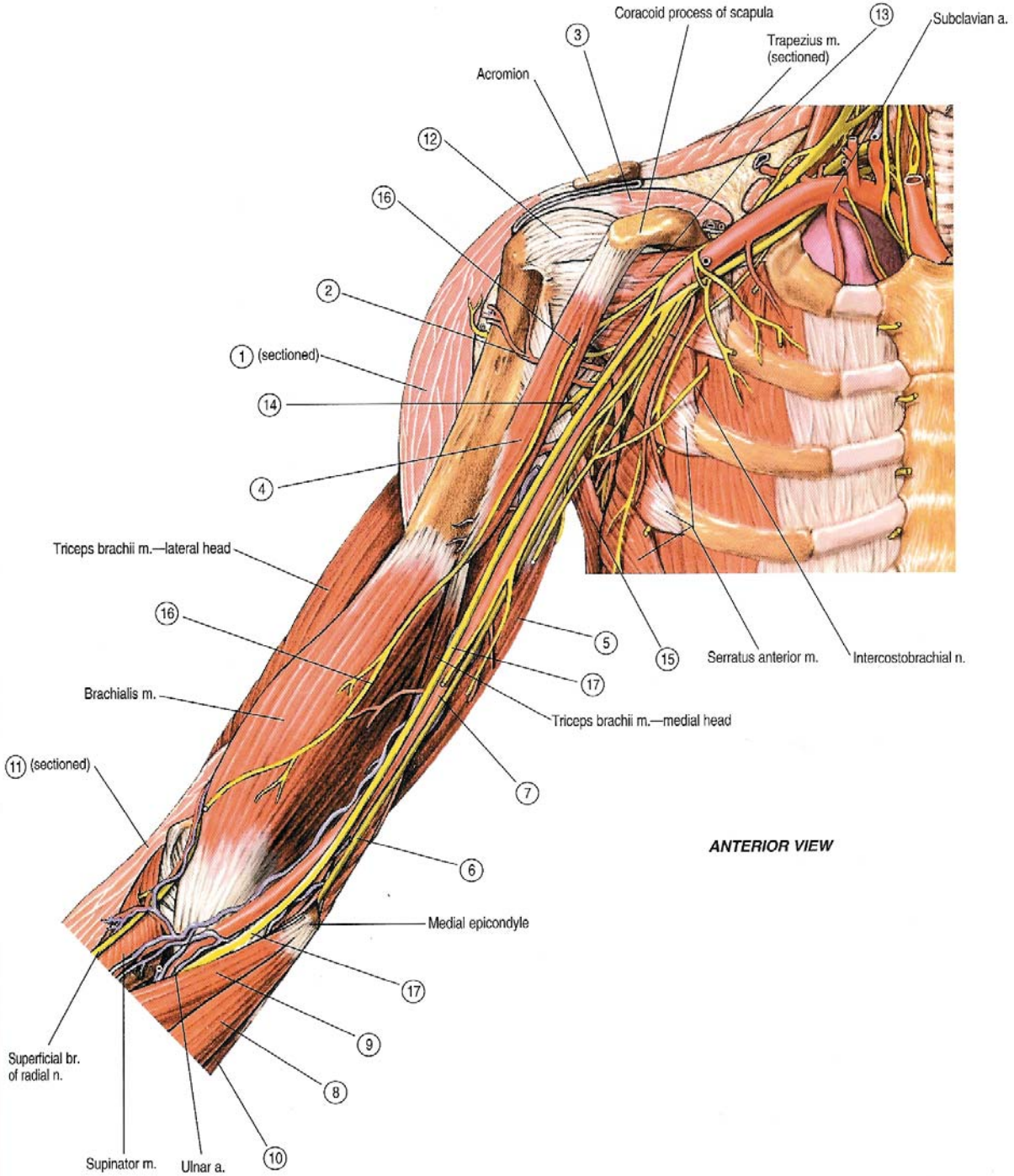
بسم الله الرحمن الرحيم

UPPER ARM


Coracoid process of scapula
3
13
Subclavian a.
Trapezius m. (sectioned)
Acromion
12
16
2
1 (sectioned)
14
4
Triceps brachii m.—lateral head
16
5
15
Serratus anterior m.
Intercostobrachial n.
17
Brachialis m.
Triceps brachii m.—medial head
11 (sectioned)
7
ANTERIOR VIEW
6
Medial epicondyle
17
9
Superficial br. of radial n.
8
Supinator m.
Ulnar a.
10

Objectives

- **Cutaneous innervation.**
- **Superficial veins.**
- **Fascial compartments:**
  - Anterior fascial compartment and their contents (muscles, vessels and nerves).
  - Posterior facial compartment and their contents (muscles, vessels and nerves).
- **Cubital fossa:**
  - Boundaries and contents

Cutaneous innervation

- **Supraclavicular nerves** (C3,4) from cervical plexus: skin over the shoulder and upper half of deltoid.
- **Upper lateral cutaneous nerve of the arm** from the axillary nerve (C5,6): skin over the lower half of the deltoid.
- **Lower lateral cutaneous nerve of the arm** (C5,6) from the radial nerve (C5-T1): skin of the lateral surface of the arm below the deltoid.
- **Intercostobrachial nerve** (T2): skin of the axilla.
- **Medial Cutaneous nerve of the arm** (C8,T1): skin of the medial side of the arm.
- **Posterior cutaneous nerve of the arm** (C8) from the radial nerve (C5-T1): skin of the posterior surface of the arm.

Veins of the arm

- **Deep veins:** venae comitantes which accompany the arteries and axillary vein.
- **Superficial vein:**

1. **Cephalic vein:** runs on the lateral side of the arm and ends by piercing the clavipectoral fascia to join the axillary vein.
2. **Basilic vein:** runs on the medial side of the arm till its middle then pierces the deep fascia to join the 2 venae comitantes of the brachial artery to form the axillary artery.

Fascial compartments

- Medial and lateral supracondylar ridges of the humerus are attached to medial and lateral intermuscular septa which in turn, are attached to the deep fascia of the arm, dividing it into anterior and posterior compartments.
- **Contents of anterior compartment:**
  - **Muscles:** biceps brachii, coracobrachialis and brachialis.
  - **Vessels:** brachial artery & it branches and basilic vein.
  - **Nerves:** musculocutaneous, median, ulnar (in the upper part) and radial (in the lower part) nerves.
- **Contents of posterior compartment:**
  - **Muscles:** triceps.
  - **Vessels:** profunda brachii and ulnar collateral.
  - **Nerves:** radial nerve (in the upper part) and ulnar nerve (in the lower part).

ANTERIOR COMPARTMENT

Biceps brachii

- **Origin:**
  1. ***Long head:*** from the supraglenoid tubercle of the scapula.
  2. ***Short head:*** from the tip of coracoid process of the scapula.
- **Insertion:**
  1. Into the posterior part of the radial tuberosity of the radius.
  2. Forms the bicipital aponeurosis which is inserted into the deep fascia of the upper part of the medial side of the forearm.
- **Nerve Supply:**

  From musculocutaneous nerve.
- **Action:**
  1. Supination of the forearm at the radio-ulnar joints.
  2. Flexion of the forearm at the elbow joint.
  3. Weak flexion of the shoulder joint.

Coracobrachialis

- **Origin:**

From the tip of coracoid process of the scapula (with short head of biceps).

- **Insertion:**

Into the middle third of the medial side of the shaft of the humerus.

- **Nerve Supply:**

From musculocutaneous nerve.

- **Action:**

1. Flexion of the shoulder joint.
2. Weak adduction of the shoulder joint.

Brachialis

- **Origin:**

From the lower half of the anterior surface of the shaft of the humerus and the adjoining parts of the medial and lateral intermuscular septa.

- **Insertion:**

Into the anterior surface of the coronoid process of the ulna.

- **Nerve Supply:**

1. Majority of the muscle from musculocutaneous nerve.
2. Small lateral part by the radial nerve.

- **Action:**

Strong flexion of the elbow joint.

Brachial artery

- **Beginning:** at the lower border of teres major as a continuation of the axillary artery.
- **End:** at the level of the neck of the radius by dividing into its 2 terminal branches; radial and ulnar arteries.
- **Course:** The upper of the artery runs medial to the humerus, while the lower part becomes anterior to the bone.

Relations of Brachial artery

- **Anteriorly:**
  - The artery is superficial and is overlaped by coracobrachialis and biceps.
  - At its middle, it is crossed by the median nerve (from lateral to medial).
  - At its lower part, it is crossed by the bicipital aponeurosis.
- **Posteriorly:** triceps, brachialis and coracobrachialis.
- **Medially:** ulnar nerve and basilic vein (above) and median nerve (below).
- **Laterally:** Median nerve, biceps and coraco-brachialis (above) and biceps tendon (below).

Branches

1. **Profunda brachii artery:** at its beginning, accompanies the radial nerve to the posterior compartment of the arm which it supplies.
2. **Muscular branches:** to the anterior compartment muscles.
3. **Nutrient artery:** to the humerus.
4. **Superior ulnar collateral artery:** accompanies the ulnar nerve.
5. **Inferior ulnar collateral artery:** with other arteries, it shares in the anastomosis around elbow joint.
6. **Terminal branches:** radial and ulnar arteries.

Musculocutaneous nerve

- **Origin:** from the lateral cord of the brachial plexus in the axilla (C5,6,7).
- **Course:** its runs downward and laterally, pierces the coracobrachialis muscle, then it passes between the biceps and brachialis and appears at the lateral margin of biceps to pierce the deep fascia and becomes superficial and descends on the lateral side of the forearm as the lateral cutaneous nerve of the forearm.
- **Branches:**

1. ***Muscular branches:*** to coracobrachialis, biceps and majority of brachialis.
2. ***Articular branches:*** to the elbow joint.
3. ***Cutaneous branches:*** to the lateral and anterior sides of the forearm.

Median nerve (C5-T1)

- **Origin:** By 2 roots;
  1. Lateral root from the lateral cord of the brachial plexus (C5,6,7).
  2. Medial root from the medial cord of the brachial plexus (C8,T1).
- **Course:**
  - The medial root crosses the 3rd part of the axillary artery (from medial to lateral) to join the lateral root forming the median nerve (in the axilla).
  - The nerve descends on the lateral side of the brachial artery till the middle of the arm then it crosses the artery (from lateral to medial) and continues on its medial side.
  - At its lower part, it is crossed by the bicipital aponeurosis.
  - It continues in the cubital fossa.
- **Branches:**

No branches in the axilla and arm.

Ulnar nerve (C7,8,T1)

- **Origin:** from the medial cord of the brachial plexus in the axilla. It takes C7 fibers from the median nerve (through a communication between them).
- **Course:**
  - ✓ It descends on the medial side of the 3rd part of axillary artery, then upper part of brachial artery.
  - ✓ At the middle of the arm, it pierces the medial intermuscular septum and enters the posterior compartment of the arm.
  - ✓ It is accompanied by the superior ulnar collateral artery (a branch of the brachial artery).
  - ✓ It passes behind the medial epicondyle of the humerus to enter the forearm.
- **Branches:**

No branches in the axilla and arm.

Radial nerve (C5-T1)

- **Origin:** from the posterior cord of the brachial plexus in the axilla.
- **Course:**
  - ✓ It descends behind the 3rd part of axillary artery, then through the lower (lateral) triangular intermuscular space, it enters the posterior compartment of the arm.
  - ✓ It runs on the spiral groove of the humerus (from medial to lateral).
  - ✓ At the lower part of the arm, it emerges between brachialis and brachioradialis to pass a short course in the anterior compartment of the arm
  - ✓ It passes in front of the lateral epicondyle of the humerus to enter the forearm.
- **Branches:**

Will be mentioned later on.

POSTERIOR COMPARTMENT

Fascial compartments

- Medial and lateral supracondylar ridges of the humerus are attached to medial and lateral intermuscular septa which in turn, are attached to the deep fascia of the arm, dividing it into anterior and posterior compartments.
- **Contents of anterior compartment:**
  - **Muscles:** biceps brachii, coracobrachialis and brachialis.
  - **Vessels:** brachial artery & it branches and basilic vein.
  - **Nerves:** musculocutaneous, median, ulnar (in the upper part) and radial (in the lower part) nerves.
- **Contents of posterior compartment:**
  - **Muscles:** triceps.
  - **Vessels:** profunda brachii and ulnar collateral.
  - **Nerves:** radial nerve (in the upper part) and ulnar nerve (in the lower part).

Triceps muscle

- **Origin:**
  1. ***Long head:*** from the infraglenoid tubercle of the scapula.
  2. ***Lateral head:*** from the upper half of the posterior surface of the shaft of the humerus, above and lateral to the spiral groove.
  3. ***Medial head:*** from the lower half of the posterior surface of the shaft of the humerus, below and medial to the spiral groove.
- **Insertion:**

  Into the upper surface of the olecranon process of the ulna.
- **Nerve Supply:**

  From the radial nerve (through many branches at the axilla and the spiral groove).
- **Action:**

  Extension of the forearm at the elbow joint.

Radial nerve

- **Course:**
  - ✓ It enters the posterior compartment of the arm by passing through the lateral triangular space.
  - ✓ It runs on the spiral groove of the humerus (from medial to lateral) between the medial and lateral heads of the triceps.
  - ✓ At the lower part of the arm, it pierces the lateral intermuscular septum and emerges between brachialis and brachioradialis to pass a short course in the anterior compartment of the arm (on the lateral side of the cubital fossa).
  - ✓ it divides into its 2 (superficial and deep) terminal branches in front of the lateral epicondyle of the humerus.

Branches of the Radial nerve

- **In the axilla:**
  1. Muscular branch to the long head of triceps.
  2. Muscular branch to the medial head of triceps.
  3. Posterior cutaneous nerve of the arm.
- **In the spiral groove:**
  1. Muscular branch to the lateral head of triceps.
  2. Muscular branch to the medial head of triceps.
  3. Muscular branch to the anconeus muscle.
  4. Lower lateral cutaneous nerve of the arm.
  5. Posterior cutaneous nerve of the forearm.
- **In the groove between brachial and brachioradialis:**
  1. Muscular branch to the lateral part of brachialis.
  2. Muscular branch to the brachioradialis.
  3. Muscular branch to the extensor carpi radialis longus.
  4. Articular branch to the elbow joint.

Ulnar nerve

- **Course:**
  - ✓ It enters the posterior compartment of the arm by piercing the medial intermuscular septum at the middle of the arm (with the superior ulnar collateral artery).
  - ✓ It descends to pass behind the medial epicondyle of the humerus.
  - ✓ It enters the forearm by passing between the two heads of the flexor carpi ulnaris muscle.
- **Branches:**
  - ✓ Articular branch to the elbow joint.

Profunda Brachii artery

- **Origin:** from the brachial artery near its beginning.
- **Course:** it accompanies the radial nerve in the spiral groove.
- **Branches:**

1. ***Muscular branches*** to the triceps muscle.
2. ***Nutrient branch*** to the humerus.
3. ***Ascending branch*** which anastomoses with anterior and posterior circumflex humeral arteries around the surgical neck of the humerus.
4. ***Anterior descending branch*** (radial collateral) runs with the radial artery.
5. ***Posterior descending branch*** (medial collateral) runs behind the lateral epicondyle of the humerus.

Cubital Fossa

- **Site:** A triangular fascial space in front of the elbow joint.
- **Boundaries:**
  - **Medially:** Pronator teres muscle.
  - **Laterally:** Brachioradialis muscle.
  - **Base:** imaginary line between the medial and lateral epicondyles of the humerus.
- **Roof:**
  - Skin, superficial fascia (containing medial cubital vein, medial & lateral cutaneous nerves of the forearm and supratrochlear L.N.), deep fascia and bicipital aponeurosis.
- **Base:**
  - Brachialis medially and supinator laterally.
- **Contents (from medial to lateral):**
  1. Median nerve.
  2. End of brachial & beginning of radial & ulnar arteries.
  3. Biceps brachii tendon.
  4. Radial nerve and its deep branch.

THANK YOU