



**MED433**

# **SUMMARY FOR PATHOLOGY LECTURES WITH ADDITIONAL QUESTIONS**

PATHOLOGY TEAM  
Med 433

**Contact us:**

[Pathology433@gmail.com](mailto:Pathology433@gmail.com)

@pathology433

**Done by**

Mohammed bin askar    Afnan almutawa

Ahmad alhussin        Rheema alfadil

## LECTUER 1: Cellular injury of nervous system

- Markers of neuronal injury :-  
Red neuron/Spheroid/Chromatolysis/Pyknosis ...etc.
- Cerebral edema :
  - is an accumulation of excess fluid in the brain
  - **Two types:**
    - Vasogenic edema (Extracellularly) caused by BBB disruption.
    - Cytotoxic edema (Intracellularly) caused by hypoxia and ischaemia.
- Astrocytes are the cells which responsible in repair & scar formation (**gliosis**).
- Oligodendrocytes Exhibit a limited spectrum of specific morphologic changes (**leukoencephalopathy**) in response to various injuries.
- Ependymal cells line the ventricular system, they show morphological changes (inclusions) in response of **cytomegalovirus (CMV)**.
- Microglial nodule :  
Aggregation of microglial cells around injured tissue.
- Nuerophagia:  
Aggregation of microglial cells around protions of dying neurons.
- Periphera neuropathies:  
Either axonal injury or demyelinating.
  - Axonal neuropathies :  
The axons get injured then the myelin degenerate .
  - Segmental demyelination :  
The myelin get injured BUT the axon don't

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LECTURE 2 +3: TUMORS OF N.S

Summary for Brain's tumor		
Gliomas	Astrocytomas	<p>Fibrillary (All grades are malignant)</p> <p>1- Diffused astrocytoma (grade II) Mutation in IDH1&amp; IDH2 enzyme 2- anaplastic Astrocytomas (grade III) 3- Glioblastoma (grade IV): necrosis + vascular proliferation -primary mutation in EGFR gene - secondary mutation in p53 gene</p> <p>Pilocytic Well circumscribed cyst with projection. Rosenthal fibers &amp; hyaline bodies are present</p>
	Oligodendrogliomas	Chromosome 1p&19q deletion & fried egg appearance
	Ependymomas	Features : rosettes and canals
Meningioma	Whorled pattern and Psammoma bodies	
Medulloblastoma	Small blue cells	
Schwannoma	<p>Benign tumor affects 8th CN Mutation in NF2 gene Common site: cerebellopontine angle Can be separated from nerve trunk</p>	
Plexiform Neurofibroma	Associated with Neurofibroma type I Doesn't separated from nerve trunk	
Metastatic tumor	Unlike primary tumors: sharply demarcated masses	

Diseases	Mutation
Neurofibromas	NF1
Schwannoma	NF2
Oligodendroglioma	p1 and q19
1st glioblastoma	EGFR
2nd glioblastoma	p53
Diffused astrocytoma	IDH1 IDH2
MS	HLA-DR

## Lecture 4: Multiple sclerosis

- **Demyelinating diseases of the CNS:** Acquired conditions characterized by damage to previously normal myelin.

- **Dysmyelinating diseases of the CNS (leukodystrophy):** Inherited. Myelin is not formed properly, or has abnormal turnover kinetics

- **Multiple Sclerosis (MS):** autoimmune demyelinating disorder. affects women more than men. shows relapsing and remitting episodes.

- **Pathogenesis:** DR2 allele is the most significantly increases the risk for developing MS. It is caused by T cell-mediated delayed type hypersensitivity reaction to myelin proteins. Without the axonal loss, some injury to axons does occur.

- **Morphology:**

1- **ACTIVE PLAQUES:** evidence of ongoing myelin breakdown with abundant macrophages containing myelin debris + inflammatory cells (monocytes and lymphocytes) .

2- **INACTIVE PLAQUES:** Gliosis is prominent without inflammation.

- **Clinical features:** wide range of clinical manifestations but the most common Problems are visual, motor, and sensory problems.

- **CSF findings:** (presence of Oligoclonal Bands, ↑IgG and sometimes moderate pleocytosis).

## MCQs

1- Damage of the nerve myelin could happen in:

- A. Axonal neuropathies.
- B. Segmental demyelination.
- C. Possible in both.

2- A very thin 17 year-old male comes to you complaining of malaise, learning disabilities, pigmented skin lesions, and seizures. Upon radiology, he turned out to have multiple CNS tumors. Which syndrome is associated with that kind of behaviour?

- A. NF1
- B. NF2
- C. Malignant peripheral nerve sheath tumors

3- A cross section Area of a brain shows some white matter lesions with sharply defined borders under the microscope, these lesions are present at the level of the midbrain, what are the symptoms that have affected this patient?

- A. Loss of hearing with numbness of the right side of the face
- B. Ataxia and can disrupt conjugate eye movements
- C. Headache and dizziness

4- Most affected microorganisms in ependymal cells:

- A. Rabies viruses.
- B. Herpes viruses.
- C. Cytomegaloviruses.

5 - A 37 year-old female patient comes to the ER due to her suffering a seizure. After administering an anti-convulsant, you decided on doing an MRI. As you helped the nurses move her from the gurney onto the machine, you noticed a scar on the side of her back .when you asked her about it she said she had kidney tumor excision. The MRI showed a well-demarcated mass on

the grey-white junction with surrounding gliosis and mild edema. Which one of the following would be your diagnosis?

- A. Metastatic tumor
- B. Type II meningioma
- C. Schwannoma

6- Multiple Sclerosis is considered as:-

- A. Grey Matter Disease
- B. White Matter Disease
- C. Both A&B

7- Patient came to ER after road traffic accident, he has trauma in his head. MRI shows movement of one cerebral hemisphere while the other is stable. Mostly he will have:

- A. Diffuse axonal injury.
- B. Cerebral edema.
- C. Intracellular inclusion.

8 - 70 years old female, discovered that she has Alzheimer disease. The most prominent feature will found under microscope is:

- A. Intracellular inclusion.
- B. Dystrophic neuritis.
- C. Pyknosis

9- Which one of these Alleles is the most one that increases the risk for developing MS?

- A. HLA DR4 Allele
- B. HLA-DR6 Allele
- C. HLA-DR2 Allele

10- The cell which is responsible for gliosis is:

- A. Tumor cells.
- B. Astrocyte.
- C. Oligodendrocyte.

11 - MS is considered as:

- A. Demyelinating Disease + CNS Myelin Disease
- B. Dysmyelinating Disease + Peripheral Myelin Disease
- C. Leukodystrophy Disease + CNS Myelin Disease

12 - Brain section under microscopic shows 'neuronal cell body enlargement, peripheral nuclear displacement, Enlargement of the nucleolus and Nissl body dispersion' this means:

- A. Red nucleus.
- B. Axonal injury.
- C. Cerebral edema.

13 - What do we call the Reaction of MS that was caused by this type of immune cells?

- A. Type-I Hypersensitivity Reaction
- B. Type-II Hypersensitivity Reaction
- C. Type-IV Hypersensitivity Reaction

14 - What type of Cells can generate the CNS Myelin?

- A. Organ of Corti
- B. Schwann Cells
- C. Oligodendrocyte

15 - A cross section Area of a spinal Cord shows multiple, well-circumscribed, slightly depressed, glassy, grey-tan, irregularly shaped lesions, what do expect to see at the microscopic level?

- A. "Antoni A" pattern
- B. "Antoni B" pattern
- C. plaques

16 - One of the commonest site for metastatic tumors to CNS:

- A. Liver
- B. Skin
- C. Bone

17 - What is the most prominent morphological feature (Grossly Appearance) for a brain that is affected with MS Disease?

- A. Liquefactive necrosis
- B. A small mass arise from the 4th ventricle
- C. Plaques

18 - Patient came to ER after getting hypoxic for 12 hours. Neuronal cells and neuroglia cells under microscope shown increase in intracellular inclusion. This detects:

- A. Cytotoxic cerebral edema.
- B. Vasogenic cerebral edema.
- C. Red nucleus.

19 - During rounds, you have been chosen to describe the tumor seen in the patient in front of you. He was a 13 year-old boy complaining of loss of balance, How would you most likely describe the tumor without the biopsy results?

- A. it has whorled pattern with psammoma body
- B. it was an extremely cellular tumor with small blue cells
- C. it has focal hemorrhage with calcification

20 - Type of brain necrosis:

- A. Coagulative necrosis.
- B. Liquefactive necrosis.
- C. Fibrinoid necrosis.

21 - The tumor with positive GFAP and found in cerebellum is:

- A. Oligodendroglioma.
- B. Pilocytic astrocytoma.
- C. Ependymoma.

22 - In chronic gliosis you will see:

- A. Fibrillary astrocytes.
- B. Rosenthal fibers.
- C. Both.

23 - Diffused astrocytoma caused by acquired mutation in:

- A. IDH1
- B. EGFR
- C. NF2

24 - Pyknosis means:

- A. Prominent nucleus.
- B. Condensation chromatin.
- C. Pleomorphism.

25 - Neurofibromas associated with:

- A. NF1
- B. NF2
- C. IDH1

26 - Which tumor has cerebellum as the common site:

- A. Schwannoma.
- B. Medulloblastoma.
- C. Ependymoma.

27 - Whorled pattern in growth and psammoma bodies found in which tumor:

- A. Schwannoma.
- B. Meningioma.
- C. Medulloblastoma.

28 - A 55 year-old male patient comes to you complaining of sudden vision loss for 20 min then it is recovering and sometimes he has speech disturbance, he said that he woke up this morning and couldn't see anything. His history indicated that two years ago, he started having seizures and a headache. Which diagnostic tool should be used

- A. MRI
- B. oligoclonal band
- C. sample

29- The most significance marker detects in CSF in MS is presence of:

- A. Oligoclonal Bands
- B. IgA
- C. IgE

30- neurophagia is seen in:

- A. Viral encephalitis
- B. Cytomegalovirus
- C. Intoxication

31-faint patient came to ER after 12 hours hypoxia , we found there is increase in intracellular fluids this indicates :

- A. Ependymoma
- B. Vasogenic cerebral edema
- C. Cytotoxic cerebral edema

32- one of the changes when axonal injury occurs:

- A. Cell body shrinkage
- B. Processes thickening
- C. Nissil body dispersion

33 -old patient diagnosed with alzheimer disease , the prominent change:

- A. Dystrophic nuetrite
- B. Intracellular inclusions
- C. Diffuse axonal injury