Arthroscopic Treatment of Lateral Epicondylitis

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Lateral epicondylitis refractory to conservative care can be effectively treated by arthroscopic release of the extensor carpi radialis brevis origin. Advantages to the technique include the ability to address other intra-articular sources of pain (capsular tears, radiocapitellar plica, etc.), a potentially faster return to work and sports, and a smaller incision. This article provides step-by-step descriptions and illustrations of the surgical technique. *(J Hand Surg 2009;34A:1130–1134. © 2009 Published by Elsevier Inc. on behalf of the American Society for Surgery of the Hand.)*

Key words Arthroscopy, elbow, epicondylitis, extensor.

Additional material is available online.

"Politician's paw" and "litigant's elbow" are the more colorful of the many terms used to describe lateral epicondylitis, or tennis elbow. Lateral epicondylitis, a poorly named but common tendinosis of the extensor carpi radialis brevis (ECRB), can typically be treated with conservative care. However, when surgical intervention is required, arthroscopic release of the ECRB origin is an effective option. This relatively straightforward arthroscopy can also help advance a surgeon down the learning curve to more complex elbow arthroscopy. Here we provide step-by-step details for the procedure.

INDICATIONS

Patients with a history and examination consistent with lateral epicondylitis and who have failed a course of conservative treatment are candidates for an arthroscopic release. The precise amount of time for that conservative care is variable, keeping in mind that most do improve substantially with the passage of enough time. In general, we find that the more severe the symptoms at presentation and the higher the demand of the job or sport, the less likely it is that conservative care will be successful. A course of therapy and bracing should nevertheless be attempted. There are many patients who say they have done therapy, much of which is misguided.

Therapy should consist of a 3-phase program. Phase 1 has 4 components: moist heat followed by circular massage to the affected area, bracing (both counterforce strap and wrist immobilization), education, and stretching with active range of motion to regain wrist flexion. Phase 2 consists of continuing the phase 1 exercises and adding more repetitions and prolonged stretches to the program. Phase 3 adds passive range of motion and, finally, strengthening. A patient is not progressed from one phase to the next unless symptoms are dramatically reduced. Injections have not shown any prolonged benefit[1] but could be considered as a last resort in conservative treatment. Iontophoresis or phonophoresis also probably have minimal impact but could be considered if a patient struggles to progress out of phase 1 or 2.

Additionally, one must differentiate on examination 2 other areas (radial tunnel and posterolateral gutter) that can either lead to a misdiagnosis or can occur with lateral epicondylitis. Patients can clearly have a poor outcome from release of the ECRB if their pathology was principally a posterolateral plica or radial tunnel compression.[2] An x-ray is also appropriate preoperatively if there is suspicion by history of other causes of elbow pain (arthritis, trauma, avascular necrosis of the capitellum, tumor, etc.).

CONTRAINDICATIONS

Surgeon inexperience with elbow arthroscopy may be a contraindication to an arthroscopic release. Postsurgi-

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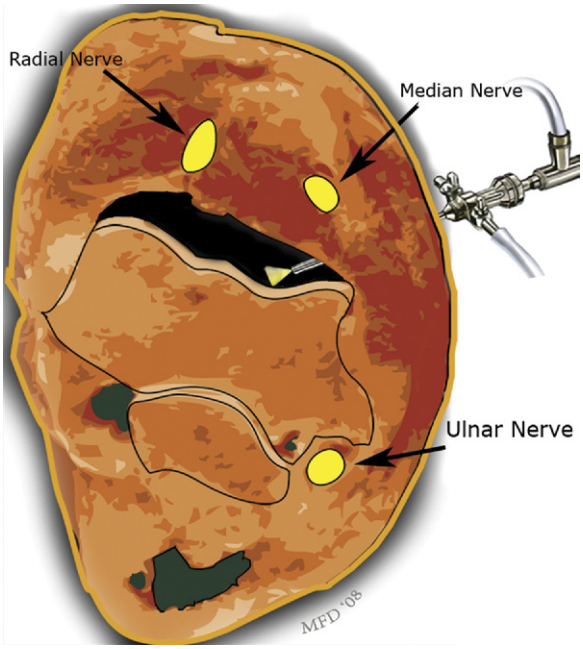

FIGURE 1: Axial view of the elbow joint demonstrating position of the proximal anteromedial portal camera placement in comparison with the median, radial, and ulnar nerves.

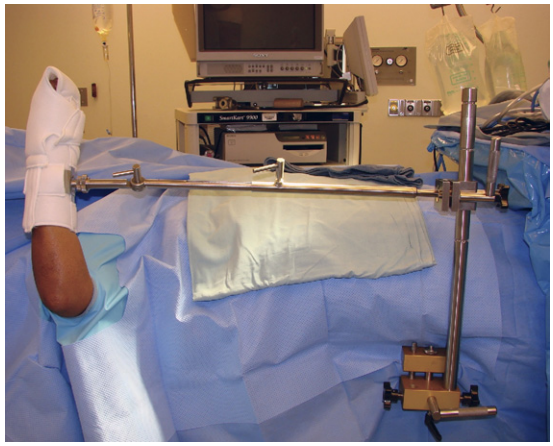

FIGURE 2: Patient positioning in the supine position with the arm suspended in an arthroscopic arm holder maintaining the elbow at 90° of flexion. This position allows convenient access to the elbow and ease of patient positioning and transfer.

cal, posttraumatic, or postarthritic changes to the native anatomy may be a contraindication depending on the nature of the changes and the experience of the surgeon. For example, an elbow with a previous ulnar nerve transposition could still be approached arthroscopically, but one may want to enlarge the medial portal to locate the ulnar nerve prior to portal placement.

A previous open release of the ECRB with persistent symptoms is not a contraindication to an arthroscopic release, and in fact we have had a number of patients like this who have achieved notable relief from the arthroscopic procedure.

SURGICAL ANATOMY

The arthroscopic release makes use of a proximal anteromedial portal and a direct lateral portal.

The medial antebrachial cutaneous nerve lies anterior to the medial portal superficially. The median nerve and brachial artery are anterior to the portal as the trocar is passed more deeply. The intermuscular septum and ulnar nerve lie posterior to the portal (Fig. 1). The radial nerve is anterior and the posterior interosseus nerve is anterior and distal to the lateral portal placement. The ECRB origin is on the anterior half of the lateral epicondyle with a length of 13 mm and a width of 7 mm.[3]

TECHNIQUE

The patient is placed supine. The arm ideally is placed in an arm holder with the elbow at 90° (e.g., McConnell [Orthopaedic Manufacturing, Greenville, TX], Spider Arm Holder [Tenet Medical Engineering, Calgary, Canada], Iron Resident [SwissOrtho, East Greenwich, RI]). We prefer the Iron Resident (Fig. 2). If the arm is big or short, a sterile tourniquet is used; for smaller longer arms, the tourniquet can be placed prior to sterile draping.

Equipment is either a long 2.7-mm or a standard 4.0-mm arthroscope, a 2.9-mm shaver, and a small-diameter exchange rod. A radiofrequency wand or 4.0-mm shaver can also be used, although the small shaver is ideal to prevent overaggressive resection. An inexpensive disposable cannula for the shaver can be made by taking a 1-mL tuberculin syringe without the plunger, clipping at the 0.4-mL mark at an angle, and fitting the rubber stopper from a 10-mL syringe plunger over the back end of the 1-mL syringe. Make just a nick in the rubber stopper and it will accommodate the shaver while preventing leakage out the back.

The hand, forearm, and elbow are exsanguinated with an Esmarch tourniquet, and the pneumatic tourniquet is inflated to 250 mm Hg. The elbow is distended with saline from the lateral soft spot to distend the joint and keep the neurovascular structures at maximum distance from the portals.

The ulnar nerve is palpated through flexion and extension of the elbow to check for subluxation. The intermuscular septum is also palpated as a landmark. The portals are marked. The skin is incised 2 cm proximal and anterior from the medial epicondyle. The trocar is inserted just anterior to the intermuscular septum, the anterior humerus is felt with the tip of the trocar, and the trocar is angled distally. The surgeon

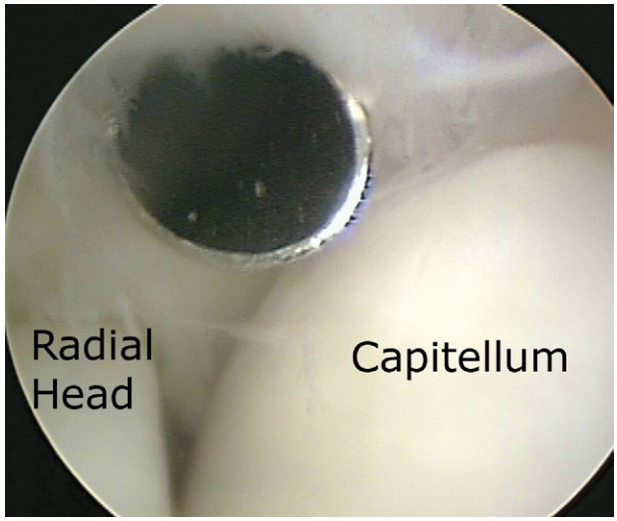

FIGURE 3: Correct positioning of a lateral portal just anterior to the radiocapitellar joint to allow ECRB release.

should then brush along the anterior aspect of the humerus and then push through the anteromedial joint capsule.

At this point, the arthroscope should be inserted to confirm entry into the joint and that there is visualization of the radiocapitellar joint. Place the arm through a pronosupination arc to confirm the radiocapitellar joint. Best visualization is usually obtained orienting the camera toward the surgical shoulder. Once appropriate joint entry is established, remove the camera and insert the Wissinger rod. Palpate the radial capitellar joint with the tip of the Wissinger rod, lower your hand to raise the tip of the rod just above the radiocapitellar joint, and push through the capsule on the lateral side to establish a perfectly positioned lateral portal from an inside-out fashion (Fig. 3). Incise the skin over the Wissinger rod and pass it now through-and-through the joint (Fig. 4). Twist the tuberculin syringe cannula over the Wissinger rod and into the joint. Reinsert the camera from the medial side and insert the shaver laterally.

Alternatively, after making the medial portal incision, the trocar is inserted medially and the tip of the trocar can be used to gently "feel" the capitellum and radial head. The trocar can then go through the lateral capsule and out through the skin laterally. The small cannula from the shaver (in this example, a custom-made metal cannula) engages the trocar (Fig. 5), and both instruments are brought back into the joint. As the instruments disengage, exit of fluid from the lateral cannula confirms intra-articular placement. The arthroscope and shaver are then locked in their respective cannulas. This ensures a consistent placement of the lateral portal regardless of the patient's body habitus.

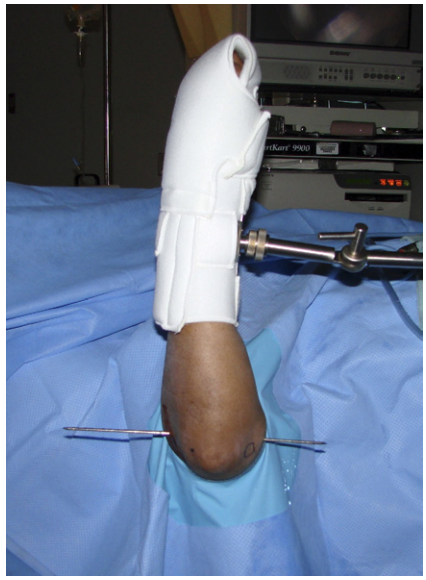

FIGURE 4: Wissinger rod passed through the medial portal and then in an inside-out fashion out through the lateral side of the joint to establish the lateral portal.

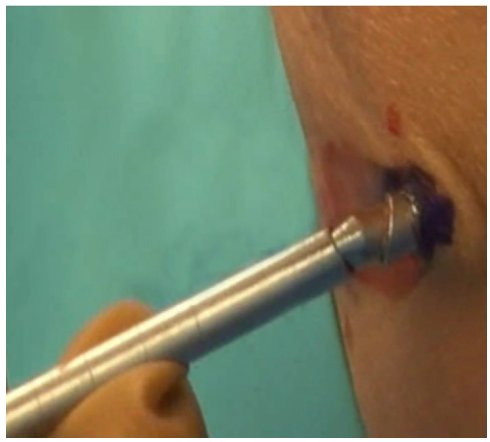

FIGURE 5: Modification of the inside-out technique that facilitates placement of both instruments into the joint. As the trocar and lateral cannula are brought into the joint, there is usually some resistance as the cannula is going through the lateral capsule.

Assess the quality of cartilage, loose bodies, anterior radiocapitellar plica, synovitis, or other intra-articular pathology. Inspect the lateral capsule for signs of tears. Typically, the lateral capsule is quite thickened.

The first step is a partial capsulectomy. Avoid any debridement with the shaver pointed anteriorly, as the radial nerve lies directly behind the anterior capsule on the lateral side of the joint. After the capsule is debrided, the tendinous fibers of the ECRB insertion come into view (Fig. 6). Work from distal to proximal until

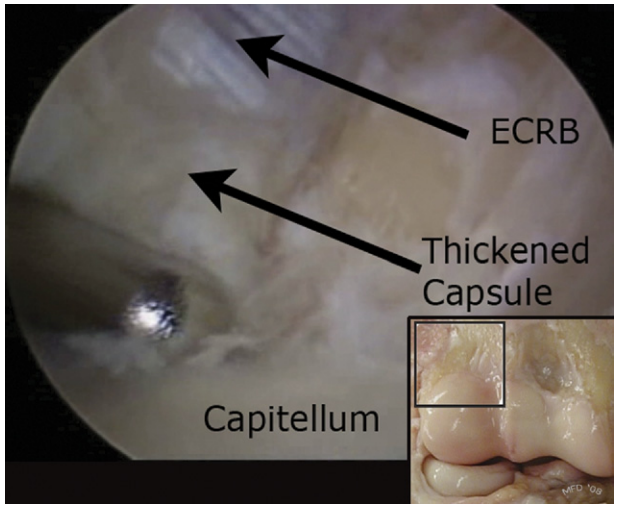

FIGURE 6: Medial perspective of the lateral elbow halfway through the debridement showing the thickened capsule and ECRB fibers. Insert shows cadaveric dissection highlighting the area of arthroscopic debridement.

the extensor carpi radialis longus (ECRL) muscle is viewed. The ECRL is distinguished from the ECRB as the muscle appears more red or pink than does the ECRB and has fewer fascial fibers (Fig. 7).

Continue to peel off the ECRB insertion working from medial to lateral, taking care not to pass posterolateral greater than one half the diameter of the radiocapitellar joint to avoid injury to the lateral collateral ligament (Fig. 8). The landmarks used for lateral debridement include the ECRL fibers superiorly, healthy ECRB fibers laterally, and the bone/cartilage interface inferiorly. One of the comments that has been made regarding arthroscopic debridement is that one cannot distinguish "tendinosis" from normal tissue. The fact is that it may be easier to do so arthroscopically than with open techniques because the visualization is excellent and the so-called "scratch test" can easily be performed with the shaver by using the bottom half of the shaver. Tendinosis or degenerative tissue is easily debrided giving the appearance of snowflakes, while normal tissue is much harder to debride with the small shaver. Only degenerative ECRB fibers are debrided. We do not routinely release the entire ECRB insertion. For further information on the technique, see the video available online at the *Journal's* Web site, www.jhandsurg.org.

REHABILITATION AND POSTOPERATIVE CARE

The patient is placed in a soft dressing and allowed to begin range of motion exercises as tolerated. Rarely, therapy is required to help regain elbow extension. The

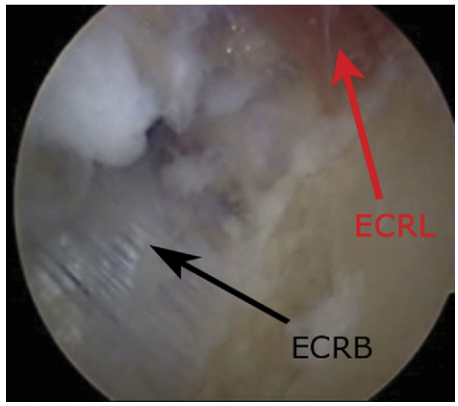

FIGURE 7: ECRL fibers mark the superior aspect and healthy ECRB fibers mark the lateral perimeter of the debridement. The key is to adequately excise the "tendinosis" tissue.

FIGURE 8: Axial view showing insertions of the flexor and extensor origins on the humerus. Note that even if full ECRB debridement were necessary, it would not extend past the halfway point from anterior to posterior of the radiocapitellar joint, thus protecting one from accidental debridement of the lateral collateral ligament origin.

patients are counseled in the office and just before the surgery to begin active range of motion as soon as possible.

Setting the appropriate expectations is crucial for any treatment of lateral epicondylitis, whether that be therapy, percutaneous, open, or arthroscopic treatment. Case series demonstrate improvement in symptoms; however, even at long-term follow-up, patients often still have low pain levels with activity.[4]

True randomized trials comparing open and arthroscopic approaches have not been published; however, comparative case series do not demonstrate significant differences in functional outcomes between the 2 techniques.[5]

PEARLS AND PITFALLS

Occasionally, excessive synovitis or other intra-articular pathology can make visualization difficult. An intra-articular retractor is simple to establish 1 cm or so proximal to the lateral portal with use of a Wissinger-type rod. This can be used to "hold the roof up" to improve visualization and expand the workable space. There should not be any hesitation to add the extra portal for a retractor if it will provide improvements in visualization.

COMPLICATIONS

The most common complication is an incomplete release and therefore less than optimal improvement in symptoms. As one becomes more comfortable with the procedure, a more extensive debridement is typically performed. An effort is made to excise or debride the tendinosis until healthy-appearing tissue is visualized. We have not had any nerve complications from this procedure. As with any other technique, attention to detail is imperative, especially in the consistent placement of the portals, which usually determines how effortlessly the procedure is performed.

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