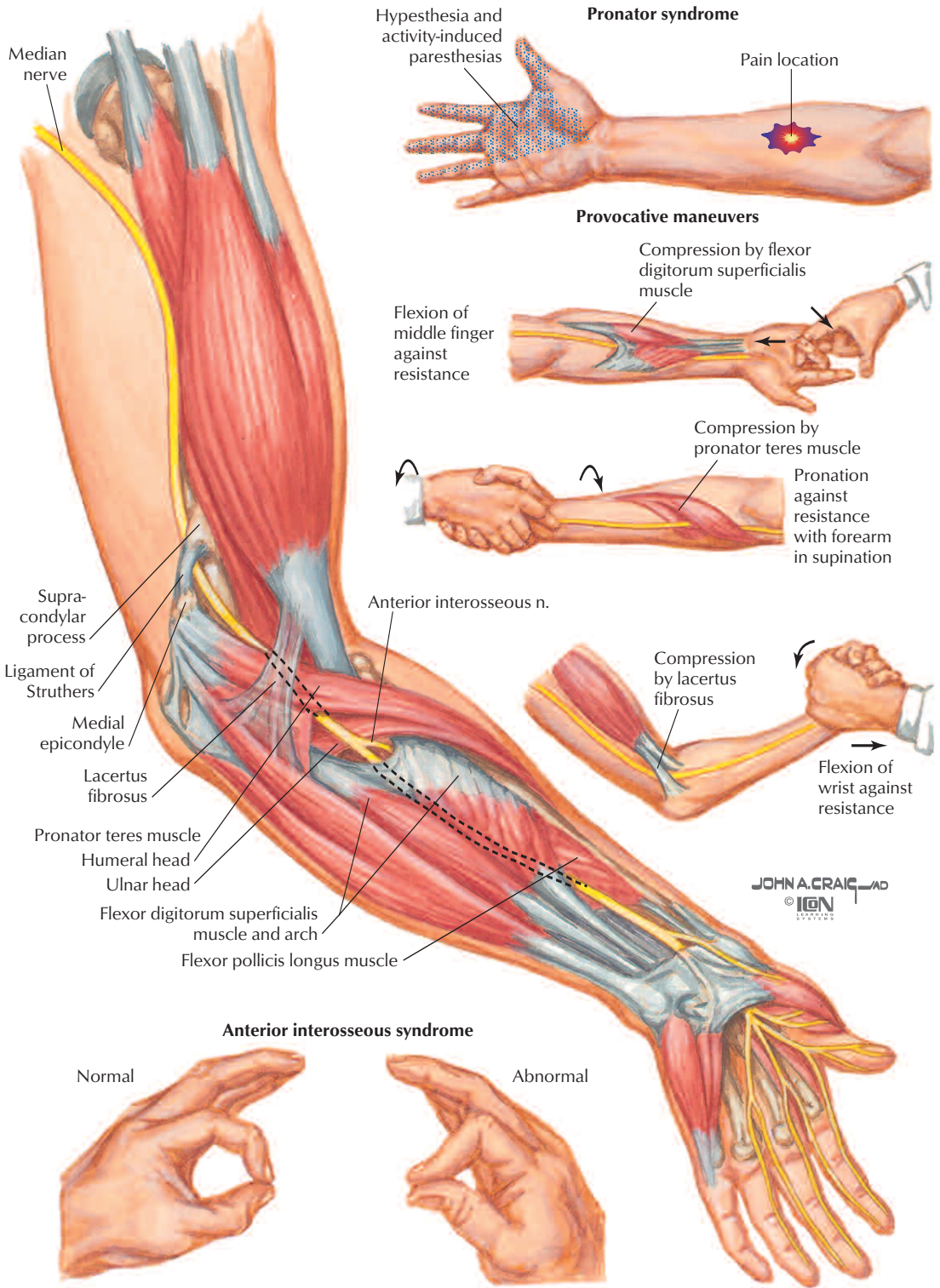


Figure 15-11: Proximal Compression of Median Nerve



The differential diagnosis includes muscle tears in the proximal forearm and carpal tunnel syndrome. Carpal tunnel syndrome can be ruled out if there is loss of sensation at the thenar eminence (supplied by the palmar branch originating proximal to the wrist) or weakness of the flexor pollicis longus. If avoidance of inciting activities does not relieve the symptoms, surgical decompression is indicated. All areas of possible compression should be explored.

### Radial Nerve Entrapment

Radial nerve entrapment at the elbow typically involves compression of the posterior interosseous branch of the radial nerve, most commonly as it passes beneath the proximal edge of the supinator muscle at the arcade of Frohse (**Figure 15-12**). Because the posterior interosseous nerve is purely motor, the posterior interosseous syndrome affects only motor function of the thumb, finger extensors, and extensor carpi ulnaris (see **Figure 15-5**). Symptoms and signs of motor weakness are often vague in the early phase of the condition, and radial tunnel syndrome sometimes masquerades as a resistant lateral epicondylitis.

Diagnosis is based on history and an examination that typically shows tenderness over the proximal supinator muscle (approximately 5 cm distal to the lateral epicondyle). Pain is typically exacerbated by extension of the long finger against resistance with the elbow extended.

Surgical decompression with release of the impinging fibrous bands of the supinator muscle is usually helpful if symptoms are severe or do not resolve after a period of observation. The course of the posterior interosseous nerve through the full extent of the supinator muscle should be explored because entrapment also may occur in the midsubstance of the muscle and in its distal margin.

## MISCELLANEOUS CONDITIONS

### Acute Sprains

The medial collateral ligament (MCL) complex includes the anterior bundle, the poste-

rior bundle, and the transverse ligament (**Figure 15-13**). The anterior bundle of the MCL originates at the midportion of the medial epicondyle and inserts onto the coronoid tubercle of the ulna. The anterior bundle is the primary restraint to valgus stress. Its eccentric location provides valgus restraint throughout the full arc of flexion-extension. With the elbow in full extension, stability to valgus stress is conferred equally by the MCL, anterior capsule, and bony articulation. With the elbow in 90° of flexion, the MCL provides 55% of valgus stability. The contribution of the radiocapitellar articulation to valgus stability is secondary and significant only when the anterior bundle is disrupted.

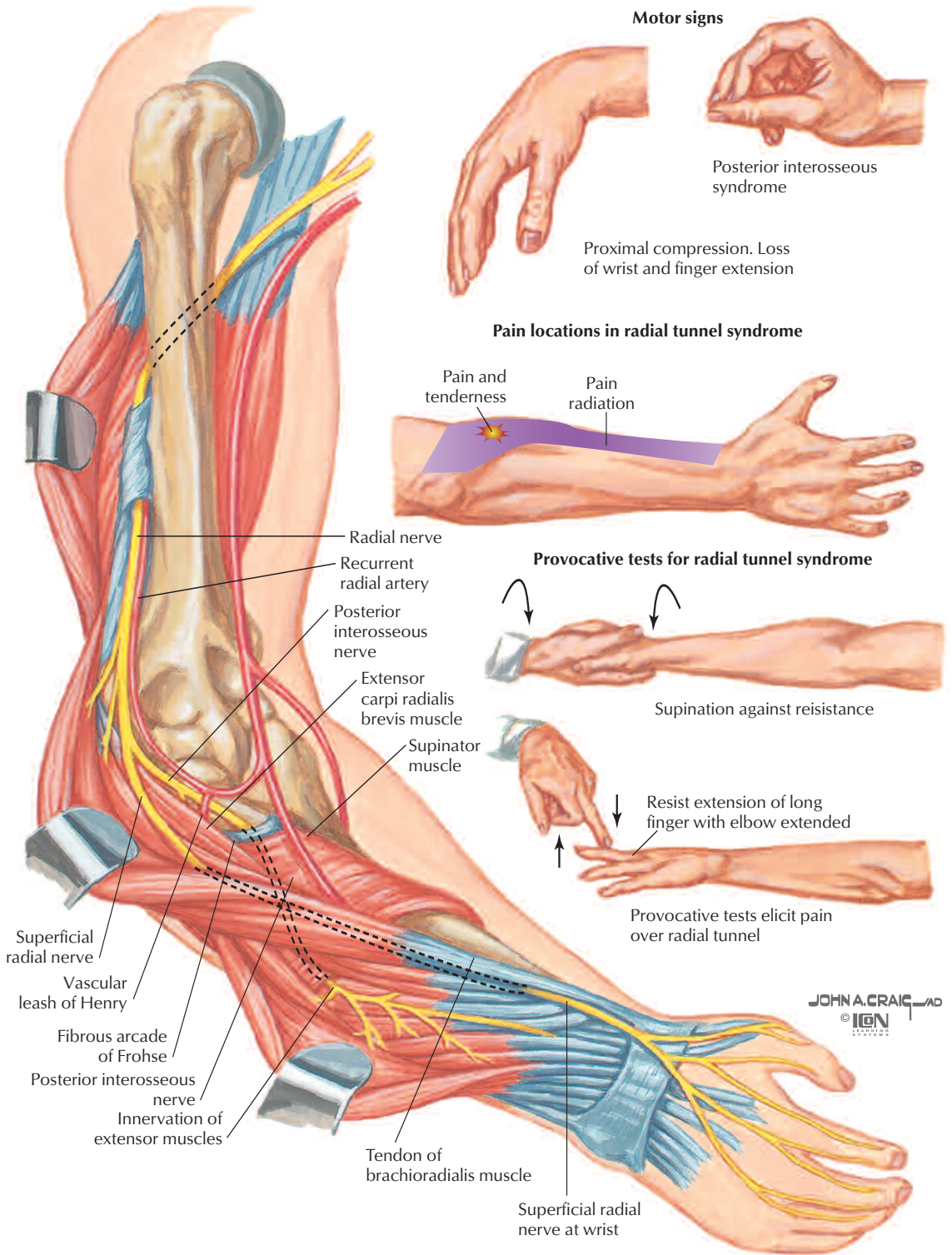
The lateral collateral ligament (LCL) complex includes the radial collateral ligament, the annular ligament, the accessory lateral collateral ligament, and the lateral ulnar collateral ligament. The *lateral ulnar collateral ligament* originates from the anteroinferior portion of the lateral epicondyle, inserts on the supinator crest of the proximal ulna, and is the primary lateral stabilizer. The *annular ligament* serves as a checkrein for the radial head.

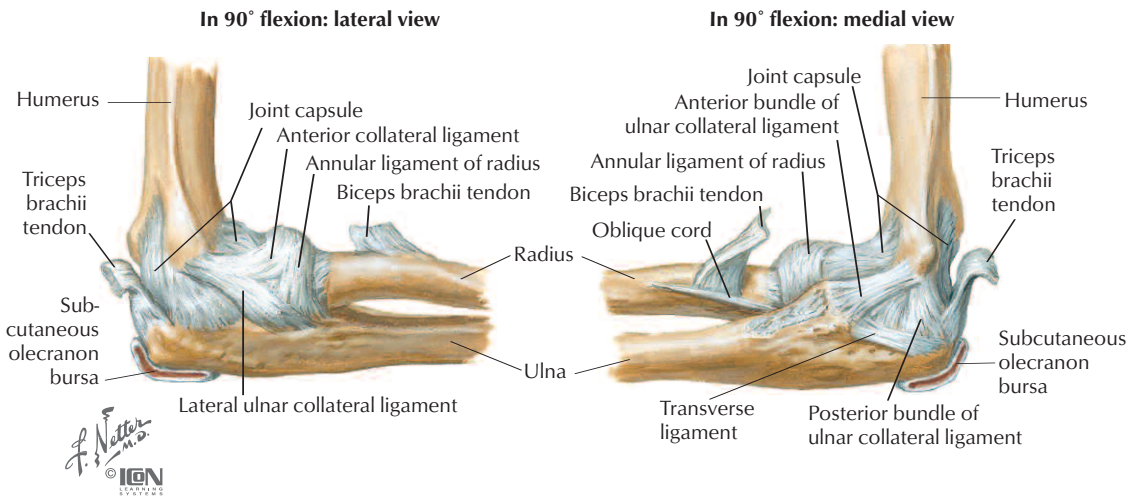
Patients with acute sprains report a history of acute pain after a fall or forceful throwing injury. Valgus distraction injuries transmit loads primarily to the MCL complex and the medial flexor-pronator muscular origin. Injuries to the LCL typically occur with a varus stress to the elbow joint when it is in extension and the forearm is in pronation. In acute injuries, the global swelling and tenderness, as well as the unreliability of stress maneuvers, make it virtually impossible for the clinician to determine precisely which ligament components are injured. Avulsion fractures may be seen on radiographs. Short-term immobilization and gradual resumption of activities are successful in treating most acute elbow sprains.

### Chronic Medial Elbow Pain and Instability

Medial elbow pain and MCL instability typically develop in athletes involved in repetitive throwing activities. Pain is usually gradual

Figure 15-12: Radial Nerve Compression



**Figure 15-13: Ligaments of Right Elbow Joint**

in onset, localized to the medial aspect of the elbow, and most severe during the acceleration phase of pitching (ie, the phase of pitching in which maximum valgus stress is transmitted to the elbow). MCL disruption or attenuation is most often noted at the mid-substance of the anterior bundle. Concomitant symptoms of lateral elbow pain may occur secondary to the valgus overload, causing compression, shear injury, and osteochondral fragments and/or osteochondritis dissecans of the capitellum.

Examination reveals tenderness on the medial aspect of the elbow. Valgus instability is assessed with the elbow in 25° of flexion to relax the ulnohumeral articulation. The patient should be evaluated for the presence of a concomitant ulnar entrapment neuropathy. Radiographs should be inspected for signs of osteochondral loose bodies, medial osteophytes, and osteochondritis dissecans. Magnetic resonance imaging (MRI) can be helpful in preoperative planning.

Nonoperative treatment includes activity modification followed by a gradual rehabilitation program. For persistent symptomatic instability, operative treatment includes reconstruction of the MCL with a tendon graft, removal of any associated osteophytes or loose bodies, and decompression of ulnar neuritis.

### Posterolateral Rotatory Elbow Instability

Posterolateral rotatory instability develops after injury to the ulnar collateral component of the LCL. With a lax or attenuated ligament, patients report lateral elbow pain and catching or giving way of the elbow. The lateral pivot test may be difficult to perform except when the patient is completely relaxed under anesthesia. MRI studies often identify the ligament disruption. Reconstruction of the lateral ulnar collateral ligament with a tendon graft is required for treatment of persistent and disabling symptoms.

### Rupture of the Distal Biceps Tendon

Rupture of the distal biceps brachii tendon is uncommon; however, timely diagnosis of these injuries is important because failure to recognize and repair the lesion before the onset of irreversible muscle contraction decreases the strength of elbow flexion and forearm supination by 30% to 50%. Predisposing factors include a male older than 40 years and the presence of preexisting degenerative changes in the tendon. Rupture typically occurs at the insertion of the biceps tendon into the radial tuberosity (see **Figure 15-13**).

Injury results from an extension force on a partially flexed and contracting biceps muscle.