

Complications of Lateral Epicondylar Release



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KEYWORDS

- Lateral epicondylitis • Tennis elbow • Surgery • Complications • Open • Percutaneous
- Arthroscopic

KEY POINTS

- Overall, there is a low complication rate for lateral epicondylar release, but this complication rate may be underreported.
- Historically, open procedures have had a higher rate and more diverse array of complications.
- Recent, higher-quality studies have not noted these differences in complications.
- Elbow posterolateral rotatory instability (PRLI), permanent nerve injury, and deep infection are possible catastrophic complications.
- Understanding the anatomy is crucial to preventing some complications.

INTRODUCTION

Lateral epicondylitis, also known as tennis elbow, is a common condition affecting an estimated 1% to 3% of adults each year.^{1,2} Runge first described it in 1873³ and in 1883 Major⁴ named it “lawn-tennis arm.” A single cause of the disease has not yet been elicited, but many think it is associated with the common extensor origin (CEO) at the lateral epicondyle, most specifically the extensor carpi radialis brevis (ECRB). Nirschl and Petrone⁵ described tendinosis of the extensor tendons originating at the lateral epicondyle, predominantly involving the ECRB. They described an angiofibroblastic hyperplastic process consistent with repeated microtrauma with “tendinous non-repair with immature reparative tissue” and noted a lack of true inflammatory cells. These findings have been corroborated in other studies.^{6,7} Thus, the term, *epicondylitis*, is a misnomer in the definition of true inflammation.

Of the many who seek medical treatment of tennis elbow, only approximately 10%^{5,8} end up requiring surgical intervention but some studies report greater than 20%.^{9,10} Many different surgical procedures have been described and choice

of procedure often determined by the surgeon’s views on the cause. Wilhelm and Gieseler^{11,12} have been proponents of a neurologic cause of the disease and have a published rate of greater than 90% success when pursuing this treatment. Most of the literature regarding treatment of tennis elbow, however, has focused on surgical release of extensor tendon or tendons at the lateral epicondyle. Open, percutaneous, and arthroscopic approaches have all been described with good outcomes and rare complications. The complications are often reported, however, in a manner lacking uniformity and without clear diagnosis. The elbow is an area of complex anatomy with articular, tendinous, ligamentous, and neurologic structures in close proximity that are at risk for injury during surgery. This article illuminates the reported and potential complications associated with tennis elbow surgical procedures.

ANATOMY

A lateral epicondylar release addresses an area of pathology located within the CEO. The extensor carpi radialis longus (ECRL), ECRB, extensor digitorum communis (EDC), extensor digiti minimi, and

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extensor carpi ulnaris (Fig. 1A) comprise the CEO. Together, the brachioradialis (BR), ECRL, and ECRB make up the mobile compartment of the forearm, which has a septum dividing it from the extensor compartment that contains the remainder of the extensor muscles. The ECRB origin lies deep to the ECRL and EDC on the anterior aspect of the lateral epicondyle. The ECRB may also have additional origin sites, including the intermuscular septum and underlying capsuloligamentous structures.¹³ The ECRB tendon coalesces with the tendon of the EDC, making differentiation of their tendinous origins difficult if not impossible.^{14,15} The origin of the ECRB lies just lateral and superior to the insertion of the lateral elbow capsular and ligamentous structures. As the ECRB tendon travels distally, its deep fibers are in contact with the superficial aspect of the elbow capsule and lateral ligamentous complex.¹⁴⁻¹⁶

The radial nerve enters the anterior compartment of the arm approximately 10 cm proximal to the lateral epicondyle (see Fig. 1B). The radial nerve exits from between the brachialis and the BR and at the level of the lateral epicondyle (up to 2 cm proximally to 5 cm distally) the radial nerve branches into deep and superficial branches.¹³ The deep branch is the posterior interosseous nerve (PIN) that travels through the arcade of Frohse of the supinator muscle and goes on to sequentially innervate dorsal forearm musculature aside from the more proximally innervated ECRL and ECRB. The superficial branch is

predominantly sensory and stays beneath the BR muscle until exiting subcutaneously distally in the forearm. The posterior antebrachial cutaneous nerve (PABCN) is a proximal branch of the radial nerve that crosses 1.5 cm anterior to the lateral epicondyle located on the fascia of the lateral part of the BR.¹⁷ Often, it is lying at the junction of the BR and ECRL in a superficial position.

The innervation of the ECRB is either from the PIN or a direct branch from the radial nerve. The mean distance between the radiocapitellar joint and the PIN as it enters the arcade of Frohse is 30 \pm 7 mm and the distance from the lateral epicondyle to the PIN is 47 \pm 8 mm.¹⁶ Furthermore, Diliberti, and colleagues¹⁸ described the anatomic relationship between the PIN and the radiocapitellar joint depending on whether the arm was in supination or pronation. In supination, the PIN is as close as 22 mm of the radiocapitellar joint, whereas in pronation, that distance increased to at least 38 mm.

The lateral ligamentous complex of the elbow has important anatomic considerations as well. It is made up of 3 components – the annular ligament (AL), radial collateral ligament (RCL), and the lateral ulnar collateral ligament (LUCL)^{13,19} (see Fig. 1C). The LUCL, confluent with the RCL, originates at the bare area just distal to the lateral epicondyle, dorsal and deep to the ECRB, and fans out distally attaching to the tubercle of the supinator crest on the ulna. Disruption of the LUCL results in PRLI.¹⁹⁻²²

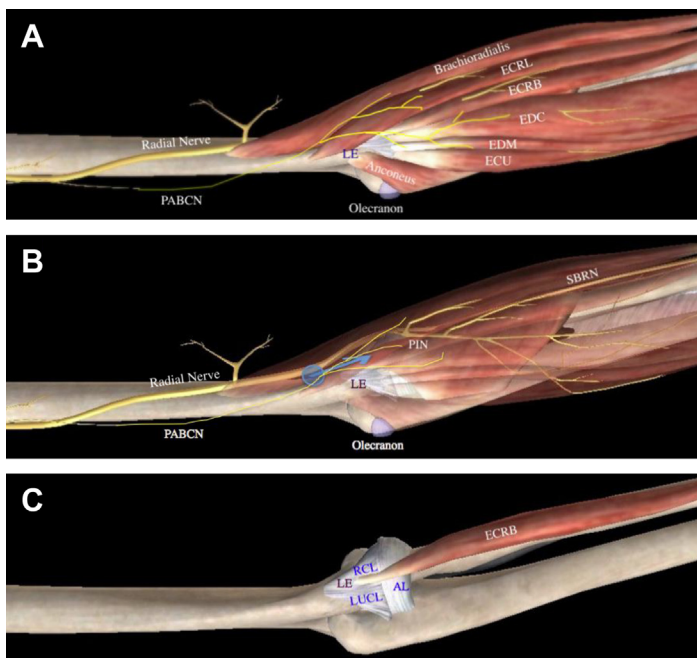


Fig. 1. Representation of anatomy on the lateral aspect of the elbow. (A) CEO and location of radial nerve and PABCN. (B) Emphasis of radial nerve and its branches. Circle and arrow demonstrate PAL arthroscopic portal and trajectory. (C) Lateral ligamentous complex in relation to ECRB. LE, lateral epicondyle; SBRN, superficial branch radial nerve. (Modified from Human Anatomy Atlas for iPad, Version 7 by Visible Body®; with permission.)

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