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The result of surgical treatment of medial epicondylitis: analysis with more than a 5-year follow-up

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Background: Angiofibroblastic changes of a musculotendinous origin at the medial epicondyle characterize medial epicondylitis of the elbow. Although nonsurgical treatment is the primary approach for medial epicondylitis, surgical treatment should be considered when conservative therapy fails. This study reports the results of surgical treatment of medial epicondylitis monitored for more than 5 years.

Methods: This study included 55 patients with 63 cases of medial epicondylitis between 2000 and 2010. The conservative treatment periods lasted for a minimum of 1 year, and steroid injections were administered more than twice before surgery. One surgeon conducted the surgical procedures. The Nirschl and Pettrone grades, visual analog scale (VAS) scores, Disabilities of the Arm, Shoulder and Hand (DASH) scores, Mayo Elbow Performance scores, and grip strengths were analyzed. Statistical analyses were performed using paired *t* tests.

Results: The mean VAS score improved from 8.5 to 2.4 ($P < .001$). Nirschl and Pettrone grades rated 43% (27 elbows) as excellent and 51% (32 elbows) as good. The Mayo Elbow Performance scores improved from 72 to 88 ($P < .001$) and DASH scores from 57 to 23 ($P < .001$). The mean grip strength of the affected side improved from 30 to 43 lb ($P < .001$). The mean time required to return to work and exercise was 2.8 months and 4.8 months, respectively. One case of heterotrophic ossification, which had no functional instability afterward, was seen.

Conclusion: The results indicate that surgical treatment of medial epicondylitis could be an effective and safe treatment when conservative treatment fails.

Level of evidence: Level IV; Case Series; Treatment Study

Keywords: Medial epicondylitis; elbow; surgical treatment; common flexor origin release; decortications; multiple drilling

Angiofibroblastic changes of the musculotendinous origin at the medial epicondyle due to the repetitive microtearing phenomenon characterize medial epicondylitis of the elbow.[9] Medial epicondylitis of the elbow is common in adults, whereas this condition is 4-times less common than lateral epicondylitis.[3] Athletes particularly susceptible to the

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development of medial epicondylitis are golfers and those involved in overhead throwing.[1] However, this condition is not only limited to the athletic population but is also associated with many occupations, such as carpentry, requiring repetitive wrist flexion and pronation.[11,14]

Given that the success rate of nonsurgical treatment of medial epicondylitis of the elbow has been reported to be greater than 90%, this type of treatment should be applied first. Nonsurgical treatment of medial epicondylitis consists of rest, nonsteroidal anti-inflammatory drug administration, stretching, well-structured physical therapy, steroid injections, or a combination of these. However, surgical treatment should be considered if the patient's symptoms do not improve after 1 year of conservative treatment.

In contrast to the myriad of operation techniques described for lateral epicondylitis, only a few studies have described the surgical management of medial epicondylitis. Surgical options include percutaneous epicondylar muscle release, open detachment of the flexor muscle origin, with or without débridement, open detachment of the flexor origin with débridement of pathologic tendinosis tissue, followed by a secure common flexor repair, open medial epicondylectomy, and open resection of pathologic tendinosis tissue.[11] Several studies have reported the outcome of open surgery for patients with recalcitrant medial epicondylitis.[5,10]

In the present study, the surgical technique used was release of the common flexor origin, epicondylectomy, and multiple drilling of the medial epicondyle. Here, we report the clinical outcome of surgical treatment of medial epicondylitis, which was monitored for more than 5 years, in a relatively large case series.

Materials and methods

Patient selection and demographics

This is a retrospective case series of medial epicondylitis treated with decompression and multiple drilling without footprint repair. Medical records were reviewed retrospectively for 80 patients who underwent surgical treatment for medial epicondylitis between 2000 and 2010. The conservative treatment period was a minimum of 1 year, and steroid injections were administered more than twice before the operation. Among these patients, we excluded 19 patients whose follow-up periods were shorter than 5 years and 6 patients who simultaneously underwent surgical treatment for lateral epicondylitis. Eight patients underwent the same procedure on the opposite elbow. The final dataset consisted 63 elbows in 55 patients (36 [65%] women).

The mean age at surgery was 51.6 years (range, 34-77 years). The mean duration of the symptoms before surgery was 24 months (range, 12-120 months). The mean follow-up period was 6.9 years (range, 5-14 years). Patients received a mean of 5 injections (range, 3-10 injections) before surgery. Of the 55 patients, 23 were manual workers whose professional occupation required repetitive wrist flexion and pronation, such as construction, manufacturing, and butchery, 23 patients were homemakers, and 9 were clerical workers.

Medial epicondylitis was diagnosed based on pain and local tenderness over the origin of the forearm flexors near the medial epicondyle, pain from resisted forearm pronation, and pain from resisted wrist flexion.[12] Neurologic assessments before and after surgery included motor function, muscle atrophy, Tinel sign, and sensation, which was evaluated by light touch and static 2-point discrimination. Tinel sign and tingling sensation was present in 32 elbows in 30 patients, and 13 of the 32 elbows had a decreased sensation with numbness. No patients had motor dysfunctions or muscle atrophy. Patients who had definite intrinsic muscle atrophy and clawing were excluded because they needed an additional procedure regarding the ulnar nerve. Also excluded from the data set were patients who underwent ulnar nerve transposition for cubital tunnel syndrome.

Operative technique

One surgeon (S.-H.H.) performed all procedures. General anesthesia was initiated, and the patient's arm was positioned with the shoulder in abduction and external rotation; thus, the anteromedial side of the medial epicondyle faced the surgeon (Fig. 1). A well-padded tourniquet was placed proximally near the axilla. A slightly curved 5-cm incision was made about 1 cm proximal and just posterior to the medial epicondyle. The incision was placed posteriorly to avoid sensory branches of the medial antebrachial cutaneous nerve anterior and distal to the epicondyle. Subcutaneous dissection was performed, during which the medial antebrachial cutaneous nerve was identified and protected.

Dissection proceeded through the subcutaneous tissues until the deep fascia of the flexor carpi ulnaris was identified. We further dissected anterolaterally in this plane and retracted the subcutaneous tissue and skin over the medial epicondyle to expose the common flexor origin. A longitudinal 3- to 4-cm incision was made distally in the tendon origin to expose the pathologic tissue. An additional transverse incision was made to completely excise abnormal tissues. Excision of the pathologic tissue was done elliptically, leaving the normal tissue attached to the medial epicondyle.

Rongeuring was performed of any fibrous tissue in the medial epicondyle, and partial epicondylectomy, which included less than half of the epicondyle, and drilling multiple small holes were performed to create a sufficient vascular bed. Subsequently, a concomitant ulnar nerve neurolysis was performed, and the released common flexor origin was left without reattachment. Incised fascia was approximated without tension. Irrigation and ordinary subcutaneous and skin closure was done with absorbable suture and nylon.

A posterior long-arm splint, with the elbow in 90°, immobilized the patients to relieve pain after the operation. The splint was removed at least 1 week after the surgery, and all normal activities and active movements of the joint were allowed.

Clinical evaluation during the last follow-up

Before the operation and during the last follow-up of each patient, we evaluated the elbow's range of motion (ROM), grip strength, valgus/varus instability, visual analog scale (VAS) pain score (0-10 points), Nirschl and Pettrone grade (rated into 4 categories: excellent, good, fair, and poor), the Disabilities of the Arm, Shoulder and Hand (DASH) score (0-100 points), Mayo Elbow Performance (MEP) score (0-100 points), and time required to return to daily activities and work. Grip strength was evaluated using the Jamar Hydraulic Hand Dynamometer (5030J1; Sammons Preston, Bolingbrook, IL, USA). Detailed neurologic assessments before the