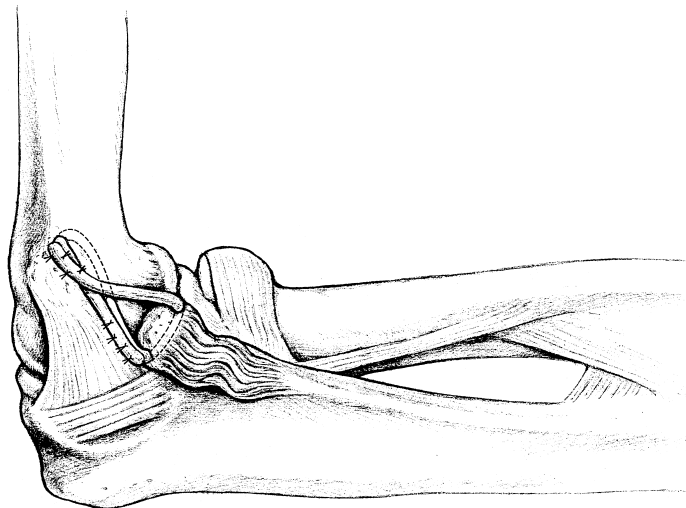


Fig. 4 Schematic showing the figure-of-eight of palmaris longus tendon used to anchor the fragment to the humerus.



Fig. 5 Radiograph at twenty-five months after surgery.

humerus was dislocated for about 5 mm distally toward the humeroulnar joint. The fracture resulted in pseudoarthrosis, which was left untreated. The medial collateral ligament consequently shortened. Therefore, the bone fragment of the medial epicondyle could not be reduced to its original position after the second dislocation of the elbow joint. Moreover, because the medial side of the joint was unstable with a cubitus valgus of 60 degrees, the medial support system had to be reconstructed.

Schwab [4] and Jobe and Stark [1] have proposed reconstruction methods of the medial collateral ligament. Both were designed to reconstruct the medial collateral ligament itself. In the present case, however, the medial collateral ligament had been shortened. Therefore, the medial collateral ligament could not be reconstructed using the Schwab method, because the distally dislocated medial epicondyle could not be

reduced. Moreover, because the original medial epicondyle was chipped, the ligament could not be reconstructed using the Jobe method. Removing the bone fragment of pseudoarthrosis to reconstruct the ligament would not result in adequate slide of the reconstructed ligament over the medial side of the humeroulnar joint. In addition, the reconstructed ligament would rupture as it hit the ulnar side of the humeroulnar joint when the elbow was moved. Moreover, the bone fragment of pseudoarthrosis from the childhood fracture had combined with the medial surface of the humeroulnar joint to form a joint with a good cartilaginous surface. Reconstruction of the medial collateral ligament of the elbow under these circumstances has not been reported. In the present case, the distally dislocated bone fragment of pseudoarthrosis was conserved and used like a sesamoid bone. The tendon of the palmaris longus muscle was transplanted between the bone fragment and the original base of the medial epicondyle to reconstruct the medial support system of the elbow. A good result was obtained. This unique surgical procedure is useful for reconstructing the medial support system of the elbow joint.

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