But if the insertion is fixed by external force, then origin moves.

However, many authors consider *proximal attachment* and *distal attachment* instead of origin and insertion.[Practical guide]

MUSCLES OF PECTORAL REGION

Pectoral region has three muscles:

1. Pectoralis major
2. Pectoralis minor
3. Subclavius

Pectoralis Major

Q. Write a short note on pectoralis major.

- It is the largest muscle of the pectoral region (Figs 6.5, 6.6, Flowchart 6.1).[Spotters]
- Pectoralis major muscle is thick, bulky, fan-shaped muscle situated anterior to the chest wall.

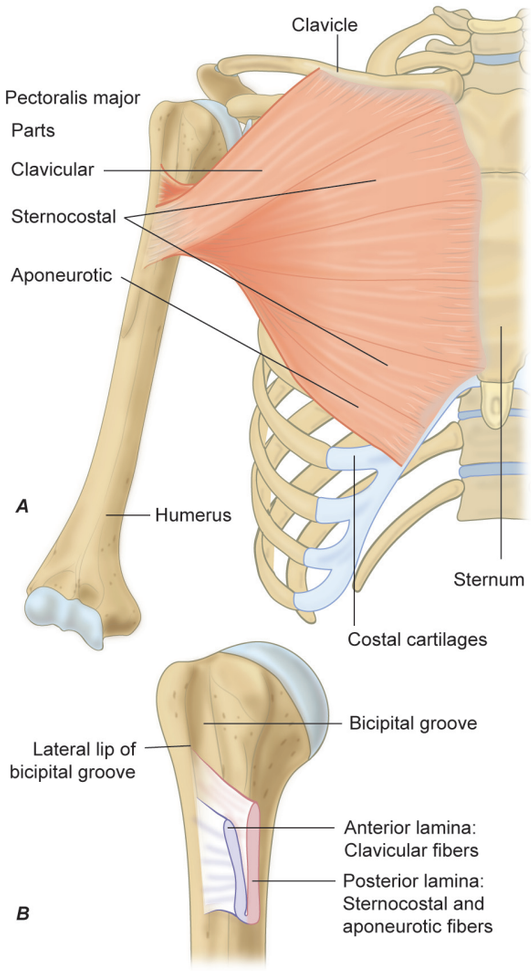


Fig. 6.5: Pectoralis major muscle: A. Gross features and parts of muscle; B. Bilaminar insertion

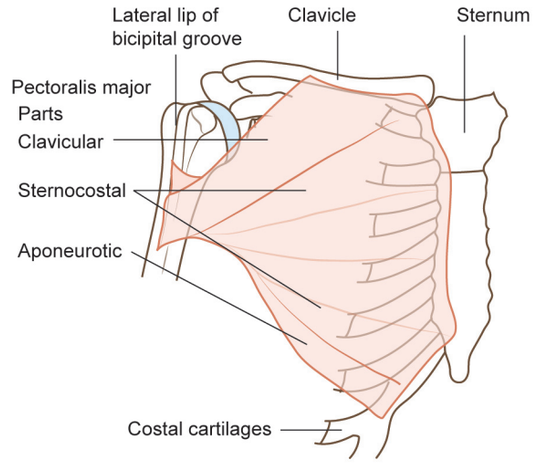


Fig. 6.6: Pectoralis major muscle

Flowchart 6.1: Pectoralis major muscle

Large bulky fan-shaped muscle

Origin	Insertion	Actions
Clavicular head: Anterior surface of medial half of clavicle Sternocostal head: - Lateral half of anterior surface of sternum up to 6th costal cartilages - 2nd to 6th costal cartilages - External oblique aponeurosis	Lateral lip of bicipital groove by bilaminar tendon: Anterior lamina Clavicular fibers Posterior lamina Sternocostal fibers (lowest fibers insert highest)	Adduction and medial rotation of arm - Clavicular head: Flexion of arm - Sternocostal head: Extension of flexed arm

Nerve supply:
Medial and lateral pectoral nerves

Origin (proximal attachment)[NEXT]

- Pectoralis major muscle has two heads of origin:

Clavicular head

- It is smaller head.
- It arises from anterior surface of medial half of clavicle.

Sternocostal head

- It has manubrial, sternal, and aponeurotic fibers.
- *Manubrial fibers* arise from lateral half of anterior surface of manubrium.
- *Sternal fibers* arise from lateral half of anterior surface of sternum up to 6th costal cartilages.
- *Costal fibers* arise from 2nd to 6th costal cartilages.
- *Aponeurotic fibers* arise from aponeurosis of external oblique muscle of abdomen.

Insertion (distal attachment)

- Pectoralis major muscle forms U-shaped bilaminar tendon that inserts on the *lateral lip of bicipital groove*.[Viva, NEXT]
- The bilaminar tendon has two laminae as follows:
  - Anterior lamina: It is shorter than posterior lamina. It is formed by clavicular fibers of the muscle.
  - Posterior lamina: It is formed by sternocostal fibers.

• External oblique muscle is the flat and outermost muscle of the anterior abdominal wall. It has a thin sheet of muscle fibers that inserts through aponeurosis (flat tendon).

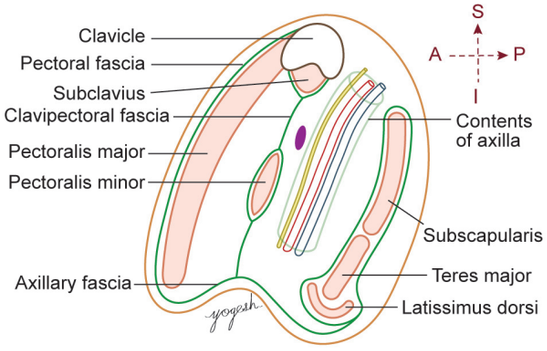


Fig. 8.3: Walls of axilla (right)

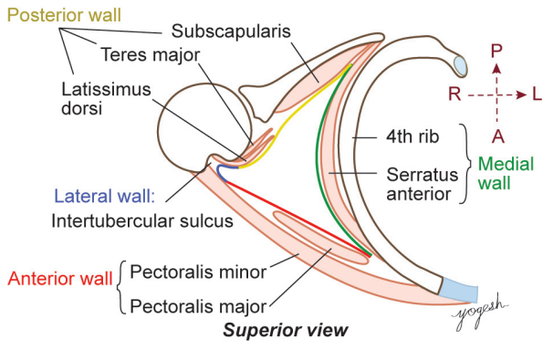
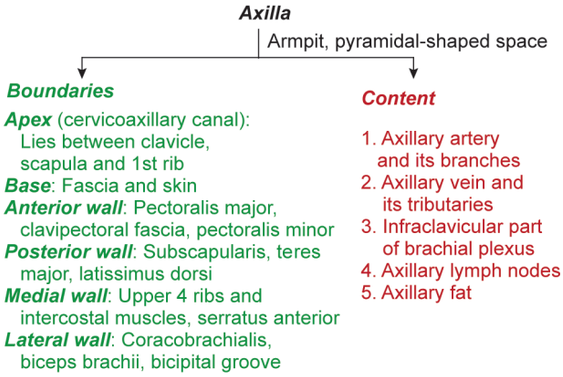


Fig. 8.4: Walls of axilla (right, section passing through the 4th rib, superior view)

Flowchart 8.1: Axilla



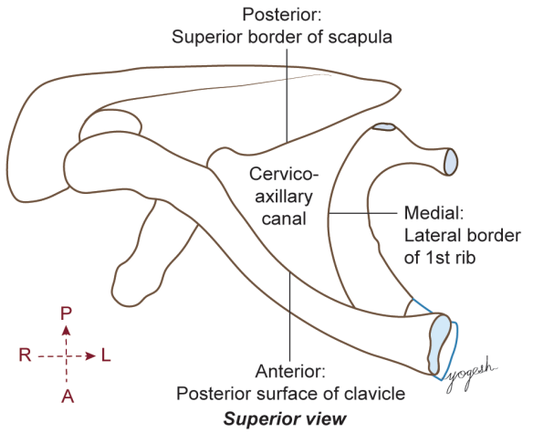


Fig. 8.5: Boundaries of apex of axilla or cervicoaxillary canal (right, superior view)

Boundaries of apex

- Apex is a triangular passage that is bounded by bones as follows:[Viva]
  Anterior: Posterior surface of middle-third of clavicle
  Posterior: Superior border of scapula
  Medial: Outer border of the first rib.

Base (floor)

- It is directed downward.
- It is formed by skin and axillary fascia.
- It is dome-shaped with convexity directed upward.
- Base of axilla extends from anterior to posterior axillary folds. Medially it is continuous with chest wall and laterally with the medial side of the arm.

Anterior wall

- It is formed by the following structures (superficial to deep):
  - Pectoralis major muscle
  - Clavipectoral fascia
  - Pectoralis minor and muscle
  - Subclavius muscle

Posterior wall (Fig. 8.6)

- It is formed by the following structures above downward.
  - Subscapularis muscle
  - Teres major and minor muscles
  - Latissimus dorsi muscle

Medial wall

- It is convex laterally and formed by the chest wall, specifically by[NEXT]
  - Upper four ribs and their intercostal muscles
  - Upper 4–5 digitations of serratus anterior muscles

Lateral wall

- It is the narrowest wall of the axilla.

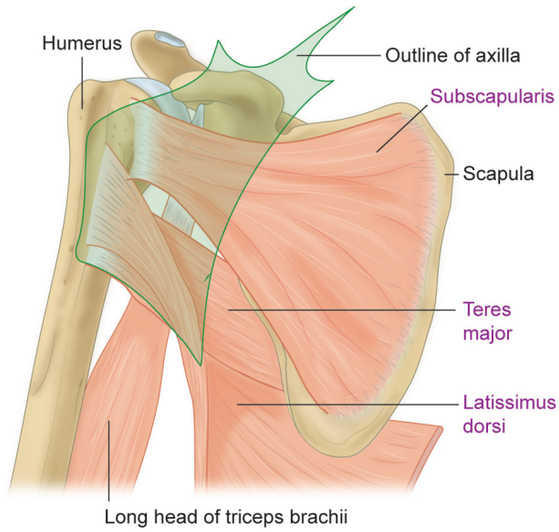


Fig. 8.6: Muscles forming posterior wall of axilla (right)

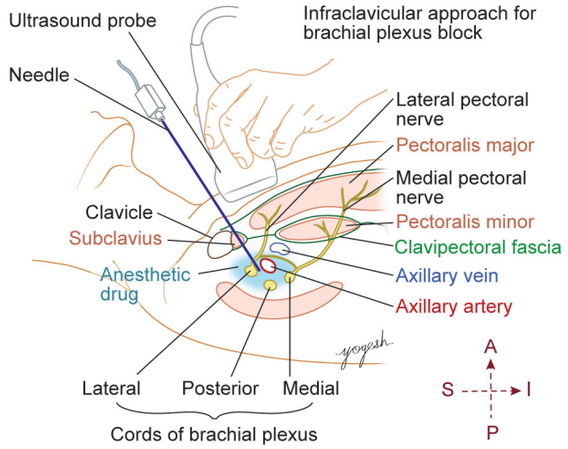


Fig. 9.5: Brachial plexus block (right)

Box 9.1: Erb's paralysis

Q. Write a short note on Erbs's palsy.

Q. Write a short note on Horner's syndrome.

- Erb's paralysis or palsy is the paralysis of arm caused by injury to upper trunk of brachial plexus [Wilhelm Heinrich Erb, German Neurologist, 1840–1921] (Figs 9.5, 9.7, Flowchart 9.3).

Site of injury

- Erb's point: Point of upper trunk where 6 nerves meet, includes C5 and C6 roots, anterior and posterior divisions of upper trunk, and 2 branches of upper trunk (suprascapular nerve and nerve to subclavius) (Fig. 9.6).[Viva, NEXT]
- Involved nerve roots: C5 and C6

Cause

- Erb's paralysis is caused due to stretching of upper trunk of brachial plexus. It may be caused by pulling away head from shoulder. It occurs due to difficult childbirth (to pull out the head of baby during birth) or fall on shoulder.

Deformity and muscles involved

- Erb's paralysis produces policeman's tip hand (porter's or waiter's tip hand) deformity.[MCQ]
- It has arm hanging by the side of body, arms adducted and medially rotated, forearm extended and pronated.

Disability	*Cause*	*Result*[NEXT]
Abduction arm	Paralysis of deltoid muscle	Adducted arm
Lateral rotation of arm	Paralysis of supraspinatus, infraspinatus, and teres minor muscles	Medial rotation of arm
Flexion of elbow	Paralysis of biceps brachii	Extended forearm
Supination of forearm	Paralysis of biceps brachii	Pronated forearm
Sensation over lower part of deltoid	Involvement of C6 root	Loss of sensation over lower part of deltoid

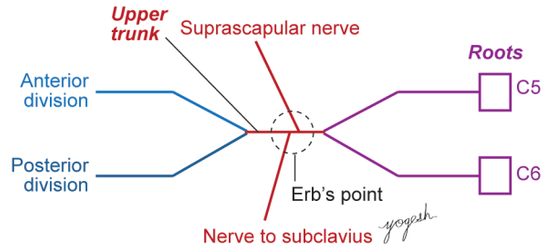


Fig. 9.6: Erb's point

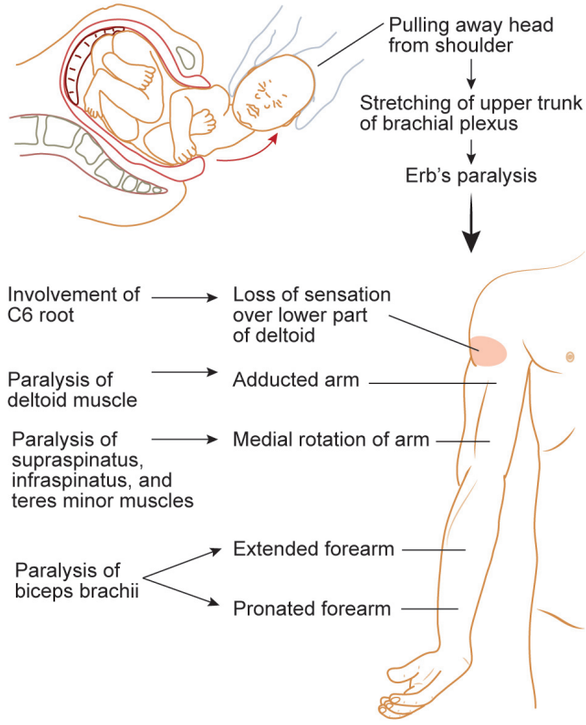
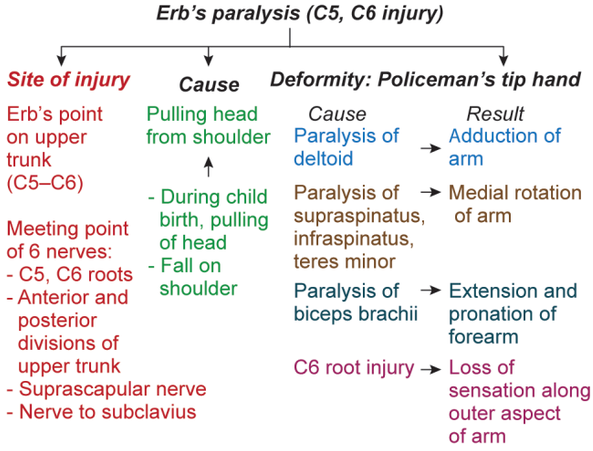


Fig. 9.7: Erb's paralysis

Flowchart 9.3: Erb's paralysis



Chapter

11

Scapular Region

Competencies

AN10.10: Describe and identify the deltoid and rotator cuff muscles.

AN10.13: Explain anatomical basis of injury to axillary nerve during intramuscular injections.

AN13.7: ……..,Testing of muscles: deltoid, …… .

This chapter includes muscles of rotator cuff, deltoid muscle, and axillary nerve.

INTRODUCTION

- Scapular region includes the muscles and the structures surrounding the scapula.
- This region contains the scapulohumeral muscles that arise from scapula and inserts on humerus.
- Muscles of scapular region:
  - Deltoid
  - Subscapularis
  - Supraspinatus
  - Infraspinatus
  - Teres minor
  - Teres major

Cutaneous nerve supply

- Skin of the scapular or shoulder region is supplied by
  - Lateral supraclavicular nerve
  - Upper lateral cutaneous nerve of arm
  - Dorsal rami of upper thoracic nerve

MUSCLES OF SCAPULAR REGION

Deltoid muscle

Q. Write a short note on deltoid muscle.

- Deltoid muscle is a triangular muscle (*delta* = triangle, in Greek) (Figs 11.1–11.3, Flowchart 11.1).
- It is a bulky muscle that forms a rounded contour of shoulder.*Viva*
- Deltoid muscle has three parts:
  1. Anterior part – unipennate
  2. Middle part – multipennate
  3. Posterior part – unipennate

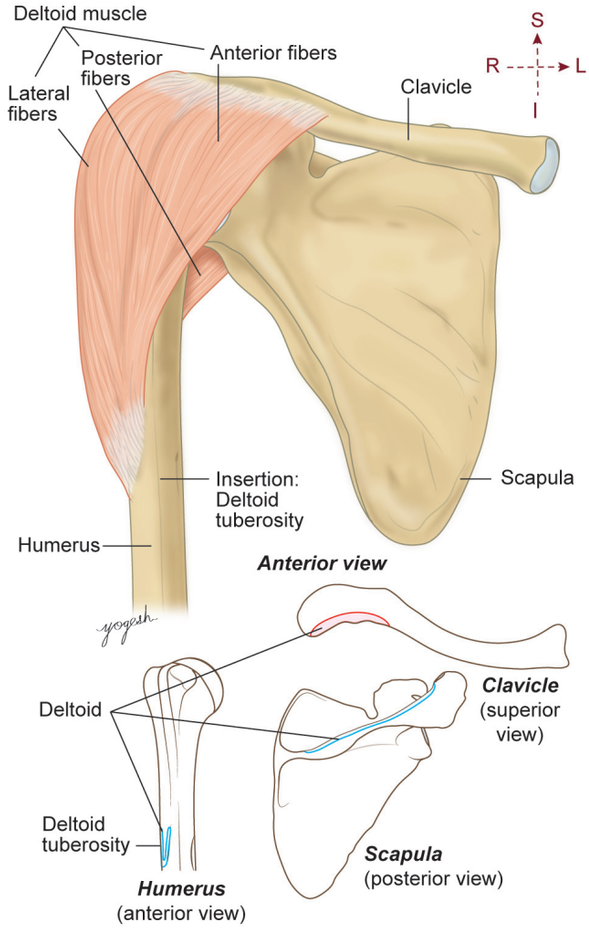


Fig. 11.1: Deltoid muscle (right)

Origin

- Deltoid originates as follows:
  1. Anterior part – from anterior border of lateral one-third of clavicle

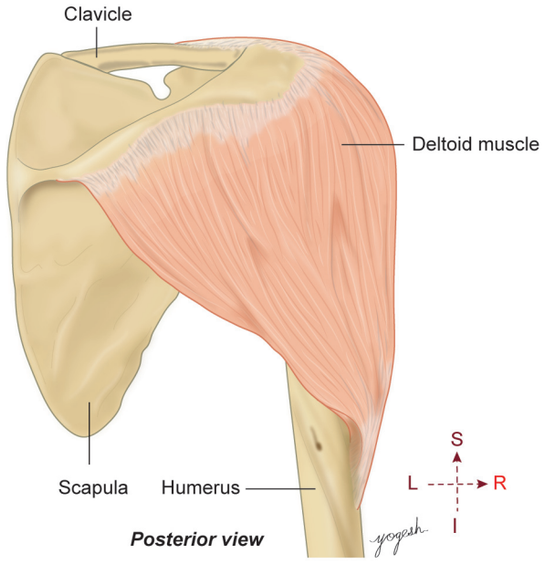


Fig. 11.2: Deltoid muscle (right, posterior view)

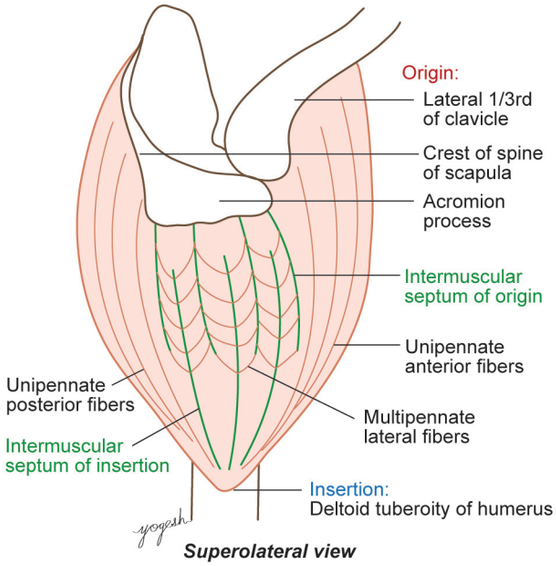
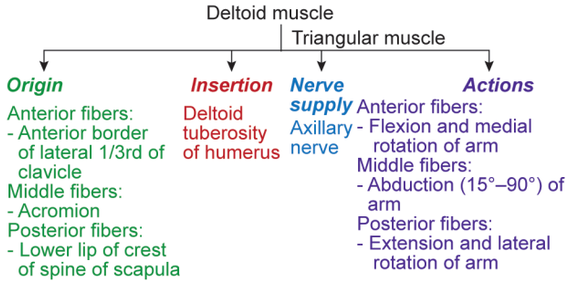


Fig. 11.3: Deltoid muscle (right, superolateral view)

Flowchart 11.1: Deltoid muscle



Clinical testing: Ask to abduct the arm against resistance

2. Middle part – from lateral margin of acromion and from four intermuscular septa
3. Posterior part – from the lower lip of crest of spine of scapula

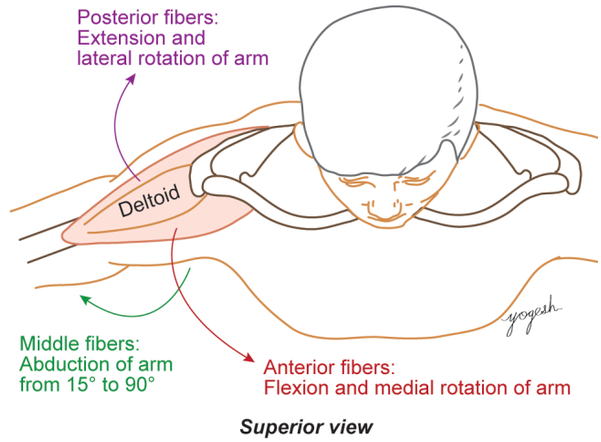


Fig. 11.4: Actions of deltoid muscle (right, superior view)

Insertion

- All the fibers converge inferiorly and insert onto V-shaped deltoid tuberosity on the lateral aspect of shaft of humerus.

Innervation

- Deltoid is supplied by axillary nerve (C5, C6).

Actions

- Deltoid performs the following actions (Fig. 11.4):*NEXT*
  1. Anterior fibers – Flexion and medial rotation of arm
  2. Middle fibers – Abduction of arm from 15° to 90°*NEXT*
  3. Posterior fibers – Extension and lateral rotation of arm.

Clinical Integration

Intramuscular injection

- Deltoid is commonly used for intramuscular injections (Fig. 11.5).
- Intramuscular injection should be given in the middle of the muscle as the upper part of the deltoid is related to the axillary nerve.*Viva, Practical guide*

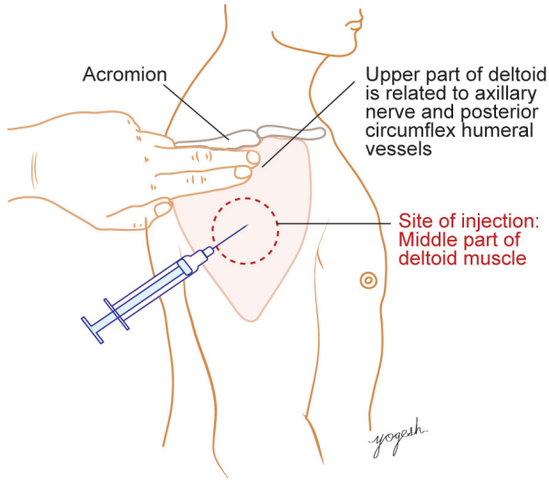


Fig. 11.5: Intramuscular injection in deltoid muscle