Pathology
3rd Year
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Roll No 3
Cell

SGD-

Topic. Necrosis

1- A 35 years old asymptomatic man showed a 3 cm nodule in the apical portion of right lung. The nodule was excised and sectioning showed a well circumscribed nodule with soft, white cheesy centre.

Culture of the tissue from the nodule grew mycobacterium tuberculosis.

a- Which pathological process has occurred in this tissue
b- Give two characteristic feature of this kind of lesion.
c- What other sites can be involved by this lesion?
d- What are the other similar kinds of lesions with one example each?

KEY:

a- Caseous necrosis

b- Granuloma formation and caseous necrosis

c- Lymph node and skin, brain, liver kidney epidydmus. most common

Fat necrosis	pancreas and breast
Coagulative necrosis	heart and kidney
Dry gangrenous	diabetic foot
Wet Gangrene	superimposed bacterial infection and intestines
Fibrinoid necrosis	blood vessels with vasculitis.

2- A 65 years old woman suddenly lost consciousness, on awakening 1 hour later, she could not speak or move her right leg and arm. A CT scan was done and it showed a cystic area in the left parietal lobe. The brain tissue has been changed into a viscus mass.

a- What pathological process has occurred in this patient?

b- What are the most important causative agents?

c- Give sites where this kind of lesion can occur.

KEY:

a- Liquefactive necrosis

b- Fungal infection and bacterial infection

c- Pus formation, abscess.

3- A A 50 year old man suddenly experienced severe chest pain radiating to left jaw and arm. His cardiac enzymes were raised. After 4 hours of severe chest pain and agony he died. On autopsy the heart was examined carefully and it was found that death of myocytes occurred.

a- What is the pathological process that caused death of the myocytes and the patient?

b- Why this peculiar kind of lesion occurs in heart?

c- What other organs can be involved by this lesion?

d- What are the characteristic microscopic features which make this lesion very peculiar?

KEY

a- Coagulative necrosis

b- Because heart is supplied by single artery

c- Spleen, kidney

d- Cell membranes are intact, nuclei are lost. Protein coagulates and there is no enzymatic reaction.

4- A 60 years old diabetic female is having numbness of toes of her feet. She has a history of diabetes for the last 20 years. One day she woke up and found her toes black colored and there were no sensations. The doctor suggested to amputate her toes.

a- What is the most likely diagnosis?

b- What is the most likely cause for this kind of lesion in this patient?

c- What will happen if doesn't care for her toes anymore?

d- What is the effect of bacterial infection in this particular case?

e- What are other sites of this kind of lesion?

KEY

a- Dry Gangrene

b- Ischemia and diabetes

c- Superimposed bacterial infection

d- Conversion to wet gangrene

e- Intestines

6- A 38 years old female presented with multiple purpuric skin lesions. Biopsy shows vasculitis.

a- What kind of lesion do you expect in this patient?

b- What is the morphological feature of this lesion?

c- What is the pathogenesis?

d- What are other conditions where this can occur?

KEY.

a- Fibrinoid necrosis

b- Fibrin leakage and pink vessel wall

c- Antigen and antibody complex deposition, Fibrin leakage.

d- Serum sickness, arthus reaction, post streptococcal glomerulonephritis, polyarteritis nodosa. Wegner's granulomatosis.

5- A 25 year old female is breast feeding her2 year old boy. She gave history of blow to her breast by head of the baby. After 15 days she developed a mass. Biopsy was done and it showed sheets of fat cells surrounded by macrophages.

a- What is the most likely lesion?

b- What is the other site where this lesion can also occur?

c- What are the other morphological changes which can happen if left untreated?

d- Can this kind of lesion occur in a patient who receives blow in epigastrium.

KEY

a- Fat necrosis

b- Pancreas, omentum

c- Calcium deposition, saponification

d- Yes, because of pancreas.

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Apoptosis

1- A patient developed leiomyoma, smooth muscle neoplasm; the nuclei are hyperchromatic and bizzare. Some cells are dying and some are being formed.
   a- What is the mechanism of death in cancer cells?
   b- What happens to nuclei, if the process of cell death occurs?
   c- How does this differ from other type of cell death?
   d- What is fragmentation of nucleus called?
   e- What is fading away of nucleus.
   f- In cell injury, why the cytoplasm is glassy.

KEY

a- Apoptosis
b- Pyknosis
c- No inflammation, programmed, physiological and pathological, enzymes are activated.
d- Karryorrexis
e- Karryolysis
f- As glycogen is depleted.

2- A child is born with syndactyly (fusion of the finger webs).

a) What went wrong during embryogenesis that lead to this condition?

b) What are the enzymes that initiate apoptosis?

c) How do these caspases function?

d) What are the pathways that activate caspases?

e) Give examples of physiologic and pathologic apoptosis.

Key:

a) apoptosis

b) caspases

c) apoptosis is mediated by caspases by activating proteases and endonucleases. Proteases break down the cytoskeleton and endonucleases break down DNA.

d) caspases are activated by multiple pathways.

1. Intrinsic mitochondrial pathway
2. Extrinsic receptor ligand pathway.
3. Cytotoxic CD8 positive T-cell mediated pathway.

e) Physiologic apoptosis:

Endometrial shedding during menstrual cycle, removal of cells during embryogenesis

Pathologic apoptosis:

CD 8 positive T cell mediated killing of virally infected cells.