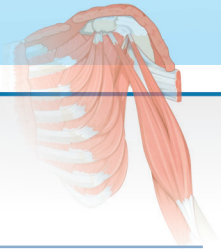
CHAPTER

1 Upper Limb



Case 1

A 44 years old woman visited the surgeon with complaint of hard, painless lump in upper outer quadrant of left breast, which she had noticed while taking bath. On inspection, surgeon found left nipple was slightly higher than the right nipple. Retraction of nipple was seen. Two small dimples were seen on outer and upper quadrant of left breast. On palpation he found left breast was immobile and axillary lymph nodes were enlarged on left side.

Questions

a. What is the probable diagnosis?

b. Why the axillary lymph nodes are enlarged in this case?

c. Why left nipple was slightly higher than right nipple?

d. Why dimples were present on left breast?

e. Why the left breast was immobile?

f. Why left nipple was retracted?

g. Which incision is preferred in case of breast abscess?

Answers

a. Breast carcinoma

b. Spread of cancer cells from the primary lesion is primarily through lymphatics. Cancer cells also spread through local infiltration and blood. Axillary group of lymph nodes usually involved in early stage of malignancy. About 75% of lymph from the breast drains into axillary group of lymph nodes, 20% drains into parasternal and 5% lymph drains into

posterior intercostals lymph nodes. That is why axillary lymph nodes are enlarged in this case.

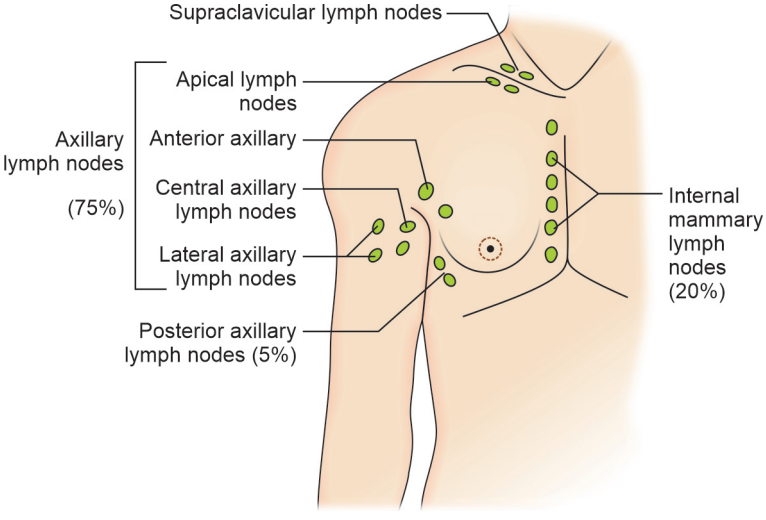


Fig. 1.1: Lymphatic drainage of breast

c. In breast parenchyma, the contracting fibrous tissue had pulled the lactiferous ducts. These ducts converge towards nipple. So, pulling of lactiferous duct leads to elevation of nipple on affected side.

d. Fibrosis of ligament of Cooper resulting in dimpling of breast.

e. Fibrosis of ligament of Cooper is responsible for fixation of the breast to the underlying deep fascia which is pectoral fascia. This leads to immobility of breast.

f. Retraction of nipple occurs because cancer cells invade the lactiferous ducts.

g. Radial incision is preferred in case of breast abscess to avoid cutting across lactiferous ducts.

Case 2

A 50-year-old woman was operated for treatment of breast carcinoma on right side. Following surgery she was unable to comb her hair from right side above the head. On examination, she was asked to push the wall with outstretched hands. Surgeon noticed the medial border of scapula was projected posteriorly.

Questions

a. What is the cause of this condition?

b. Why patient was unable to raise her arms above head?

c. Why surgeon asked the patient to push the wall?

d. What is the root value of nerve injured?

e. Which is boxer's muscle?

Answers

a. During removal of fat and lymph nodes from axilla in breast carcinoma surgery, sometimes by accident long thoracic nerve is cut. This leads to paralysis of serratus anterior muscle.

b. Serratus anterior muscle is responsible for overhead abduction at shoulder joint. In overhead abduction scapula is rotated by trapezius and serratus anterior muscle, but involvement of serratus anterior muscle is more. That is why patient is having difficulty in combing.

c. Protraction of scapula is done by serratus anterior muscle with the help of pectoralis minor. This protraction movement is required for pushing and punching movement. That is why surgeon asked the patient to push against the wall.

d. C5, C6, C7: Long thoracic nerve.

e. Serratus anterior as it helps in pushing and punching movements.

Case 3

A 30-year-old man met with an accident. He fell on his right shoulder and the right side of head. On examination, the right arm was internally rotated by his side with the forearm pronated and extended. He did not feel any sensation along the lateral side of upper arm.

Questions

a. What is the probable diagnosis?

b. What is the cause of this condition?

c. Explain the deformity in terms of nerves and muscles affected.

Answers

a. Damage to upper trunk of brachial plexus leads to Erb-Duchenne palsy or porter tip hand.

b. It is caused by injury to the upper trunk nerves (C5-C6) of brachial plexus. It can occur in both infants and adults. In infants it is caused during delivery, the most important factors are large head, shoulder dystocia or breech delivery. In these cases sometimes traction is applied for delivery. This traction can lead to upper trunk injury. In adults it is caused by traumatic downward force on upper arm and shoulder.

c. It involves C5 and C6 roots of brachial plexus. This palsy affects deltoid, biceps brachii, brachialis, infraspinatus, supraspinatus, serratus anterior, subclavius, corachobrachialis and teres minor muscles.

Nerves affected are axillary nerve, suprascapular and musculocutaneous nerve.

Case 4

A medical student came to emergency with a problem of pain in left arm, hyperextension at metacarpophalangeal joint and flexion at interphalangeal joints. He had a history of fall while rock climbing. As he started to fall, he grabbed a bush with his outstretched hand.

Questions

a. Write the type of injury. What is the cause of injury?
b. Which nerves are affected in this case?
c. What deformity occurs from this injury?

Answers

a. Klumpke's paralysis. Cause is traction on lower trunk of brachial plexus because of forcible hyperabduction of arm during fall.
b. Weakness of interossei and lumbricals supplied by T1 root via median and ulnar nerves.
c. Claw hand—in this case fingers hyperextended at metacarpophalangeal joint and hyperflexed at interphalangeal joints. Wrist joint is hyperextended due to paralysis of flexors at wrist. Horner's syndrome can also occur due to injury to T1 spinal nerve.

Case 5

While drawing a blood sample from median cubital vein, technician noticed vein was not clearly seen. So, he blindly inserts a needle. Patient experienced sharp pain which is radiating towards lateral three and half fingers. Then he withdraws the needle.

Questions

a. Which structure is affected in this case which leads to pain in lateral half?
b. Why median cubital vein is preferred for taking sample?
c. Which structures lie deep to bicipital aponeurosis?

Answers

a. Median nerve

b. Lower tendency to move when needle is inserted.
- It is superficial vein. It is easy to withdraw the blood.
- It is guarded by bicipital aponeurosis.

c. Brachial artery and median nerve

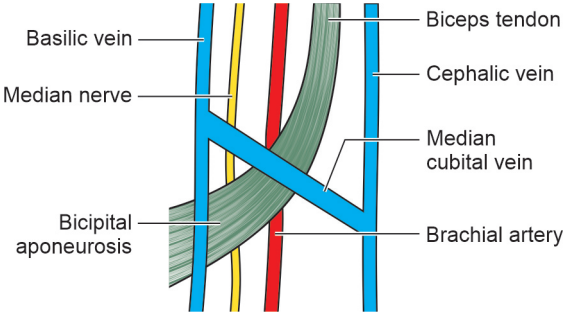


Fig. 1.2: Structures beneath bicipital aponeurosis

FAQs

1. What is bicipital aponeurosis?
2. Name the muscles supplied by median nerve.

Case 6

A 20-year-old boy met with an accident. He experienced severe pain and loss of movement at right shoulder. He was brought to the hospital. On examination, it was found that his right shoulder was flattened and head of humerus is palpable below lateral part of right clavicle.

Questions

a. What is the probable diagnosis and which nerve is affected in this injury. Which muscles are supplied by affected nerve?

b. Why right shoulder is flattened in this case?

c. Which dislocation of shoulder joint is common and why?

d. Write the peculiarity of branch to teres minor of affected nerve.

e. Write root value of affected nerve and from where it arises.

Answers

a. Anterior dislocation of shoulder joint. Axillary nerve is affected in this case. Deltoid and teres minor.

b. Because of damage to axillary nerve which supplies deltoid muscle. Deltoid muscle is responsible for maintaining shoulder contour.

c. Anterior dislocation of shoulder joint is common because capsule is weak on anteroinferior side.

d. It has pseudoganglion on it.

e. Root valve is C5, C6.
It arises from posterior cord of brachial plexus.

Case 7

A 50-year-old diabetic patient presented with pain in right shoulder. On examination, he was unable to do movements on shoulder joint. No swelling was seen. There is history of surgery in right arm 4 weeks back. After surgery immobilization of right arm was advised.

Questions

a. What is the probable diagnosis?

b. What is the cause?

Answers

a. Frozen shoulder.

b. Prolonged immobility and diabetes, these are the two factors for frozen shoulder in this case. The bones, ligaments and tendons that make up shoulder joint are encased in a capsule of connective tissue. Frozen shoulder occurs when this capsule thickens and tightens around the shoulder joint which restricts the movements.

Case 8

A 50-year-old woman presented with a complaint of numbness and heaviness on lateral side of right hand and fingers. She had a history of worsening of pain during night. On examination, impaired sensation was detected on affected area. Thenar eminence was normal.

Questions

a. What is the probable diagnosis? Give reasons in support of your diagnosis.

b. Which nerve is affected in this case?

Answers

a. Carpal tunnel syndrome. This syndrome occurs because of pressure exerted on the main trunk of median nerve. This nerve passes beneath the flexor retinaculum. In hand this nerve supplies muscles of thenar eminence, 1st two lumbricals and give digital branches. Altered sensation in fingers was felt because of involvement of digital branches. In this syndrome pain worsens during night.

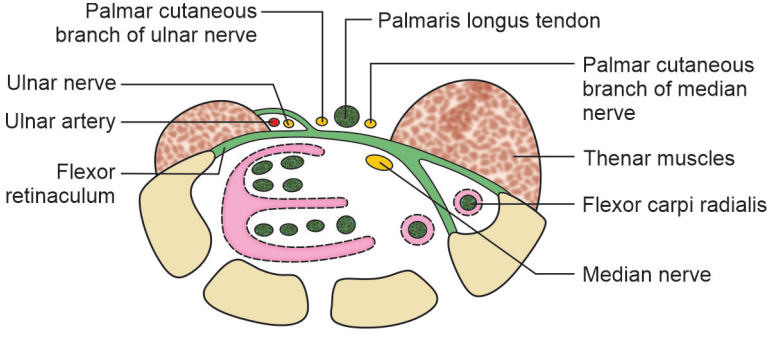


Fig. 1.3: Flexor retinaculum relations

b. Median nerve.

Case 9

Young boy had a injury with glass on his left hand. The doctor found the wound was bleeding profusely. He had sensory loss over palmar aspect of medial one and half fingers, but sensation was normal on dorsal aspect of hand. He was unable to grip a piece of paper between his left index and middle finger.

Questions

a. Which nerve and artery cut in this case?

b. Name the test which was performed in this case.

c. What is the other name of this nerve?

Answers

a. Ulnar nerve of left hand in front of flexor retinaculum.
Ulnar artery of left hand in front of flexor retinaculum.

b. Card test for testing palmar interossei.

c. Musician's nerve as it is responsible for fine movements of digits.

FAQs

1. Enumerate the muscles supplied by ulnar nerve in hand and forearm.
2. What is student's elbow?

Case 10

A 50-year-old woman was not able to extend her left elbow, left wrist and fingers. She had a history of dislocation of her left shoulder joint a few days back. Her dislocation had been reduced. After a few days of reduction she had these symptoms. There was also sensory loss on lower half of arm and back of forearm.

Questions

a. Why patient is unable to extend the elbow, wrist and fingers of her left hand?

b. What is the root value of affected nerve? From which cord of brachial plexus it arises?

Answers

a. Radial nerve injury in axilla of left side. It supplies extensor compartment of upper limb. Wrist drop occurs due to unopposed action of flexors of wrist. Wrist drop is very disabling, since one is unable to flex the fingers strongly for the purpose of firmly gripping an object when the wrist is full flexed. Brachioradialis, triceps, supinator muscles are also paralyzed. Supination is still performed as it is done by biceps brachii. There is small sensory loss because of involvement of cutaneous nerves on posterior surface of lower part of arm, down back of forearm, on dorsum of hand and on dorsal aspect of lateral three and half fingers.

b. C5, C6, C7, C8, T1

Posterior cord of brachial plexus.

FAQ

1. Which muscles are supplied by radial nerve?

Case 11

A 25-year-old man fell from his bike onto his outstretched left hand. On examination, the back of left hand with fingers and thumb fully extended. Small swelling and tenderness present in left anatomical snuffbox.

Questions

a. Write the type of injury.

b. Boundaries and contents of anatomical snuffbox.

c. Enumerate carpal bones.

Answers

a. Scaphoid fracture of left side.

b. Posteriorly—extensor pollicis longus tendon

Anteriorly—abductor pollicis longus and extensor pollicis brevis tendon

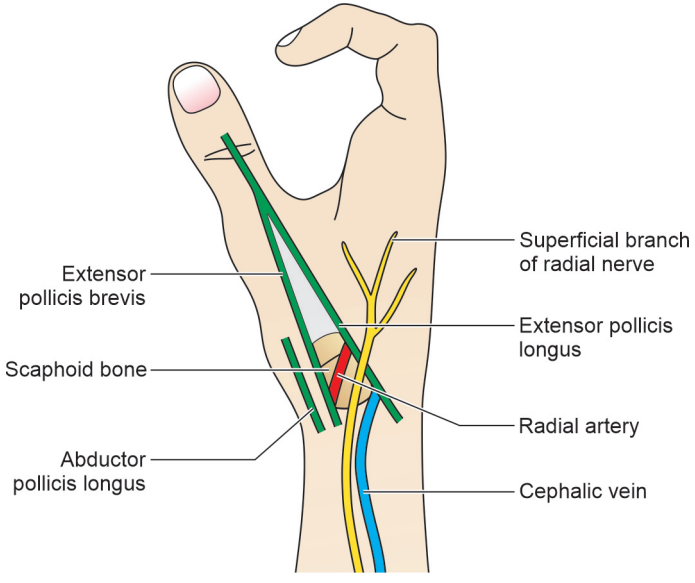


Fig. 1.4: Boundaries and contents of anatomical snuffbox

Floor—from proximal to distal side

Styloid process of radius, scaphoid, trapezium and base of 1st metacarpal.

Roof—superficial fascia which is crossed by cephalic vein and superficial branch of radial nerve.

Contents—Radial artery

c. Scaphoid, lunate, triquetral, pisiform, trapezium, trapezoid, capitate and hemate.

Case 12

A 4-year-old child presented in emergency during night with a complaint of severe pain on left thumb. He had a history of injury with needle 2 days back. On examination, left thumb was found to be swollen, red and tender. Centre of the pulp and small area of yellow devitalized skin was seen.

Questions

a. What is your diagnosis?

b. What can be the complication?

c. What is the lymphatic drainage of affected area?

d. How can it be treated?

Answers

a. Whitlow—left thumb pulp space infection.

b. Avascular necrosis—tension within the pulp space can rise which can lead to occlusion of blood supply to diaphysis of terminal phalynx. That can lead to osteomyelitis, small area of devitalised skin indicates pus accumulation within the space and appears on the surface.

c. It is drained by lymphatic vessels accompanying cephalic vein and drained into deltopectoral group of lymph nodes.

d. Abscess is drained by giving small incision on point of maximum tenderness.