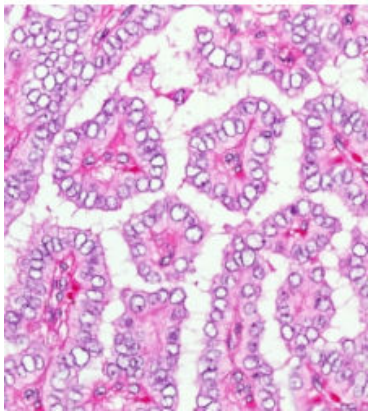
PrepLadder

Last 5 year PYQs in pathology for NEET PG

Q1. A patient presents with midline swelling in the neck. A biopsy revealing Orphan Annie's eye nuclei is shown in the image below. What is the diagnosis?

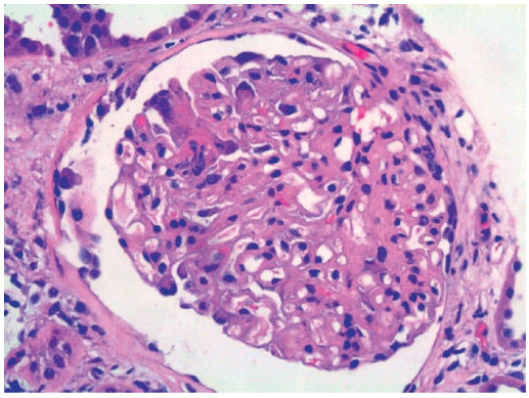


1. Follicular carcinoma
2. Papillary carcinoma
3. Toxic nodular goitre
4. Medullary carcinoma

Ans. 2) Papillary carcinoma

- Papillary carcinoma is a type of thyroid cancer that is characterized by the presence of specific nuclear features, including 'Orphan Annie's eye nuclei'.
- This term refers to nuclei that are enlarged, irregularly shaped, and optically clear, giving them the appearance of an 'Orphan Annie's eye'.

Q2. A 51-year-old male patient came with complaints of hematuria to the clinic. On examination, he was normotensive and had pedal edema. Investigations revealed the patient had no glycosuria and had a creatinine of 9. His renal biopsy is shown below. Which of the following investigations should be done to identify the disease?



1. ANA
2. Anti-GBM antibodies
3. HIV RNA
4. Urine immunoelectrophoresis

Ans. 2) Anti-GBM antibodies

- Crescents on renal biopsy indicate glomerular involvement and suggest the possibility of rapidly progressive glomerulonephritis (RPGN).
- The most relevant test to perform is the detection of anti-glomerular basement membrane (anti-GBM) antibodies.
- Anti-glomerular basement membrane antibodies are specific markers for Goodpasture syndrome, a rare autoimmune disease characterized by the presence of autoantibodies targeting the glomerular basement membrane and lung alveolar basement membrane.

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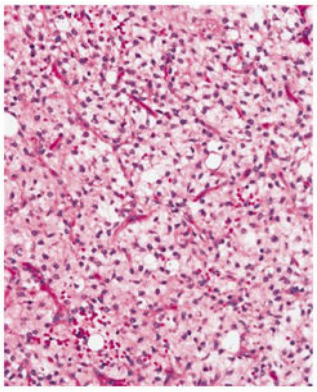
Q3. A 50-year-old man presented with a retroperitoneal mass. A biopsy of the lesion is shown in the image below. Molecular analysis revealed t(12;16). What is the most likely condition?



1. Myxoid liposarcoma
2. Lipoma
3. Spindle lipoma
4. Polymorphic lipoma

Ans. 1) Myxoid liposarcoma

- Myxoid liposarcoma is a type of soft tissue sarcoma that commonly presents as a retroperitoneal mass.
- It is characterized by a specific chromosomal translocation involving the t(12;16) rearrangement, resulting in the fusion of the genes DDIT3 and FUS.

Q4. Large, friable, irregular vegetation on heart valves is seen in which condition?

1. Infective endocarditis
2. Rheumatic heart disease
3. Libman-Sacks endocarditis
4. Non-bacterial thrombotic carditis

Ans. 1) Infective endocarditis

- Infective endocarditis is an infection of the endocardium, typically involving heart valves.
- It is characterized by the formation of vegetations, which are friable, irregular growths composed of fibrin, platelets, and bacteria.
- These vegetations can be large in size and have a tendency to embolize, leading to systemic complications.

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Q5. A 23-year-old male patient presented with a history of fatigue and tiredness. On investigation, he was found to have Hb = 9 g/dl and MCV = 101 FL. A peripheral smear examination showed macrocytic RBC and hypersegmented neutrophils. Which of the following is the most likely etiology?

1. Lead poisoning
2. Iron deficiency anemia
3. Hemolytic anemia
4. Chronic alcoholism

Ans. 4) Chronic alcoholism

- Chronic alcoholism is associated with several hematological abnormalities, including macrocytic anemia.
- The most common cause of macrocytic anemia in chronic alcoholism is folate deficiency.
- Alcohol interferes with folate absorption and utilization, leading to reduced folate levels and impaired DNA synthesis.
- This results in the production of macrocytes and hypersegmented neutrophils.

Q6. A 70-year-old patient presented with cough, fatigue, and weight loss. He was diagnosed with squamous cell carcinoma on bronchoscopy. The resected specimen had a hilar lymph node that was 1 cm in size and showed a black pigment. What is the black pigment likely to be?

1. Anthracotic pigment
2. Melanin
3. Lipochrome
4. Hemosiderin

Ans. 1) Anthracotic pigment

- Anthracotic pigment, also known as carbon pigment, is a type of black pigment that is commonly seen in individuals exposed to environmental pollutants, particularly inhaled particles of carbonaceous material such as soot or coal dust.
- The pigment accumulates in the lungs and can be transported to the regional lymph nodes, including the hilar lymph nodes.
- It is typically asymptomatic but can be observed on pathological examination.

Q7. A 30-year-old male has been complaining of fatigue for the past year. The examination revealed massive splenomegaly. His blood workup shows the presence of anemia, TLC 1,50,000/microL, and PBS shows 60% neutrophils, 6% basophils, 4% eosinophils, myeloblasts, myelocytes, and metamyelocytes. The myeloid-to-erythroid ratio was 18:1. Which of the following is the most sensitive investigation in this case?

1. Immunophenotyping
2. LAP score
3. FISH and PCR
4. Flow cytometry

Ans. 3) FISH and PCR

- The patient's presentation with fatigue, massive splenomegaly, anemia, leukocytosis with increased myeloid cells, and an elevated myeloid-to-erythroid ratio is suggestive of a myeloproliferative disorder.
- FISH (fluorescence in situ hybridization) and PCR (polymerase chain reaction) are molecular techniques used to detect specific chromosomal abnormalities, such as the Philadelphia chromosome [t(9;22)], which is characteristic of CML. These tests can provide definitive evidence for the presence of the BCR-ABL1 fusion gene, confirming the diagnosis of CML.

Q8. A girl presents with short stature, a webbed neck, thick calves, a shield-shaped chest, swelling of the ankle, and an increased carrying angle. What is the likely diagnosis?

1. Turner syndrome
2. Down syndrome
3. Patau syndrome
4. Edward syndrome

Ans. 1) Turner syndrome

Turner syndrome, also known as monosomy X, is a genetic disorder that affects females.

- It occurs when one of the two X chromosomes is partially or completely missing.
- The characteristic features of Turner syndrome include short stature, a webbed neck, thick calves, a shield-shaped chest, swelling of the ankle, and an increased carrying angle.

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Q9. A patient with occupational exposure to benzene presents with repeated infections, easy fatigability, weight loss, and an evening rise in temperature. This occupational exposure will predispose him to which of the following cancers?

1. Leukemia
2. Lung cancer
3. Bladder cancer
4. Skin cancer

Ans. 1) Leukemia

- Benzene is a known occupational carcinogen that can increase the risk of developing various types of cancer, with leukemia being the most strongly associated.
- Repeated exposure to benzene can lead to the development of hematopoietic malignancies, particularly acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL).

Q10. In iron deficiency anemia, all of the following are increased, except:

1. Transferrin saturation
2. RBC protoprophyrin
3. Total iron binding capacity
4. Ferritin soluble receptors

Ans. 1) Transferrin saturation

Iron Deficiency Anemia	
Serum iron	↓
Total iron binding capacity	↑
Transferrin saturation	↓
Serum ferritin	↓
Soluble transferrin receptor	↑
Serum RBC protoporphyrin	↑

Q11. Choose the correct statement regarding the telomerase theory of ageing:

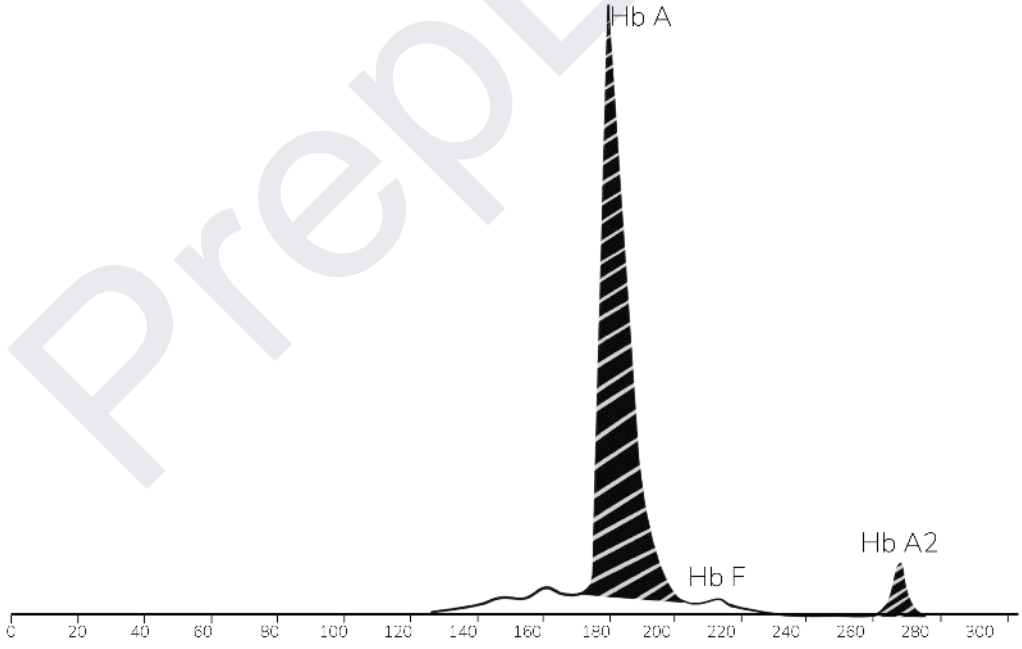
1. Telomere stability is associated with ageing
2. Abnormal telomerase activation is associated with ageing
3. Decreased telomere length is associated with ageing
4. Increased telomere length is associated with ageing

Ans. 3) Decreased telomere length is associated with ageing

Telomerase theory of ageing: Cellular ageing and the emergence of age-related disorders are linked to the steady shortening of telomeres.

- The telomerase enzyme may prolong telomeres, but as people age, its activity decreases.
- Telomeres can no longer shield the chromosome from harm as they get shorter and reach a critical length, which causes cell death.
- Telomere length loss is linked to aging and diseases of the elderly.

Q12. A child presents with recurrent chest infections and abdominal pain. There is a history of delayed growth and bone problems causing facial changes. On examination, he had icterus and mild splenomegaly. Electrophoresis is given below. What is the likely diagnosis?



1. Beta thalassemia

2. HbC disease
3. Sickle cell disease
4. Acute coronary disease

Ans. 1) Beta thalassemia

- The patient's presentation with recurrent chest infections, abdominal pain, and a history of delayed growth and bone problems with icterus and mild splenomegaly on examination and the electrophoresis results suggest beta thalassemia.

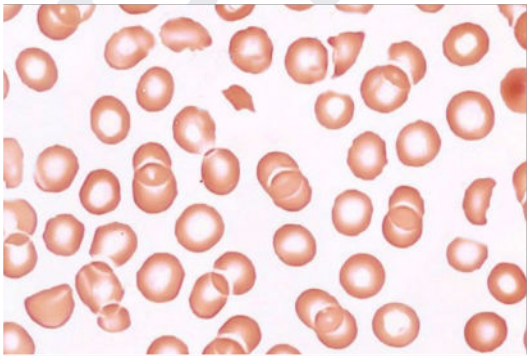
Q13. Why do neoplastic cells utilise Warburg metabolism?

1. It decreases glucose utilisation by neoplastic cells
2. It forms metabolic intermediates which are needed for cell growth and multiplication
3. It provides more energy in the form of increased ATP production
4. In prevents apoptosis and makes the cancer immortal

Ans. 2) It forms metabolic intermediates which are needed for cell growth and multiplication

- Neoplastic cells utilise a metabolic pathway known as the Warburg effect, which involves the conversion of glucose to lactate even in the presence of sufficient oxygen, resulting in lower ATP production than in normal cells.
- This phenomenon is also known as aerobic glycolysis.
- Neoplastic cells use this pathway as it generates metabolic intermediates such as pyruvate and lactate, which are required for the biosynthesis of nucleotides, amino acids, and lipids, which are essential for cell growth and division.

Q14. An elderly patient presents with anemia and hemoglobinuria. Investigations reveal increased bilirubin and lactate dehydrogenase. The peripheral smear image is given below. Which of the following is associated with this?



1. Splenomegaly

2. Mechanical second heart valve
3. Increased HbA2
4. Goitre

Ans. 2) Mechanical second heart valve

- The patient's presentation with anemia, hemoglobinuria, and increased bilirubin and lactate dehydrogenase with schistocytes on a peripheral smear suggests microangiopathic hemolytic anemia or prosthetic cardiac valve.

Q15. All of the following statements are true regarding neutrophil extracellular trapping (NET), except?

1. It is detected in blood during sepsis
2. It is produced in response to bacterial infection
3. Mitochondrial DNA is seen
4. It is chromatin with antibacterial enzymes

Ans. 3) Mitochondrial DNA is seen

- Activated neutrophils create neutrophil extracellular trapping (NET), which are web-like structures made of chromatin and antimicrobial enzymes in response to bacterial, viral, and fungal infections.
- These structures support host defences by trapping and eliminating germs.
- In NET, mitochondrial DNA is rarely found.

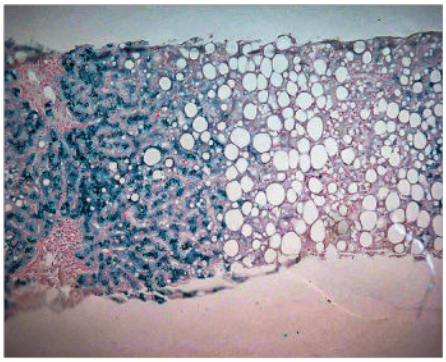
Q16. All of the following are features of fragile X syndrome, except:

1. Trinucleotide mutation in FMR-1 gene
2. Mental retardation
3. Microorchidism
4. Large everted ears

Ans. 3) Microorchidism

- Fragile X syndrome is not associated with microorchidism.
- However, it is associated with macroorchidism.
- Macroorchidism becomes more evident during puberty and is a characteristic finding in males with fragile X syndrome.

Q17. A 55-year-old man is found to have hepatomegaly on physical examination. He also complains of a dark tan despite avoiding sun exposure. His liver microscopy is given on the slide below. This patient most likely suffers from which condition?



1. Wilson's disease
2. Autoimmune hepatitis
3. Alpha-1 antitrypsin deficiency
4. Hemochromatosis

Ans. 4) Hemochromatosis

- Hemochromatosis is a genetic disorder characterized by excessive iron absorption and accumulation in various organs, including the liver.
- Hepatomegaly is a common finding in hemochromatosis due to iron deposition in hepatocytes.
- The liver microscopy image showing hepatocellular iron staining supports the diagnosis of hemochromatosis in this patient.
- Darkening of the skin, known as bronze diabetes or dark tan, is another characteristic feature of hemochromatosis resulting from iron deposition in the skin.

Q18. Punched-out ulcers in the esophagus are caused by which of the following?

1. Herpes simplex virus
2. Cytomegalovirus
3. Candida
4. Gastric acid

Ans. 1) Herpes simplex virus

- Punched-out ulcers in the esophagus can be caused by a herpes simplex virus (HSV) infection.
- HSV esophagitis typically presents with shallow, well-demarcated ulcers with a punched-out appearance.
- The infection is commonly seen in immunocompromised individuals, such as those with HIV/AIDS or undergoing immunosuppressive therapy.