

BRACHIAL PLEXUS

Spinal nerve

Plexus brachialis (C4-Th1)

- within fissura scalenorum
- Senzory innervation: skin of the upper limb
- Motor innervation: muscles of the upper extremity and some muscles of the back and thorax

Plexus brachialis (C4-Th1)

The primary bundles - trunks/*trunci*:

Truncus superior (C4) C5+6

Truncus medius C7

Truncus inferior C8+Th1

The secondary bundles - cords/*fasciculi*:

Fasciculus posterior: connection of all three posterior branches

Fasciculus lateralis: connection of anterior branches of truncus superior and medius

Fasciculus medialis: anterior branch of truncus inferior

The particular nerves arise from the cords:

FP: n. radialis, n. axillaris

FL: n. musculocutaneus + part of n. medianus

FM: n. ulnaris + part of n. medianus

Result: there are axons from more segments within the one nerve- by injury of the root, there can be paralysis of more muscle

- **scalenus syndrome** (fissura scalenorum)
- **Costoclavicular syndrome** (1. rib and clavicle)
- **Brachial Plexus Avulsion Injuries** (the nerves are actually yanked out of the spinal cord)

nervus dorsalis scapulae (C5-6)

- m. levator scapulae et mm. rhomboidei

nervus thoracicus longus (C5-7)

- m. serratus anterior

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- scapula alata

nervus subclavius C4-6

- m. subclavius

nervus suprascapularis (C4-6)

- m. supraspinatus, m. infraspinatus,
sensory innervation of articular capsule
of the shoulder joint

nervi subscapulares C5-7

- m. subscapularis, m. teres major

nervus pectoralis lateralis C5-7

- m. pectoralis major et minor

nervus pectoralis medialis C8-Th1

- m. pectoralis major et minor

nervus thoracodorsalis C6-8

- m. latissimus dorsi

Pars infraclavicularis plexus brachialis

- fasciculus lateralis
- fasciculus medialis
- fasciculus posterior

Fasciculus lateralis

n. musculocutaneus

(mixed) (C5-7)

rr. musculares (m. coracobrachialis,
m. biceps brachii, m. brachialis)

n. cutaneus antebrachii lateralis

vulnerable place - fossa cubiti

radix lateralis n. mediani

Fasciculus medialis

radix medialis n. mediani

n. cutaneus brachii medialis (C8–Th1)

- Connections with nn. intercostales II., (III.) – **nn. intercostobrachiales**

n. cutaneus antebrachii medialis (C8–Th1)

(it passes through hiatus basilicus into the subcutaneous tissue and it continues distally onto the antebrachium)

r. anterior et r. ulnaris

n. ulnaris

n. ulnaris - (mixed) (C8–Th1)

- It runs on the medial side of the arm, then within sulcus nervi ulnaris, between m. flexor carpi ulnaris and m. flexor digitorum profundus together with a. ulnaris and further toward the palm on the surface of retinaculum flexorum

- **rr. articulares**

- **rr. musculares**

- **r. dorsalis n. ulnari**

 - nn. digitales dorsales

- **r. palmaris n. ulnaris**

N. ulnaris divides within the palm into:

- **r. superficialis**

 - r. muscularis (m. palmaris brevis)

 - 2 nn. digitales palmares communes et proprii

- **r. profundus** - rr. musculares

Motor innervation: m. flexor carpi ulnaris, m. flexor digitorum profundus (for 4th and 5th finger), muscles of hypothenar, m. adductor pollicis and m. flexor pollicis brevis (caput profundum), mm. interossei, mm. lumbricales (III. and IV.)

Senzory innervation: on the palm: 5th and half of 4th finger

on dorsum: 5th, 4th and half of 3rd finger

Canalis ulnaris

**-Cubital tunelle syndrome
(lesion of n. ulnaris within
sulcus nervi ulnaris)**

Guyon´s canal

**(between os pisiforme
and hamulus ossis
hamati)**

Claw hand

n. medianus

mixed(C5–Th1) – *radix med.* (C8–Th1), *radix lat.* (C6-8)

it passes along a. brachialis, between m. pronator teres and flexor digitorum superficialis and then between the deep and superficial flexor (into the palm below retinaculum flexorum)

- rr. musculares, rr. articulares
- **n. interosseus antebrachii anterior**
- **r. palmaris**

Within the palm:

- **r. communicans cum nervo ulnari** (at the level of canalis carpi)
- **r. thenaris** (rr. musculares)
- **nn. digitales palmares comm.- nn. digitales palmares proprii**

Motor innervation: muscles of the anterior group of forearm (except m. flexor carpi ulnaris and part of m. flexor digitorum profundus), m. abductor pollicis brevis, m. opponens pollicis, m. flexor pollicis brevis (caput superficiale)

Senzory innervation: thenar part of the palm and palmar part of fingers till the borderline which lies in the middle of 4th finger

The injury of the nerve:

- suicide attempts (gashes)
- pathological changes within carpal tunnel
- gripping movement is missing

**Ape hand -
Opposition of thumb
stagnates**

Hand of benediction

(inability of opposition of thumb and flexion of 2nd and 3rd finger)

Fasciculus posterior

n. axillaris

foramen humerotricipitale

(mixed) (C5–6)

- **rr. musculares**
- **rr. articulares**
- **n. cutaneus brachii lat. sup.**

Motor innervation: m. deltoideus, m. teres minor

Senzory innervation: the area around the shoulder

The injury of the nerve (luxation, fracture of collum chirurgicum)

- supination and abduction of the arm till horizontal are missing

n. radialis

(mixed) (C5–Th1)

- **n. cutaneus brachii posterior**
- **n. cutaneus brachii lateralis inferior**
- **rr. musculares**

- **n. cutaneus antebrachii posterior**

Branching within cubital area(between m. brachialis and m. brachioradialis)

- **r. profundus** (muscles of the dorsal group of forearm)
 - n. interosseus antebrachii posterior** (sensory nerve)
- **r. superficialis** (below m. brachioradialis onto dorsum manus)
 - nn. digitales dorsales**

Motor innervation: m. triceps brachii, lateral group of forearm muscles, m. supinator, muscles of the posterior side of forearm

Sensory innervation: dorsal surface of wrist and 1st, 2nd and half of 3rd finger

The injury of the nerve: on the arm
(fractures)

- palsy of extensors of hand – it drops
in palmar direction

Canalis supinatorius

Drop wrist