Abstract: Medial epicondylitis, also known as “golfer’s elbow,” is a common orthopaedic condition that typically results from overuse of the flexor pronator mass. Repetitive eccentric loading of the muscles responsible for wrist flexion and forearm pronation leads to microtrauma and subsequent degeneration of the flexor pronator tendon. Patients with medial epicondylitis typically present in the fourth to sixth decade of life and have an insidious onset of medial elbow pain. Occasionally, medial epicondylitis may result from an acute traumatic event, such as an acute avulsion of the common flexor tendon. Patients should be examined for concomitant elbow pathologies, including ulnar neuritis and ulnar collateral ligament injury. T2-weighted magnetic resonance imaging can show increased signal intensity in the common flexor tendon or a complete rupture. Nonsurgical management is the mainstay of treatment; however, surgical treatment may be indicated in elite athletes and patients with persistent symptoms after conservative treatment. This technical note article with accompanying video describes open debridement and repair of the flexor pronator tendon, with an emphasis on restoration of the anatomic footprint and compression across the repair site to promote biological healing.
neuritis symptoms. Other nonsurgical management options include extracorporeal shockwave therapy and corticosteroid injections, with several case series showing successful treatment with these modalities.\textsuperscript{8,9} Surgical management is considered for patients with persistent symptoms after several months of conservative therapy or for young athletes with evidence of acute tendon avulsion.\textsuperscript{10} The purpose of this article is provide a detailed technique for surgical debridement and anatomic repair of the common flexor tendon for medial epicondylitis or flexor pronator mass avulsion using transosseous suture fixation.

**Surgical Technique**

**Patient Positioning**

After anesthesia is administered, the patient is positioned supine with the operative extremity on a hand

![Fig 1](image1.png)

Fig 1. Axial (A) and coronal (B) T2-weighted magnetic resonance images of the right elbow showing edema and disruption of the common flexor tendon at the level of the medial epicondyle (ME) as indicated by the arrows.

![Fig 2](image2.png)

Fig 2. The patient is positioned supine with the right upper extremity on a hand table. (A) The medial epicondyle (ME) is outlined, as well as the proposed incision, which is just anterior to the ME. (B) The medial antebrachial cutaneous nerve (MACN) is identified and protected during subcutaneous dissection. (C) The fascial incision for the common flexor tendon is outlined between the pronator teres (PT) and flexor carpi ulnaris (FCU). (D) The degenerative tissue just deep to the tendon is sharply excised. (CFT, common flexor tendon.)
A nonsterile tourniquet is placed on the proximal arm, and the extremity is prepared and draped in standard sterile fashion (Video 1).

**Exposure**

The medial epicondyle and the proposed skin incision centered just anterior to the medial epicondyle are outlined (Fig 2A). After limb exsanguination with an Esmarch bandage, a 4- to 6-cm curvilinear incision is made centered over the medial epicondyle. Dissection is carried down the subcutaneous tissue with particular attention to identify the medial antebrachial cutaneous nerve branches, which are mobilized and protected (Fig 2B). Next, the common flexor tendon is outlined between the flexor carpi ulnaris and the pronator teres (Fig 2C). The tendon is incised along this U-shaped
incision and elevated from its origin onto the medial epicondyle while avoiding injury to the UCL. The common flexor tendon is reflected, revealing the degenerative tissue and tendinosis (Fig 2D). The tendinotic tissue is sharply excised.

Bony Preparation and Tendon Repair

Once the tendon is elevated, the medial epicondyle is abraded with a curette to prepare for healing of the tissue to the bone. Two bone tunnels are then made with a 0.045-mm Kirschner wire (K-wire) while care is taken to protect and avoid the ulnar nerve (Fig 3A and B). The bone tunnels are created with a 5-mm bone bridge, with 1 tunnel more superior and another more posterior in the orientation of the common flexor tendon. A No. 0 nonabsorbable suture (Arthrex FiberWire suture in this case) is passed from posterior to anterior through each bone tunnel (Fig 3C). A separate suture is then sewn through the substance of each suture limb that was passed through the bone tunnels (Fig 3D). This effectively creates 3 suture limbs available to be shuttled for each both tunnel (Fig 3E), yielding a total of 6 suture limbs available for the repair. Small perforations are then made in the bone with a K-wire to create a vascular bed for tendon healing (Fig 3F). All 6 sutures are passed in simple fashion through the common flexor tendon to repair and compress it to its footprint (Fig 4A). The 3 suture limbs from the posterior tunnel are passed more posteriorly and the 3 suture limbs from the anterior tunnel are passed more anteriorly through the tunnel. Once all the sutures are passed, the sutures from each limb are tied to themselves and then to the adjacent suture limbs to create a crossing pattern to compress the tendon down to bone (Fig 4B).

Closure and Immobilization

The fascial incision is closed with absorbable suture (No. 3-0 Vicryl suture [Ethicon] in this case) in simple fashion. The dermal layer is closed with absorbable suture (No. 3-0 Vicryl) in buried simple fashion, followed by a running subcuticular layer for the skin (No. 4-0 Monocryl; Ethicon). The patient is immobilized in a posterior plaster splint at 70° of flexion for 10 days.

Postoperative Rehabilitation

The patient is initially placed in a posterior plaster splint postoperatively that is removed at the first postoperative visit in 10 to 14 days; the patient is then transitioned to a hinged elbow brace that allows for range of motion as tolerated. Strengthening exercises are started at 6 to 8 weeks postoperatively, with no restrictions at 3 to 4 months.

Discussion

The prevalence of medial epicondylitis or a common flexor tendon injury is less than 1%, but cases can be found with higher frequency in particular athletes and individuals in certain occupational settings.1,2,4 Most cases are successfully treated with conservative measures including activity modification, physical therapy, oral analgesics, or various injections. Surgical intervention is considered for recalcitrant symptoms despite conservative management or for elite athletes with evidence of tendon disruption on imaging or acute avulsion of the common flexor tendon.11

The described surgical techniques usually consist of open debridement of the common tendon, with or without microfracture of the medial epicondyle, and either side-to-side tendon repair or reattachment of the common tendon to the medial epicondyle.10 Vangsness and Jobe12 retrospectively reviewed surgical cases of medial epicondylitis and found good to excellent outcomes in 34 of 35 elbows treated with open debridement and repair. Recent techniques have included debridement of the common flexor tendon and repair.
to the medial epicondyle using suture anchors with satisfactory pain relief and patient-reported outcome measures.\textsuperscript{11,13} Another described technique involved a mini-open muscle resection of the common flexor mass and microfracture of the medial epicondyle without reattachment of the tendon, followed by closure of the fascia, therefore creating an enclosed hematoma for healing.\textsuperscript{14} This technique, however, involved a very small incision, which does not allow identification of the ulnar nerve in cases in which it needs to be decompressed or transposed. In addition, Kwon et al.\textsuperscript{15} reported on a fascial elevation and tendon origin resection technique, with 18 of 20 patients in their cohort reporting satisfaction with surgical outcomes.

We prefer our technique of debridement followed by anatomic repair using transosseous sutures and compression back to the footprint (Table 1). Pearls and pitfalls of our procedure are outlined in Table 2. This open technique, as described in this article, allows the surgeon to identify and protect the ulnar nerve, as well as perform concomitant procedures when necessary, specifically when addressing ulnar neuritis or UCL injuries. Our technique also describes a method of suture shuttling through bone tunnels with 3 suture limbs through each tunnel and sequential tying of the limbs to each other to provide robust fixation and compression of the tendon to the medial epicondyle.

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