UNIT 17. DISSECTION: JOINTS OF THE UPPER LIMB

STRUCTURES TO IDENTIFY:

Anterior sternoclavicular ligament       Glenohumeral ligaments
Posterior sternoclavicular ligament      Superior
Interclavicular ligament                 Middle
Costoclavicular ligament                 Inferior
Acromioclavicular ligament              Subscapular bursa and tendon
Coracoclavicular ligament               Ulnar collateral ligament (at elbow)
    Conoid ligament                       Radial collateral ligament (at elbow)
    Trapezoid ligament                    Palmar and dorsal radiocarpal ligament
Coracoacromial ligament                 Ulnar collateral ligament (at wrist)
Superior transverse scapular ligament   Radial collateral ligament (at wrist)
Coracohumeral ligament                  Deep transverse metacarpal ligament
Transverse humeral ligament             Glenoid labrum
Tendon of the long head of biceps brachii Annular ligament

DISSECTION INSTRUCTIONS:

1. Remove the soft tissue on one of the upper limbs to expose the joints. If this is done in a systemic way, it can be an excellent review.

2. Identify the lateral and medial pectoral nerves (from the lateral and medial cord of the brachial plexus) and follow them to the pectoralis major and minor muscles. Review the origin and the insertion. Remove the muscles by cutting their insertions.

3. In the axilla, locate the axillary nerve and posterior humeral circumflex vessels. Trace them through the quadrangular space, note the nerve to the teres minor muscle and follow the neurovascular bundle into the deltoid muscle. Remove the deltoid. Trace the thoracodorsal nerve and vessels into the latissimus dorsi muscle, then follow the tendon of the muscle into the intertubercular sulcus. Cut the tendon near its insertion and remove the muscle. Note the tendon of the long head of the biceps held in place by pectoralis major and the transverse humeral ligament. Find the lower subscapular nerve and trace it to the subscapularis and teres major muscles. Review the origin and insertion of these muscles. Find the upper subscapular nerve and follow it to the subscapularis muscle.

4. Locate the musculocutaneous nerve from the lateral cord of the brachial plexus and find its branches to the coracobrachialis and biceps brachii muscles. Review the origins and insertion of the biceps brachii muscle. Cut the long head of the biceps brachii where the tendon joins the belly of the muscle. Review the coracobrachialis muscle, then remove it and the short head of the biceps brachii from the coracoid
process. Detach the coracobrachialis from the humerus and cut then tendon of insertion of the biceps brachii.

5. Note the course of the radial nerve from the posterior cord of the brachial plexus, between the humerus and the long and lateral heads of the triceps brachii muscle. Detach the long head of the triceps brachii from the infraglenoid tubercle of the scapula and the lateral head from the humerus. Note that the deep brachial vessels travel with the radial nerve in the radial groove of the humerus. Very carefully remove the rest of the triceps and the anconeus from the humerus and the olecranon process of the ulna without damaging the capsule of the elbow joint, which is fused to its deep surface.

6. Review the subscapularis, supraspinatus, infraspinatus and teres minor muscles forming the rotator cuff of the shoulder joint. Divide the muscles; follow the suprascapular neurovascular bundle, free the muscles from the capsule of the shoulder joint and then cut them from their bony attachment on the humerus.

7. The sternoclavicular joint should now be opened and the disc exposed. Review it in your atlas (N. plates 186, 419; G. plates 1.10, 6.40).

8. Identify the acromioclavicular joint and ligament (N. plate 423; G. plates 6.40, 6.42). Saw through the scapular spine where it becomes the acromion process. Clean the coracoclavicular ligament consisting of conoid and trapezoid parts (N. plate 423; G. plates 6.40, 6.42).

9. Turn to the back of the shoulder joint and make a vertical incision down the back of the joint capsule so the humerus can be rotated away from the glenoid fossa of the scapula. Identify the glenoid labrum. Locate the tendon of the long head of the biceps brachii muscle and follow it to the supraglenoid tubercle. Now locate the communication between the joint space and the subscapular bursa. Between the biceps tendon and the opening of the bursa is the superior glenohumeral ligament. Bordering the inferior margin of the opening of the subscapular bursa is the middle glenohumeral ligament. Below this and running downward and lateral is the inferior glenohumeral ligament (N. plate 423; G. plates 6.42, 6.43).

10. Locate the radial nerve above the elbow and review the nerves to the extensor muscles of the forearm. Remove the extensor muscles that attach to the lateral epicondyle and supracondylar ridge of the humerus after the origin and insertions have been reviewed.

11. Note the relationship between the median nerve and the brachial artery. The nerve has no branches until it reaches the cubital fossa. Trace the ulnar nerve through the arm, behind the medial epicondyle of the humerus and between the two heads of the flexor carpi ulnaris muscle. Locate its branch to this muscle and to the flexor digitorum profundus. Review the origins and insertions of the flexor muscles of the forearm, then remove those that arise from the medial epicondyle of the humerus.
Identify the brachial artery, radial artery, ulnar artery, common interosseous artery, and anterior and posterior interosseous arteries.

12. Carefully, remove the brachialis from the anterior surface of the elbow joint (the capsule is very thin and fused to the muscle). Clean and identify the ulnar collateral ligament, radial collateral ligament and annular ligament (N. plate 438; G. plates 6.51, 6.52). Open the elbow joint by making a horizontal incision though the front of the joint capsule at the level of the radial head-capitulum articulation. Alternately pronate and supinate the hand and watch for movement of the annular ligament. It should be noted that the annular ligament does not move, but the capsule distal to the annular ligament is loose and allows for the movement.

13. Find the insertion of the flexor carpi ulnaris on the pisiform bone, then cut the tendon proximal to the bone. Review the origins and insertions of the flexor pollicis longus, flexor digitorum superficialis and profundus, then detach them. Locate the flexor carpi radialis origin and insertion and then cut its tendon. Review the anatomy of the median and ulnar nerves in the hand in the superficial and deep palmar arterial arch. Review the muscles of the hand.

14. Review the extensor retinaculum; identify the tendons passing under it and trace them to their insertions. Review the blood supply to the dorsal aspect of the forearm and hand. Now remove the muscles that cross the wrist and hand joints, but not the metacarpophalangeal joints. Clean the interosseous ligament (N. plate 439) between the radius and the ulna. The distal radioulnar joint is a separate synovial joint between the head of the ulna and the ulnar notch of the radius (N. plates 454, 455; plates 6.82, 6.83). Alternately supinate and pronate the hand and note the movement at the distal radioulnar joint. At the distal end of the ulna is a fibrocartilaginous disc, which separates the ulna from the carpal bones.

15. Remove the tissue covering the wrist joint (N. plates 454, 455; G. plates 6.82, 6.83) and identify the dorsal and palmar radiocarpal ligaments. Note that they come from the distal end of the radius and pass distally and medially as they cross the wrist joint. On the sides of the joint are the radial and ulnar collateral ligaments of the wrist.
