

Guide information

A- Subdural hematoma

1- Anatomy

- **What is the role of the cerebral hemispheres in motor cortex and how does subdural hematoma on left side effect motor function on right side of the body?**

Frontal lobe shows precentral sulcus which is ant to central sulcus with precentral gyrus between them. Ant to it, frontal lobe shows sup & inf frontal sulci dividing it into sup, middle & inf frontal gyri. Medially the frontal lobe shows cingulate & callosal sulci with a cingulate gyrus in between.

<i>Functional area</i>	<i>site</i>	<i>function</i>	<i>lesion</i>
1ry motor area (4)	• Precentral gyrus. • Paracentral lobule	Voluntary movements of opposite side	Contralateral hemiplegia
Premotor area (6)	Anterior to 1ry motor area	Learned movements	Apraxia (loss of learned movements)
Frontal eye field area (8)	middle frontal gyrus (post)	Movement of both eyes to opposite side	Deviation of both eyes to same side
Motor speech (Broca's) area (44&45)	inferior frontal gyrus (post) of dominant hemisphere	Coordinate speech muscles	Motor aphasia (loss of speech)
Prefrontal area (9,10,11&12)	Ant ½ of frontal lobe	Personality, behavior & will	Personality changes

2- Histology

- **Discuss the effect of hematoma on nerve cells and fibers?**
(Degeneration)

A- Retrograde degeneration (Traumatic degeneration): In nerve cell and proximal part of nerve fiber

- **Chromatolysis:** disappearance of Nissl bodies with decrease in basophilia.
- Increase in volume of Perikaryon with loss of dendrites so becomes globular.
- Migration of nucleus to peripheral position.
- Disappearance of Golgi body and mitochondria.
- Fragmentation of neurofibrils.
- Lysosomes increase

B- Wallerian degeneration: in distal part of nerve fiber.

- a. Axon: neurofibrils appear beaded, then segmented, then granular and finally disappear.

- b. Myelin sheath shows widening of nodes of Ranvier. The internodal segments are termed fermentation chambers as fat split into fatty acids.
- c. Schwann cells proliferate giving rise to cellular columns that act as guide for the growing axons during regeneration

3- Physiology

➤ **Explain hyperreflexia and unsteady gait of this patient**

- **Hyperreflexia means increased or over active reflex response**
- **Causes of hyperreflexia**
 - UMN
 - TS of spinal cord in the recovery stage
 - Stress
 - Hyperthyroidism
- **The unsteady gait is due to** the spasticity of the muscles on the affected side.

B- Incomplete transection of spinal cord

1- Anatomy

○ Mention the corresponding levels between vertebrae and spinal cord?

- Cervical segments = number of vertebrae +1 (e.g.: C5 segment is at the level of C4 vertebra).
- T1-T6 segments = number of vertebrae +2.
- T7-T12 segments = number of vertebrae +3.
- Lumbar segments: level of T10 & T11 vertebrae.
- Sacral & coccygeal segments: level of T12 & L1 vertebrae.

2- Histology

○ Mention Ascending sensory tracts from body and talk briefly about the tract compressed in this case?

❖ Ascending tracts

- | | |
|---------------------------------|--------------------------------|
| 1- Gracile tract. | 3- Cuneate tract |
| 2- Lateral spinothalamic tract. | 4- Ventral spinothalamic tract |

❖ Affected tract → lateral spinothalamic tract

- **Origin** → Cells of SGR of opposite side.
- **Course** → - Crossed.
 - Lateral column of spinal cord.
 - Joins ventral spinothalamic tract at the pons to form spinal lemniscus.
- **Termination** → ventral posterolateral nucleus (V.P.L.N) of thalamus.
- **Function** → Pain, temperature from opposite side of body

3- Physiology

○ Discuss transverse sections of spinal cord?

➤ **Spinal shock**

- Def: complete loss of all reflexes below level of lesion
 - Reflexes lost are:
- 1- **Stretch reflex:** Its loss leads to
 - a- Atonia
 - b- Areflexia
 - 2- **Blood pressure:** VD ---decrease BP
 - 3- **Loss of Autonomic reflexes: Loss of**
 - a- Defecation reflex
 - b- Micturition reflex (retention with overflow): Accumulate urine in bladder till pressure in bladder overcomes tone of sphincter---dripping
 - 4- No Sweating reflex ---skin is dry
 - 5- No erection
 - **Duration of spinal shock:**
- lower animals as frogs----1-2 hours
 - dogs-----days

- in humans -----2-6 weeks
 - **Cause of spinal shock:** Sudden cut of the supra spinal facilitatory impulses from higher centers
 - Recovery of reflexes:(due to denervation hypersensitivity)
- A- Early recovery of reflexes:**
 - Immediately after the end of spinal shock (after 2-6 weeks).
 - The reflexes which return early are:
- a- Stretch reflex:**
 - First reflex to return
 - The tone in the muscles is weak
 - The tone appear in the flexor muscles at first---lead to ----- paraplegia in flexion.
- b- Planter reflex:** (NEW REFLEX APPEAR NOT PRESENT AT PAST)
 - Stimulus: scratch skin of foot
 - Response: dorsiflexion of big toe (Positive babiniski sign)
- c- Deep reflexes:**
 - First knee jerk appear----weak
 - Later Ankle jerk ----- weak
- d- Mass reflex:** (NEW ABNORMAL REFLEX APPEAR NOT PRESENT AT PAST)
 - Stimulus: scratching the skin of the
 - ✓ abdominal wall
 - ✓ lower limb
 - lead to
 - Response: - Evacuate bladder & Rectum - Increase Blood pressure
- e- Autonomic reflexes:** the patient will be shifted to the automatic bladder & automatic rectum (reflex micturition , reflex defecation)
 - there will be increase in the BP
 - there will be erection & ejaculation on manipulating the glans but not the complete act
 - the skin will be warm, ulcers heal , good color due to increased BP
 - Late recovery:
 - after 6 months
 - Marked reflex activity appear
 - The tone in the extensor muscles become greater (paraplegia in extension)
 - Mass reflexes disappear
 - FWR is accompanied by CER
- f- NEW REFLEXES APPEAR**
 - 1- positive supporting reaction
 - 2- stepping reflex
 - **NB: if the patient had: severe urinary tract infection, severe bed sores& The patient will go to stage of FAILURE OF REFLEXES where reflexes disappear and patient die.**

○ **Care of patient with complete T.S. of spinal cord:**

- The aim of the care is to pass the patient from stage of SPINAL SHOCK to RECOVERY OF REFLEXES
- Catheterization
- rectal enema
- frequent mobilization
- antibiotics