

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

Aplastic Anemia

DR ZAHIDA QASIM

MBBS, DCP, M.Phil.(Haematology)

Associate Prof. (Haematology)

APLASTIC ANAEMIA

The diagnosis of Aplastic anaemia is made on the basis of

(i) Pancytopenia

(ii) A hypo cellular or Aplastic marrow with increased fat spaces

(iii) The virtual absence of Reticulocytes

CAUSES OF APLASTIC ANAEMIA

I. CONGENITAL

Fanconi's Aplastic Anaemia

II. ACQUIRED

1. Idiopathic

2. Chemical and Physical Agents

a. Agents which regularly produce Aplasia if dose is sufficient:

- Ionizing radiation
- Benzene
- Chemotherapeutic agents

b. Agents which occasionally produce Aplasia:

- Antibiotics: Chloramphenicol, Cotrimaxazole
- Anti-inflammatory drugs: Phenylbutazone, Indomethacin, Ibuprofen,
- Antirheumatic: Gold salts, Penicillamine

3. Viral Infections:

Hepatitis (Non A, Non B, Non C)

EB virus

HIV

Association with disorders

- Hepatitis B, C and A
- Fanconi's anemia:

Familial disorder
DNA repair disorder
Missing bones
Renal defects
Acute Leukemias

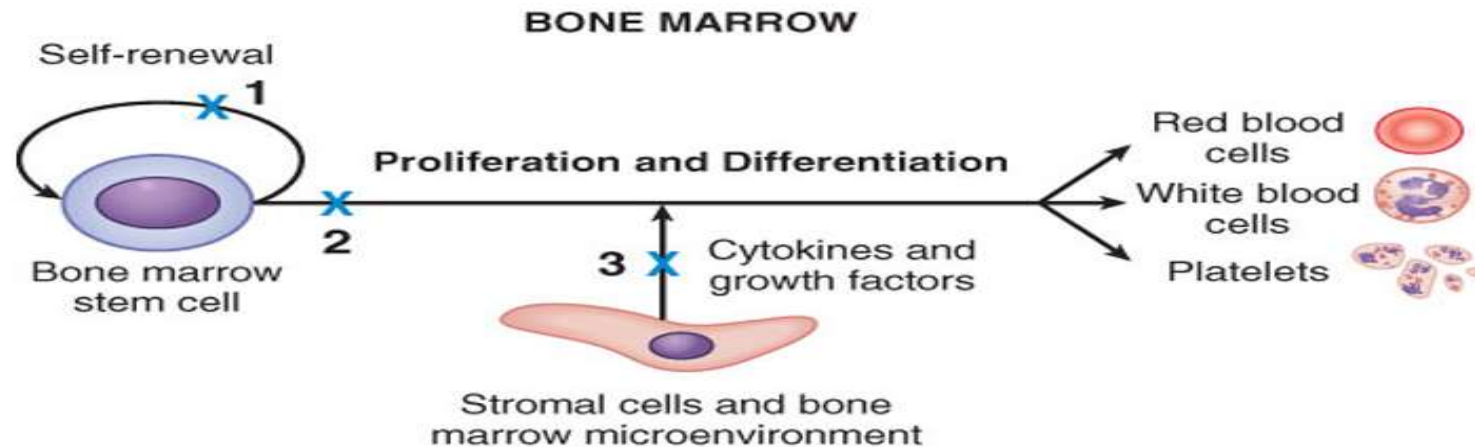
- PNH
- Pancreatic insufficiency

Pathogenesis

Multiple Theories

- Stem cell injury (Irreversible)
- Idiosyncrasy
- Hypersensitivity
- Role of activated T-cells (Cytotoxic or suppressor T-Cells)

Pathophysiology of aplastic anemia



APLASTIC ANEMIA

Pathophysiology:

Reduction or Depletion hematopoietic **stem cells**

Decreased production of all cell lines leading to **peripheral pancytopenia**

CLINICAL FEATURES OF APLASTIC ANAEMIA

onset -any age -peak incidence around 30 years with slight male predominance

insidious or acute with symptoms and signs
anaemia, neutropenia &
thrombocytopenia.

.

Manifestations

- Due to anemia: Pallor, easy fatigability'
lethargy,
exertional dyspnea,
Heart failure
- Due to Neutropenia: Bacterial Infections
Regional L. N enlargement
- Due to Thrombocytopenia
Muco-cutaneous Bleeding
Ecchymoses, petechiae,
Epistaxis, bleeding gums
haematemesis, melana

Clinical Manifestations cont...

- **Bleeding -presenting initial presentation.**
- **Bruising, bleeding gums, Epistaxis, petechiae menorrhagia are hemorrhagic manifestations**

- **Infections, particularly of mouth and the throat are common and generalized infections are frequently life- threatening**

CLINICAL FEATURES OF APLASTIC ANAEMIA...contd

Lymph nodes, liver. Spleen are not enlarged

Rarely jaundice can be feature in patients with post hepatitis Aplasia.

The patients of Aplastic anaemia having a history of hepatitis, usually presents at a time when clinically jaundice had already subsided.

At presentation it is necessary to take a detailed drug, occupational and symptomatic history to try to establish any etiological agent. Unfortunately it is not always easy.

Clinical Behavior

- Reversible/Transient
- Progressive
- Unstable/Fluctuating
- Stable

Long-term associations

- MDS
- PNH
- Acute Leukemias
- Hepatitis B/C: as a complication of transfusion

Lab Diagnosis

- **Peripheral Blood Picture**

Hb, PCV and Red Cells: Decreased

TLC: Decreased (Neutrophils: Decreased)

Platelets: Decreased

Retics: Decreased

Red Cell Morphology: Normocytic Normochromic

MCV, MCH & MCHC: Normal

ESR: Markedly raised

Bone marrow aspiratrion

- Very Hypocellular Bone marrow aspirate

All cell lines

- Erythroid, myeloid and megakaryocytic series cells are decreased
- Lymphocytes and plasma cells may be increased

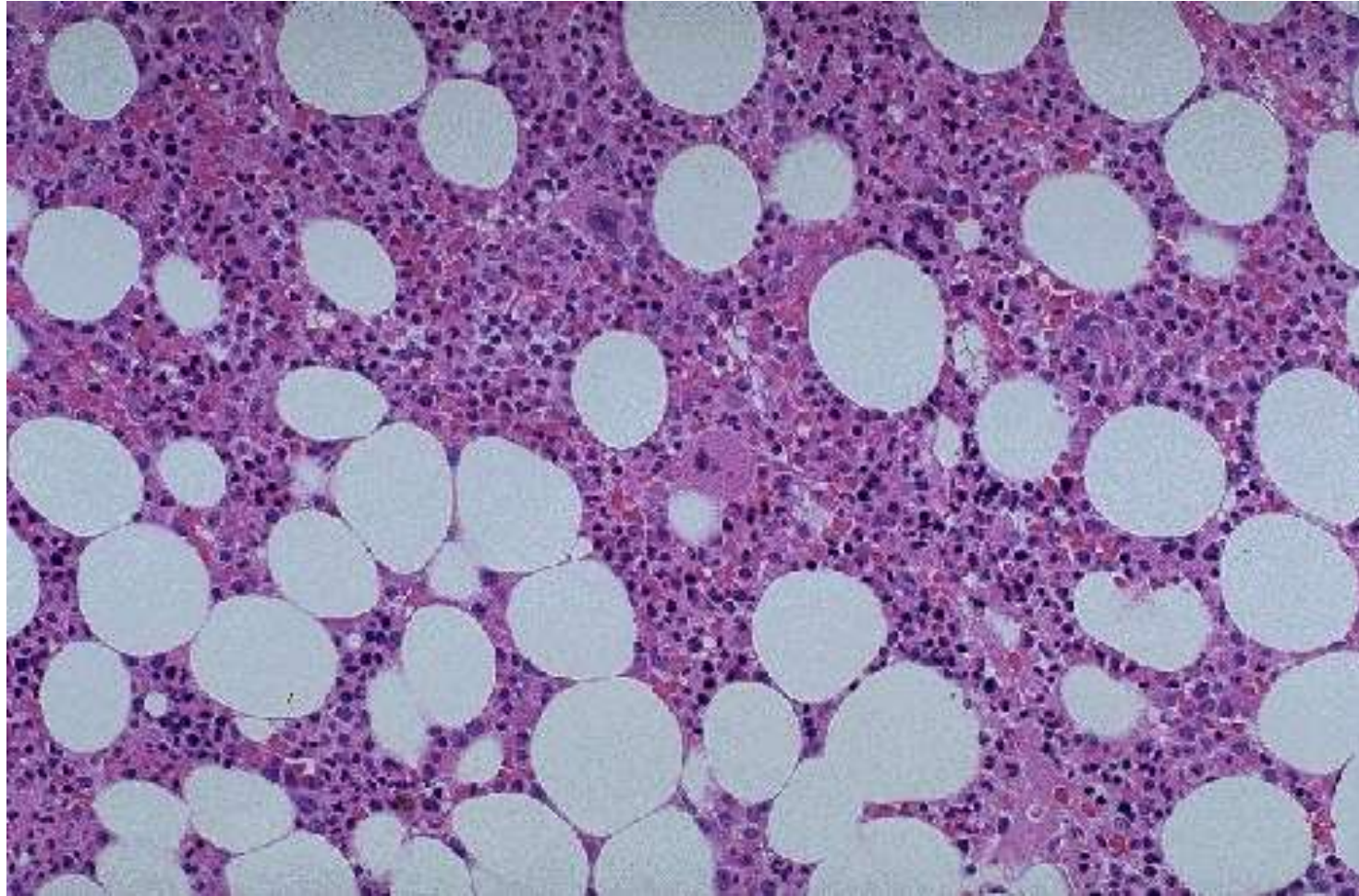
7. The bone marrow aspirate is usually easily obtained, typically with many fragments, which appear hypocellular (more than 75% fat). There is relative increase in lymphocytes, plasma cells. The remaining haemopoietic cells are normal. In the early stages Haemophagocytosis may be prominent

8. Bone marrow trephine is essential to make a diagnosis. It shows fat replacement of marrow, and normal haemopoietic tissue is absent or scanty

Bone marrow Trepine

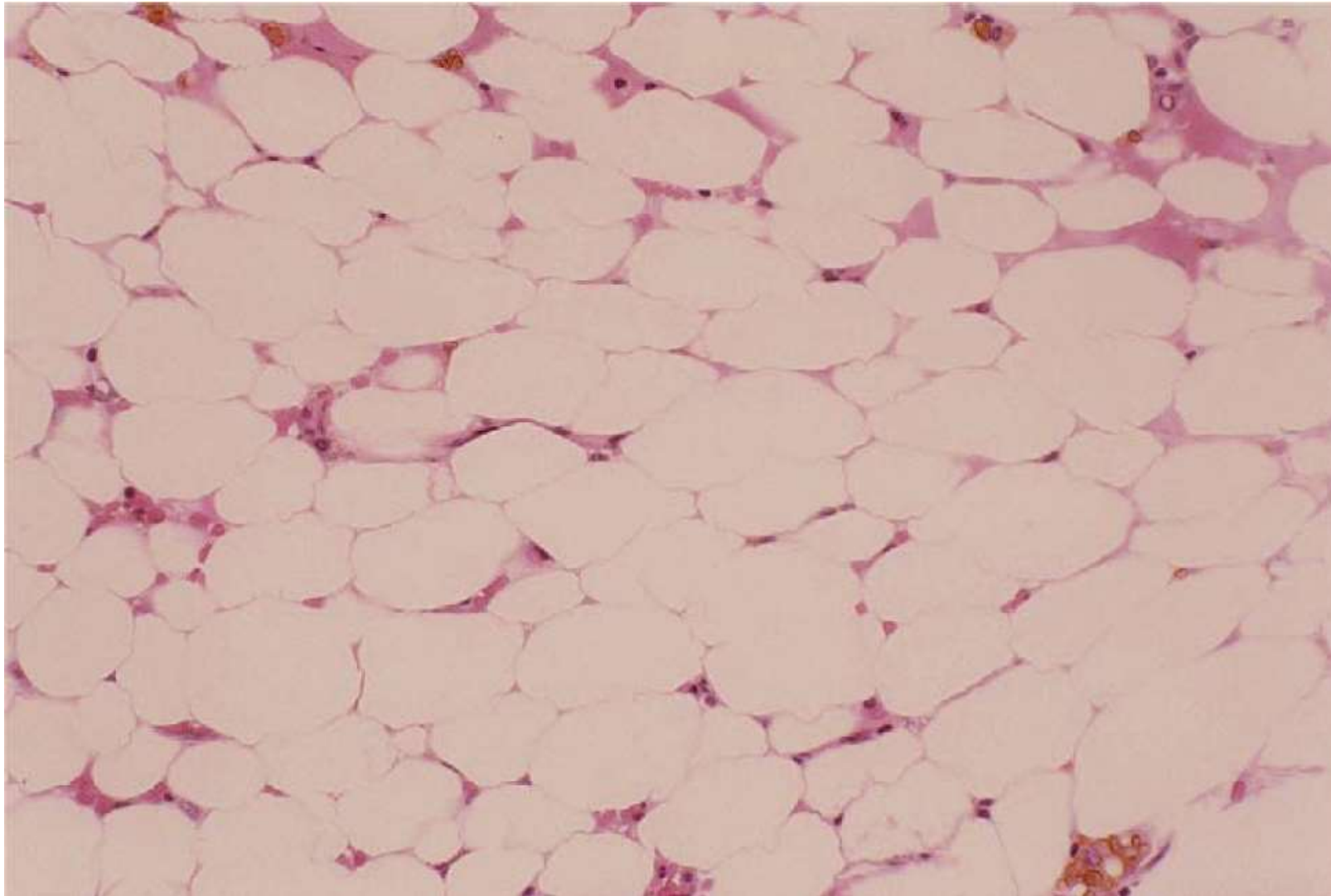
- Hypocellular Trepine
- Increased fat spaces
- Decreased erythroid, myeloid & megakaryocytic series cells
- Lymphocytes and plasma cells are increased

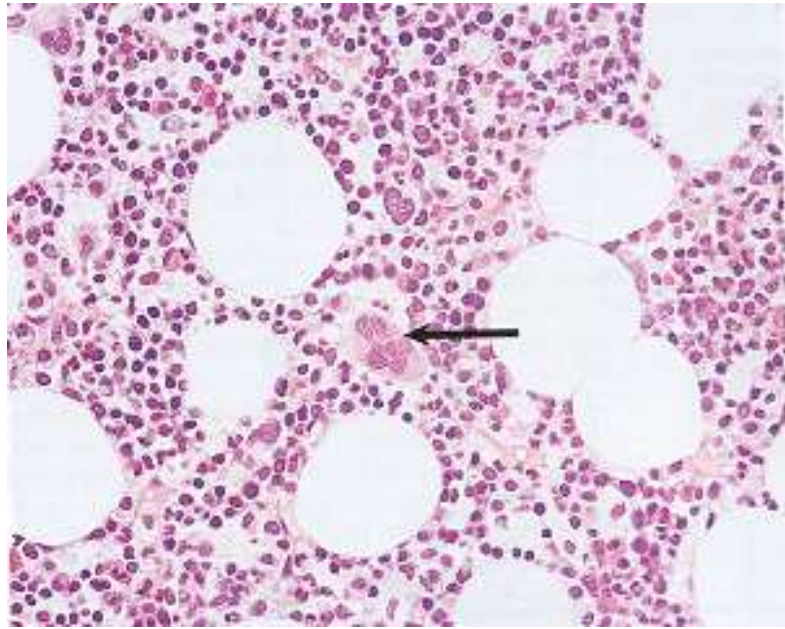
APPEARANCE OF NORMAL BONE MARROW



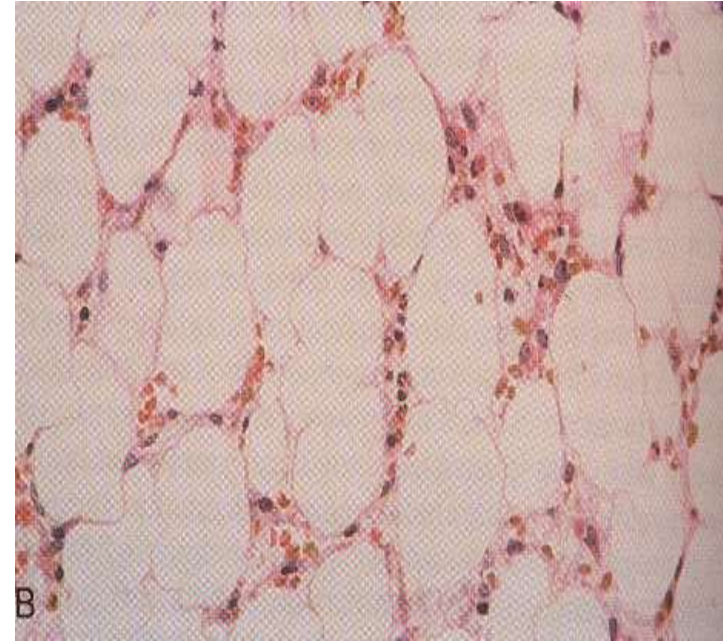
Appearance of normal bone marrow

Bone Marrow in Aplastic anemia





Vs



Normal bone marrow: From a section of bone marrow trephine biopsy. Marrow cells are interspersed between fat spaces. The arrow points to a megakaryocyte

Aplastic Anaemia: Bone marrow trephine biopsy showing markedly hypoplastic marrow composed largely of fat cells