Open and Arthroscopic Management of Lateral Epicondylitis in the Athlete

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KEYWORDS

• Elbow • Tennis • Epicondylitis • Arthroscopy

"The etiology of tennis elbow is various, its pathology is obscure and its cure is uncertain,"

—Kellogg Speed, 1929[1]

Lateral epicondylitis is the most common affliction of the elbow. It was originally described as an occupational condition in the late 1800s.[2,3] The term "tennis elbow" was coined in 1883, because of the association of lateral elbow pain with lawn tennis.[4] Although there has been much effort to identify the etiology and pathology of epicondylitis during the past century, the quote by Speed, delivered in an address to the Royal Society of Medicine, remains relevant today.

From epidemiologic studies, it is clear that epicondylitis most commonly affects individuals of middle age, between 35 and 60 years. It occurs 4 to 5 times as frequently in males as in females and more commonly in the dominant arm.[5,6] It is less common in black individuals.[7] The condition typically begins insidiously, although it is not uncommonly attributed to 1 event or activity. Lateral elbow pain is the most characteristic feature, commonly associated with diminished grip strength. Symptoms are aggravated by activities involving wrist extension against resistance or with applied load.

The pathology of epicondylitis has been attributed to a variety of conditions, including bursitis, synovitis, degenerative arthritis, and so on. The tendinous origin of the extensor carpi radialis brevis (ECRB), however, is the most commonly identified source of pathology.[8,9] Although imaging is not typically required to confirm the diagnosis, abnormal signal of the tendon origin has been confirmed by MR scanning.[10,11] Although irritation of the posterior interosseous nerve can coexist, this is fairly rare.

The source of elbow pain associated with the lateral epicondylitis is poorly understood. Histologic studies have failed to identify inflammation of the extensor tendon origin. However, periostitis of the humeral epicondyle was identified microscopically as early as 1910.[8,12] In addition, reactive granulation tissue containing nerve fibers has been reported in the subtendinous space beneath the ECRB in individuals with this condition.[13] Tendon degeneration (tendinosis) has also been cited as a potential source of pain.[14]

In most cases, lateral epicondylitis is self-limiting, clearing within 8 to 12 months. A variety of conservative measures have been reported to be beneficial, including various therapy modalities, counterforce bracing, acupuncture, and so on.[15] At present, there is insufficient scientific evidence to support any of these treatment methods.[16,17] It is clear that stretching and exercise conditioning are beneficial as opposed to immobilization.[18] Cortisone injection to the epicondyle does provide short-term benefit, although it may not alter the natural history of the condition.[19,20] Once

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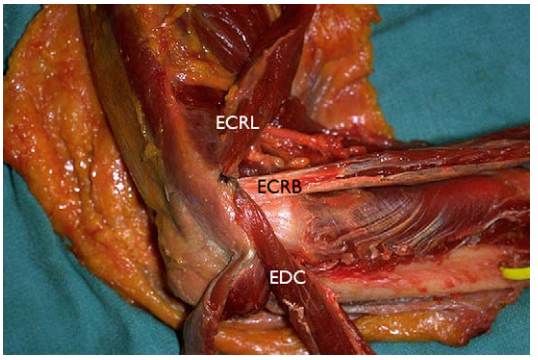

Fig. 1. Anatomic specimen (*right elbow*) with the extensor tendon origins dissected. The ECRL is reflected anteriorly, and the extensor digitorum communis posteriorly, to reveal the ECRB tendon.

epicondylitis resolves, recurrence is rare, and it has been reported in less than 3% of cases.[21]

ANATOMY

The extensor carpi radialis longus (ECRL) and the ECRB have a unique relationship at the level of the elbow (**Fig. 1**). The ECRL origin is entirely muscular along the lateral supracondylar ridge of the humerus. The muscle origin has a triangular configuration, with the apex pointing proximally. In contrast, the origin of the ECRB is entirely tendinous. Although it blends with the origin of the extensor digitorum communis (EDC), when dissected from a distal to proximal direction, using the tendon undersurface, it can be separated from the EDC back to the humerus.[22] The anatomic origin of the ECRB is located just beneath the distal-most tip of the lateral supracondylar ridge. The footprint is diamond shaped, measuring approximately 13 × 7 mm (**Fig. 2**). At the level of the radiocapitellar joint, the ECRB is intimate with the underlying anterior capsule of the elbow joint, but it is easily separable at this level.[22]

OPERATIVE TREATMENT: OPEN METHODS

Surgery is reportedly required in approximately 4% to 8% of cases.[7,21,23] However, this probably represents a falsely high estimate, as the denominator is likely greater because of those individuals who do not seek formal medical evaluation. The first effective surgical procedure reported for lateral epicondylitis dates back to 1873. Runge[3] used simple cautery to burn all tissue from the skin down to the humerus. Since that time, several surgical procedures have been described, including simple resection of the epicondyle, resection of the annular ligament and joint synovium, percutaneous or open division of the common extensor origin, distal tendon lengthening, denervation, radial nerve decompression, and epicondylar resection followed by aconeous

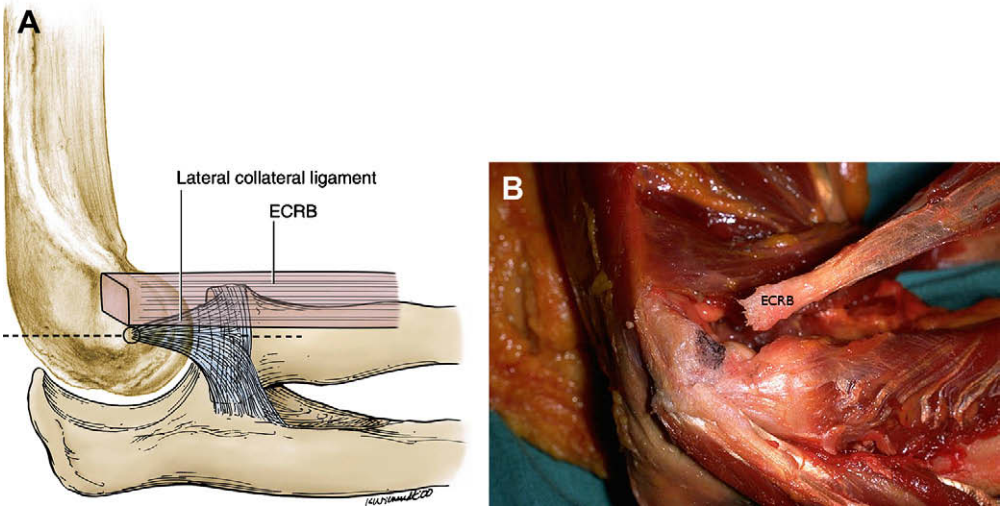

Fig. 2. (*A*) Relationship between the ECRB origin at the humerus and bony landmarks. Note that the ECRB footprint origin is diamond shaped and located between the midline of the joint and the top of the humeral capitellum beneath the most distal extent of the supracondylar ridge. The tendon does not originate on the epicondyle specifically. Note the relationship between the ECRB origin and the underlying lateral collateral ligament. (*B*) Lateral view of cadaveric specimen. The ECRL and EDC have been removed, revealing the ECRB footprint on the humerus. (*From* Cohen MS, Romeo AA, Hennigan SP, et al. Lateral epicondylitis: anatomic relationships of the extensor tendon origins and implications for arthroscopic treatment. J Shoulder Elbow Surg 2008;17(6):959; with permission.)