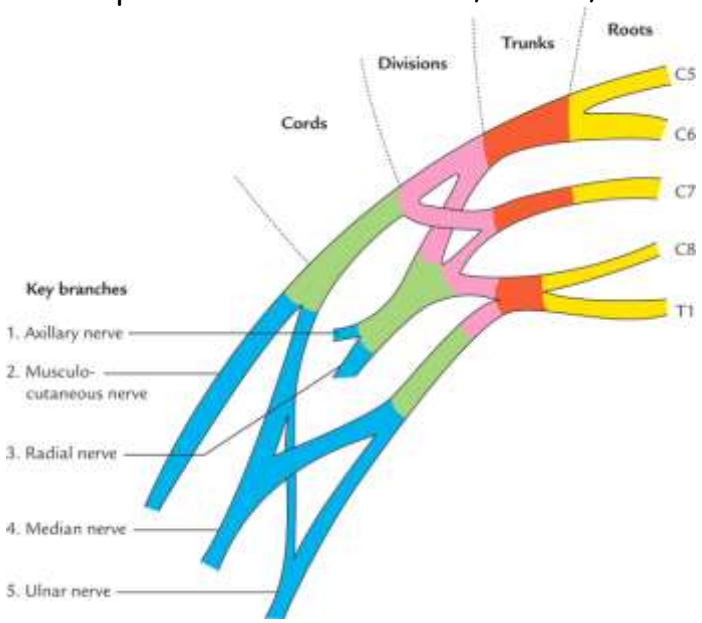
AXILLA

BRACHIAL PLEXUS (LE)

Formation:

Formed by the ventral rami of lower four cervical nerves and the first thoracic nerve (C5, C6, C7, C8, T1).

The brachial plexus consists of roots, trunks, divisions and branches.



PARTS:

Roots:

The roots are five in number. (C5-T1).

They emerge downwards and laterally between the scaleneus anterior and medius muscle.

Trunks: There are 3trunks. Upper – Middle - Lower. They appear in the posterior triangle of neck.

Upper trunk is formed by the union of C5 &C6.

Middle trunk is formed by C7

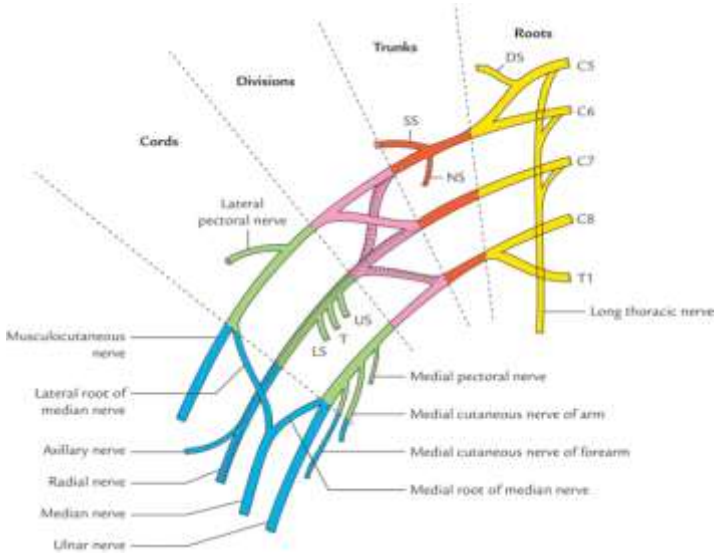
Lower trunk is formed by union on C8 & T1.

Divisions:

Each of the trunks splits into anterior and posterior divisions. Divisions unite or continue to form cords.

Cords: There are 3 cords.

Lateral cord-formed by anterior divisions of upper & middle trunks.
Medial cord-formed by anterior division of lower trunk.
Posterior cord-formed by posterior divisions of all the trunks.



Branches:

Branches of the roots:

Nerve to serratus anterior (long thoracic nerve) (C5,C6,C7)
Nerve to rhomboideus(dorsal scapular nerve) (C5).

Branches of the trunks. (Upper trunk)

suprascapular nerve (C5-C7).
nerve to subclavius (C5-C7).

Branches of the cords.

Branches of lateral cord.

Lateral pectoral(C5-C7).
Musculocutaneous(C5-C7).
Lateral root of median(C5-C7).

Branches of medial cord.

medial pectoral.(C8,T1).
medial cutaeneous nerve of arm(C8,T1).
medial cutaneous nerve of forearm(C8,T1).
ulnar (C7,C8,T1).
medial root of median(C8,T1).

Branches of posterior cord.

upper subscapular(C5,C6).

nerve to lattisimus dorsi(C6,C7,C8)

lower subscapular(C5,C6).

axillary(C5,C6).

radial(C5-C8,T1).

Applied anatomy:

Injury to the long thoracic nerve produces winging of scapula.

Injury to the axillary nerve due to fracture of the surgical neck of humerus results in inability to abduct the arm with loss of sensation over the lower part of the deltoid.

Erb's palsy: injury to the upper trunk at the Erb's point.

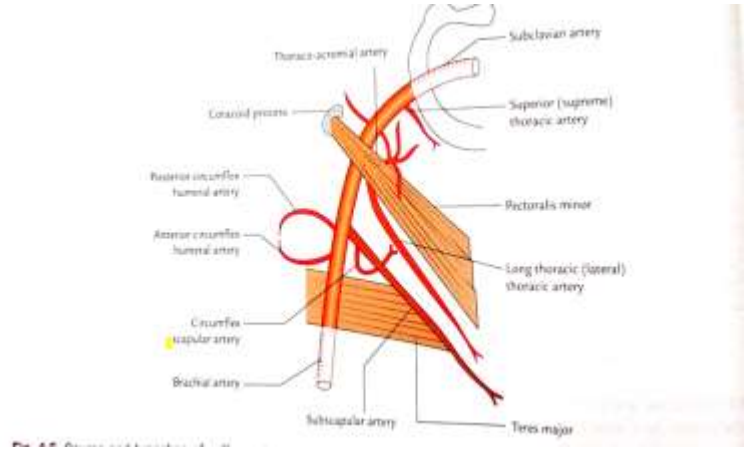
AXILLARY ARTERY (LE)

Axillary artery is the continuation of subclavian artery.

Extent

From the outer border of 1st rib to the lower border of teres major muscle.

It continues as brachial artery.



The pectoralis minor muscle crosses the artery and divides it into 3 parts-

1st part - proximal to the muscle

2nd part – deep to the muscle

3rd part – distal to the muscle

Relations

1st part

Axillary artery with the cords of brachial plexus is enclosed within the axillary sheath.

Anterior – pectoralis major , loop of communication between lateral and medial pectoral nerves.

Posterior- medial cord, long thoracic nerve, serratus anterior.

Medial- axillary vein.

Lateral- lateral and posterior cords.

2nd part

Anterior – pectoralis minor

Posterior- posterior cord , subscapularis

Medial – medial cord of brachial plexus , axillary vein

Lateral – lateral cord of brachial plexus

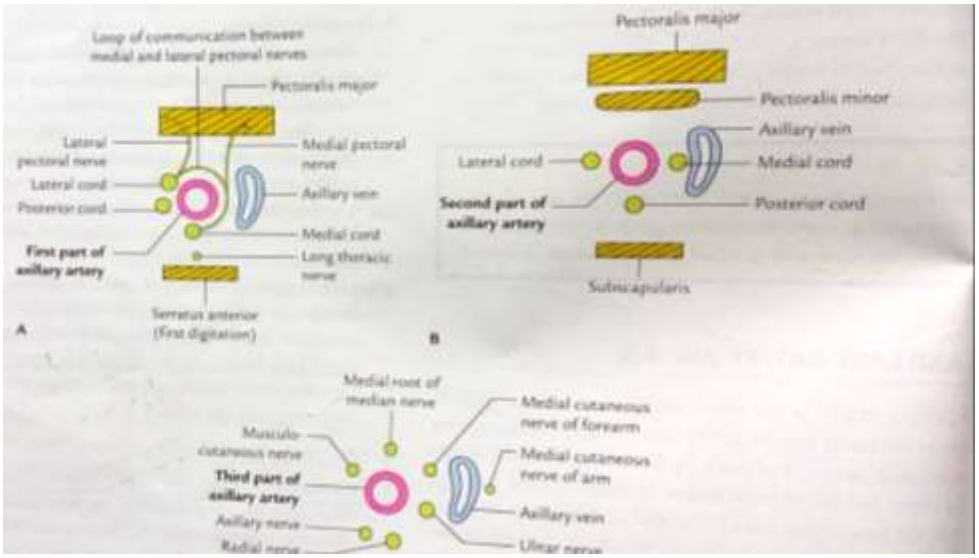
3rd part

Anterior- medial root of median nerve

Posterior – radial nerve, axillary nerve, subscapularis, teres major

Medial – axillary vein, medial cutaneous nerve of forearm, ulnar nerve

Lateral – musculocutaneous nerve.



Branches : Axillary artery gives 6 branches

From 1st part-

Superior thoracic artery-

From 2nd part

Thoracoacromial artery

Lateral thoracic artery –

In females the artery is large and gives off lateral mammary branches to the breast.

From 3rd part

Subscapular artery-

It gives off a large branch – circumflex scapular artery which takes part in the anastomosis around scapula.

Anterior circumflex humeral artery

Posterior circumflex humeral artery

Passes through the quadrangular intermuscular space.

Applied anatomy

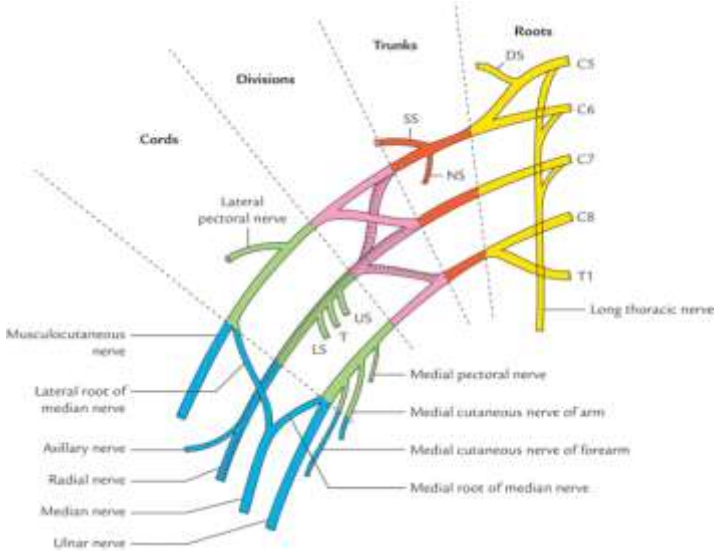
Axillary artery pulsations can be felt against the lower part of lateral wall of axilla.

The artery can be effectively compressed against the humerus to check bleeding from distal part of the limb (in injuries, operations and amputation).

When the axillary artery is blocked , scapular anastomosis serves as a potential pathway (collateral circulation) between the subclavian artery and axillary artery.

DRAW A NEAT LABELLED DIAGRAM OF FORMATION & BRANCHES OF BRACHIAL PLEXUS. (SE)

FORMATION OF BRACHIAL PLEXUS. (SE)



LATERAL CORD OF BRACHIAL PLEXUS. (SE)

Lateral cord of brachial plexus is formed by the union of anterior divisions of upper & middle trunks.

It lies lateral to the axillary artery.

Branches of lateral cord.

Lateral pectoral(C5-C7).

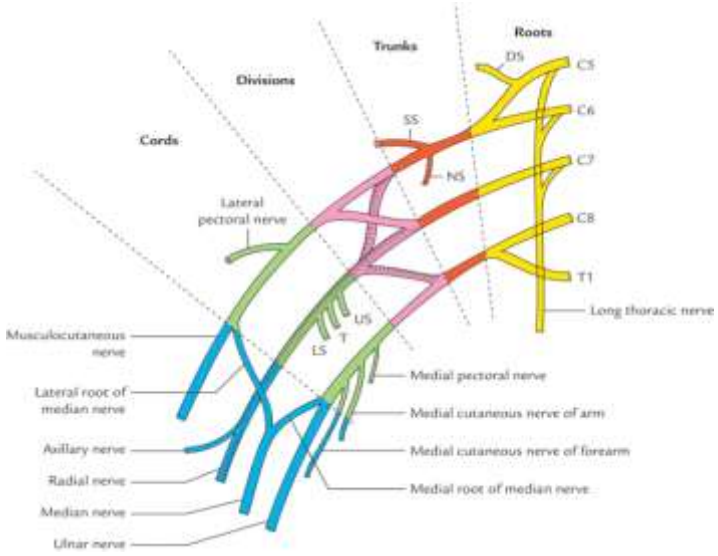
Musculocutaneous(C5-C7).

Lateral root of median(C5-C7).

Lateral pectoral nerve: It is a branch of the lateral cord,conveys the fibres from C5,C6,C7.It pierces the clavipectoral fascia & supplies the pectoralis major and minor muscles.

Musculocutaneous nerve: It is derived from the lateral cord.It pierces the coracobrachialis, & supplies it before it pierces it.

Lateral root of median nerve joins with medial root & forms the main trunk of median nerve.



AXILLARY ARTERY – EXTENT, RELATIONS AND BRANCHES (SE)

Axillary artery is the continuation of subclavian artery

It extends from the outer border of 1st rib to the lower border of teres major muscle

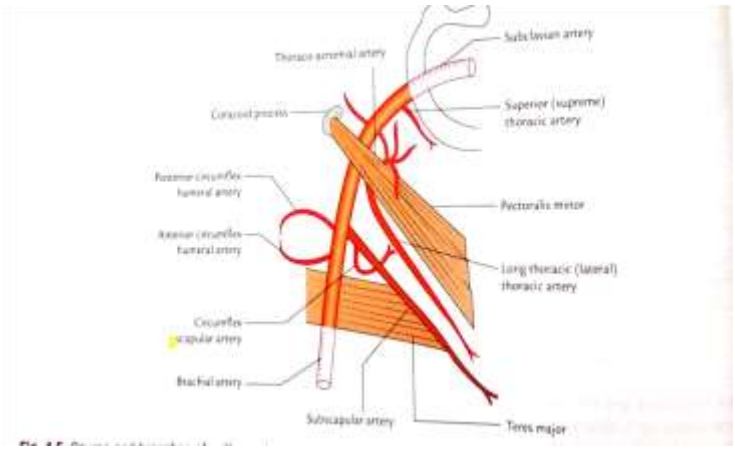
It continues as brachial artery.

The pectoralis major muscle crosses the artery and divides it into 3 parts-

1st part - proximal to the muscle

2nd part – deep to the muscle

3rd part – distal to the muscle



RELATIONS

1ST PART-

Axillary artery with the cords of brachial plexus is enclosed within the axillary sheath

Anterior – pectoralis major , loop of communication between lateral and medial pectoral nerves

Posterior- medial cord, long thoracic nerve, serratus anterior

Medial- axillary vein

Lateral- lateral and posterior cords.

2ND PART-

Anterior – pectoralis minor

Posterior- posterior cord , subscapularis

Medial – medial cord of brachial plexus , axillary vein

Lateral – lateral cord of brachial plexus

3RD PART

Anterior- medial root of median nerve

Posterior – radial nerve, axillary nerve, subscapularis, teres major

Medial – axillary vein, medial cutaneous nerve of forearm, ulnar nerve

Lateral – musculocutaneous nerve.

Branches

Axillary artery gives 6 branches

Superior thoracic artery
Thoraco-acromial artery
Lateral thoracic artery
Subscapular artery
Anterior circumflex humeral artery
posterior circumflex humeral artery

THIRD PART OF AXILLARY ARTERY(SE)

Axillary artery is divided into 3 parts by pectoralis minor muscle.

1st part - proximal to the muscle
2nd part – deep to the muscle
3rd part – distal to the muscle

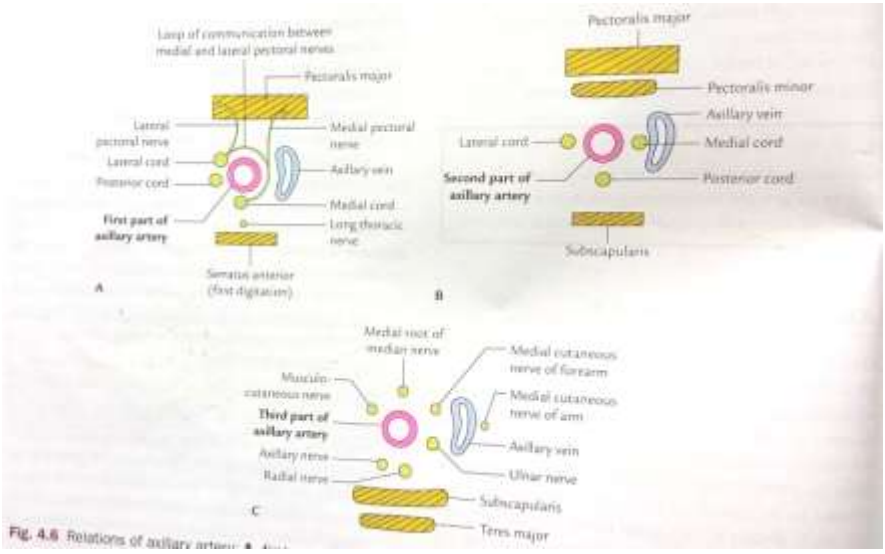


Fig. 4.6 Relations of axillary artery

Relations of 3rd part of axillary artery

Anterior- medial root of median nerve
Posterior – radial nerve, axillary nerve, subscapularis, teres major
Medial – axillary vein, medial cutaneous nerve of forearm, ulnar nerve
Lateral – musculocutaneous nerve.

3 **branches** arise from the 3rd part of axillary artery

Subscapular artery

Anterior circumflex humeral artery

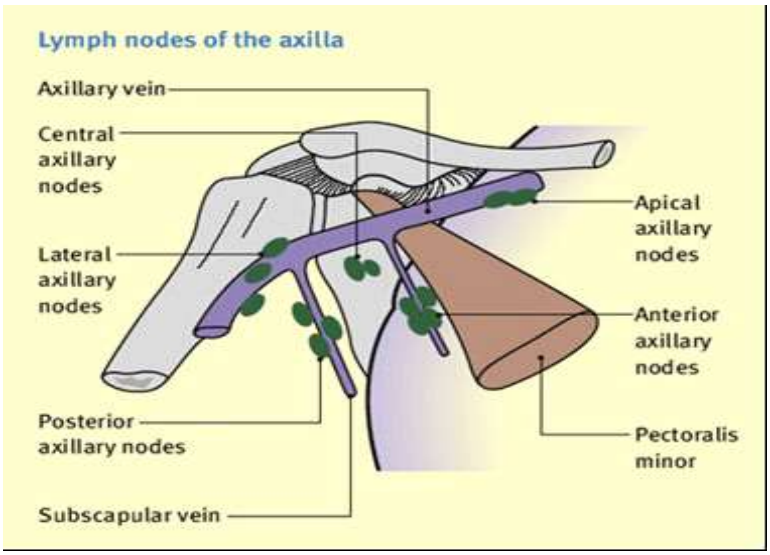
Posterior circumflex humeral artery

Arterial anastomosis around scapula is formed between the branches of 1st part of subclavian artery and 3rd part of axillary artery.

When the axillary artery is blocked, scapular anastomosis serves as a potential pathway (collateral circulation) between the subclavian artery and axillary artery.

AXILLARY LYMPH NODES(SE)

Axillary lymph nodes are scattered in the fibro fatty tissue of axilla.



They are divided into 5 groups

Anterior (pectoral) group

They lie along lateral thoracic vessels

Receive lymph from upper half of anterior wall of trunk and mammary gland.

Posterior (scapular) group

They lie along subscapular vessels

Receive lymph from upper half of posterior wall of trunk and axillary tail of mammary gland.

Lateral group

They lie along upper part of humerus, medial to axillary vein.

They receive lymph from the upper limb.

Central group

They lie in the fat of upper axilla.

They receive lymph from anterior , posterior and central groups and drain into the apical group.

Apical (infraclavicular) group

They lie along axillary vessels.

They receive lymph from central group, upper part of mammary gland and from the thumb and its web.

ERB'S POINT & ITS APPLIED ANATOMY (ERB-DUCHENNE'S PARALYSIS)(SE)

Erb's point present in one of the region of upper trunk.

Six points meet here. They are-

C5,

C6,

suprascapular nerve,

Anterior and posterior division of upper trunk.

Nerve to subclavius.

Site of injury: Erb's point. (six nerves meet here).

Causes of injury: Undue separate of the head from the shoulder caused due to

- Birth injury
- Fall on the shoulder
- During anaesthesia

Nerve roots involved: mainly C5 partly C6

Muscles paralysed:

- Biceps brachii
- Deltoid
- Brachialis
- Brachio radialis

Deformity: porters tip hand.

Disability: the following movements are lost.

Abduction and lateral rotation of the arm.

Flexion and supination of the forearm.
Biceps and supinator jerks are lost.
Sensations are lost over a small area over the lower part of the deltoid.

STRUCTURES FORMING ANTERIOR WALL OF AXILLA. (SA)

Pectoralis major in front .
Clavipectoral fascia ,Pectoralis minor.

CONTENTS OF AXILLA.(SA)

Axillary artery and its branches
Axillary vein and its tributaries
Infraclavicular part of brachial plexus
Axillary lymph nodes and its associated lymphatics
Long thoracic and intercostobrachial nerves
Axillary fat and areolar tissue

LONG THORACIC NERVE.(SA)

It is the nerve to serratus anterior.
Arises from dorsal aspects of C5,C6,&C7 roots.
The C5 & C6 roots pierce the scalenus medius and pass downwards behind the brachial plexus.
They unite and enter the apex of axilla behind the first part of axillary artery.
The nerve is closely applied to the serratus anterior,descends posterior to the midaxillary line & supplies the muscle segmentally.
Applied anatomy:
Injury to long thoracic nerve produces winging of scapula.

BRANCHES OF MEDIAL CORD OF BRACHIAL PLEXUS.(SA)

medial pectoral.(C8,T1).
medial cutaeneous nerve of arm(C8,T1).
medial cutaneous nerve of forearm(C8,T1).
ulnar (C7,C8,T1).
medial root of median(C8,T1).

BRANCHES OF POSTERIOR CORD OF BRACHIAL PLEXUS.(SA)

upper subscapular(C5,C6).
nerve to lattisimus dorsi(C6,C7,C8)
lower subscapular(C5,C6).
axillary(C5,C6).
radial(C5-C8,T1).

BRANCHES OF AXILLARY ARTERY (2ND& 3RD PART) (SA)

Thoracoacromial artery(2nd part)
Lateral thoracic artery(2nd part)
subscapular artery(3rd part)
anterior circumflex humeral artery(3rd part)
posterior circumflex humeral artery(3rd part)

ERB'S PARALYSIS.(SA)

Site of injury: Erb's point.(six nerves meet here).
Causes of injury: Undue separate on of the head from the shoulder caused due to

-birth injury
-fall on the shoulder
-during anaesthesia

Nerve roots involved: mainly C5 partly C6
Muscles paralysed:
Biceps brachii
Deltoid
Brachialis
Brachio radialis
Deformity: porters tip hand
Disability: the following movements are lost.
abduction and lateral rotation of the arm.
flexion and supination of the forearm.
biceps and supinator jerks are lost.
sensations are lost over a small area over the lower part of the deltoid.

KLUMPKE'S PARALYSIS.(SA)

Site of injury:
lower trunk of the brachial plexus.

Cause of injury:

Undue abduction of the arm,as in clutching something with the hands after a fall from height.or in birth injury.

Nerve roots involved:

Mainly T1 and partly C8.

Muscles involved:

Intrinsic muscles of hand(T1)

Ulnar flexors of the wrist and fingers.

Deformity:

claw hand.

Disability:

Hyperextension at the metacarpo-phalangeal joints & flexion at the interphalangeal joints.