Unit 8: Posterior Forearm and Hand

Dissection Instructions:

The posterior compartment of the forearm contains **12 muscles**, all supplied through the radial nerve (*Table 6.11*-p. 555). The blood supply comes from several sources rather than one major source.

Clean the superficial layer of muscles on the back of the forearm (*Plates 427; 6.76 A, 6.77A*). Do not cut or destroy the extensor retinaculum. The *brachioradialis* was seen when the cubital fossa was studied. It takes *origin* from high on the lateral supracondylar ridge and *inserts* on the lateral side of the distal end of the radius. Its nerve supply comes off the main trunk of the radial nerve in the arm and it is related to the superficial branch of the radial nerve and the radial vessels throughout most of its length. Next to it is the *extensor carpi radialis longus*. It also takes *origin* from the lateral supracondylar ridge and receives its nerve supply from the main trunk of the radial nerve in the arm. Next to it is the *extensor carpi radialis brevis*. It is innervated by the deep radial nerve before the nerve enters the supinator muscle. This, and the other muscles in this layer, take *origin* from the lateral epicondyle. The *extensor carpi radialis muscles* parallel each other in the forearm, pass through the same compartment in the extensor retinaculum and *insert* on the bases of the second and third metacarpal bones. The *extensor digitorum* divides into three tendons before passing through a compartment of the extensor retinaculum. On the dorsum of the hand, the tendon for the little finger is formed. The four tendons go to the dorsum of the fingers and form the *dorsal expansion* (*hood*). They *insert* on the intermediate and distal phalanges after receiving slips from the lumbrical and interosseous muscles (*Plates 447; 6.80A&B*). They join the dorsal expansion beyond the metacarpophalangeal joint.

The *extensor digiti minimi (quinti)* is a separate muscle passing through its own compartment under the extensor retinaculum and joins the tendon from the extensor digitorum on the dorsum of the little finger. The *extensor carpi ulnaris* lies next to the extensor digiti minimi. It has its own compartment under the extensor retinaculum and inserts on the base of the fifth metacarpal. The *anconeus muscle* is the last of the superficial layer of muscles. It takes *origin* from the common tendon of those muscles taking origin from the lateral epicondyle and inserts on the upper fourth of the ulna. Note that its uppermost fibers are adjacent and parallel to fibers of the medial head of the triceps brachii.

Clean the extensor retinaculum and note the other tendons which pass under it (*Plates 428, 453; 6.76, 6.79B-D, 6.81 A*). On the radial side, the tendons of the *abductor pollicis longus* and *extensor pollicis brevis* pass through the first compartment of the retinaculum. These are the first muscles of the *anatomical snuff box* (*Plates 424, 450, 452, 453; 6.79B-D, 6.81 A-C*). The second compartment has the two tendons of the *extensor carpi radialis muscles*. The third compartment has the tendon of the third snuff box muscle, *extensor pollicis longus*. The fourth compartment has four tendons, three belonging to the *extensor digitorum* and one belonging to the *extensor indicis muscle*. The fifth compartment contains the tendon to the fifth finger, *extensor digiti minimi* and the last compartment contains the last muscle on the ulnar side of the wrist, the *extensor carpi ulnaris*. On one upper limb, the compartments containing superficial muscles can be cut so the muscles can be elevated, exposing the deep layer of muscles. Extending the wrist will help in elevating the superficial muscles.

Clean the *supinator muscle* and the *deep branch of the radial nerve* passing through it (*Plates 423, 425, 428, 461; 6.77 A*). Note that the deep branch of the radial nerve supplies the extensor carpi radialis brevis and usually the supinator before it enters the substance of the muscle. The *supinator* takes *origin* from the lateral epicondyle of the humerus and the side of the ulna, wraps around the radius and *inserts* on its medial surface.
The **abductor pollicis longus** and **extensor pollicis brevis** travel side by side in the forearm and across the wrist, but the **abductor** begins higher and takes **origin** from both the radius and ulna (Plates 424, 428, 461; Table 6.11, p. 555, 6.76A, 6.77A). The **extensor** takes **origin** from only the radius. The **insertion** of the **abductor pollicis longus** is on the base of the first metacarpal and the **insertion** of the **extensor pollicis brevis** is on the base of the proximal phalanx of the thumb. The dorsal tubercle of the radius serves as a pulley allowing the tendon of the extensor pollicis longus to change directions. Medial to the extensor pollicis brevis in the forearm is the **extensor pollicis longus**. It takes **origin** from the ulna, passes through the third compartment of the extensor retinaculum and **inserts** on the base of the distal phalanx of the thumb. The **extensor indicis** is the most medial muscle of the deep group. It **arises** from the ulna and passes through the compartment with the extensor digitorum muscle to join the tendon of that muscle to the index finger. Note that the abductor pollicis longus and extensor pollicis brevis muscles of the deep layer of muscles cross the brachioradialis and extensor carpi radialis longus and brevis muscles of the superficial layer, and the extensor pollicis longus crosses the latter two muscles also.

When the **deep branch of the radial nerve** exits the supinator muscle, it divides into its terminal branches and supplies the extensor muscles which haven’t already been innervated (Plates 461; 6.77A). It continues as a small nerve, the **posterior interosseous nerve** going deep to join the **posterior interosseous vessels** and descends to the back of the wrist. Above the wrist, a branch of the **anterior interosseous artery** pierces the **interosseous membrane** and joins the circulation on the dorsum of the wrist (Plates 428; 6.76D).

Follow the **radial artery** from the **anatomical snuff box** as it turns into the palm as the **deep palmer arch**. Before it turns the radial artery gives off a branch turns to form in part the **dorsal carpal arch**. The latter arch is formed also from branches of the **ulnar artery** and **anterior interosseous artery**.

**Clean the neurovascular structures on the dorsal margins of the fingers** (Plates 452, 454; 6.76, 6.78, 6.79D). Also, **clean the tendons of the lumbrical muscles and slips from the interosseous muscles which join the extensor expansion** (Plates 446, 447, 453; 6.80A&B, 6.81B&C).

**Be sure to identify all of the following in this unit:**

- brachioradialis muscle
- extensor carpi radialis longus muscle
- extensor carpi radialis brevis
- extensor digitorum muscle
- dorsal expansion (hood)
- extensor digitii minimi (quinti)
- extensor carpi ulnaris muscle
- anconeus muscle
- abductor pollicis longus muscle
- extensor pollicis brevis muscle
- anatomical snuff box
- extensor carpi radialis muscle
- extensor pollicis longus muscle
- extensor indicis muscle
- supinator muscle
- deep branch of the radial nerve
- posterior interosseous nerve
- posterior interosseous vessels
- anterior interosseous artery
- interosseous membrane
- radial artery
- deep palmar arch
- dorsal carpal arch

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