21 Lateral and Medial Epicondylitis

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Introduction

Epicondylitis of the elbow involves pathologic alteration in the musculotendinous origins at the lateral and/or medial epicondyle [1]. Runge first described lateral epicondylitis in the German literature in 1873 [2]. Ten years later, in 1883, Morris first noted an association between lateral epicondylitis and lawn tennis [3]. This has led to the commonly used term "tennis elbow" for lateral epicondylitis. Furthermore, medial epicondylitis is often referred to as "golfer's elbow." Both conditions result in pain and discomfort about their respective aspects of the elbow. Lateral epicondylitis, however, is encountered far more often, affecting 1–3 % of the general population and up to 7 % of manual workers [4, 5]. This is 7–20 times more prevalent than medial epicondylitis [6].

Several studies have investigated the etiology and pathogenesis of lateral epicondylitis, including those by Cyriax [7], Goldie [8], as well as Coonrad and Hooper [9]. More recently, Nirschl and associates [10, 11] localized the underlying lesion to involve the origin of the extensor carpi radialis brevis (ECRB). Repetitive overuse, either from recreational or occupational activities, leads to microtears within the ECRB tendon origin. Attempted healing of these tears, however, is unsuccessful, leading to replacement with immature reparative tissue. Histologically, this tissue demonstrates a noninflammatory degenerative tendinosis, with fibroblasts, disorganized collagen, and neovascularization. This has been termed "angiofibroblastic tendinosis" [11]. Similar findings are seen in medial epicondylitis, though the pathologic fibrotic tissue is noted within the origin of the flexor-pronator mass, most commonly involving the humeral head of the pronator teres (PT) and the flexor carpi radialis (FCR) [12].

Lateral and medial epicondylitis are both encountered most often in the fourth and fifth decades, with an equal distribution between males and females, most often in the dominant arm [1, 10]. While lateral epicondylitis can be encountered in tennis players, medial epicondylitis is rarely seen in golfers. More often, it is observed in baseball pitchers and individuals whose recreational or occupational activities involve repetitive valgus forces about the elbow [6]. Both conditions have an insidious onset of symptoms.

Clinical Presentation

Clinically, patients with lateral epicondylitis will complain of a sharp pain localized about the lateral aspect of the elbow which is exacerbated with activities involving active wrist extension or passive wrist flexion with the elbow extended [13]. On physical examination, pain is maximally elicited at a point slightly distal and anterior to the midpoint of the lateral epicondyle, within the tendinous portion of the ECRB. Pain is worsened with resisted wrist and finger extension with the elbow in extension. Other conditions included in the differential diagnosis of lateral elbow pain that should also be assessed to include cervical radiculopathy, radial tunnel syndrome, osteochondral lesion of the radiocapitellar joint, a synovial elbow plica, and/or posterolateral rotatory instability [13]. Medial epicondylitis will present with two different scenarios: one with burning type pain over the bony tip of the epicondyle and the second type similar to lateral epicondylitis localized more to the muscle of the flexor-pronator origin just distal to the tip of the epicondyle. Pain is sometimes exacerbated with resisted wrist flexion and forearm pronation. Additional conditions that should be assessed to include concomitant valgus elbow instability and ulnar neuritis [12]. Some of the differential diagnoses for lateral and medial elbow pain are summarized in Table 21.1.

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Table 21.1 Lateral versus medial elbow pain

Lateral elbow pain	Medial elbow pain
Lateral epicondylitis	Medial epicondylitis
Cervical radiculopathy	Cervical radiculopathy
Radial tunnel syndrome	Flexor-pronator muscle strain/tear
OCD lesion of the radiocapitellar joint	Ulnar collateral ligament injury
	Ulnar neuritis
Synovial elbow plica	Valgus extension overload
Posterolateral rotatory instability	

Summary of the differential diagnoses to be considered when evaluating a patient with either lateral- or medial-sided elbow pain

Radiographic Evaluation

Though lateral and medial epicondylitis both remain clinical diagnoses, imaging is oftentimes included in the diagnostic workup of patients with either lateral or medial elbow pain. Plain radiographs, including anteroposterior, lateral, and oblique views of the elbow, are frequently obtained and usually are normal. However, calcifications within the soft tissues about the lateral epicondyle may be noted in 22–25 % of patients with lateral epicondylitis, though this has not been found to have a prognostic implication [10].

Magnetic resonance imaging (MRI), while not an essential part of the diagnostic workup, can be a useful adjunct in assessing both conditions. In particular, MRI allows for evaluation of both the surrounding tissue structures and the intra-articular surface, which helps determine if any other potential causes of elbow pain may be present. This is especially useful in patients with medial elbow pain, as the integrity of the UCL can be determined. The typical appearance on MRI shows abnormally high signal intensity on T2-weighted and short TI inversion recovery (STIR) sequences within a thickened common extensor or flexor-pronator tendon origin for lateral and medial epicondylitis, respectively [14]. Overall, MRI has a 90–100 % sensitivity and a 83–100 % specificity for detecting epicondylitis [15]. It may be performed either with or without intra-articular gadolinium contrast injection.

Treatment Options and Outcomes

The majority of cases of both lateral and medial epicondylitis respond well to conservative management. While no consensus treatment algorithm currently exists for either condition, multiple options have been utilized previously. This includes an initial phase of rest, ice, and nonsteroidal anti-inflammatory (NSAIDs) medications. This is often followed by a course of physical therapy, the use of counterforce bracing, and/or corticosteroid injection [13]. Other modalities that have been investigated include extracorporeal shock wave (ECSW) therapy [16–18], platelet-rich plasma injection [19], and use of low-dose thermal ablation devices [20]. While most patients respond well to nonoperative management, historically noted at up to a 90 % recovery rate within 1–2 years [9, 10], surgical treatment of recalcitrant disease is sometimes required. Bot et al., however, recently found that, while most patients (90 %) obtained at least some improvement with conservative treatment for lateral epicondylitis at 1 year follow-up, only 13 % reported a full recovery at 3 months and 34 % at 1 year [21]. This may indicate an expanded surgical role in the treatment of both lateral and medial epicondylitis.

Regardless of these prior findings, a minimum of 3–6 months of nonoperative treatment is recommended prior to pursuing surgical treatment for either lateral or medial epicondylitis. Traditionally, surgical options involved open debridement of the involved tissue, such as those previously described by Bosworth in 1955 [22], as well as Nirschl and Pettrone in 1979 [10] in treating lateral epicondylitis. Percutaneous approaches for ECRB release have also been described [23, 24]. However, with the advances made in arthroscopic surgery of the elbow, there has been an increased focus on arthroscopic management of epicondylitis. Baker et al. initially reported on 40 patients (42 elbows) with recalcitrant lateral epicondylitis who underwent arthroscopic debridement of the diseased tissue, often combined with decortication of the lateral epicondyle [25]. These arthroscopic techniques have continued to evolve beyond simple debridement, with ECRB repair and plication utilizing both simple suture and suture anchor devices being described [20].

Given its increased prevalence, surgical outcomes regarding the arthroscopic management of lateral epicondylitis have been investigated more extensively than has medial epicondylitis. Several studies comparing open and arthroscopic debridement techniques for the treatment of lateral epicondylitis have been performed. While overall equivalent clinical results have been oftentimes noted, those treated arthroscopically were noted to return to work earlier without restrictions [25–28]. More recently, however, Solheim et al. noted that patients undergoing arthroscopic release had a better QuickDASH score than those that underwent an open surgical debridement [29]. An additional advantage of arthroscopic treatment is that a full intra-articular assessment of the elbow joint can be performed and any concomitant pathology addressed during the same surgical setting, as concurrent intra-articular pathology has been found in up to 44 % of cases [30].

While arthroscopic treatment of lateral epicondylitis has become more prevalent and accepted, concerns exist over the arthroscopic treatment of medial epicondylitis. This is due to the proximity of both the ulnar nerve and the medial ulnar collateral ligament to the flexor-pronator origin at the medial epicondyle. On the other hand, cadaveric models have indicated that these structures lie at a far enough distance away from the debridement site and that arthroscopic debridement for medial epicondylitis can be performed at a low risk of injury to these structures [31]. Relative contraindications to elbow arthroscopy do exist, however, including prior medial elbow surgery with ulnar nerve transposition or the presence of ulnar nerve subluxation. Absolute contraindication includes active infection.

Case Presentation: Concurrent Lateral and Medial Epicondylitis

A 38-year-old, right-hand dominant female presented with a long-standing history of elbow pain. Her pain was localized over both the lateral and medial aspects of her elbow. This had been present over the past several years, and she had been treated by her primary care physician with anti-inflammatory medications, counterforce bracing, and intermittent corticosteroid injections. Orthopedic consultation had been obtained, and a sequence of injections had been given with some temporary relief, but each time, the pain returned and thought to be more severe with each recurrence. Her pain symptoms had become constant, with worsening both at night and with lifting activities. She denied any traumatic etiology of her symptoms and had not had any previous surgical procedures to her right elbow.

Upon her initial presentation to our orthopedic clinic, her physical examination showed tenderness to palpation about both the medial and lateral epicondyle. She had full active and passive range of motion to elbow flexion and extension, as well as forearm pronation and supination. She had increased pain with active resisted wrist extension over her lateral elbow and with active resisted wrist flexion over her medial elbow. No elbow instability was present clinically, with negative varus/valgus stress testing and a negative lateral elbow pivot shift. She had full motor strength in all key groups and had no sensory deficits or complaints of numbness. She had a negative Tinel's test over the cubital tunnel.

Radiographic assessment was obtained including two view X-rays of the right elbow. These were found to be normal. An MRI obtained by her orthopedic surgeon was reviewed. This revealed the presence of increased signal both within the tendinous portion of the flexor-pronator mass medially and within the common extensor mass laterally, consistent with both medial and lateral epicondylitis, as seen in Fig. 21.1a–d. Further conservative recommendations were made at her initial appointment, including a course of physical therapy, topical and oral anti-inflammatory medications, a wrist brace, and repeat corticosteroid injections to both the medial and lateral epicondyle. This course of treatment provided good initial relief, but her symptoms returned fully within 3 months. Surgical intervention in the form of elbow arthroscopy was then offered, and the patient elected to pursue.

The patient was taken to the operating room, and general anesthesia was induced. She was then placed in the prone position, and her right upper extremity prepped and draped in the normal sterile manner. Following initial joint insufflation with 30 mL of sterile saline, an initial proximal anteromedial portal was created, and the 30° arthroscope inserted into the joint. Inspection was begun on the lateral aspect of the elbow, focusing on the radiocapitellar joint (Fig. 21.2a). Spinal needle localization was then utilized to establish a lateral working portal just anterior to the lateral epicondyle (Fig. 21.2b). An arthroscopic shaver was used to debride the capsule underlying the ECRB tendon insertion. This allowed for visualization of the degenerative "tendinosis" seen within the ECRB, which appears grayish in color (Fig. 21.3a). Debridement of this degenerative tissue reveals the remaining healthy ECRB tendon, which is more shiny and white in color (Fig. 21.3b). Following completion of the tendon release, the muscle fibers of the extensor carpi radialis longus (ECRL) are seen (Fig. 21.3c). A small amount of bony debridement was also performed on the lateral epicondyle.

Attention was then turned medially, with the arthroscope placed through the previous lateral portal. Muscle fibers from the flexor-pronator mass are initially noted (Fig. 21.4a). Debridement of the medial epicondyle is then performed, moving from anterior to posterior, until the tendon fibers of the flexor-pronator mass insertion are encountered. Again, the grayish, degenerative "tendinosis" tissue (Fig. 21.4b) is noted and subsequently debrided until the white, shiny appearing healthy tendon tissue is found (Fig. 21.4c, d). The lateral portal sites were closed to prevent continued drainage and fistula formation. The arm was placed in a posterior splint with the elbow at 90° for her immediate postoperative period.

Conclusions

Epicondylitis of the elbow is a commonly encountered condition in people with elbow pain, with lateral epicondylitis involved more often than medial epicondylitis. Clinically, patients present with an insidious onset of pain about either the lateral or medial epicondyle, worsened with resisted wrist

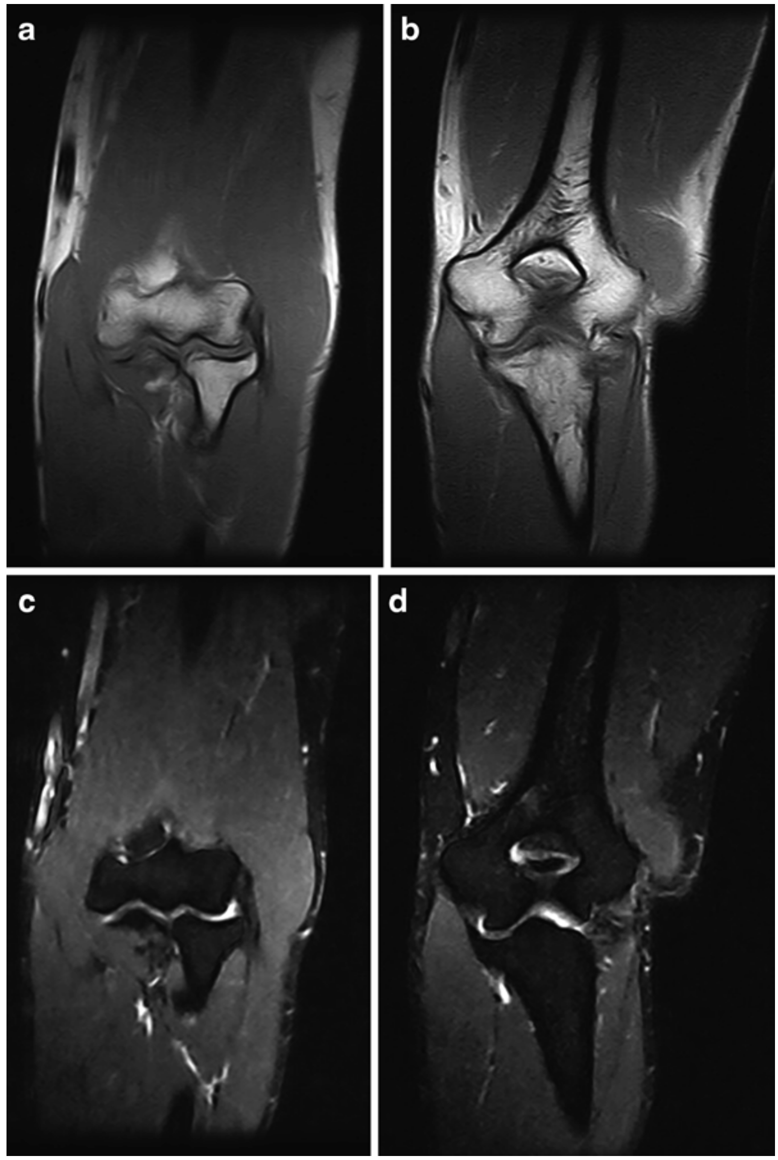

Fig. 21.1 Coronal T1-weighted and STIR MRI images indicating increased signal intensity within the common extensor tendon origin (**a**, **b**) and the flexor-pronator mass (**c**, **d**). Additionally, the intra-articular surfaces are noted to be normal (**a**, **b**), as is the ulnar collateral ligament (**c**, **d**) (**a–d**: Published with kind permission. Copyright © Felix H. Savoie, III, MD)

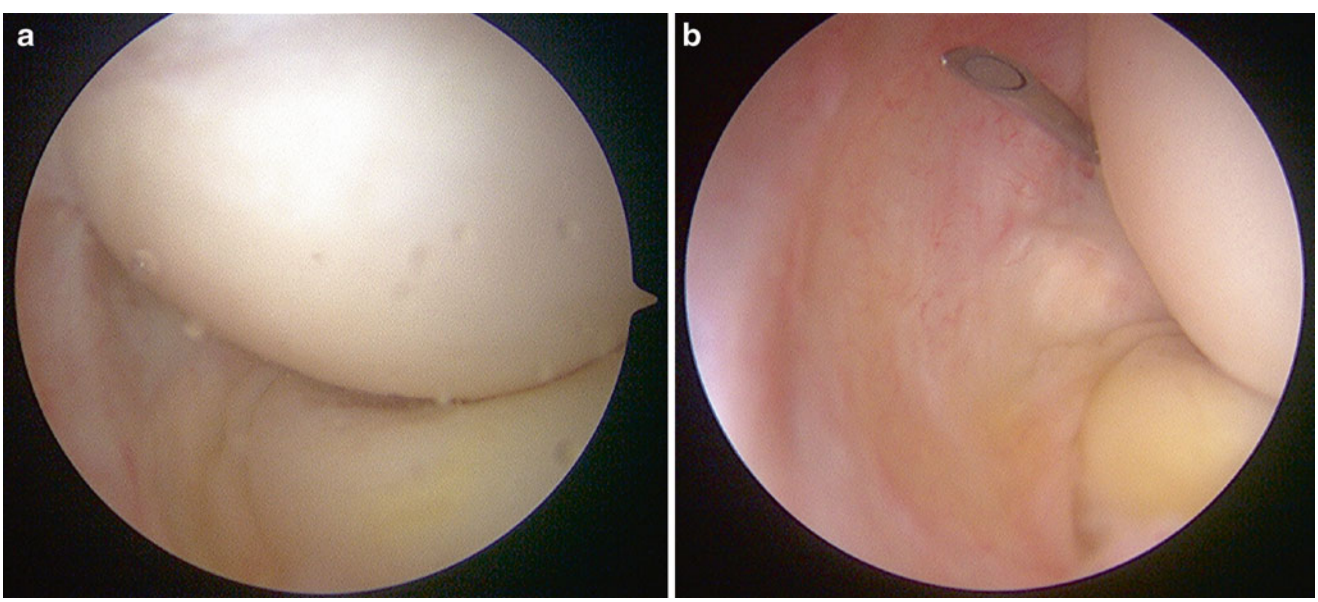

Fig. 21.2 (**a**) Arthroscopic visualization of the radiocapitellar joint when viewing from the proximal anteromedial portal. (**b**) Spinal needle being used to create lateral working portal just anterior to the lateral epicondyle. (**a**, **b**: Published with kind permission. Copyright© Felix H. Savoie, III, MD)

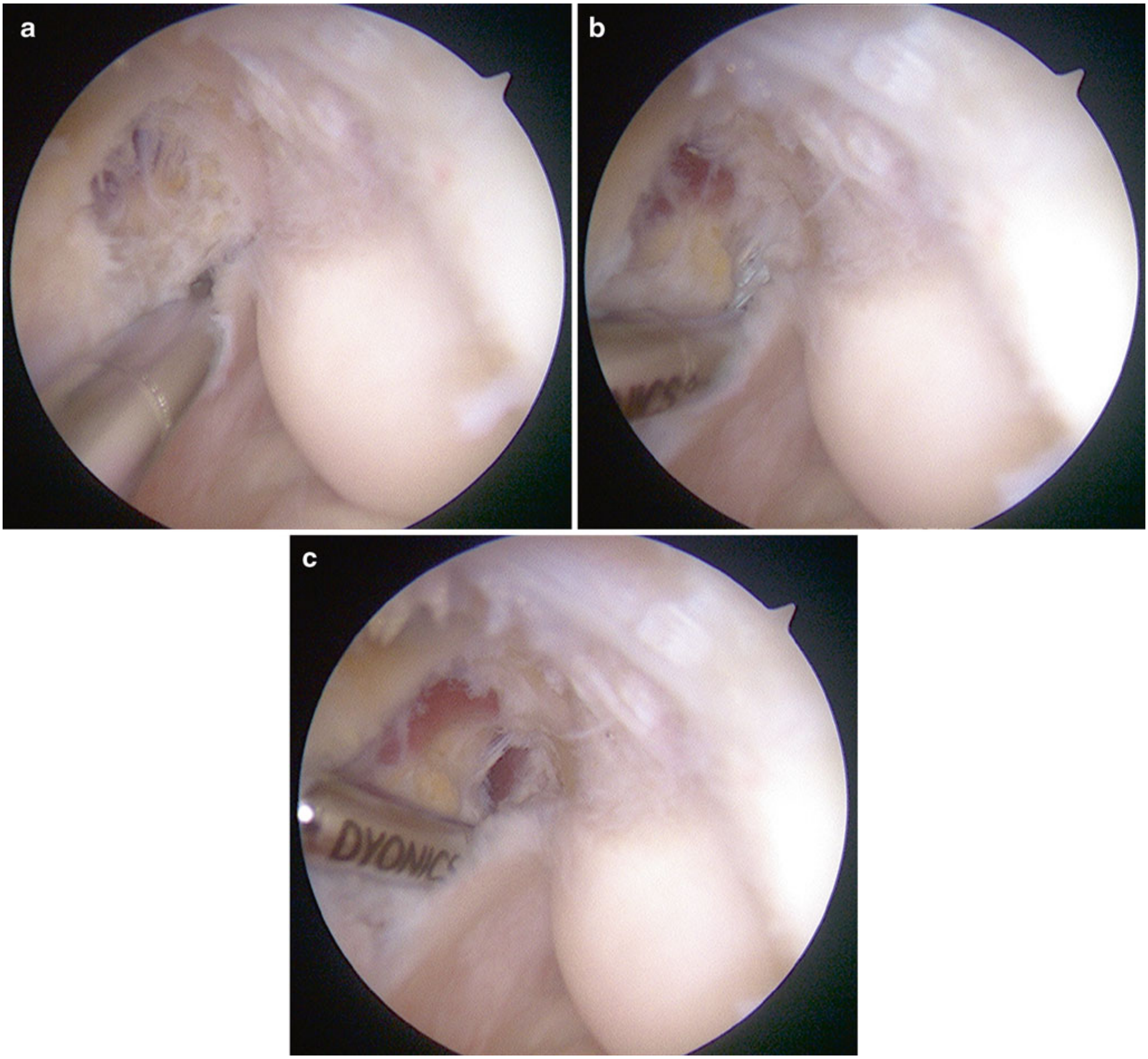

Fig. 21.3 (**a**) Following debridement of the underlying capsule the degenerative, *grayish* "tendinosis" tissue of the ECRB is identified. (**b**) Further debridement of the diseased tissue reveals the *white*, *shiny* normal ECRB tendon. (**c**) Following complete release of the ECRB tendon, the muscle fibers of the ECRL are visible. A small bony debridement of the lateral epicondyle has also been performed (**a–c**: Published with kind permission. Copyright © Felix H. Savoie, III, MD)

extension in the former and resisted wrist flexion in the latter. Concurrent conditions, however, may be present and must be evaluated, especially when investigating medial elbow pain. While both conditions remain clinical diagnoses, MRI can provide valuable information, particularly in assessing the adjacent tissue for any concomitant pathology. Numerous conservative treatment options have been described and are usually effective. However, in recalcitrant cases, surgical intervention may be required. While traditionally performed with open surgical debridement of the diseased tissue, arthroscopic treatment of epicondylitis has been shown to provide equivalent, if not superior, clinical improvement with the potential for a quicker return to work and sporting activities.

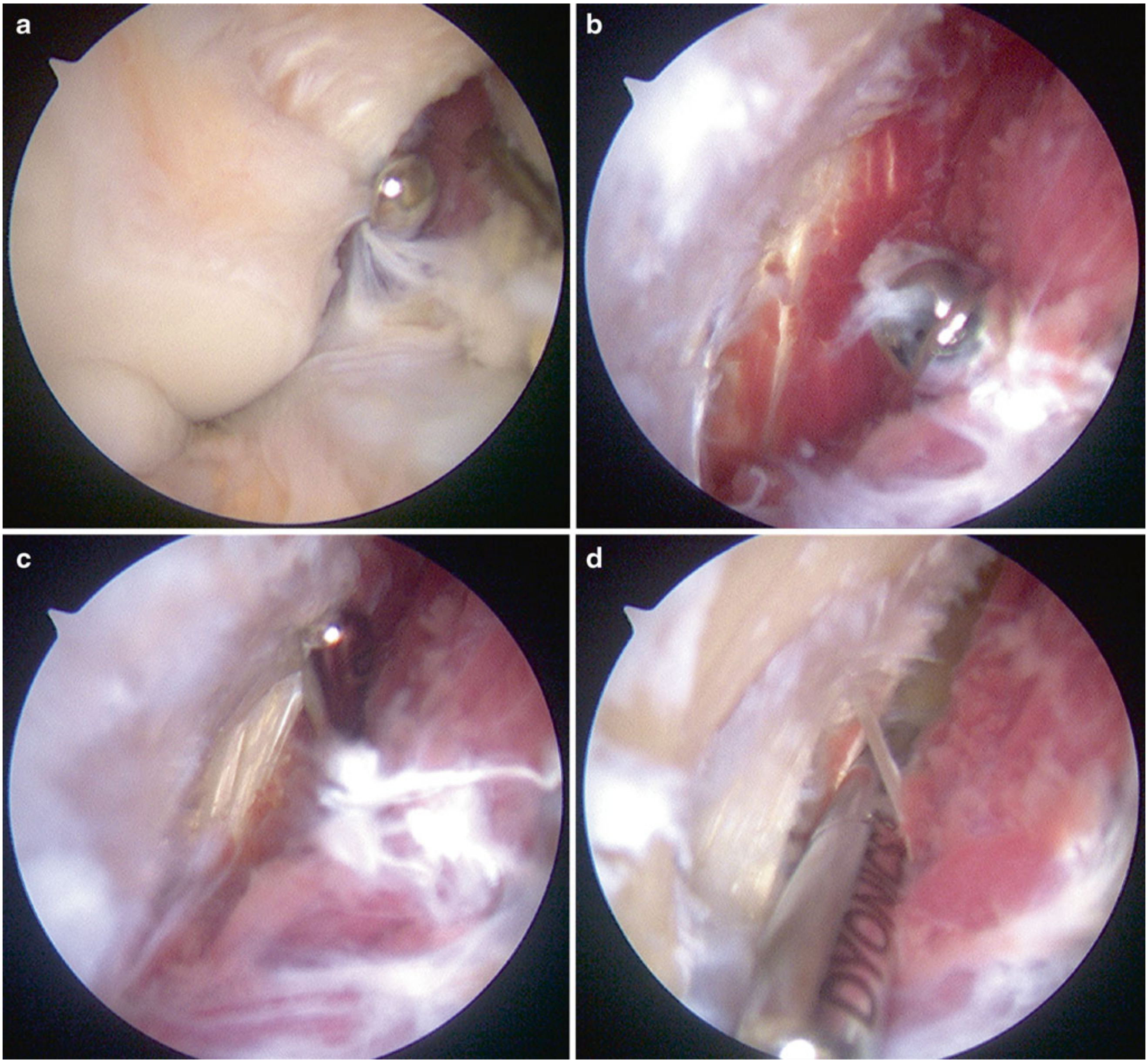

Fig. 21.4 (**a**) The medial side of the elbow is visualized, with the trochlea seen superiorly and the coronoid inferiorly. An arthroscopic shaver has begun debriding back on the medial epicondyle. (**b**) Continued debridement posteriorly reveals the degenerative "tendinosis" tissue of the flexor-pronator mass, *grayish* in appearance. (**c**, **d**) Following debridement of the diseased tissue, the *white*, *shiny* fibers representing healthy tendon tissue are seen (**a–d**: Published with kind permission. Copyright © Felix H. Savoie, III, MD)

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