

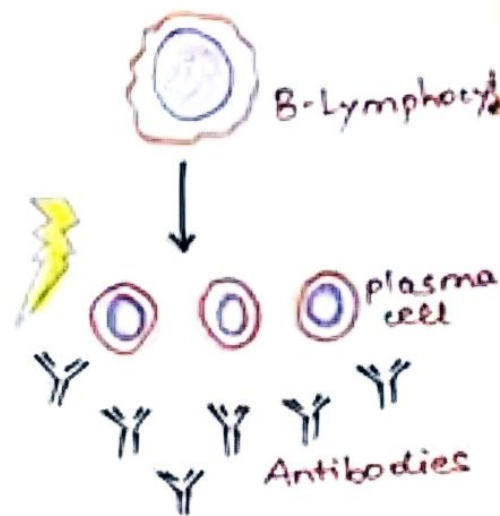
MULTIPLE MYELOMA

Def:-

Plasma cell neoplasm
with

- Hypercalcemia
- Renal failure
- Anemia
- Bone lesions
- Immune abnormalities

[CRAB-I]



Affects :- Men, Older adults

Path:-

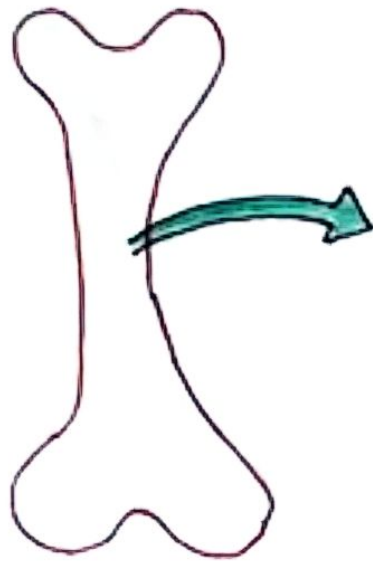
Rearrangement of genes

- ① IGH on chr. 14
- ② Cyclin D₁ & Cyclin D₂
- ③ MYC

Deletion

- ① TP53





Marrow
stromal
cell

⊕
IL-6



⊕ IL-6
Plasma cell neoplasm

⊖
⊕ MIP1α

OSTEO-
BLAST

OSTEO-
CLAST



Morph :-



Destructive bone lesions in axial skeleton

- (i) Vertebral column
- (ii) Ribs
- (iii) Skull
- (iv) Pelvis

punched out
defects

consist of soft,
gelatinous red
tumor masses



Blood

Rouleaux formation

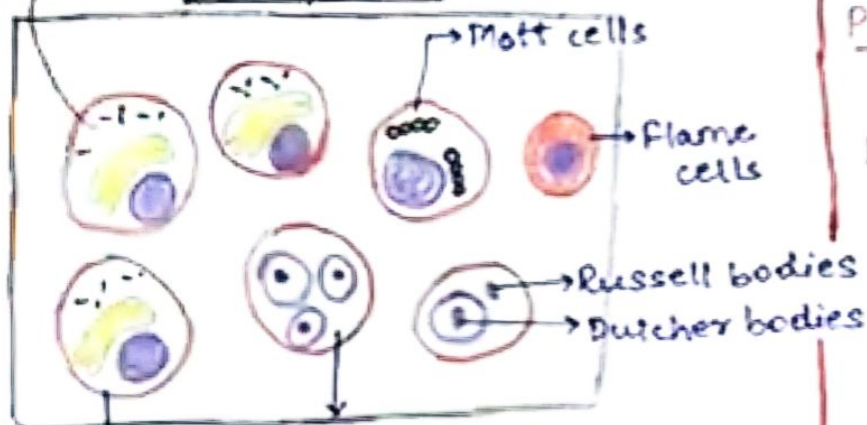


Urine

Bence Jones proteinuria

Intracellular accumulation of intact / partially degraded Ig (protein)

BM aspirate



>30% plasma cells

Plasmablast

Plasma cell :- perinuclear G.A.
- Eccentric nucleus

Plasmablasts :- multinucleated
- prominent nucleoli

Flame cells :- fiery red cytoplasm

Mott cells :- Multiple grape like droplets

Inclusion if $\left\{ \begin{array}{l} \text{cytoplasmic} = \text{Russell bodies} \\ \text{Nuclear} = \text{Dutcher bodies} \end{array} \right.$

Immunophenotyping :-

- CD138⁺⁺
- Syndecan-1⁺⁺
- CD56⁺

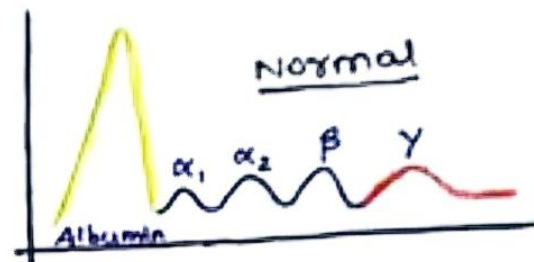
Clinical features :-

- C = Hypercalcemia → Neurologic manifestation
 - ↳ confusion
 - ↳ weakness
 - R = Renal dysfunction
 - A = Anemia
 - B = Bone lesions
- d/t Bence Jones proteinuria
↓
Abnormal light chains
toxic to renal tubular
epithelial cells
- ↓ production of (N) Ig's → ↑ risk of infection.
 - AL type amyloidosis

Electrophoresis & Immunofixation :-

o Serum protein electrophoresis

- 'M spike' is detected
- Doesn't tell which Ig is ↑sed



o Urine protein electrophoresis

- 'Bence-Jones' in urine is detected
- Doesn't tell which Ig is ↑sed



o Serum immunofixation electrophoresis

- Detects which Ig is ↑sed

Most common monoclonal Ig (M protein)

↓
IgG > IgA

o Urine immunofixation electrophoresis

- Detects type of Ig in Bence-Jones

Diagnosis :-

- Identification of clonal plasma cell in marrow
- CRAB (clinical features)
- Electrophoresis + Immunofixation