Unit 6. Cubital Fossa, Anterior Forearm and Wrist

Dissection Instructions:

The bicipital aponeurosis goes to the deep fascia covering the flexor muscles (Plates 416, 429; 6.32, 6.49 B&C). Free the aponeurosis from the deep fascia but leave it attached to the biceps tendon. Locate and clean the brachioradialis and pronator teres muscles without destroying their nerve and blood supply. They are the lateral and medial boundaries of the cubital fossa (Plates 416, 429; 6.32, 6.49 B&C), the other being an imaginary line between the epicondyles of the humerus. The roof of the fossa is the investing layer of deep fascia and the floor is the brachialis muscle. In cleaning the cubital fossa, the elbow should be flexed enough to release the tension on the muscles bounding it.

The three largest structures within the cubital fossa are the tendon of the biceps brachii muscle, brachial artery and median nerve arranged from lateral to medial. As these structures are cleaned, be careful of small named vessels. Note that the median nerve leaves the cubital fossa by passing between the humeral and ulnar heads of the pronator teres muscle. The brachial artery divides in the fossa into radial and ulnar arteries. The radial artery passes laterally superficial to the pronator teres but under cover of the brachioradialis. The ulnar artery passes deep to both heads of the pronator teres muscle and the flexor digitorum superficialis to lie on the surface of the flexor digitorum profundus.

In the lateral wall of the cubital fossa between the brachialis and brachioradialis muscles is the radial nerve. It is here the radial nerve supplies the brachioradialis and extensor carpi radialis longus. It then divides into superficial and deep branches (Plates 430, 456; 6.49 D). The superficial branch of the radial nerve is sensory and accompanies the radial artery through most of the forearm. The deep branch of the radial nerve supplies the extensor carpi radialis brevis and may give a branch to the supinator muscle before it enters the substance of that muscle.

Remove the skin from both hands, being especially careful with the fingers.

The anterior osteofascial compartment of the forearm (Plates 423, 425, 426, 429-433; 6.60, 6.61, 6.62, 6.63, Table 6.8 and figures-p. 533) contains eight muscles. Six and one-half are innervated by the median nerve and the remaining one and one-half by the ulnar nerve. The radial and ulnar vessels supply the compartment with blood.

Clean the flexor carpi radialis, palmaris longus and flexor carpi ulnaris muscles, which take origin from the medial epicondyle of the humerus. With the pronator teres, they form the superficial layer of muscles in this compartment. The flexor carpi radialis and flexor carpi ulnaris muscles should be cleaned to the wrist, but the palmaris longus, after fusing to the flexor retinaculum at the wrist, continues into the hand as the palmar aponeurosis. Clean the palmar aponeurosis (Plates 442, 443; 6.60, 6.66, 6.68, 6.69). In about 13% of individuals, the palmaris longus muscle is absent, but the palmar aponeurosis will be present. On one side, the palmar aponeurosis should be reflected as a continuation of the palmaris longus muscle, or removed if the muscle is absent, by carefully detaching it from its attachments in the wrist and hand.

Cut the pronator teres muscle one inch from its insertion on the radius on both sides. Elevate the superficial muscles by flexing the wrist and clean the flexor digitorum superficialis muscle (Plate 430; 6.61). It forms a broad second layer by arising from the medial epicondyle of the humerus and from the upper half of the radius. The humeral and radial heads are connected by a fibrous arch. It divides into four tendons near the wrist.
Follow the **radial** and **ulnar arteries** throughout the forearm and note branches to the muscles. Find the **common interosseous artery**, a branch of the ulnar artery and attempt to follow it as it divides into the **anterior** and **posterior interosseous arteries** (*Plates 430, 431, 456; 6.58, 6.61, 6.62, 6.64, Table 6.7 and figure-p. 530).

Clean the palmar surface of the wrist (*Plates 442-444; 6.66, 6.68-6.70, 6.71 C*). The **flexor retinaculum** is a strong ligament extending from the **pisiform bone** and **hook of the hamate bone** over to the tubercle of the **scaphoid bone** and crest of the **trapezium bone**. It, with the carpal bones, forms the **carpal tunnel**. The flexor carpi radialis tendon splits the lateral end of the flexor retinaculum as it goes to insert on the bases of the second and third metacarpal bones. The tendon of the palmaris longus muscle fuses to the palmar surface of the retinaculum. Locate the **median nerve** proximal to the retinaculum between the tendons of the flexor carpi radialis and palmaris longus muscles (*Plates 430, 458; 6.64*). The **ulnar nerve** and vessels pass superficial to the retinaculum immediately lateral to the pisiform bone. This neurovascular bundle is held in place as it crosses the flexor retinaculum by the **palmar carpal ligament**, a thickening of the deep fascia. The tendon of the **flexor carpi ulnaris** inserts on the pisiform bone. The tunnel transmits the four tendons of the flexor digitorum superficialis, four tendons of the flexor digitorum profundus and tendon of the flexor pollicis longus, as well as the median nerve.

On one side, carefully cut through the flexor retinaculum. Now detach the radial origin of the flexor digitorum superficialis and elevate it and its tendons so the **flexor digitorum profundus**, **flexor pollicis longus** and **pronator quadratus muscles** can be cleaned (*Plates 431; 6.62, 6.63*). The flexor digitorum profundus and flexor pollicis longus form a third layer of muscles under the flexor digitorum superficialis. The **flexor digitorum profundus** takes origin from the ulna and interosseous membrane and sends four tendons through the carpal tunnel. The **flexor pollicis longus** arises from the radius and interosseous membrane and also sends its tendon through the carpal tunnel. The **pronator quadratus** lies deep to the tendons of the muscles of the third layer, thus forming a small fourth layer. It arises from the distal ulna and crosses transversely to insert on the distal radius. Clean the median nerve, ulnar artery and nerve throughout the forearm. **DO NOT DISSECT IN THE HAND OTHER THAN CLEANING AND REFLECTING THE PALMAR APONEUROSIS, FOR THIS UNIT.**

Now go back and clean the collateral circulation around the elbow joint (*Plates 417, 431; 6.11, 6.62, Table 6.7 and figure-p. 530*). In company with the radial nerve in the lateral wall of the cubital fossa is the **radial recurrent artery**, which is a branch of the radial artery that will anastomose with the **radial collateral artery** of the deep brachial artery. In the groove between the flexor muscles of the forearm and the brachialis muscle is the **anterior ulnar recurrent artery**, which anastomoses with the **inferior ulnar collateral artery**. Shortly after the **ulnar artery** is given off, it gives rise to the **common interosseous artery** which divides into **anterior** and **posterior interosseous arteries**. Deep in the cubital fossa, the posterior interosseous artery gives off the **interosseous recurrent artery**, which anastomoses with the **middle collateral branch of the deep brachial artery**. The ulnar artery will also give rise to a **posterior ulnar recurrent artery** to anastomose with the **superior ulnar collateral artery** behind the medial epicondyle with the ulnar nerve.
Be sure to identify all of the following in this unit:

- bicipital aponeurosis
- brachialis muscle
- tendon of the biceps brachii muscle
- brachial artery
- median nerve
- radial artery
- ulnar artery
- radial nerve & deep & superficial branches
- flexor carpi radialis muscle
- palmaris longus muscle
- flexor carpi ulnaris muscle
- pronator teres muscle
- flexor digitorum superficialis muscle
- flexor reticulum
- flexor digitorum profundus muscle
- flexor pollicis longus muscle
- pronator quadratus muscle
- radial recurrent artery
- radial collateral artery
- anterior ulnar recurrent artery
- inferior ulnar collateral artery
- common interosseous artery
- posterior interosseous artery
- anterior interosseous artery
- interosseous recurrent artery
- middle collateral artery
- posterior ulnar recurrent artery
- superior ulnar collateral artery