



Necrosis

□ Necrosis

Necrosis: is the morphological changes that follow cell death in the living tissue or organ.

▪ Causes of Necrosis

- ✓ Anoxia
- ✓ Ischemia
- ✓ Physical agents
- ✓ Chemical agents
- ✓ Biological agents
- ✓

□ Pathogenesis

Necrotic changes in the tissues are caused by:

- **Digestion of the cell by enzymes**

Autolysis: digestion of the cell by enzymes derived from their own lysosomes.

Heterolysis: digestion of the cell by enzymes derived from the lysosomes of leukocytes.

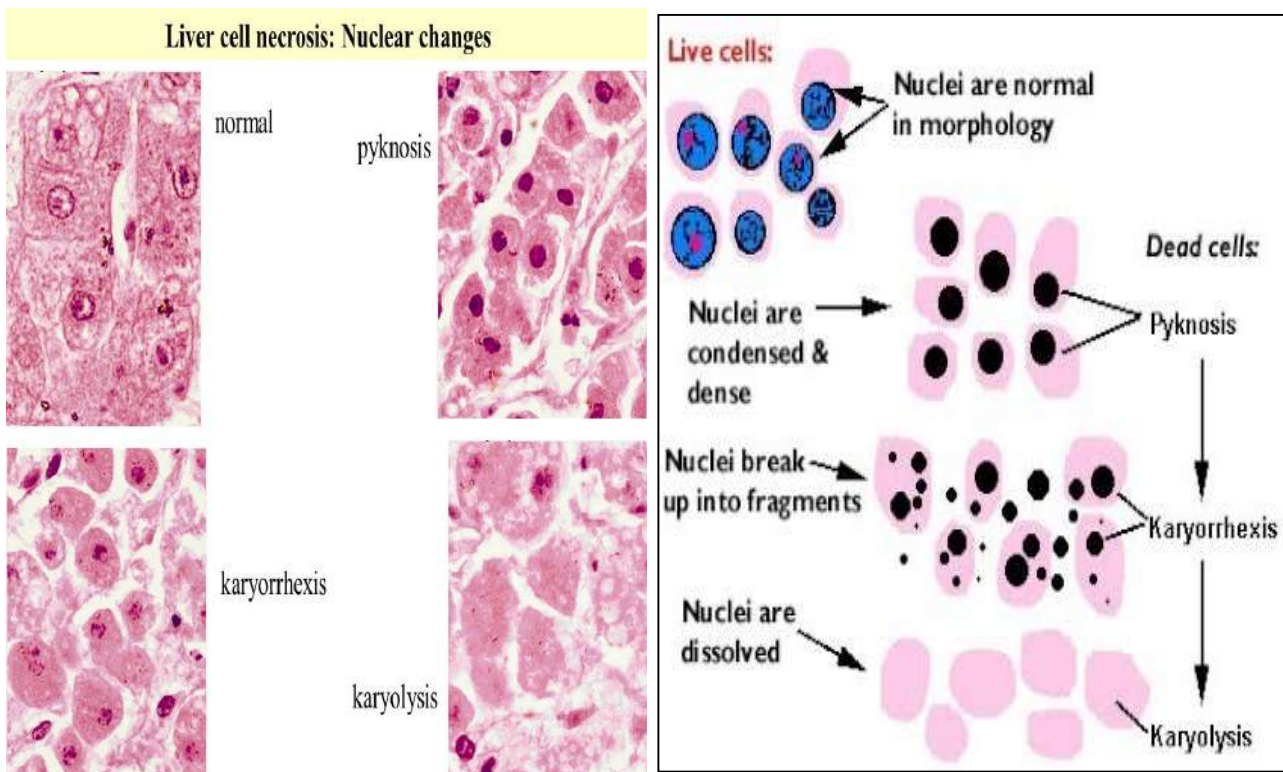
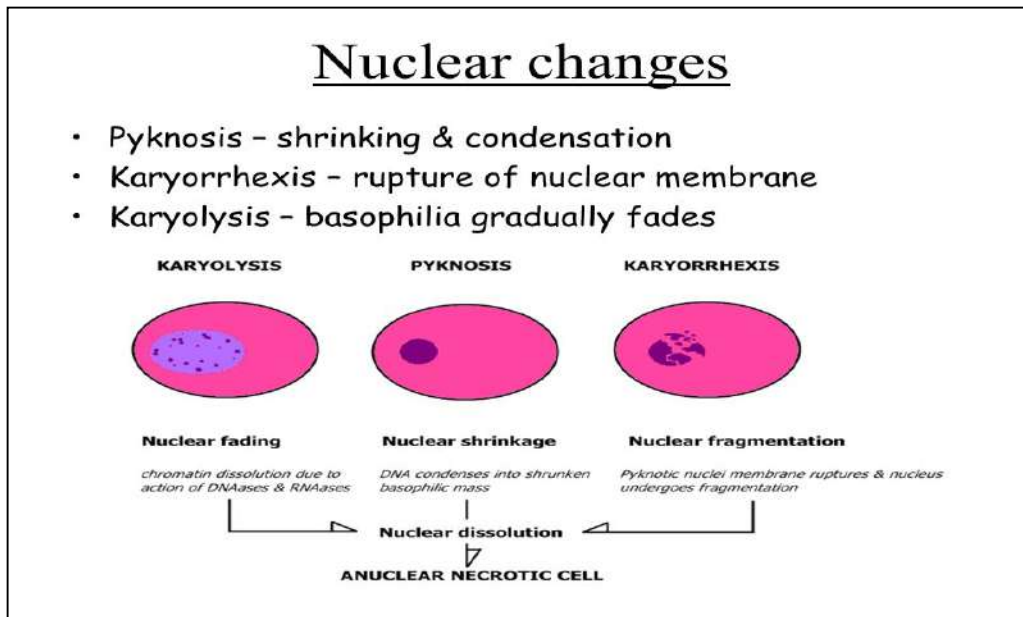
- **Denaturation of protein**

Denaturation of proteins caused by intracellular acidosis due to cell membrane injury.



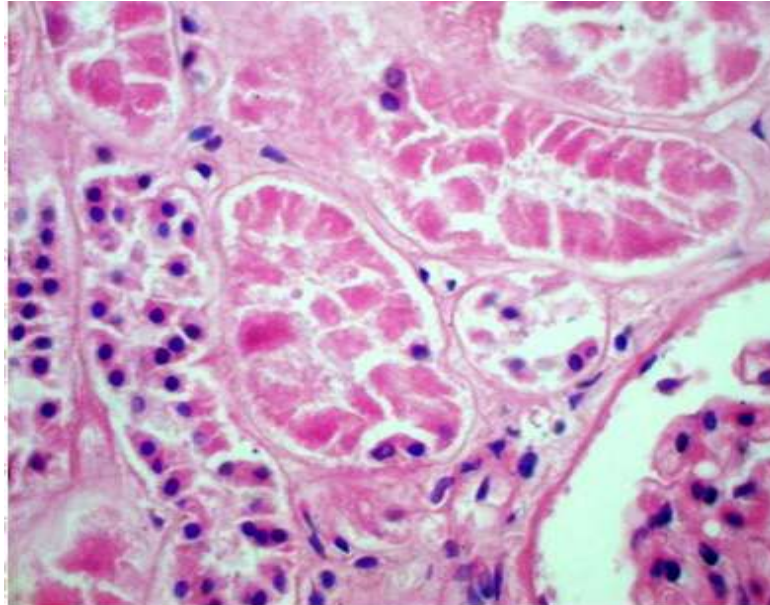
❑ Changes in Necrosis

➤ Changes in nucleus



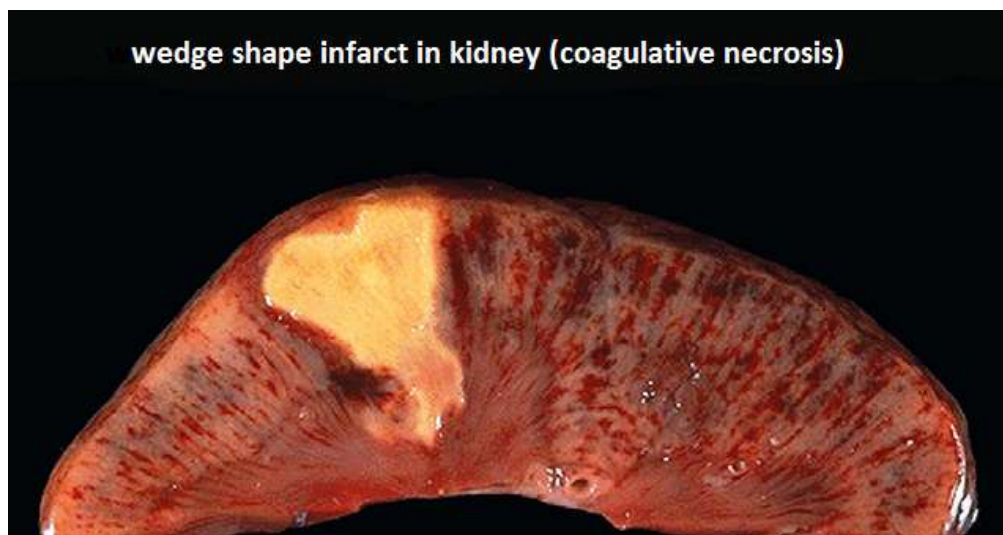
❑ Changes in cytoplasm

- Cytoplasm become more eosinophilic due to loss of RNA and denaturation of cytoplasmic proteins.
- Cytoplasm becomes opaque.

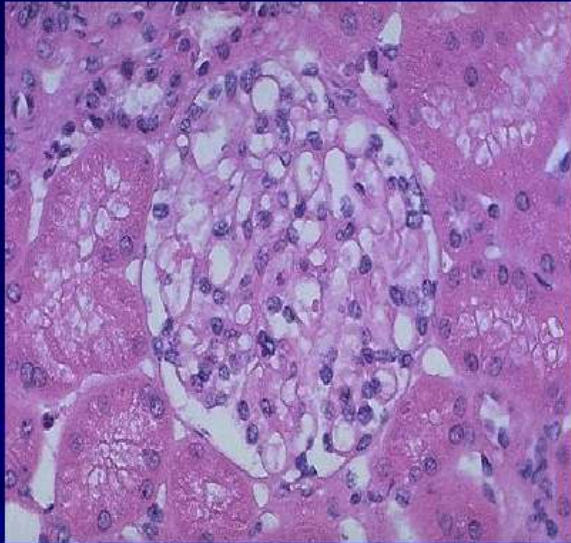


❑ Coagulative Necrosis

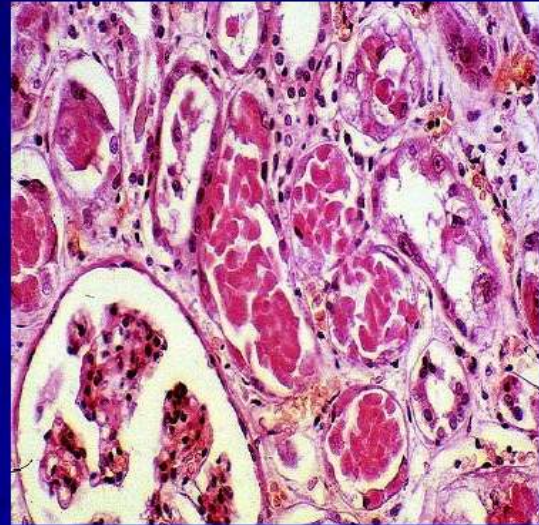
- In this type of necrosis, the necrotic cell retain its cellular outline for several days.
- Coagulative necrosis typically occurs in solid organs such as kidney, heart and adrenal gland usually as a result of deficient blood supply and anoxia e.g. myocardial infarction.
- **Morphology:**
- Preservation of basic structural outline of the coagulated cells.
- Appears as a mass of coagulated, pink staining homogenous cytoplasm.



NORMAL KIDNEY



COAGULATIVE NECROSIS



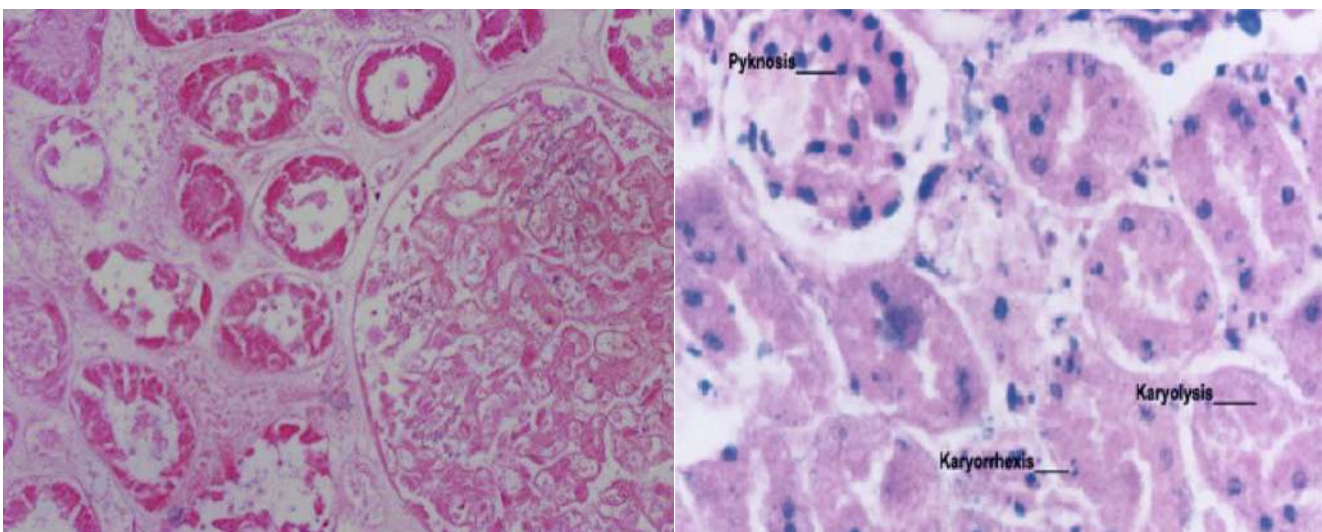
Diagnosis: Coagulative Necrosis.

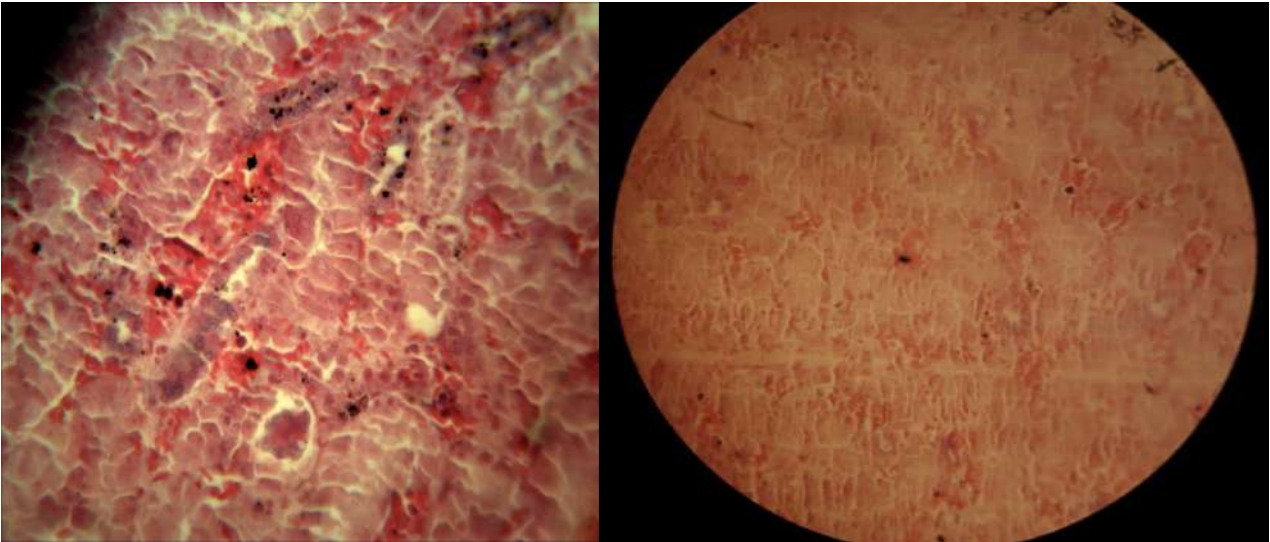
Organ: kidney.

Stain: H&E.

Lesion:

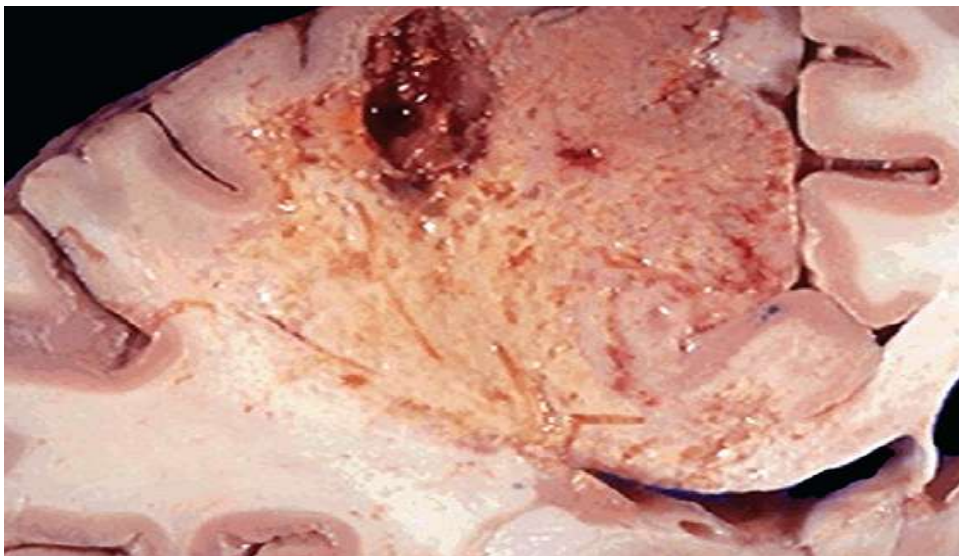
- 1- Loss of cellular details of tissue and the outline of the tissue is remained.
- 2- Pyknosis of nuclei of epithelial cells lining the renal tubules in addition to karyorrhexis & karyolysis.
- 3- Cytoplasm of these cells become granular and eosinophilic





❑ Liquefactive Necrosis

- Liquefactive necrosis is a form of necrosis in which dead tissue turns into a liquid substance.
- Liquefactive necrosis is usually caused by bacterial or fungal infections that damage cells.
- In liquefactive necrosis, the affected cell is completely digested by hydrolytic enzymes, resulting in a soft, circumscribed lesion consisting of pus and the fluid remains of necrotic tissue. Dead leukocytes will remain as a creamy yellow pus.



Liquefactive necrosis of the brain tissue

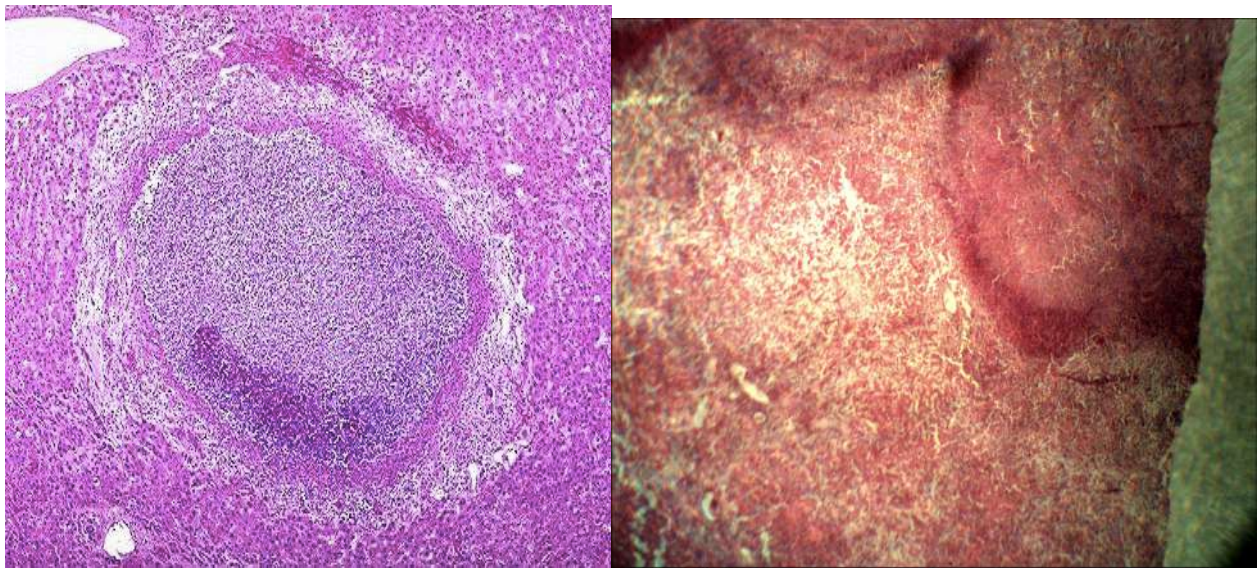
Diagnosis: Liquefactive Necrosis.

Organ: Liver.

Stain: H&E

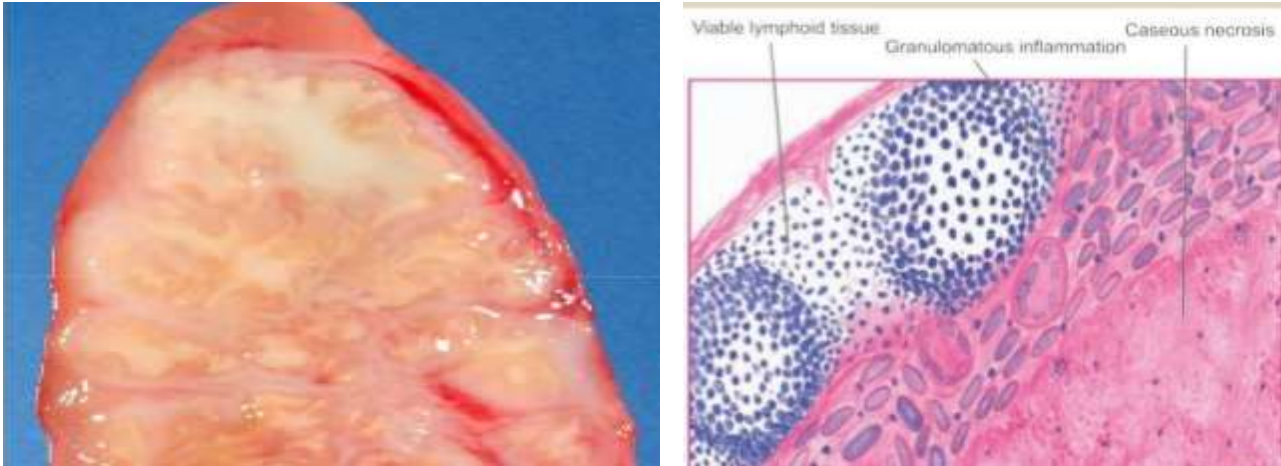
Lesion:

1. Disappearance of architectural & cellular details of tissue.
2. Presence of many necrotic foci surrounded by cellular debris
3. There is pink liquid material & it is represented the pus
4. The necrotic area is surrounded by inflammatory cells represented by the live & dead neutrophils (line of demarcation).



❑ Caseous Necrosis

- Typically seen with specific bacterial diseases eg. TB.
- **Gross Appearance:** White, soft, cheesy-looking material
- **Microscopic:** A uniformly eosinophilic center (necrosis) surrounded by a collar of lymphocytes and activated macrophages (giant cells, epithelioid cells).



Diagnosis: Caseous Necrosis

Organ: Lymph node

Stain: H&E

Lesion:

1. Loss of cellular & architectural details of tissue.
2. Presence of homogenous pink material in the outer of necrotic area surrounded by phagocytes, plasma cells, lymphocytes, epithelioid cells & langhans giant cells.
3. Blue patches in the center of necrotic tissue which represent calcium salt deposition.

