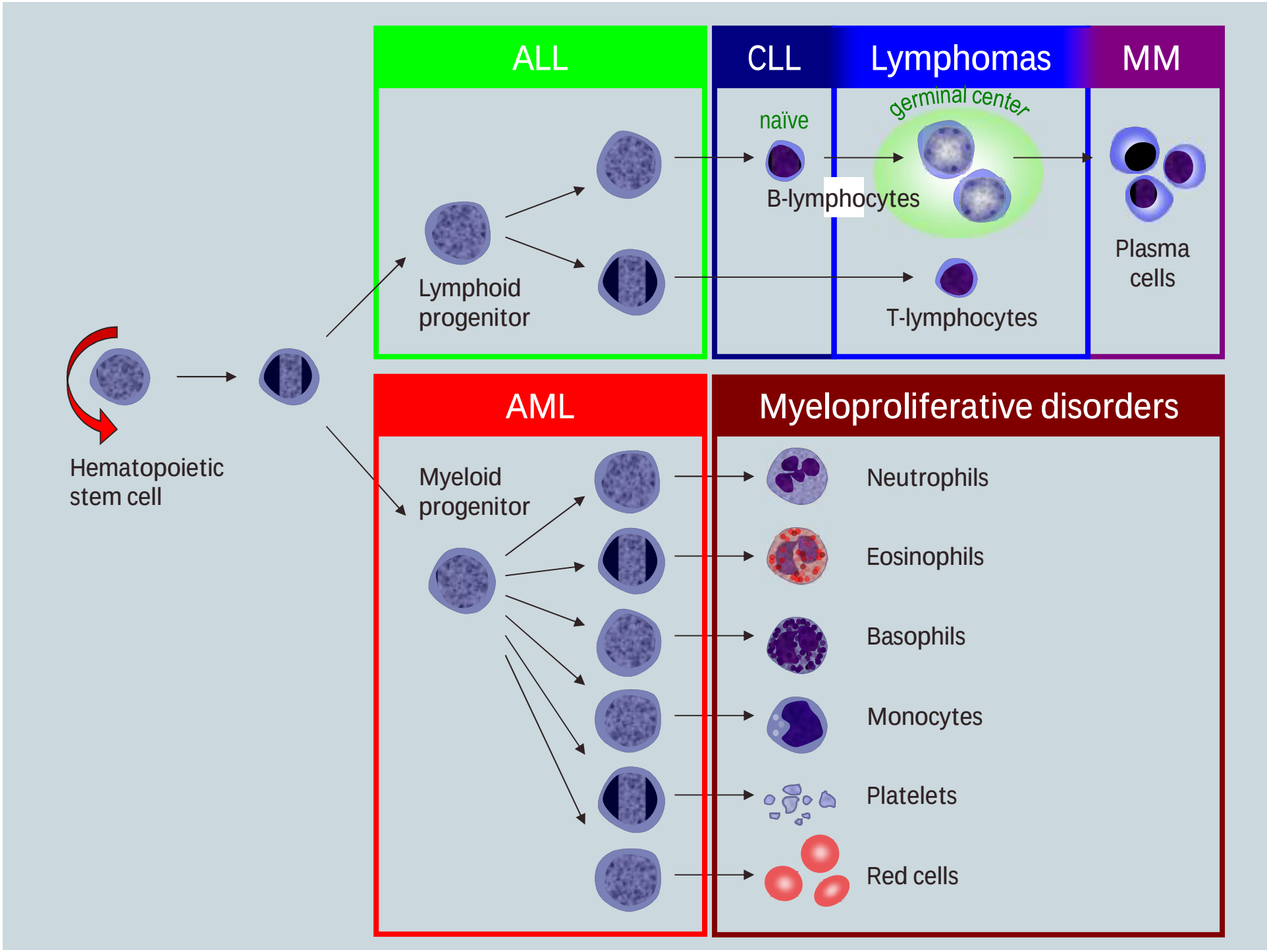
Case presentation

- A 67-year-old woman presents with acute severe back pain. She is normally fit and well, but there is a past history of osteoporosis.
  - Hb 10.6 g/dl
  - Calcium 2.9 mmol/l
  - Alkaline phosphatase 126 iu/l
  - Total protein 76g/l
  - albumin 30g/l
  - S. creatinin= 4

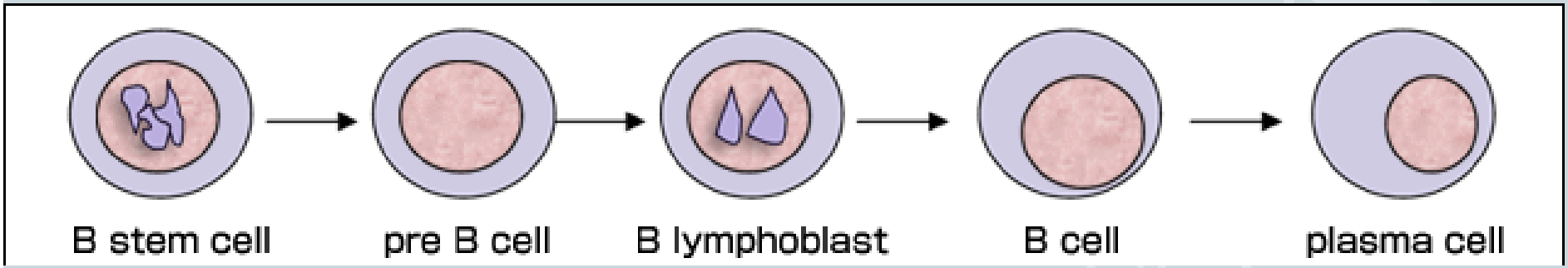
PLASMA CELL DYSCRASIA

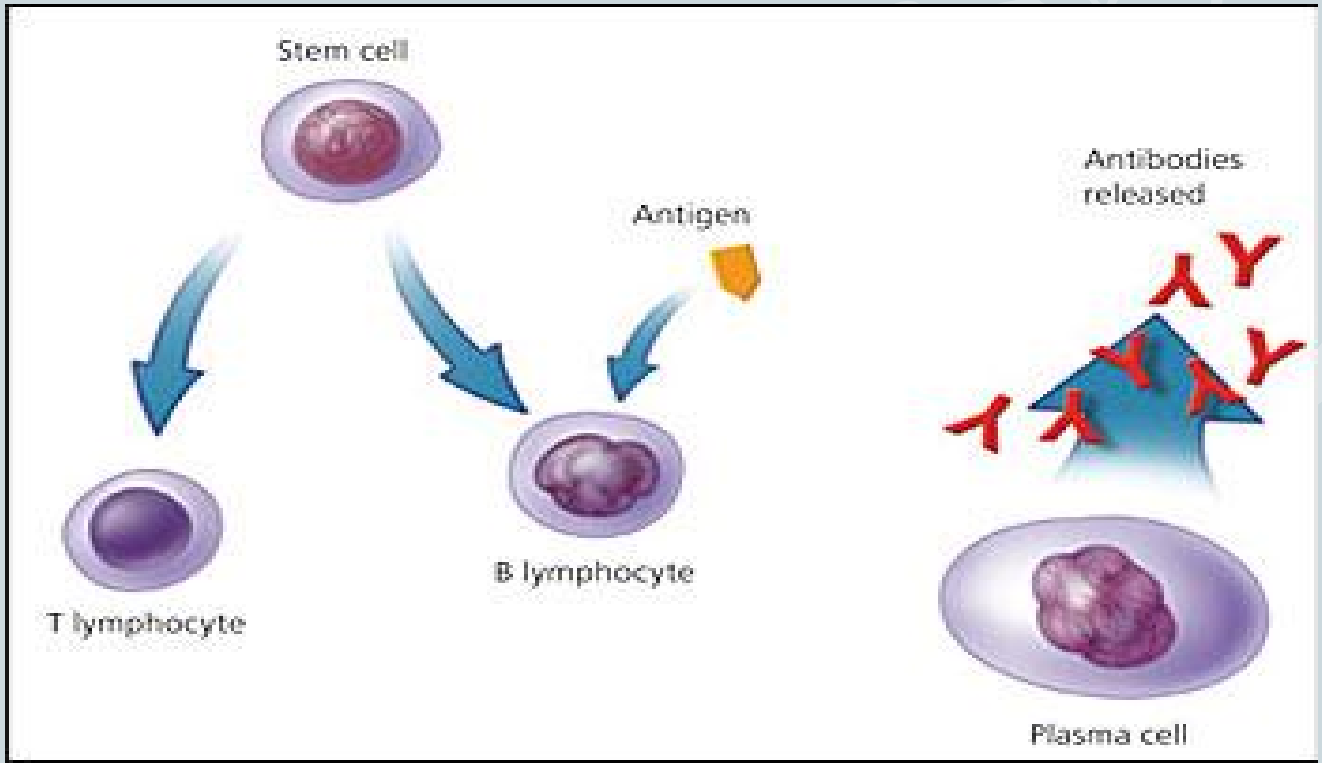
Multiple myeloma

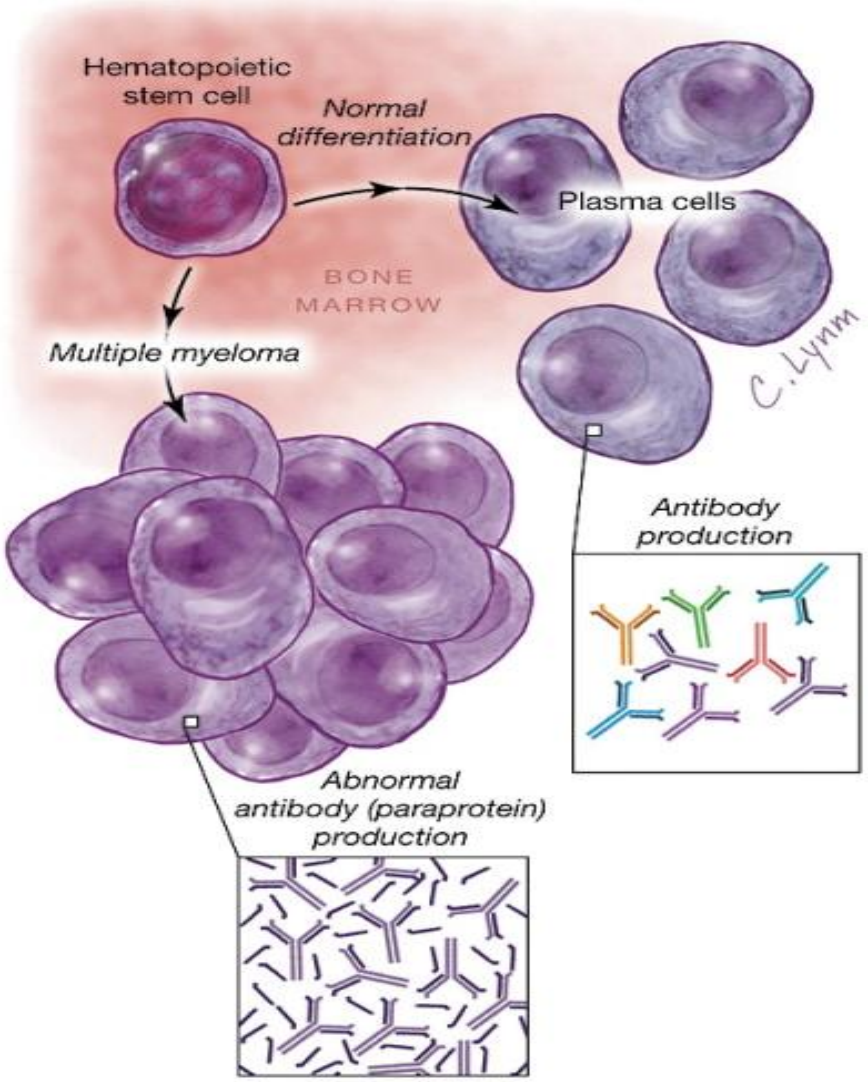


Introduction

- Mature B lymphocytes destined to produce immunoglobulin.







multiple myeloma

- Lytic bone lesions
- serum/urine Ig
- plasma cells in bone
- hypercalcemia

Multiple myeloma (MM)

- It is characterized by the proliferation of a single clone of plasma cells that produce a monoclonal protein (cancer of plasma cells).
- The plasma cell proliferation results in extensive skeletal involvement, with osteolytic lesions, hypercalcaemia, anaemia and/or soft tissue plasmacytomas.

- The excessive production of nephrotoxic monoclonal immunoglobulin can result in renal failure and an increased risk of developing potentially life - threatening infections due to the lack of functional immunoglobulins.

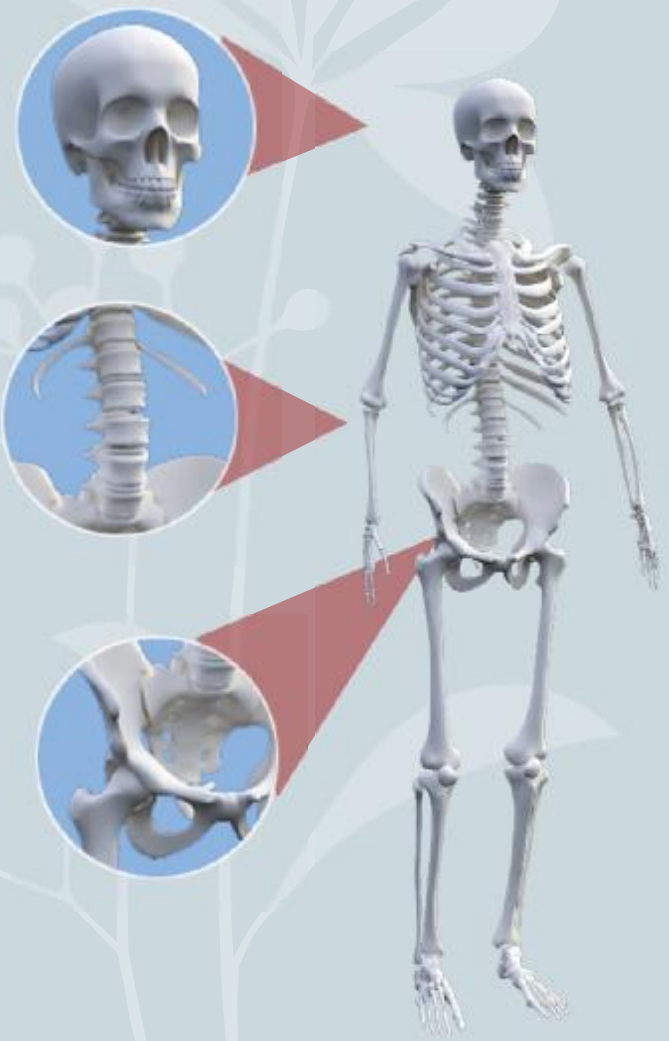
Epidemiology

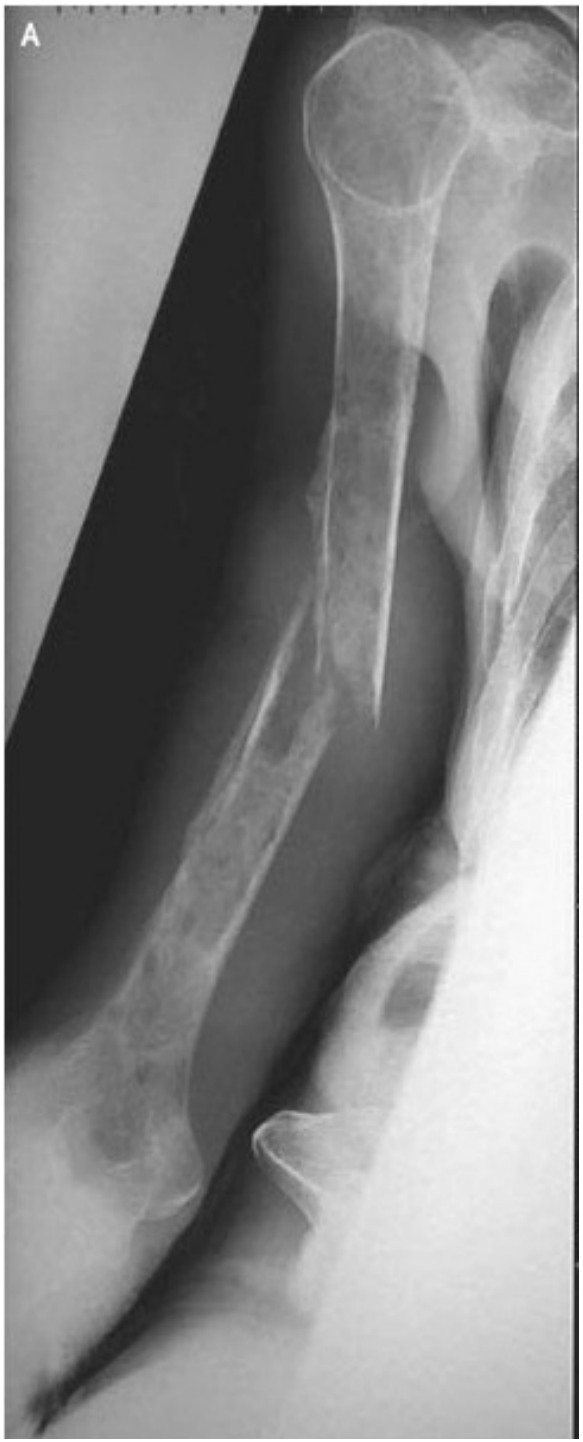
- Myeloma increases in incidence with age.
- The median age 60-70 years.
- Males > females.
- It about 1% of all malignant diseases and 15% of all haematological malignancies.

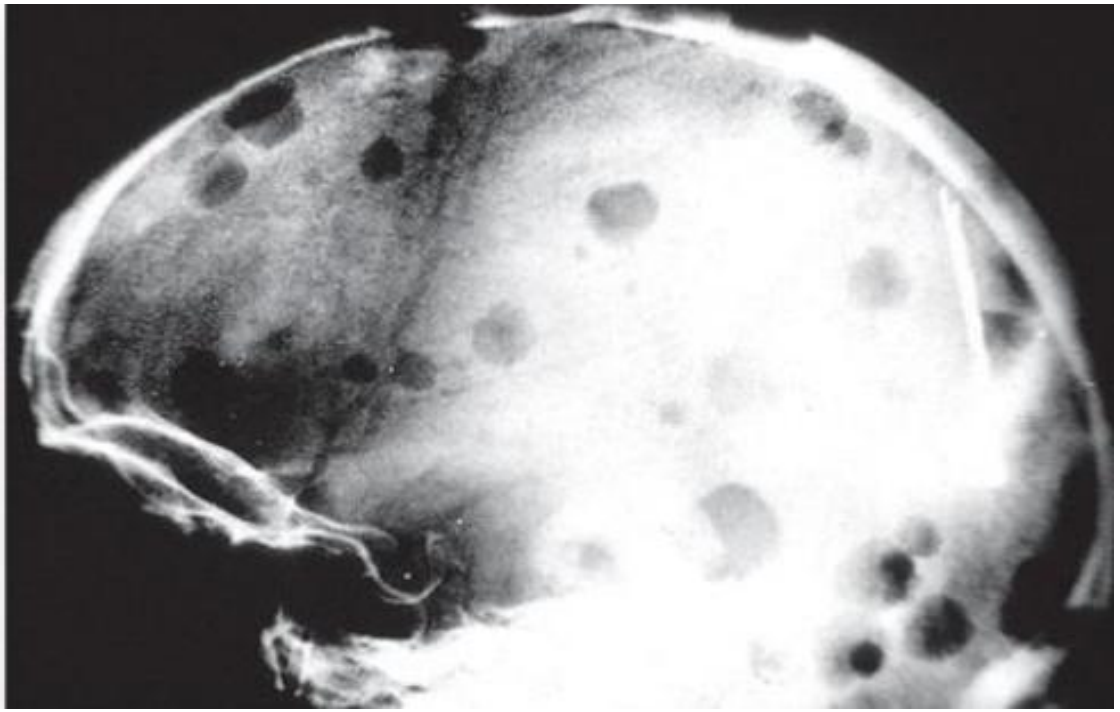
Clinical Manifestations

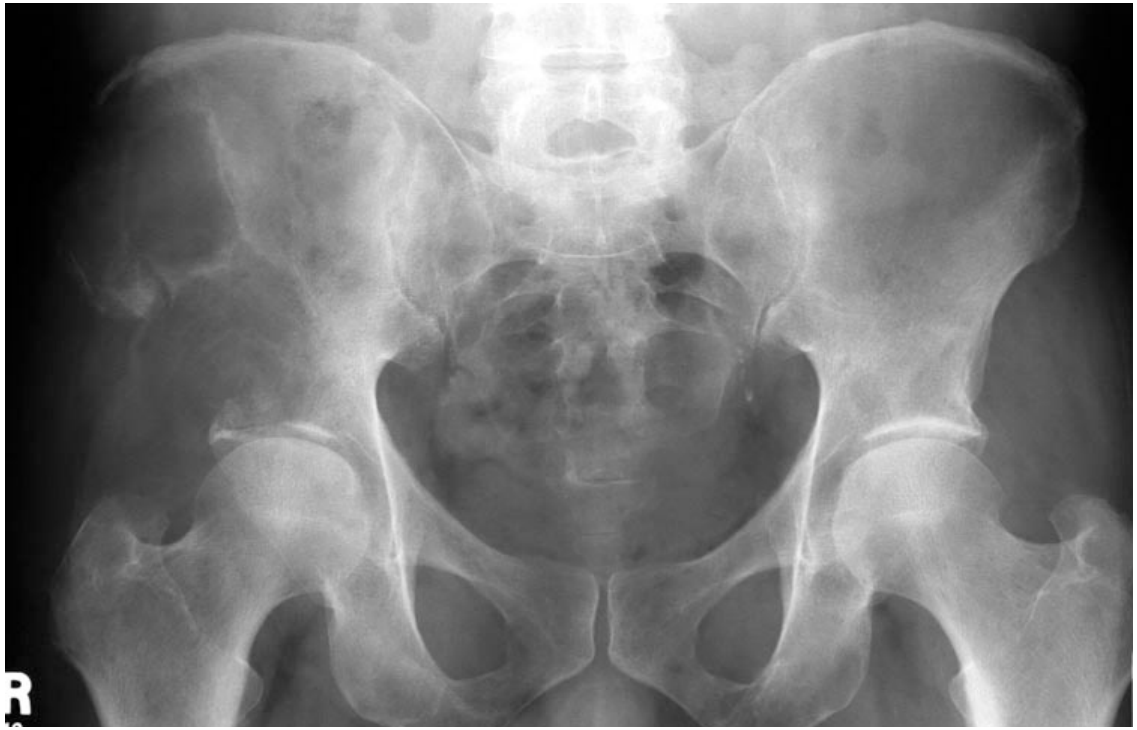
- Overproliferation of plasma cells can cause:
  - Risk of infection
  - Osteolytic bone lesions
  - Hypercalcemia
  - Bone marrow suppression (pancytopenia)
  - Renal complication risk
- Production of monoclonal M proteins causes:
  - Decreased levels of normal immunoglobulins
  - Hyperviscosity

- *Bone pain* is the most common symptom (70% of patients).
  - ü Worse at night
  - ü Precipitated by movement.
- The next most common clinical problem in patients with myeloma is *susceptibility to bacterial infections*.





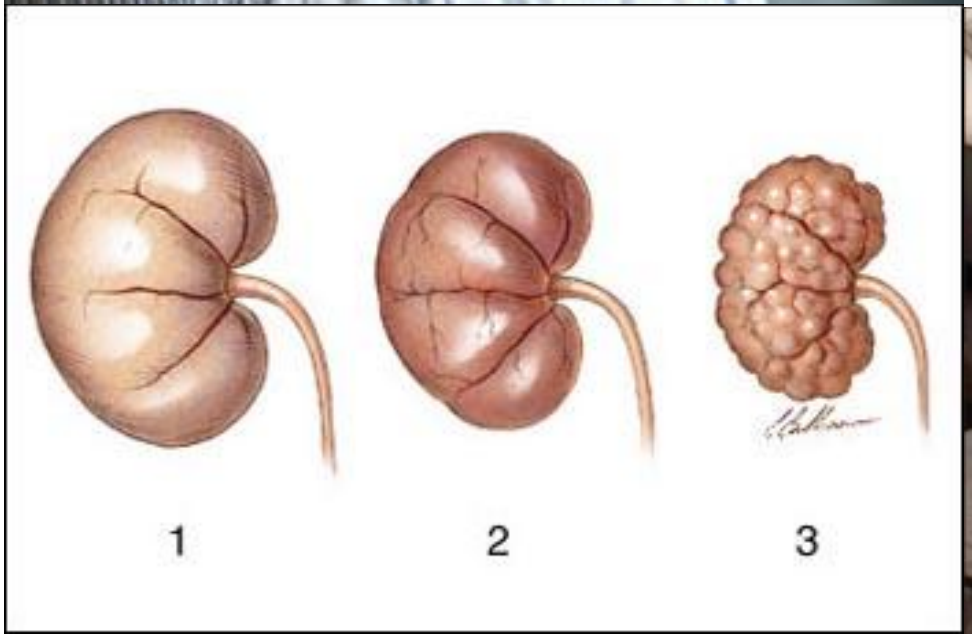


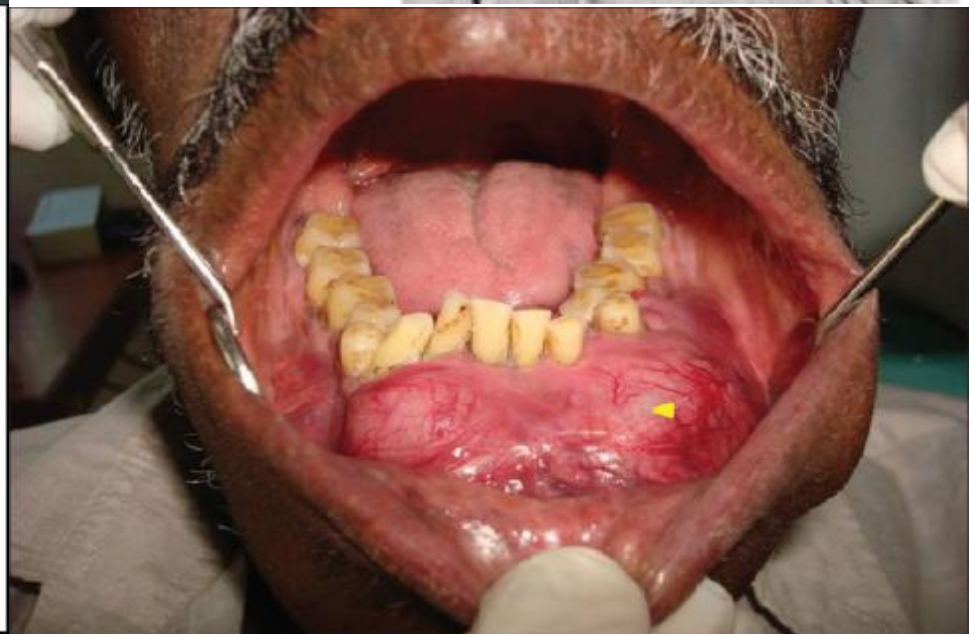


- *Renal failure* occurs in nearly 25% of myeloma patients. Due to:
  - Hypercalcemia is the most common cause of renal failure.
  - Glomerular deposits of amyloid,
  - Hyperuricemia,
  - Recurrent infections,
  - Drugs: such as NSAIDs for pain control.
  - Occasional infiltration of the kidney by myeloma cells.

- Neurologic symptoms (minority of patients), due to.
  - ü Hypercalcemia may produce lethargy, weakness, depression, and confusion.
  - ü Hyperviscosity may lead to headache, fatigue, visual disturbances, and retinopathy.
  - ü Bony damage and collapse may lead to cord compression, radicular pain, and loss of bowel and bladder control.
  - ü Infiltration of peripheral nerves by amyloid.

- Anemia: produces weakness and fatigue.
- Hyperviscosity: generalized malaise, fever, paresthesia, sluggish mentation, epistaxis and sensory loss. Patients may report headaches and somnolence, and they may bruise easily and have hazy vision.
- Deep venous thrombosis.





Signs

- Pallor from anemia.
- Ecchymoses or purpura from thrombocytopenia.
- Bony tenderness.
- Neurologic findings may include a sensory level change, neuropathy, and myopathy.
- Extramedullary plasmacytomas, which consist of soft-tissue masses of plasma cells.
- Cardiomegaly, Hepatomegaly, splenomegaly, lymphadenopathy secondary to immunoglobulin deposition.

- A 65 year old man complains of bone pain especially in his spine. X-ray revealed lytic lesions in the vertebrae and skull. He also had anemia and hypercalcaemia. Which of the following is least likely to be present in this patient:

1. Bence Jones proteins
2. Decreased resistance to infection
3. Infiltration of flat bones by plasma cells
4. Macroglobulinemia
5. Monoclonal gammopathy

Hyperviscosity
Retinal bleeds
Bruising
Heart failure
Cerebral ischaemia

Amyloid
'Panda' eyes
Nephrotic syndrome
Carpal tunnel syndrome

Spinal cord compression
Bony collapse
Extradural mass

Bone pain/fracture

Lytic lesions

Anaemia
Normochromic
Normo- or macrocytic

Pancytopenia

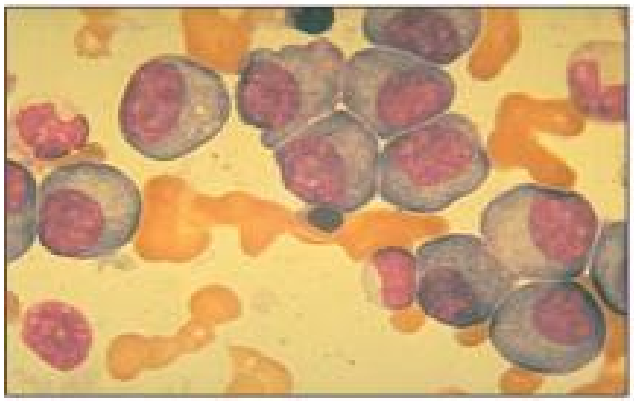
Raised ESR

Hypercalcaemia

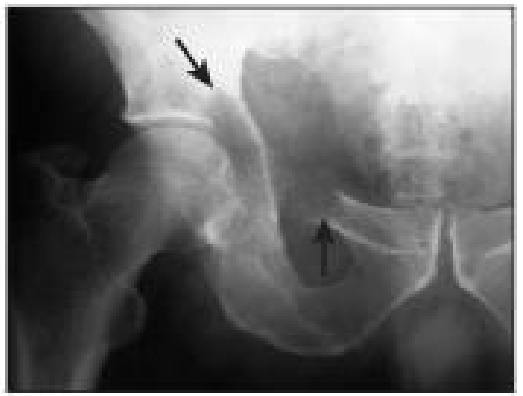
Renal failure
Paraprotein deposition
Hypercalcaemia
Infection
NSAIDs
Amyloid
Dehydration

Bone marrow plasmacytosis
> 30%

Paraproteinaemia
IgG/A/D/E
(κ or λ light chains only)
Immune paresis
Bence Jones proteinuria

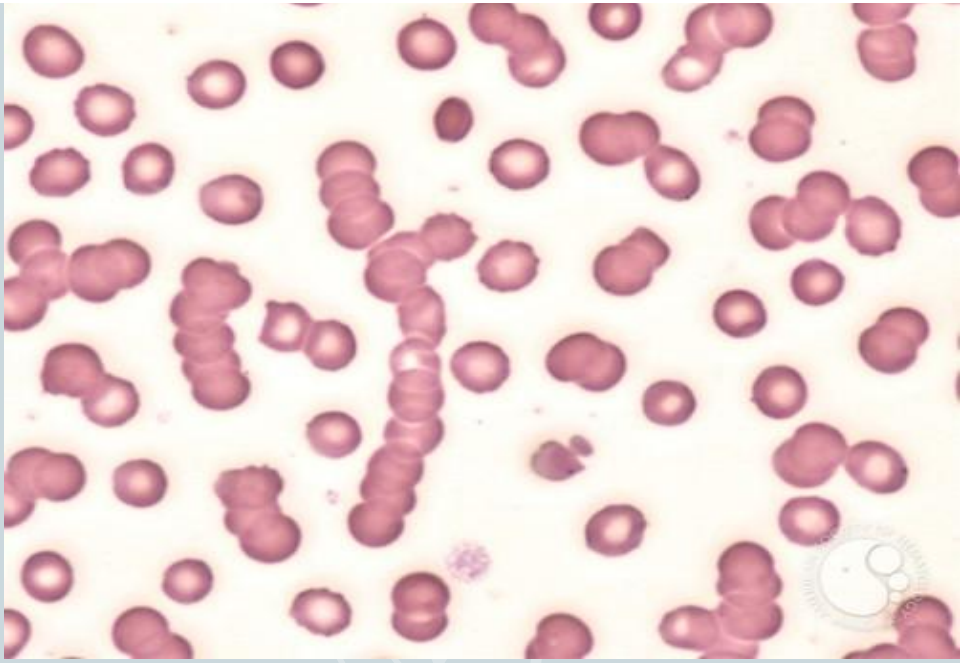


Plasma cells in bone marrow



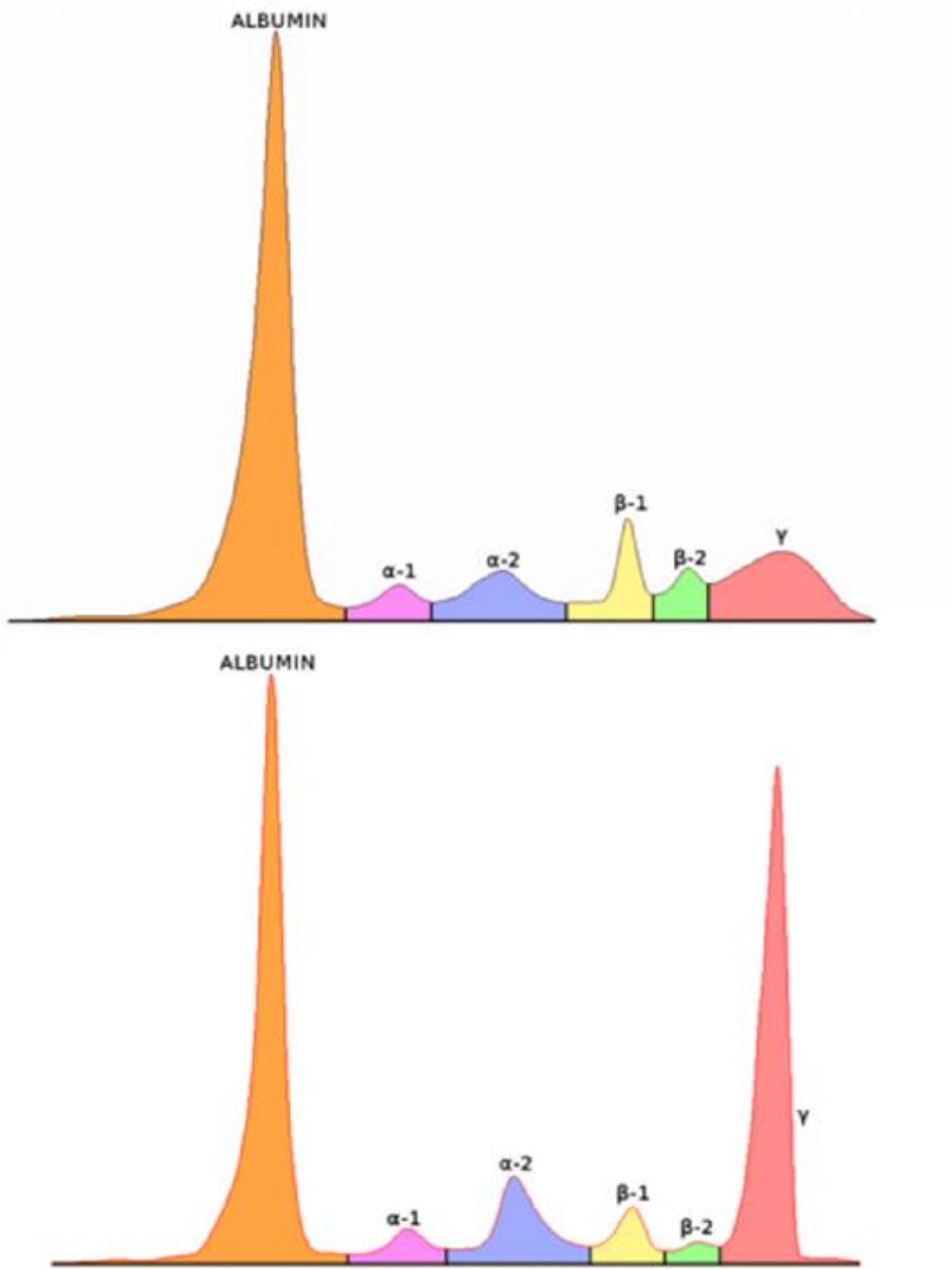
Myeloma deposit eroding right superior pubic rami and acetabulum

Investigation

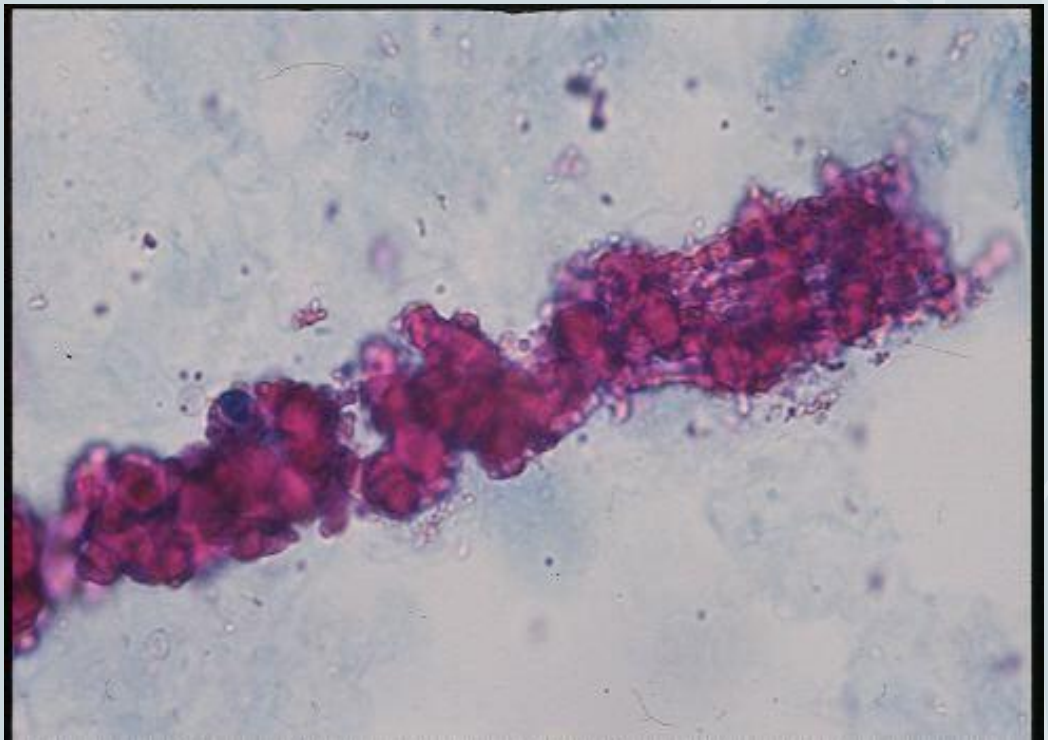


- Complete blood count (CBC):
  - ü Anemia, thrombocytopenia, or leukopenia.
  - ü An increased erythrocyte sedimentation rate (ESR).
  - ü Rouleau formation.
- Metabolic Panel: RFT, LFT (Plasma alkaline phosphatase is normal in the absence of fractures or bone repair), calcium, and uric acid.

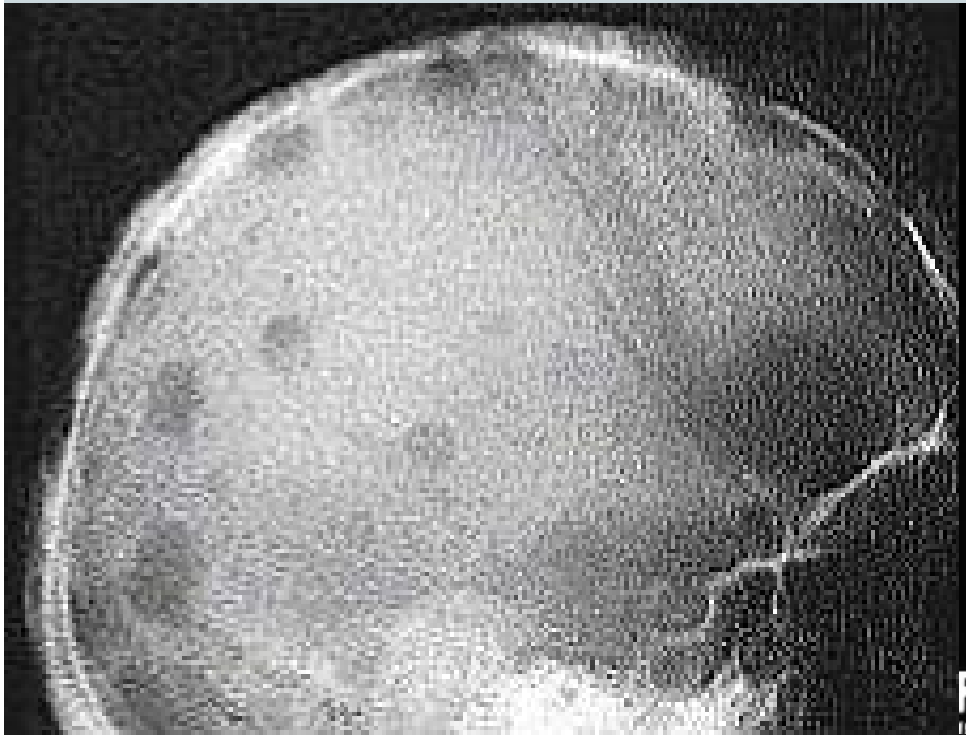
- Serum protein electrophoresis (SPEP) is used to determine the type of each protein present and may indicate a characteristic curve (ie, where the spike is observed).

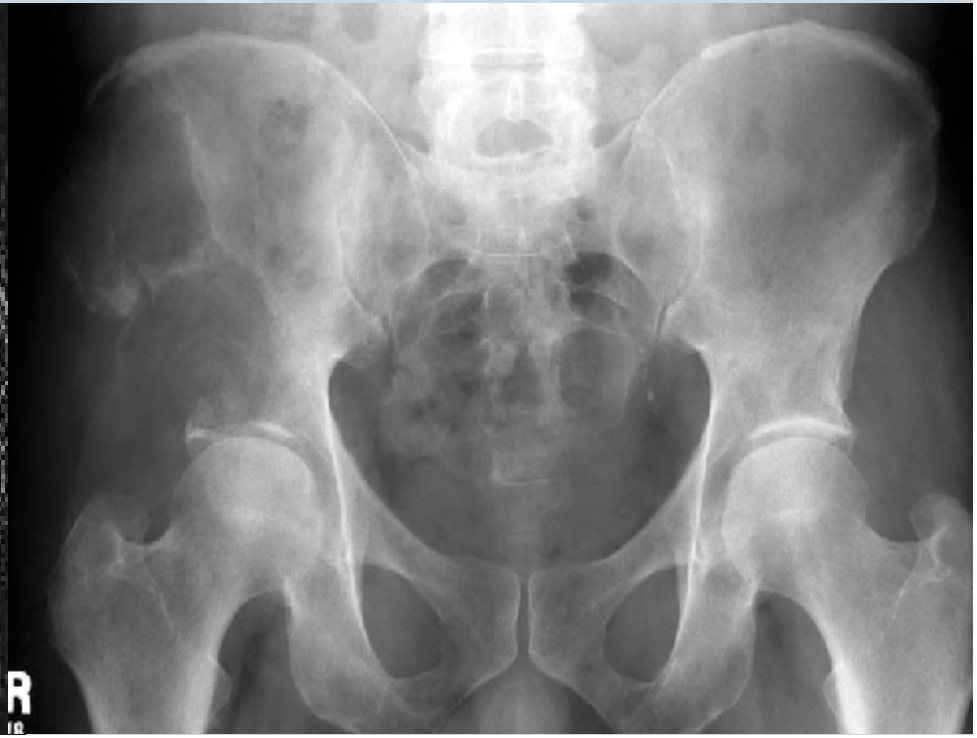


- Quantitative Immunoglobulin Levels (IgG, IgA, IgD, IgE)
- Urine protein electrophoresis (UPEP) is used to identify the presence of the Bence Jones protein in urine.

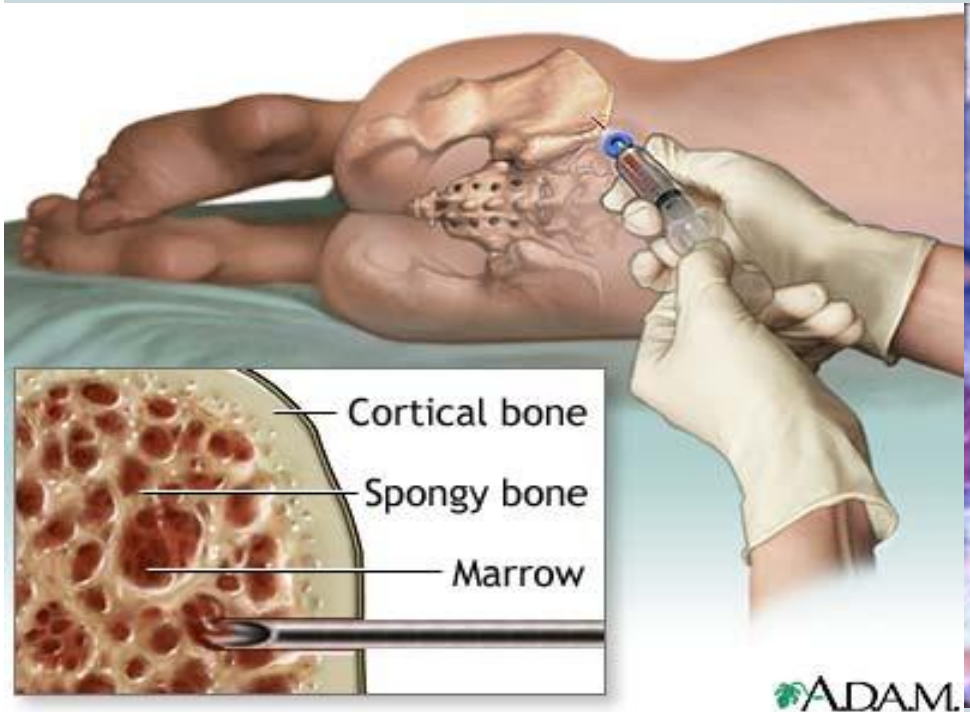


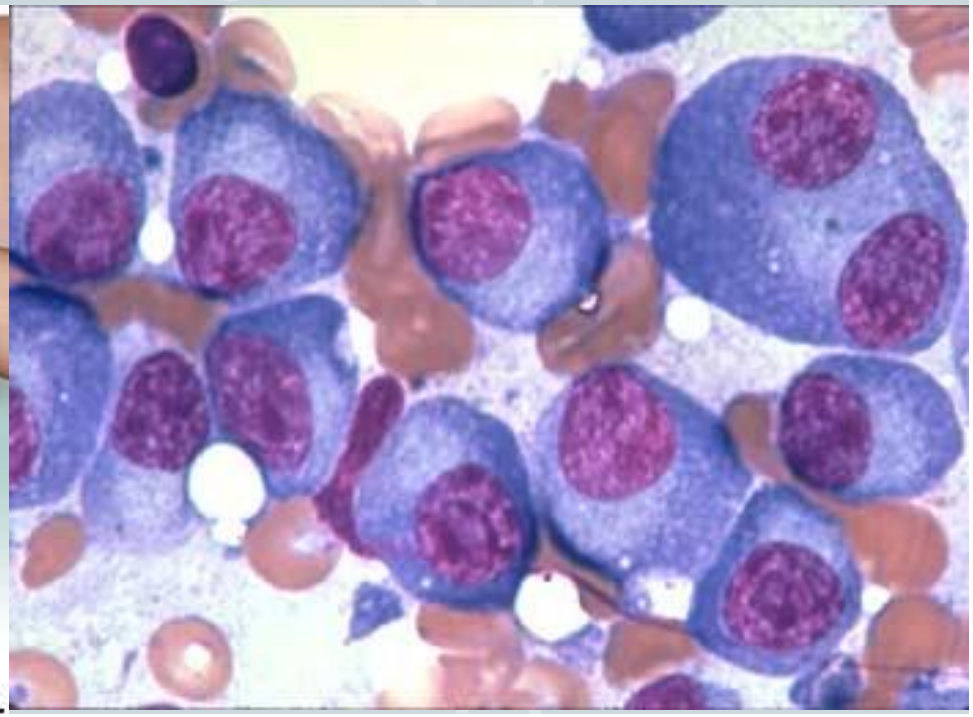
- Serum β_2-microglobulin (prognostic).
- Skeletal survey: including the skull, the long bones, and the spine.

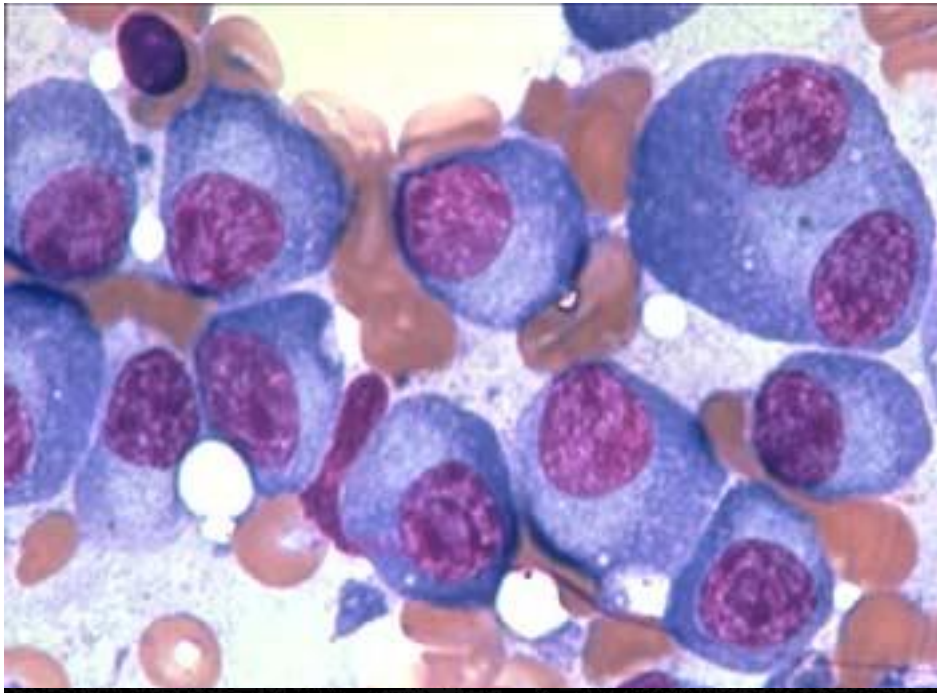


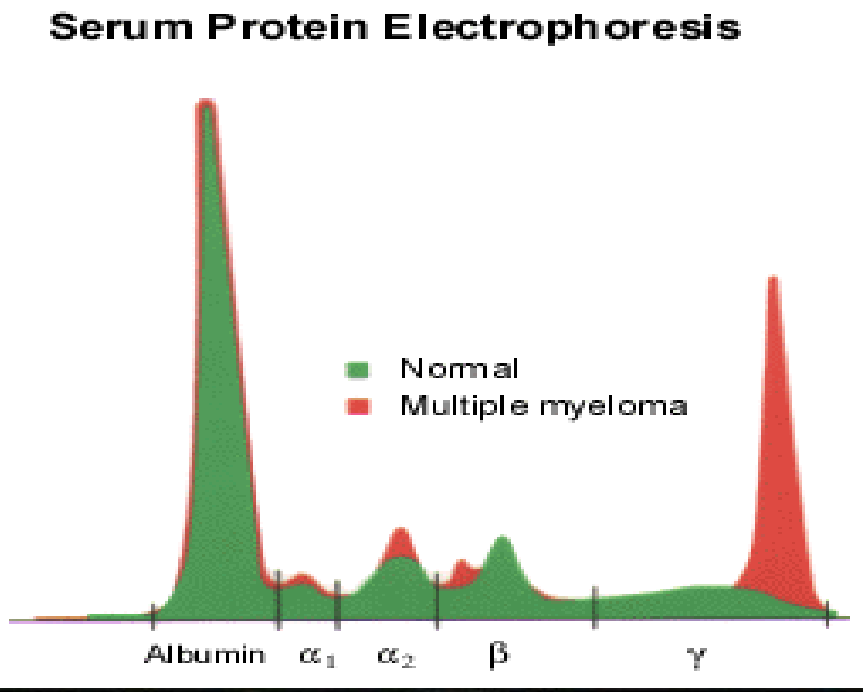


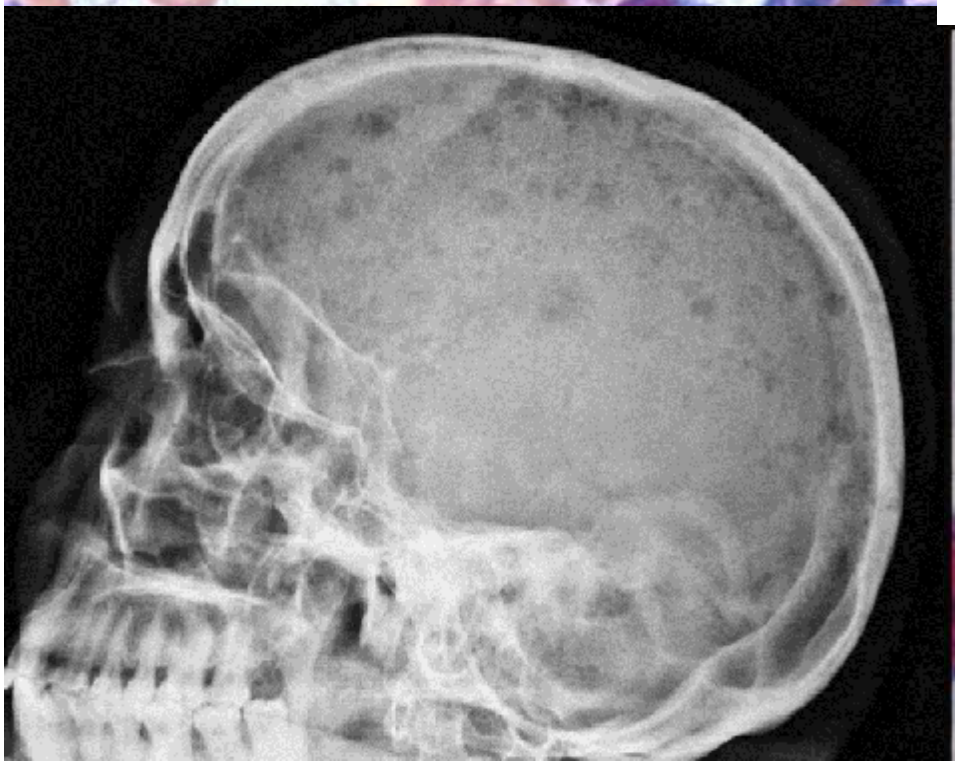
- Bone marrow aspiration and Biopsy: MM is characterized by an increased number of bone marrow plasma cells.

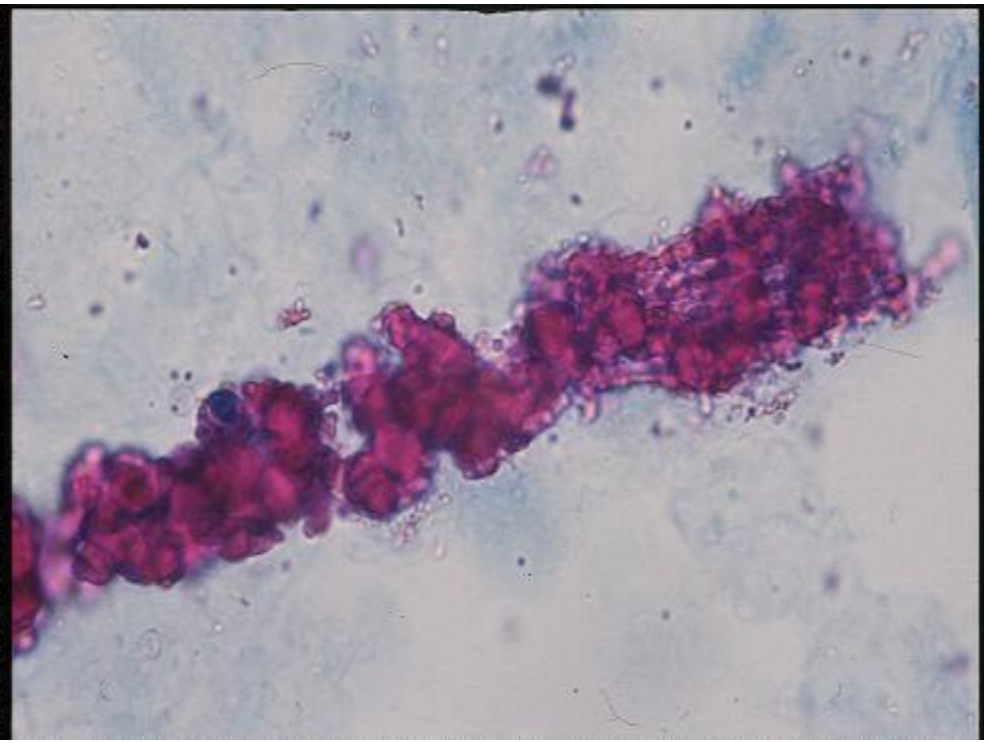












Case presentation

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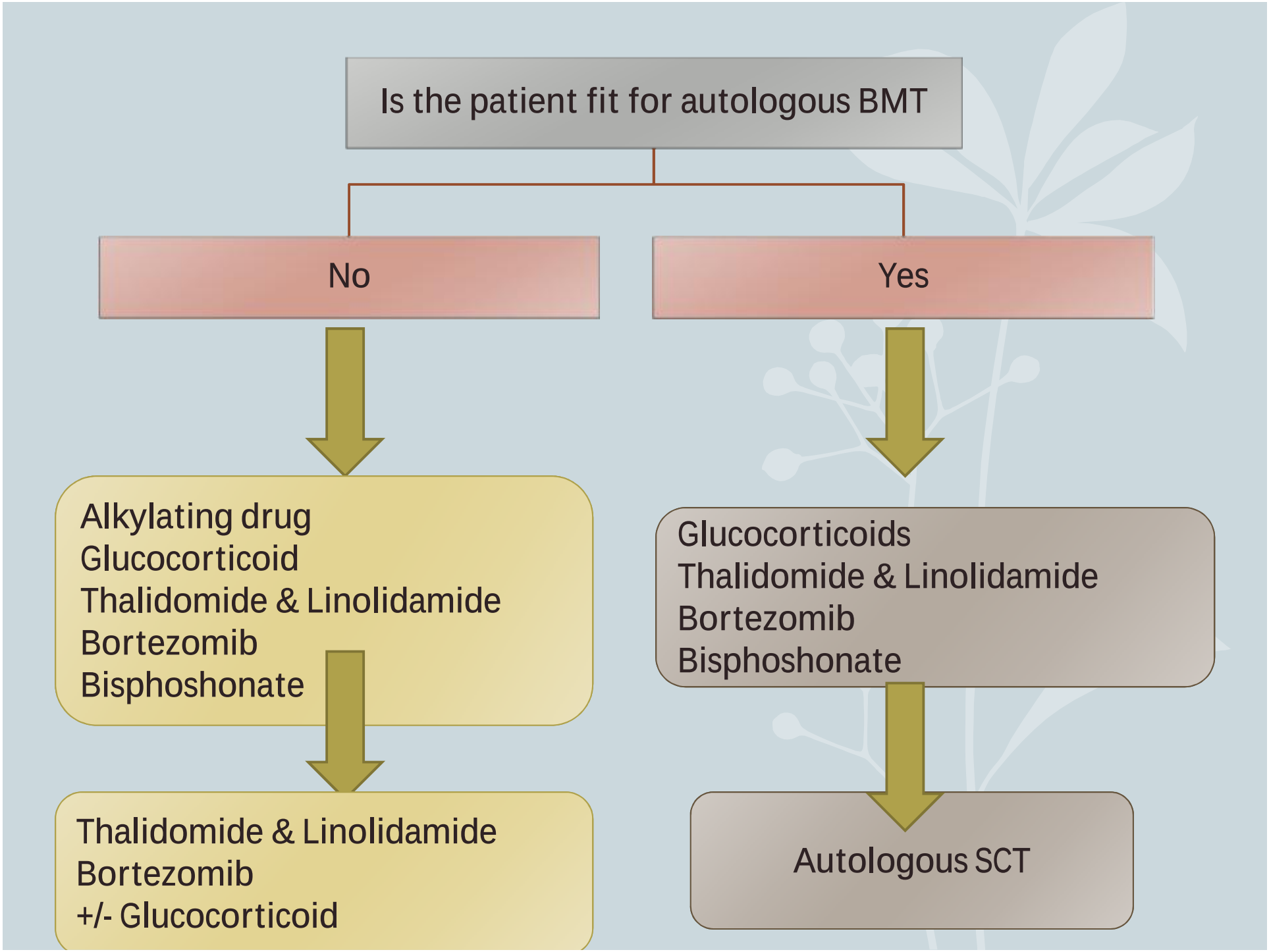
  - S. creatinin= 4

Treatment

- Myeloma *is not a curable malignancy*, systemic therapy can prolong survival and dramatically improve quality of life.
- The initial standard treatment for newly diagnosed myeloma is dependent on whether or not the patient is a candidate for high-dose chemotherapy with autologous stem cell transplant.



Not transplant candidates patients

- An alkylating agent, melphalan,
- Steroid.
- Thalidomide or lenalidomide (immunomodulatory *agents)*
- Bortezomib (proteosome inhibitor).

Transplant candidates patients

- An alkylating agent should be avoided
- Newer agents (lenalidomide, thalidomide, bortezomib) combined with pulsed glucocorticoids have now become standard of care as induction therapy in newly diagnosed patients, followed by autologous SCT.

Supportive measures

- Erythropoietin improves MM associated anemia.
- Renal Insufficiency management.
- Infection: appropriate therapy for bacterial infections is necessary. immunizations for pneumonia and influenza are mandatory.

- Hypercalcemia treatment.
- Skeletal Lesions:
  - ü Encouraged activity as possible but avoid trauma.
  - ü Bisphosphonate.
  - ü Palliative radiotherapy.