DEGENERATION

DR. HARSHAD PATEL
ASSISTANT PROFESSOR
GENERAL PATHOLOGY G.D.C.H.

DEFINITION

- Visible changes in living tissue indicative of cellular damage short to actual death.
- It only affect the cytoplasm .Nucleus remains unaffected.
- It is reversible change.
- If remove the etiology cells become normal.
- Damage short of actual death.

GENERAL FEATURES

It consists of

- Accumulation of normal substance in excess in cytoplasm. e.g. fat, protein, water.
- Appearance of abnormal substance in cytoplasm or in intercellular spaces.

FACTORS AFFECTING DEGREE OF DAMAGE

- Nature of injurious agent ,its toxicity and concentration.
- Duration of action.
- Nature of tissue affected. e.g. Parenchaymal.
- Genetic factors
- Immunological factors

TYPES OF DEGENERATION

- Cloudy degeneration
- Hydropic degeneration
- Fatty degeneration
- Mucoid degeneration
- Myxoid degeneration
- Hyaline degeneration
- Calcification
- Amyloid degeneration

CLOUDY DEGENERATION

INTRODUCTION

It is also known as

Granular degeneration

Albuminous degeneration

Parenchymatous degeneration

It is characterised by appearance of protein granules in cytoplasm of parenchymatuos cells of affected tissue.

ETIOLOGICAL FACTORS:

- Poison
- Bacterial toxin
- Chemicals like- carbolic acid,mercuric cloride,arsenic,chloroform,ccl4.
- Diabetic coma
- Jaundice
- High grade fever
- Burns

PATHOPHYSIOLOGY

Damage to the mitochondria and E.R.

- Decrease ATP synthesis
- Disturbance of Na+ K+ ATPase pump

MORPHOLOGY :

- Organs affected: Liver ,Kidney, Heart and voluntary muscles – Parenchamal cells.
- Gross: Enlargement of organ with increase weight

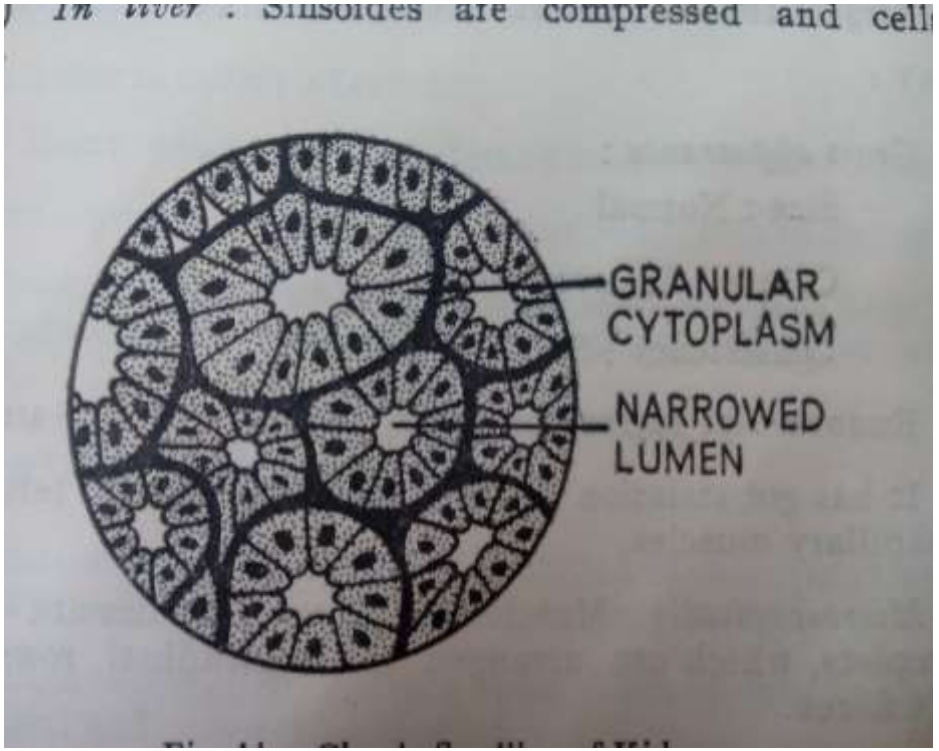
  -Pale ,soft in consistancy

  -Cut surface is dull (cloudy)

  -Sharpness of the border is lost.

MICROSCOPIC FEATURES

Protein granules in cytoplasm, increase size and star shaped lumen.



HYDROPIC DEGENERATION

- It is the extension of changes seen in cloudy degeneration.

  It indicate severe type of injury.
- Water is accumulated in excess.
- Microscopic changes:

  - Cytoplasm is pale, watery shows vacuoles lined by membrane like structure.

  - In advanced stage vacuoles are fused together and push the nucleus towards the periphery.

FATTY DEGENERATION

- Fat is accumulated in excess in cytoplasm.
- Parenchymatous degeneration.

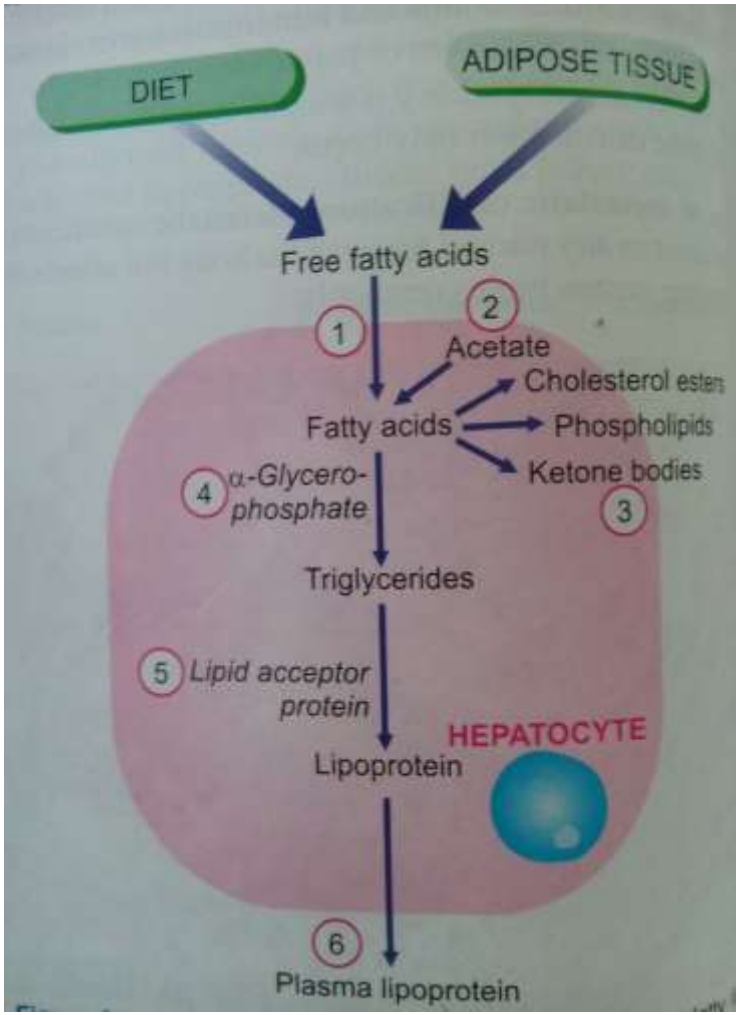
ETIOLOGY:

- Anoxia - Anemia, CCF
- Poison: bacterial toxins - Cl. welchi
- Heavy metals- nickel, chromium, arsenic
- Alcohol
- Infections-Viral hepatitis, Other viral infection, bacterial infection.

-Starvation

Protein energy malnutrition

PATHOGENESIS



PATOLOGICAL CHANGES

- Organs commonly affected: liver, heart, kidney

_-Grossly: organ is enlarged

- cut surface is yellow and give greasy sensation on cutting

- c/s is pale

Gross appearance of fatty liver

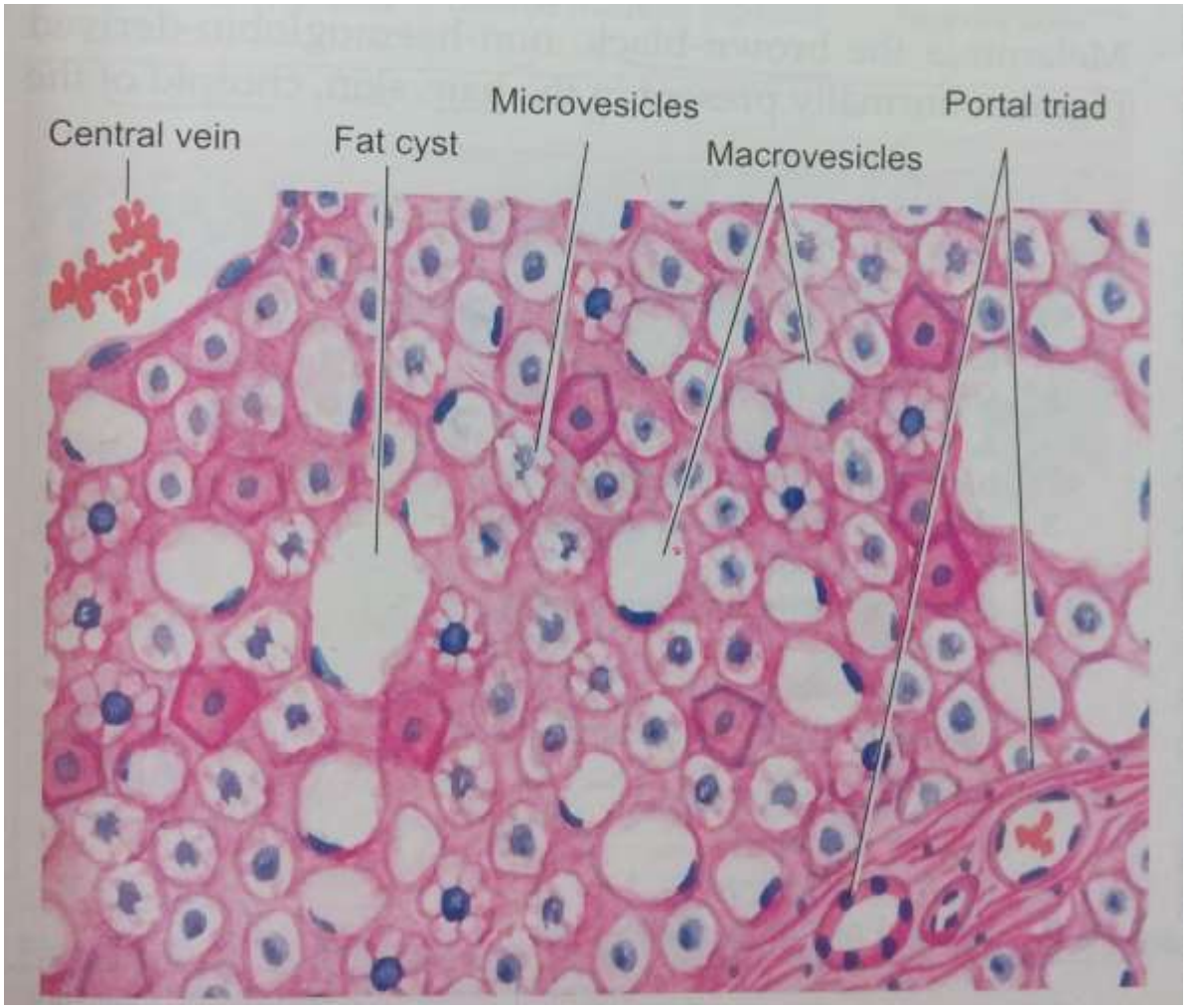
MICROSCOPIC CHANGES

-Signet ring appearance of hepatocytes in H. & E. stain.

-Special stain used for demonstration of fat are –Osmic acid, Sudan B black, Sudan III, Orange red etc.

- also seen under pollarised microscope

Microscopic appearance of fatty liver



THANK YOU