

Sheet lab 3

Page 8B ... Section1 of medulla at pyramidal {motor} decussation:

*This section is at **lower third of medulla** and is the most close part to spinal cord and it has some characteristic of spinal cord (closed medulla at motor decussation):*

1-both have central canal

2-around the central canal: gray matter

3-post to the central canal: Gracile fasciculus and cuneate fasciculus (dorsal column) {if we follow them superior they become gracile nucleus and cuneate nucleus and the gracile and cuneate tracts become smaller because the fibers in the tract enter the nucleus and synapse (2nd order neurons of dorsal column system) }

Remember at lateral corticospinal tract the fibers become less as well as we go down in the spinal cord: at cervical region (55%) at thoracic region (25%) and so on.

4-both have ventral horn of spinal cord

In this section:

We have spinal trigeminal tract and nucleus (are instead of dorsal horn of spinal cord); this nucleus is from Pons to medulla to upper part of spinal cord.

REMEMBER: trigeminal nerve has 3 sensory nuclei

1-Spinal trigeminal nucleus

2-main sensory nucleus in Pons

3-mesencephalic nucleus goes to the mid brain

the most imp thing in this section is the {MOTOR DECUSSATION}:

we have pyramid on each side and pyramidal tract inside it (corticospinal and corticobulbar) 90% of corticospinal fibers decussate forming lateral corticospinal by returning back (posterior) but 10% don't decussate forming ventral corticospinal tract

in this section we have descending and ascending pathways (we see them in the spinal cord also) : rubrospinal, lat and vent spinothalamic, dorsal and vent spinocerebellar - tracts

****J: MEDIAL LONGITUDINAL FASCICULUS**

If u want to examine lesion in the RT MLF, u should ask the patient to look to the LT side, if there is a lesion in it : RT eye doesn't move and the LT eye make abduction and nystagmus (internuclear ophthalmoplagia)

راح يجي عليه اسئلة بالامتحان و مهم للكليينكال و ما بعده فعيب تنسوا تشخيص ال MLF :P

IN THE NORMAL SECTION BELOW:

Black color: tract or pathways

Light color: nuclei (axons)

L : The pyramid is small and the decussation is large so we are at the lower third of MEDULLA

Page 8C ... Section2 of closed medulla at the level of sensory {med-lemniscus} decussation:

This section is at mid third of medulla: so Gracile and Cuneate tracts become smaller and the nuclei become larger (which are 2nd order neurons and the 1st order neurons in dorsal root ganglion)

The most imp thing in this section is the sensory decussation formed by axons of Gracile , Cuneate and Z nucleus which cross the midline forming Medial LEMNISCUS , then the internal arcuate fibers (decussate fibers) go to the thalamus (VPL,3rd order neuron) then to the somatosensory cortex .

SO: med lemniscus consists of GRACILE, CUNEATE, AND Z NUCLEUS of the OPPOSITE side.

Lesion in medial lemniscus lead to contralateral loss of position sense, vibration, stereognosis and 2 point discrimination. {EXAM QUESTION} ☺

In this section the pyramidal tract is large because pyramidal decussation doesn't happen yet at this level of medulla.

Also in this section we have: dorsal and ventral spino-cerebellar tract, ventral and lateral spino-thalamic tract.

Between the nuclei, tracts and decussation, there is Reticular formation containing the vital centers.

IN THE NORMAL SECTION BELOW:

This is section of medulla at the level of sensory decussation because the pyramid is large and the decussation is small, the tract becomes smaller and the nuclei become larger, we also see spino-trigeminal tract (we will see it until we reach the Pons).

Page 8D ... Section3 of medulla at the level of inf-olive {open medulla}:

This section is in the upper third of medulla, this is the most imp section.

No gracile or cuneate in this section, the central canal becomes the 4th ventricle (posterior to the 4th ventricle is the cerebellum)

Posterior to pyramid :inf-olive(remember: Cotrico-olivo-cerebellar tract , which consists of climbing fibers) , more posterioer: I.C.P {which connect medulla with cerebellum.}

posterior part of the section forming : floor of 4th ventricle

REMEMBER: when we study the 4th ventricle the doctor said that the roof of it is (indirectly) the cerebellum, the floor : the pons and posterior surface of upper 1/3 of medulla .

in the upper third of medulla we have Gray matter (within floor of 4th ventricle) which have nuclei of certain cranial nerves, which are from med to lat :

1-hypoglossal(#12-GSE (motor to muscles of tounge) which go to the surface between pyramid and inf-olive)

2-dorsal nucleus of vagus(#10 – parasympathetic -GVE)

3-Solitary tract and nucleus (nucleus solitarias-taste-SVA)

4-med and inf vestibular nuclei(#8-SSA)

4-accessory cuneate nucleus (cuneao-cerebellar tract which transport unconscious proprioception from the lower limb) –(don't forget : dorsal-spino-cerebellar from the upper limb)

In the reticular formation we have nucleus-ambiguus SVE (#9,10,11-cranial accessory) to supply muscles of pharynx ,larynx and palate .

Dorsal to the pyramid : med-lemniscus

*Further dorsally we see hypoglossal nucleus the **MLF(in every section in the brain stem)**.*

We also see I.C.P and medial to it spinal trigeminal tract and nucleus (in every section below the pons)

*We have a very **imp** area : postero-lat part of medulla which take blood supply directly from vertebral artery or from branch of the vertebral which is **PICA** .*

Refer to Page 8B :

Occlusion of the vertebral artery or the PICA leads to : PICA SYNDROME OR WALLEMBERG'S SYMDROME OR LATERAL MEDULLARY SYNDROME

The affected ares usually includes the following :

1-Nucleus ambiguus : loss of gag reflex , difficulty in swallowing, nasal regurgitation .

2-spinal trigeminal tract and nucleus : loss of pain and temp sensations from the ipsi-lat face

3-spinothalamic tract :loss of pain and temp over the contra-lat half of the body

4-I.C.P: cerebellar ataxia , tendency to fall toward the site of lesion

5-med and inf vestibular nucleus (Q and R in the section) : Vomiting and Vertigo (hallucination of turning or false sensation of rotation) also happen when there is lesion in the inner ear (3 semicircular canals, utricle and saccule)

6- descending sympathetic fibers from the hypothalamus to the spinal cord : Horner's syndrome (miosis ,mild ptosis , anhidrosis)

NOTE THAT PICA SYNDROME IS THE ONLY SYNDROME WHICH THE PATIENT LOSS THE PAIN AND TEMP SENSATION FROM THE CONTRALAT BODY AND IPSILAT FACE .

In the anterior part of medulla we have ant.spinal artey which supply :

1-pyramid (K IN THE SECTION) if we cut the blood supply to it : contralateral spastic hemiplegia

2- med lemniscus (L) if we cut the blood supply to it :contralateral loss of vibration ,position sense, stearognosis and 2 point discrimination

3-hypoglossal nucleus (M) if we cut the blood supply to it : ipsilateral paralysis of one have of the tongue then atrophy and fasciculation , don't forget that the tongue will site of lesion (يطلع لسانه لبرا) (go toward the)

MED MEDULLARY SYNDROME (imp) :

Hemiplegia in the body in one side and paralysis of one half of the tongue on the other side(the tongue go away from the site of hemiplegia toward the site of lesion)

But lesion in the midbrain : contralat hemiplegia of the body and the eye which is on the site of lesion goes downward and outward (because the crus have : corticospinal ,cortico bulbar tacts , near them oculomotor nerve and corticopontine) .

Alternative hemiplagia

راح يجي عنهم سؤال بالامتحان

PRACTICAL PART :

HORIZONTAL SECTION CROSS THE PONS AND CEREBELLUM :

M.C.P : forms by axons of pontine nuclei of the opposite side

Don't forget the input of **cerebro-cerebellum tract** : cortico-ponto- cerebellar tract

And the output :dentato_rubro-thalamo-cortical tract

Affect intended movement .

DONE BY : Alaa Talafha

GD LUCK 😊