Arthroscopic Treatment of Concomitant Medial and Lateral Epicondylitis

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Abstract: Arthroscopic treatment of lateral epicondylitis has been well documented in the orthopedic literature. When these patients also suffer from symptoms of medial epicondylitis and fail conservative treatment, a combined medial and lateral epicondylar debridement can be performed with excellent patient outcomes. On completion of the extensor carpi radialis brevis debridement, the instruments are reversed using a switching stick, and a thorough debridement of the flexor-pronator mass is performed. From a series of 14 patients who underwent this combined procedure and agreed to participate, 79% of patients were satisfied with their outcome and 86% would have the same surgery again, if needed. We have not had any neurological complications from this procedure. Concomitant medial and lateral epicondylitis can be safely and successfully treated using a combined arthroscopic technique.

Key Words: medial epicondylitis, lateral epicondylitis, elbow, arthroscopy

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Lateral epicondylitis, commonly known as "tennis elbow," is seen in approximately 1% to 3% of adults each year.[1] It is classically seen in the dominant extremity of adults in the fourth or fifth decade of life, with equal predilection of males and females.[1] Clinically, patients complain of lateral-sided elbow discomfort and have point-specific tenderness over the lateral epicondyle at the origin of the forearm extensor mechanism. This disorder has been attributed to overuse of the extremity with repetitive wrist extension activities with the forearm alternating between supinated and pronated positions.[1] Histologic analysis of lateral epicondylitis has revealed noninflammatory angiofibroblastic tendinosis of the extensor carpi radialis brevis (ECRB) origin, which is consistent with a repetitive process of microinjury followed by healing attempts.[1,2] Treatment options are broad, ranging from rest and anti-inflammatory medications to operative intervention. Approximately 4% to 11% of patients will require surgical treatment, consisting of ECRB tendon debridement, performed either open or arthroscopically.[1] Both open and arthroscopic techniques have provided very good patient outcomes. Dunn et al[3] reported 84% of patients with good to excellent results at an average follow-up of 12.6 years using the Nirschl mini-open surgical technique. Arthroscopic treatment has had similar success rates in the literature. Baker and Baker[4] reported an 87% satisfaction rate and a mean pain score at rest of 0 in 30 patients at 130-month follow-up after arthroscopic management of the patients recalcitrant lateral epicondylitis. Peart et al[5] conducted a retrospective review comparing outcomes of open versus arthroscopic treatment of lateral epicondylitis and found no significant difference in outcomes at mean follow-up of at least 16 months. However, it was noted that arthroscopic treatment required less therapy and quicker return to work.

Medial epicondylitis, commonly known as "golfers elbow," is thought to be a similar disease process to its lateral counterpart, although occurring 4 to 7 times less frequently.[6,7] Seen most frequently in golfers and overhead throwing athletes, patients complain of medial-sided elbow pain, with tenderness over the medial epicondyle at the origin of the flexor-pronator mass.[8] It is thought to be an overuse syndrome, with tendinosis resulting from repetitive microtrauma and healing processes, with histology similar to that seen in lateral epicondylitis. The flexor carpi radialis and pronator teres are the most frequently involved tendons of the flexor origin.[8] Nonoperative management, consisting of rest and anti-inflammatory measures followed by physical therapy, is the mainstay of treatment with approximately 90% success rate.[8–10] However, in cases resistant to 6 to 12 months of conservative measures, surgical intervention can be beneficial. In a retrospective review by Vangsness and Jobe[11] of 35 patients who underwent open medial epicondyle debridement, 97% reported good or excellent results and 86% had no functional limitations of the use of their elbow. To our knowledge, there has been no published data on outcomes after arthroscopic medial epicondyle debridement.

Occasionally patients present with symptoms consistent with both lateral and medial epicondylitis. When neither of these diagnoses respond to the variety of nonoperative measures, a combined arthroscopic procedure can be performed with debridement of both the medial and lateral epicondyle tendinous origins. Patients with a history and physical examination consistent with lateral and medial epicondylitis, who have failed a minimum 6-month course of conservative therapy, are candidates for a combined arthroscopic procedure. Surgeon inexperience with elbow arthroscopy may be a contraindication to this procedure. Patients with postsurgical, posttraumatic, or arthritic conditions of the elbow may be a contraindication depending on the nature of the changes and the comfort level of the surgeon.

Understanding the surgical anatomy of the elbow is key in performing this procedure. The arthroscopic medial and lateral epicondyle debridement makes use of the anteromedial and anterolateral portals. The anteromedial portal, located approximately 2 cm proximal and anterior to the medial epicondyle, is posterior to the more superficial medial antebrachial cutaneous nerve. As the trocar is advanced into the joint space, the medial nerve and brachial artery are located more anteriorly, whereas the ulnar nerve lies posteriorly.[12] The anterolateral portal, located approximately 2 cm proximal and anterior to the

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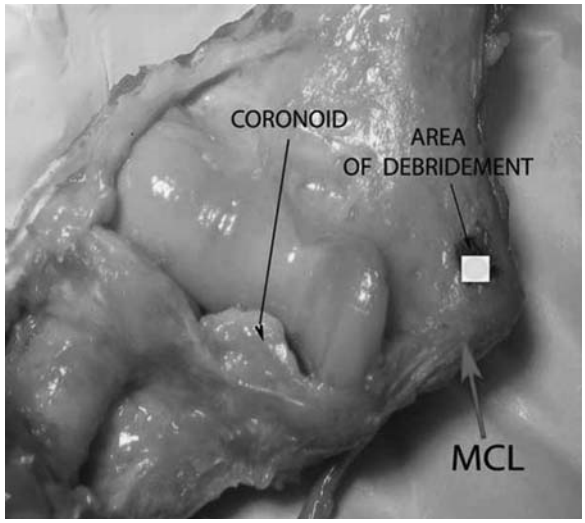

FIGURE 1. Cadaver dissection revealing proximity of medial collateral ligament (MCL) to the area of medial debridement.

radiocapitellar joint, is posterior to the radial nerve and posterior and distal to the posterior interosseus nerve.[12]

Proximity of the medial epicondyle debridement to the ulnar nerve and medial collateral ligament (MCL) has often been a concern for orthopedists performing this procedure. A study by Zonno et al[13] revealed that the ulnar nerve was approximately 20.8 mm from the central area of debridement on the medial epicondyle, whereas the most proximal portion of the MCL was 8.3 mm away from the debrided area (Figs. 1 and 2).

METHODS/SURGICAL TECHNIQUE

The patient is placed in the supine position on the operating room table with a proximal arm tourniquet in place. The arm is placed in an arthroscopic arm holder, such as the Iron Resident (SwissOrtho, East Greenwich, RI) (Fig. 3), with the elbow at 90-degree flexion. The hand, forearm, and elbow are exsanguinated with an Esmarch bandage and the tourniquet inflated to 250 mm Hg. The elbow is distended with approximately 20 mL of saline before beginning the arthroscopic procedure to distend the joint and keep the neurovascular structures at a maximum distance from the portals. After marking the superficial landmarks of the elbow with a marking pen and ensuring the location of the ulnar nerve through palpation, an anteromedial portal is established. The anteromedial portal position is approximately 2 cm proximal and anterior to the medial epicondyle. The anterolateral portal is placed approximately 2 cm proximal and anterior to the radiocapitellar joint. The trocar is inserted through the anteromedial portal, just anterior to the intermuscular septum and angled just distal to the anterior surface of the distal humerus. The trocar should then brush along the anterior aspect of the humerus and through the anteromedial joint capsule. Once intra-articular, the long 2.7-mm arthroscope is inserted to confirm appropriate placement and visualization of the radiocapitellar joint (Fig. 4). The arthroscope is then removed and a switching rod is inserted. The switching rod is pushed through the anterolateral joint capsule and to the skin, where an incision is made to establish the anterolateral portal in this inside-out technique. The rod is pushed through the skin and an arthroscopic elbow cannula is placed over it and into the joint. The rod is removed and the camera is replaced medially and a 2.9-mm shaver is inserted laterally. Alternatively, after making the medial portal incision, the trocar can be inserted medially and the tip of the trocar can be used to gently "feel" the capitellum and radial head. The trocar is then advanced through the lateral capsule and out through the skin laterally. The small cannula from the shaver engages the trocar, and both instruments are brought back into the joint. The ECRB insertion is then identified and debrided working distal to proximal until the beefy red fibers of the adjacent extensor carpi radialis longus is identified. This marks the proximal extent of the debridement. Only degenerative ECRB fibers are debrided (Figs. 5 and 6). Distally, the area of debridement does not extend past the capitellum cartilage/bone interface. Once the lateral side has been adequately debrided, the instruments are reversed using a switching rod and the medial side is approached. An important caveat to recognize is that as the switching rod is introduced through the lateral portal and as it stays close to the articular surface, it will go through the anterior capsule at a point that is more medial than the

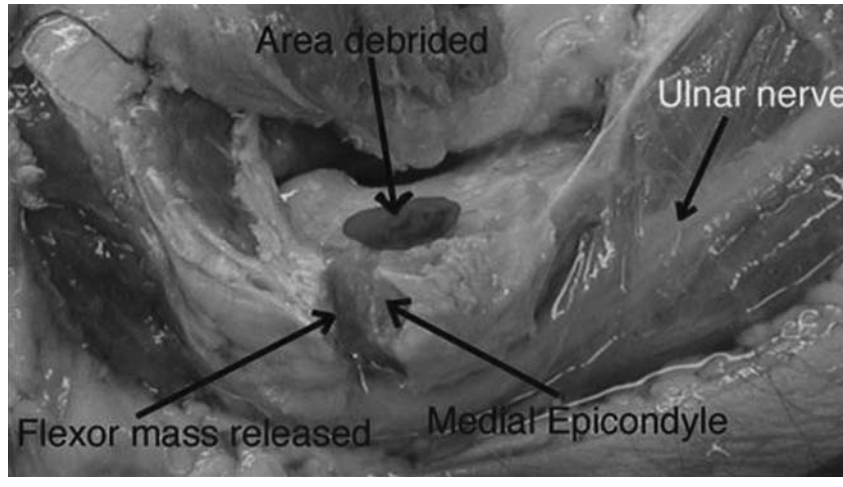

FIGURE 2. Cadaver dissection revealing proximity of ulnar nerve to the area of medial debridement.

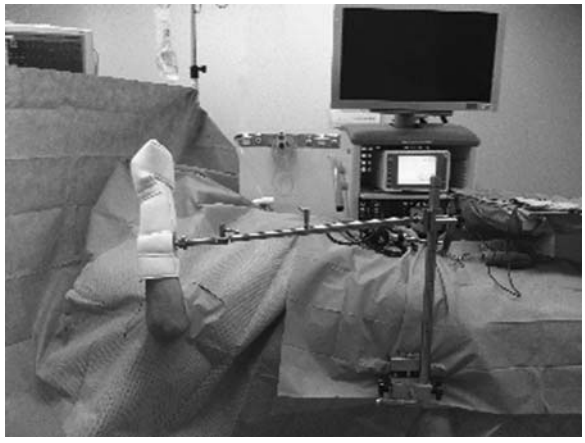

FIGURE 3. Supine position with the arm in arthroscopic arm holder. This position facilitates patient positioning and easy access to the elbow.

initial entry point. If this step is not done carefully, visualization of the medial epicondyle area can be difficult. After a partial synovectomy and capsulectomy are done, the flexor-pronator origin on the medial epicondyle is inspected and the pathologic fibers are typically at the deep flexor-pronator insertion onto the anteromedial epicondyle, just proximal to the MCL complex. The coronoid process serves as a landmark to begin debridement proximally and medially. Debridement of the degenerative fibers continues until the superficial fibers of the anterior band of the MCL are visualized (Fig. 7). The healthy appearing fibers are kept intact as well as the origin of the medial collateral ligament. Once completed, the joint is injected with plain bupivicaine and portals are closed with interrupted nylon suture. It is our routine to hold external pressure on the medial side primarily as there can be ecchymosis as a result of the debridement.

FIGURE 4. Schematic representation of the lateral aspect of the elbow. The extensor carpi radialis brevis (ECRB) insertion is tendinous whereas the extensor carpi radialis longus (ECRL) has a more muscular insertion along the supracondylar ridge of the humerus.

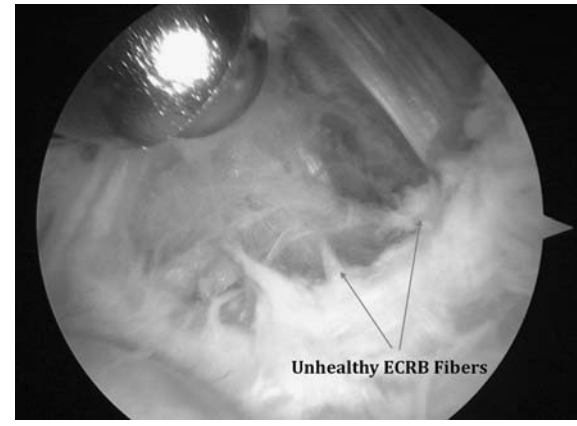

FIGURE 5. Initial lateral epicondyle debridement of unhealthy extensor carpi radialis brevis (ECRB) fibers.

Postoperatively patients are placed in a soft dressing and strongly encouraged to begin immediate active range of motion exercises. Rarely is a referral to occupational therapy required, as most patients regain full flexion and extension with a home exercise regimen. Patients are counseled preoperatively about the importance of immediate range of motion and establishing appropriate expectations in their recovery.

RESULTS

Forty consecutive patients, with symptoms of concomitant medial and lateral epicondylitis, who had no improvement with at least 6 months of conservative management, underwent a combined arthroscopic procedure by the same attending surgeon between April 2003 and December 2005. The average patient age was 48 years (range, 28 to 68 y) with an average patient follow-up of 26 months (range, 12 to 30 mo). In this group of 40 patients, there were no noted complications. Fourteen patients agreed to be included in this outcome study. All patients completed a questionnaire regarding satisfaction with the procedure and a disabilities of the arm, shoulder, and hand (DASH) outcome measure questionnaire. Seventy-nine percent (11/14) of patients were satisfied, very satisfied, or extremely satisfied with their outcome and 86% (12/14) would

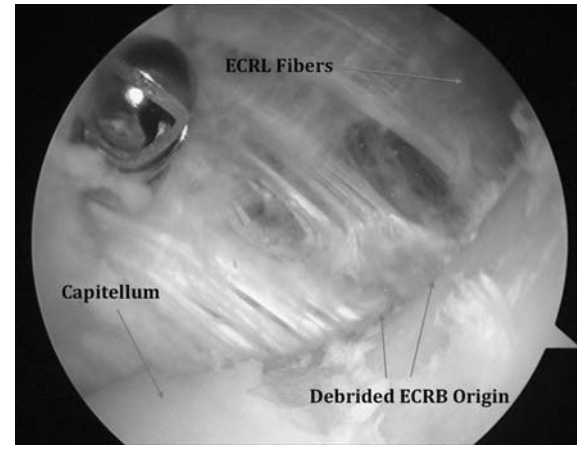

FIGURE 6. Completed lateral epicondyle debridement revealing health extensor carpi radialis brevis (ECRB) fibers.

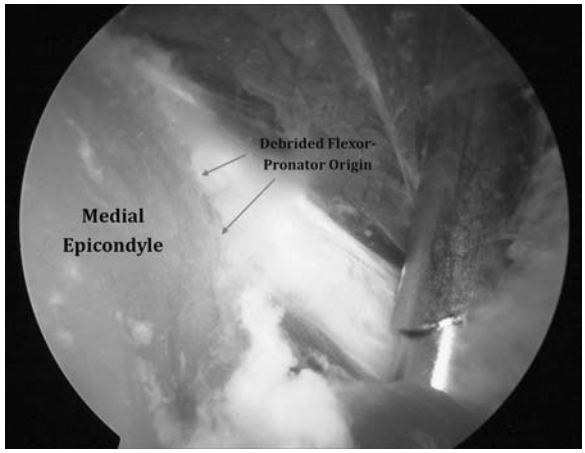

FIGURE 7. Completed debridement of the flexor-pronator mass on the medial epicondyle.

agree to have the same surgical procedure performed again. Seventy-nine percent (11/14) had no or mild discomfort in the operative elbow and 71% (10/14) noted normal or mildly decreased strength. The average DASH score was 23.4, with a median score of 7.9. The DASH outcome measure is scored from 0 to 100, with the higher the score indicating a greater degree of disability.

DISCUSSION

The most common complication associated with this procedure is incomplete debridement of either the ECRB origin or the flexor-pronator mass, resulting in persistent elbow pain. As the comfort level of the performing surgeon improves, a more extensive and appropriate debridement is performed. Other complications associated with elbow arthroscopy have been described and include superficial portal site infection, persistent elbow stiffness, transient nerve palsies, and joint space infections.[14] We have not had any neurological complications from this procedure.

In patients who present with the combined symptoms of medial and lateral epicondylitis, the combined arthroscopic medial and lateral epicondyle debridement can be an effective technique for symptom relief. In patients who have failed an appropriate course of conservative therapy, this minimally invasive technique can be the next step to attempt to return these patients back to pain-free function. We have experienced a high rate of patient satisfaction, with the majority of patients experiencing no or only mild discomfort postoperatively.

Arthroscopic debridement of the lateral epicondyle has become a common and safe surgical procedure for the treatment of lateral epicondylitis. However, arthroscopic medial epicondyle debridement has been infrequently performed secondary to trepidation associated with its proximity to the ulnar nerve. Zonno et al[13] determined the ulnar nerve to be approximately 21 mm from the site of medial debridement, and we have had no neurological complications from this procedure.

Understanding the anatomy of the elbow joint and its surrounding neurovascular structures is paramount in performing successful elbow arthroscopy and preventing complications.

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