SURGICAL TREATMENT OF MEDIAL EPICONDYLITIS

RESULTS IN 35 ELBOWS

C. THOMAS VANGNESS, JR FRANK W. JOBE

From the University of Southern California School of Medicine

We reviewed 35 of 38 consecutive patients who had operative treatment for medial epicondyritis of the elbow after the failure of conservative management. Their mean age was 43 years and mean follow-up was 85 months. At operation residual tears with incomplete healing were consistently found in the flexor origin at the medial epicondyle and microscopy showed reactive fibrous connective tissue with varying degrees of inflammation.

The mean subjective estimate of elbow function was improved from 38% to 98% of normal, while isokinetic and grip strength testing in 16 patients showed no significant difference from the unoperated elbow. Results were excellent in 25 cases, good in nine and fair in one; 86% of the patients had no limitation in the use of the elbow.

Medial epicondyritis at the elbow is relatively uncommon and usually responds to conservative management by methods which may include anti-inflammatory drugs, electrical stimulation, iontophoresis, stretching, exercises, a forearm band and steroid injections. When conservative management fails and there is persistent pain after six to 12 months, surgical treatment must be considered. This is mentioned in two studies which are mainly concerned with lateral epicondyritis (Coonrad and Hooper 1973; Baumgard and Schwartz 1982). We could trace no published article on the surgical treatment of medial epicondyritis.

We now report 35 such cases and conclude that the cause is a tear in the origin of the forearm flexor mass and that surgical repair gives predictably good results.

PATIENTS AND METHODS

From 1974 to 1984, from a total of 334 patients with medial epicondyritis, 38 had failure of conservative treatment and required an operation by the senior author (FWJ). Of these, 35 patients (92%) were available for follow-up; they all completed a detailed questionnaire and were interviewed by telephone. Sixteen patients also returned for physical examination, radiography and strength testing.

The mean age of the 35 reviewed patients was 43 years (range 21 to 65) and 32 of them were men. In 33 patients the dominant arm was involved; there were 28 right and seven left elbows. The duration of the symptoms prior to surgery averaged 22 months (range 5 to 48) with an average of four pre-operative cortisone injections (range 1 to 24) and physical therapy for an average of 4.2 weeks. Radiological calcification or spurs were noted in seven (20%).

Twenty patients had only medial epicondyritis, eight also had ulnar nerve involvement, and seven also had lateral epicondyritis in the same elbow. Two patients had one previous operation and two had two previous operations on the involved elbow, two of the operations being for lateral epicondyritis. Four of the eight with ulnar nerve involvement had transposition of the nerve at the time of surgery; one other needed transposition later. One patient had bilateral medial epicondyritis.

The onset of symptoms was gradual in 26 (74%) and was related to a specific incident by the other nine. The cause was considered to be sports activity in 20 of the patients (57%), among whom were six professional and one college baseball players, one professional and three college tennis players, one professional footballer player, and one professional rackets player. The main sports which were associated with symptoms were tennis (12), baseball (9), golf (7), rackets (4) and bowling (2).
Assessment. We used the grading system of Nirschl and Pettrone (1979) to assess results as follows:

Excellent, full return to all activity with no pain;

Good, full return to all activity with occasional mild pain;

Fair, normal activity with no pain, significant pain with heavy activity, and 75% or better overall improvement in pain; and

Failure, no relief of pre-operative symptoms.

Clinical examination of some of our cases included testing with a Cybex II isokinetic dynamometer, comparing the operated with the nonoperated arm. Strength of wrist flexion and pronation were evaluated at speeds of 60°, 120° and 180° per second, three repetitions at each speed being followed by repetitions to fatigue at 180° per second. Fatigue was evaluated by the number of repetitions before peak torque fell to 50%. The tests were closely supervised with equipment adjustments and calibrations according to the Cybex manual (1980), and with the shoulder directly over the 90° flexed elbow. Additional strength testing was done with the JAMAR dynamometer, using three repetitions for each arm.

Surgical technique. All operations were performed by the senior author (FWJ). A 10 to 12 cm incision is centred on the medial epicondyle (Fig. 1), cutaneous nerves being exposed and protected. The common flexor origin is detached by sharp dissection and reflected without disturbing the medial collateral ligament. Any abnormal tissue is identified and excised (Fig. 2) before the medial epicondyle is stripped of soft tissue and drilled with multiple small holes. The common flexor origin is reattached to this bleeding bone, care being taken to preserve the normal resting length of the forearm flexors (Fig. 3) and to avoid the ulnar nerve.

Postoperatively the arm is placed in a 90° posterior splint with the wrist free. Sponge squeezing exercises and wrist movements start immediately, but care is taken to avoid resisted wrist flexion or pronation for six to eight weeks. Exercises against light resistance then begin but active participation in sport begins only after four to six months as tolerated.

RESULTS

Twenty-four patients (69%) had excellent results; 10 (19%) were good; and one was fair. There were no failures. All the patients had some improvement and 86% had no limitations in daily living or sports activities. Only one patient failed to return to his previous level of sport. The time for full recovery ranged from three to 24 months (average 8.5). The mean subjective pre-operative estimate of elbow function was 39% of normal; postoperatively this improved to 98%. All patients were satisfied with their procedure and would have the same operation again. Five patients (14%) had some limitation of heavy lifting or loss of endurance. Of the five patients (14%) who also had ulnar nerve transposition, four had an excellent and one had a fair result.

Power. All the 16 patients who were examined at follow-up had a full range of supination, pronation, flexion and extension, and only one had any tenderness about the medial epicondyle. No incisional tenderness or neurovascular deficits were found. All 16 patients had surgery on their dominant arm, and Cybex testing showed no significant difference in strength of flexion or pronation, or in fatigue onset, compared with the nonoperated arm.
(p > 0.05, Student's t-test). Similar tests of grip strength using the JAMAR grip dynamometer also showed no difference. The results were similar in the nine patients with isolated medial epicondylitis, the three with mild ulnar nerve symptoms (not transposed), and the four who also had lateral epicondylitis.

**Pathology.** Gross examination showed varying amounts of granulation tissue, necrotic tissue and calcified masses. Tendon tears were seen in all patients. Microscopic examination of excised tissue showed granulation tissue, tendon microfragmentation, calcification, fibrovascular tissue, fibrocartilaginous tissue, inflammatory cells and necrosis. No consistent histological changes were seen.

**Complications.** One patient had persistent painful ulnar nerve irritation; this resolved after a later revision. One patient developed a postoperative haematoma which was aspirated with no sequelae. A third patient had persistent hypo-aesthesia and a positive percussion sign over the ulnar nerve at the cubital tunnel. This was a worker's compensation case and was eventually treated in a pain clinic.

**DISCUSSION**

Medial epicondylitis was attributed to sports activities in 20 patients, and surgery relieved pain and restored the strength, power and endurance of the forearm flexors, which are particularly important in this group of patients. Only one athlete did not return to his previous level of sport. He was a baseball player who continued to play college baseball but could not pitch adequately after his second revision operation.

Medial epicondylitis may be associated with other elbow pathology as reported by Nirschl and Pettrone (1979) for lateral epicondylitis. The differential diagnosis includes ulnar neurapraxia, carpal tunnel syndrome, radial tunnel syndrome, cervical osteoarthritis, nerve root compression, intra-articular abnormalities, joint laxity, bursitis and seronegative arthritis. We found ulnar nerve involvement in 23%, and lateral epicondylitis in 20%.

Only one patient had persistent postoperative ulnar nerve symptoms, with hypo-aesthesia at the tip of the little finger. Our indications for ulnar nerve transposition included a subluxing ulnar nerve, symptomatic neurapraxia on valgus stress and extensive scarring which impinged on the nerve. Nerve conduction studies were not done. Anterior transposition of the nerve under the flexor mass was performed through an extended incision in 14%; they had no persistent symptoms.

Baumgard and Schwartz (1982) studied 34 percutaneous elbow releases for epicondylitis. All six medial releases (one requiring revision) and 91% of lateral releases eventually had excellent results. Coonrad and Hooper (1973) had treated 539 patients with epicondylitis (122 medial), but did not report how many medial cases had surgery.

Comparison of our results with those reported for surgery for lateral epicondylitis shows that the results of operation for medial epicondylitis are similar, if not better. Nirschl and Pettrone (1979) had 85% excellent or good results after 88 lateral procedures while Spencer and Herndon (1953) obtained 96% excellent and good results in 26 elbows after a stripping procedure. Posch, Goldberg and Larrey (1978) reported 96% excellent or good results in 43 elbows after fasciotomy of the common extensor origin. Boyd and McLeod (1973) reported that all of their 37 surgically treated patients had 'good' results.

Only Goldie (1964), and Nirschl and Pettrone (1979) have reported objective postoperative muscle testing after surgery for lateral epicondylitis, using JAMAR dynamometer testing of grip strength. Schmidt and Toews (1970) and Thorngren and Werner (1979) have reported 3% to 7% greater strength in the dominant arm, and our results, showing no statistically significant difference between operated and nonoperated arms, may imply a mild deficit in grip strength on the operated dominant side. However, the patients felt that there was no subjective difference in strength. Little previous work has been done to evaluate normal wrist strength by Cybex testing (Vanswearingen 1983).

We conclude that surgery for failure of conservative treatment of medial epicondylitis is predictably efficacious. It relieves pain, restores strength and allows a return to the previous level of daily living and sports activity.

No benefits in any form have been received or will be received from a commercial party related directly or indirectly to the subject of this article.

**REFERENCES**


