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EPIDEMIOLOGY AND ANATOMY LECTURE NOTES 2013.

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BLOOD SUPPLY OF THE UPPER LIMB

1. On the right side:

Aorta-----brachiocephalic truncus-----subclavian artery ---> Axillary artery ---> Brachial artery---> radial and ulnar artery---> which form the palmer arch-----> digital arteries

NB: The brachiocephalis truncus gives branch to common carotid artery and the subclavin artery gives branch to vertebral artery

2. On the left side direct from the aorta branches off common carotid artery and subclavian artery.

2. VENOUS SYSTEM

A. Deep veins

B. Superficial veins

DEEP VENOUS BLOOD FLOW

Palmer metacarpal --->deep palmer veins---->Radial and ulnar veins-----
Brachial vein----->Axillary vein---subclavian----->brachiocephalic

SUPERFICIAL VEINS

1. BASILIC VEIN

2. CEPHALIC VEIN

Both of which drain into brachial vein -----> subclavian vein
----->brachiocephalic -----Superior vena cava

SPECIAL NERVES:

1. FACIAL NERVE

Innervates the muscles of expression and anterior 2/3 of taste and oral cavity.

Branches:

1. Greater petrosal nerve : innervates the nasal glands, palates, lacrimal glands. Supplies the stapedius, chorda tympani (submandibular gland, sublingual gland and taste of the tongue.
2. Posterior auricular nerve: muscles around the ear
3. Temporal branch of facial nerve:
4. Zygomatic branch of facial nerve
5. Marginal branch of mental nerve
6. of facial nerve
7. Cervical branch of facial nerve

2. TRIGEMINAL NERVE

A. OPHTHALMIC BRANCH comes out through superior orbital fissure.

- Frontal nerve:** Innervates the scalp, forehead, upper eye lid, conjunctiva and cornea
- Nose (including the tip of the nose)
- Frontal sinuses

B. MAXILLARY BRANCH-comes out from the skull through foramen rotundum

- Infraorbital nerve -Innervates the cheek, upper lip, upper teeth and gums.
- nasal mucosa, palate and roof of the pharynx
- the maxillary, ethmoid and sphenoid sinuses and part of the meninges

C. MANDIBULAR BRANCH

- Comes out from foramen ovale
- Innervates the lower lip, lower teeth and gums.
- chin and jaw (but not the angle of jaw which is supplied by the C2-C3)

Branches:

- i) **Lingual nerve** supplies the sensation of the anterior 2/3 of the tongue
- Inferior alveolar nerve supplies

ii) Auriculotemporal nerve=is commonly gets injured during the tempomandibular surgery leading to loss of sensation on the auricle and skin surrounding ear

iii) Buccal nerve=supplies the mucus membranes of the buccal i. e inside

iv) Mental nerve: supplies the chin and lower lip (mucus membrane) it is the branch of inferior alveolar which itself is branch of mandibular branch of trigeminal.

Specific nerve damage:

1. T4 is level of nipples
2. T10 is umbilicus
3. C4 over acromioclavicular joint
4. Diaphragmatic nerve usually irritated in peritonitis causing shoulder tip pain. Also known as phrenic nerve.
5. Claw hand is a sign of ulnar nerve damage. Usually the little finger and ring finger are affected
6. Wrist drop is a sign of radial nerve damage.
7. **Carpal tunnel syndrome** is a sign of median nerve damage and compression is at the level of the wrist. Phalen's test or tinnel test can be used to make the diagnosis of carpal tunnel syndrome.

The nerve is compressed in the carpal tunnel and treatment can be conservative or surgical (by Incision of the flexor retinaculum)
8. Foot drop can be caused by both peroneal nerve and sciatica nerve.
9. Sciatica is a term usually used to describe the lower back pain radiating all the way down the leg up to knee or below it.

ORTHOPAEDIC ANATOMY

Radial nerve→ innervates

All extensors of hand I.e. extension of wrist, fingers, elbows

Therefore radial nerve palsy causes wrist drop

Ulnar n nerve→

Innervates all intrinsic hand muscles, except the LOAF which are innervated by the median nerves.

Therefore ulnar n palsy if claw hand

Median nerve → LOAF

L- The 2 Lateral lumbricals

O- Opponens pollicis

A- Abductor pollicis brevis

F- Flexor pollicis brevis

1. Shoulder abduction:

- Deltoid
- Axillary
- C5

1. Elbow flexion:

- Biceps
- Musculocutaneous
- C5, C6

1. Elbow extension:

- Triceps
- Radial
- C7

1. Finger Extension:

- Extensor Digitorum superficialis & profundus
- Radial
- C7

1. Finger flexion:

- Flexor digitorum profundus & superficialis
- Median & Ulnar
- C8

1. Finger abduction :

- First dorsal interosseous
- Ulnar
- T1
-

1. Thumb abductor:

- Abductor Pollicis Brevis
- Median
- T1

1. Finger Adduction:

- Second Palmar interossei
- Ulnar
- T1

Shoulder Muscles:

- Pulling arm backward while the hands is on waist & move elbow backwards on resistance

Rumboid muscle

Serratus Anterior muscles:

- Imagine you are pushing the a car. In this position you are using the serratus anerior muscle

1. Supraspinatus:
 - Suprascapular nerve.
 - Lifting arms sideways between 60 and 120 degrees.

1. Infraspinatus muscle:

- With a flexed elbow, move the arm inwards

1. Long flexors of little and finger ring:
Flexion of distal IPJ is flexor digitorum Profundus 3 & 4
DIP → Profundus
PIP → Suprficialis

2. Flexor pollicis longus:
 - Flexes thumb

Hip flexion Hip Extension

L1, L2; Iliopsoas S1; Gluteus Muscle
; Sacral plexus ; Inferior gluteal nerve

Knee extension

L3, L4;
Femoral nerve
Quadriceps muscle

Dorsiflexion foot

L5;
Tibialis antetrior muscle
;Deep Peroneal

Knee Flexion:

- Hamstring muscle
- Sciatic nerve (foot drop)
- L5, S1
-

Plantar flexion of the foot:

- Gastrocnemius muscle
- Posterior tibialis
- S1

Reflexes

1. Supinator → Radial nerve , C6
2. Triceps → Radial nerve, C7, Biceps – C5 Musculocutaneous nerve
3. Finger → Median, Ulnar nerves
4. Knee → Femoral, L3, L4
5. Ankle → S1, S2

DERMATOME FOR LOWER LIMB:

L1 → Pocket

L2 → Inner thigh
L3 → Knee
L4 → Medial malleoli
L5 → Lateral Dorsum of the foot
S1 → Sole
S5 → Saddle
Upper limb
L4 Shoulder
L5 arm
6 thumb
7 Middle finger
8 Little finger

LYMPH NODES DRAINAGE

1. The cervix lymph drains into the para-aortic lymph nodes
2. Vulva lymph drains into superficial Inguinal lymph nodes ----->then into deep inguinal lymph nodes
3. Lower nodes then into deep inguinal lymph nodes
4. Body of the uterus drains into external ilia lymph nodes
5. Fundus of the uterus drains into para-aortic lymph nodes
6. Ovaries drain into para-aortic lymph nodes
7. Superior half of the rectum drains into pararectal lymph nodes --->then into inferior mesenteric lymph nodes
8. Lower half of the rectum drains into internal iliac and sacral group of LN.
9. Testes drain into paraaortic lymph nodes
10. Superficial Inguinal Lymph nodes drains from penis, scrotum, perineum, buttock, vulva and abdominal wall below the umbilicus.

11. Usually the **superficial lymph nodes** drain into **deep inguinal** then into **external iliac** and then into **para-aortic**
12. Ovaries drain into **para-aortic lymph nodes**
13. Prostate drains into **external iliac**
14. **EXTERNAL ILIAC LYMPH NODES:** drains from the glans of the penis, prostate, upper vagina, fundus of the bladder.
15. **INTERNAL ILIAC NODES:** drains from deeper perineum, urethra, buttock and back of the thigh.
16. **PARAAORTIC LYMPH NODES** drains from ovaries, testes and superior rectum
17. **SUPERFICIAL CERVICAL LYMPH NODES:** nodes: lower part of auricular and parotid region.
18. **ANTERIOR CERVICAL LYMPH NODES:** lower part of the larynx, thyroid gland and upper part of the trachea.

LYMPH NODES OF THE FACE

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SUBMENTAL LYMPH NODES: drains from the floor of the mouth, apex of the tongue and lower lip then goes to deep cervical lymph nodes..

LYMPHATIC VESSELS OF THE TONGUE

- Apical of the tongue or tip =submental
- Lateral margin of the tongue= submaxillary lymph nodes
- basal of the tongue =superior deep cervical LN

SUBMAXILARY OR SUBMANDIBULAR LYMPH NODES= nasal cavity and gums, cheek, upper lip, lateral part of the lip, medial palmar commissure, lateral part of the lower lip.

SUBMENTAL LYMPH NODES: lower lip and floor of the mouth and apex of the tongue.

BREAST: mainly drain into axillary lymph nodes

TERMINOLOGIES IN EPIDEMIOLOGY

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1. **INCIDENCE:** Is the number of new cases divided by the total population per year who are at risk of becoming a case
2. **Prevalence:** The proportion of people in a given population at a given point/time who had a disease
3. **Mode:** is the value that occurs most frequent
4. **Median :** is the middle value when the values are ranked.
5. **Sensitivity:** Is the proportion of true positives correctly identified by a test.
6. **Specificity:** Is the proportion of the true negatives correctly identified by the tests.

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