

Pathology of Hematopoietic and Lymphoid tissue

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CONTENTS

White blood cells and lymph nodes

- Quantitative disorder of white blood cells
- Reactive lymphadenopathies
- Infectious lymphadenitis
- Tumor metastasis in lymph nodes
- Myeloid neoplasms
- Lymphoid neoplasms

QUANTITATIVE DISORDERS OF WHITE BLOOD CELLS

LEUKOPENIA

- Neutropenia (agranulocytosis)
 - Reduced or ineffective production of neutrophils
 - Suppression of myeloid stem cells : AA
 - Suppression of granulocytic precursors : Drug
 - Ineffective granulopoiesis : megaloblastic anemia
 - Inherited condition

○ Accelerated removal or destruction of neutrophils

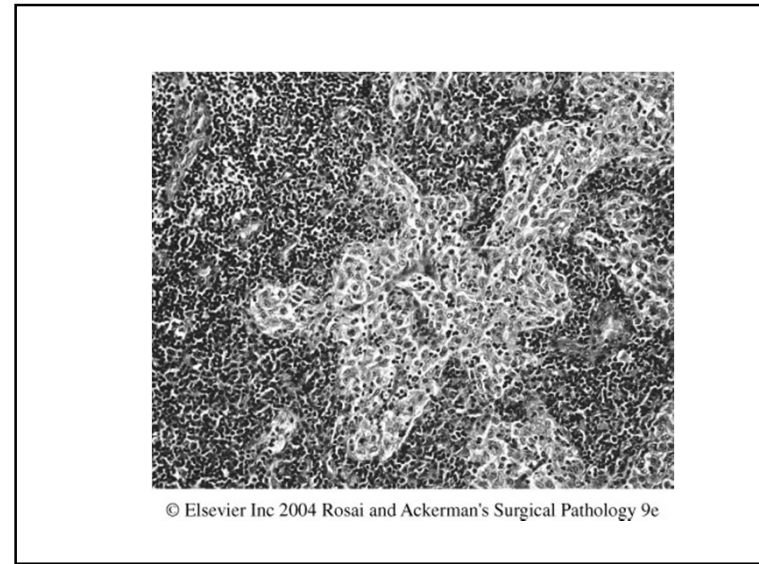
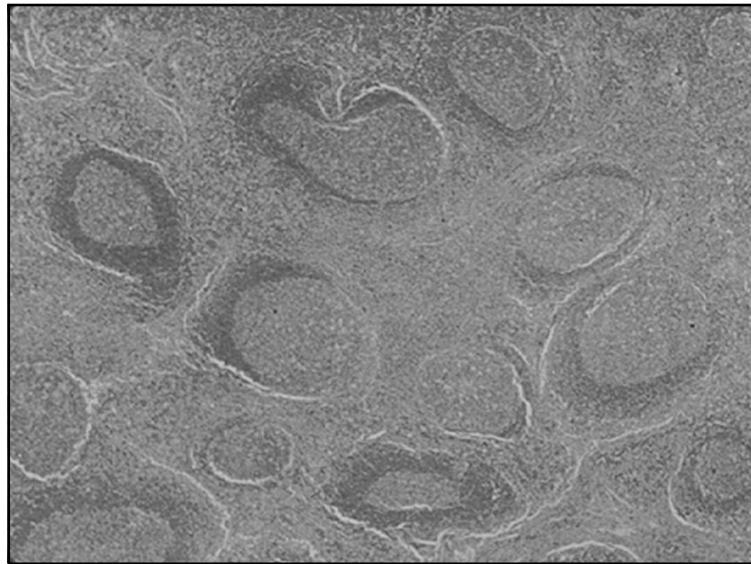
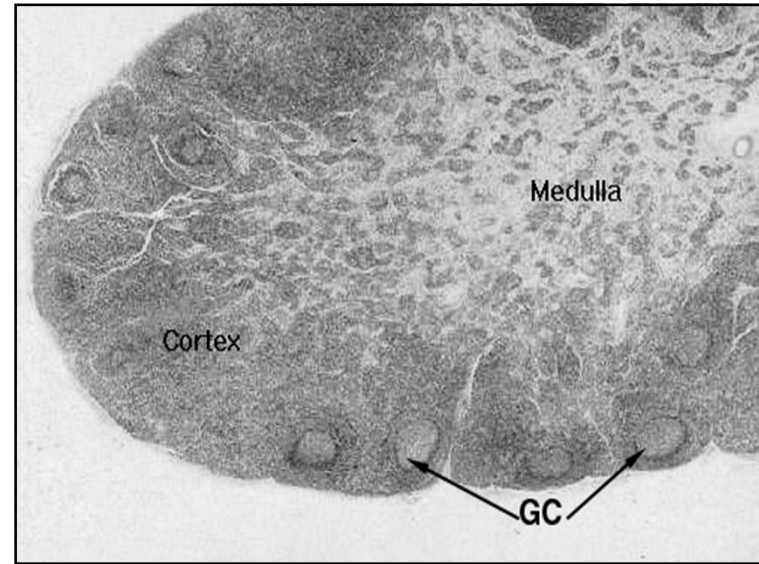
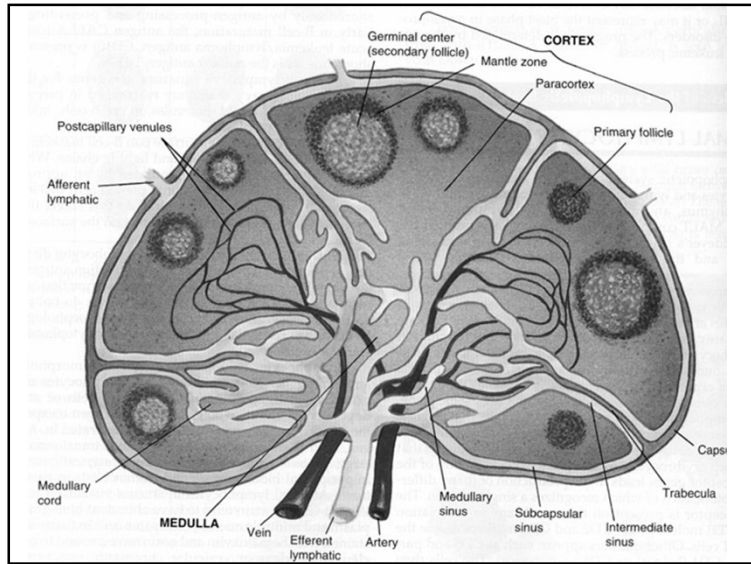
- Immunological mediated injury
 - SLE
 - Drugs
- Splenic sequestration
 - Splenomegaly
- Increased peripheral use
 - Severe infection

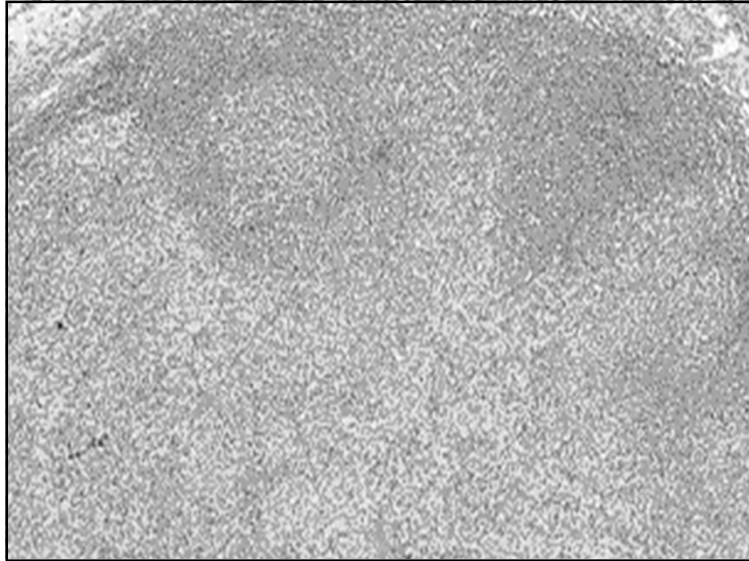
- Neutrophilia
 - Bacterial infection
 - Tissue infarction
- Monocytosis
 - Chronic infection
 - Collagen-vascular diseases
- Eosinophilia
 - Allergy
 - Drug reaction
 - Parasitic infiltration
 - Collagen-vascular diseases

- ### LYMPHADENOPATHIES
- Lymph nodes enlargement
- Reactive lymphadenopathy
 - Lymphadenopathy associated with clinical syndrome
 - Infection
 - Neoplasm : lymphoma, leukemia, metastatic tumor



- ### REACTIVE LYMPHADENOPATHY
- Reactive lymphoid hyperplasia (reactive hyperplasia)
- Increased cellularity of lymph nodes
 - Palpable mass ~ 1 cm.
 - Axilla, inguinal, cervical and supraclavicular



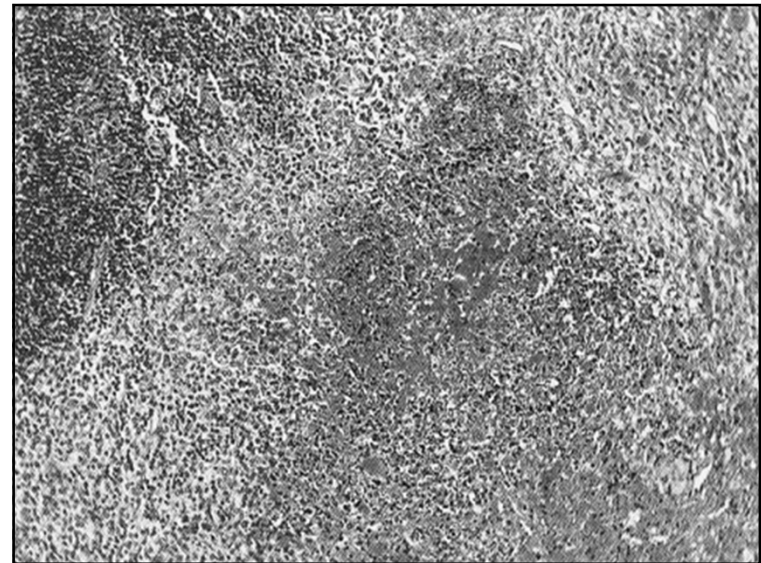
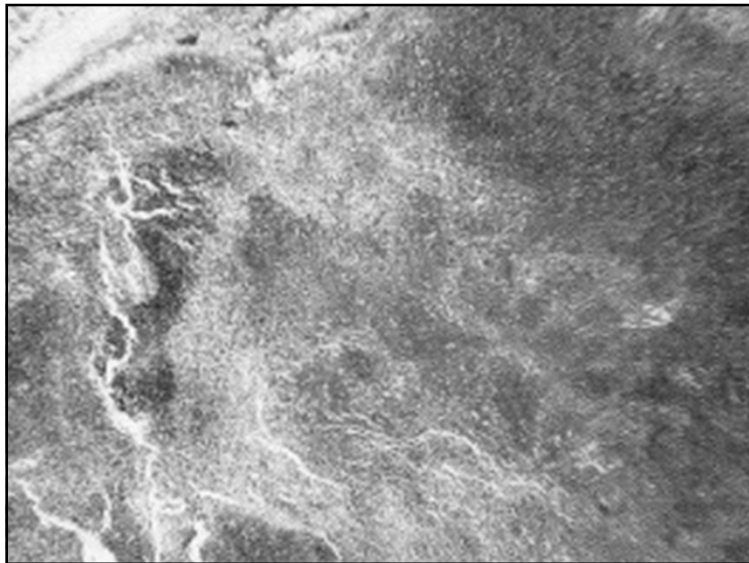


LYMPHADENOPATHY ASSOCIATED WITH CLINICAL SYNDROME

SLE lymphadenopathy

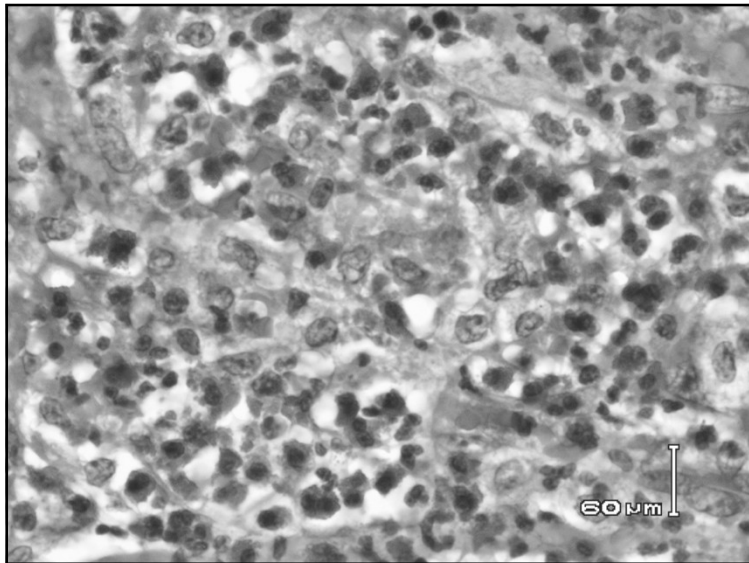
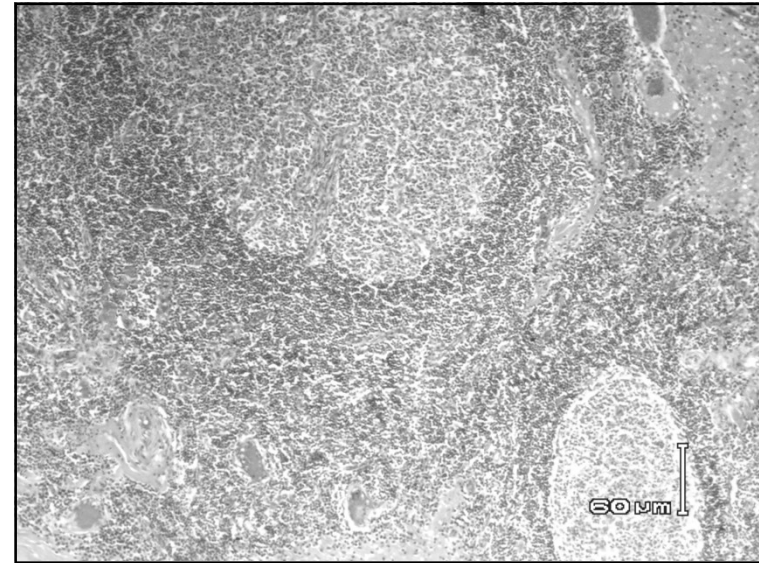
○ SLE → increased risk of lymphoma and infection

Lymph node biopsy → Exclude these conditions



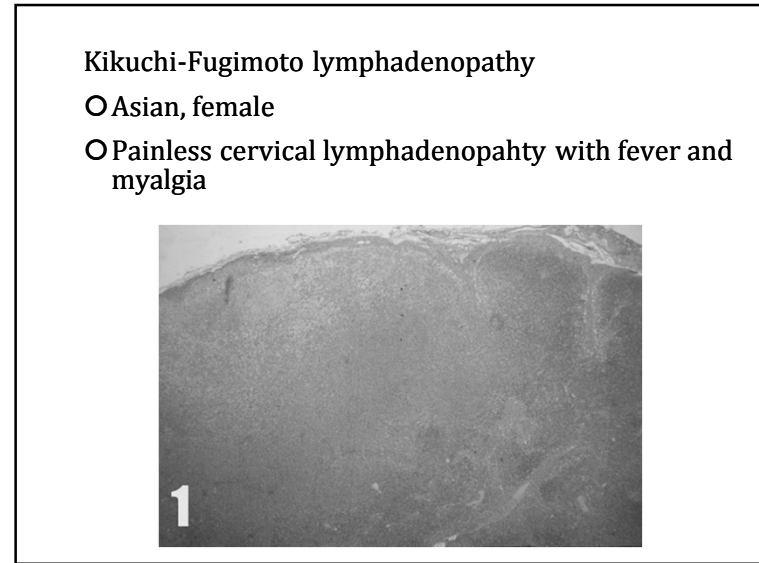
Kimura lymphadenopathy

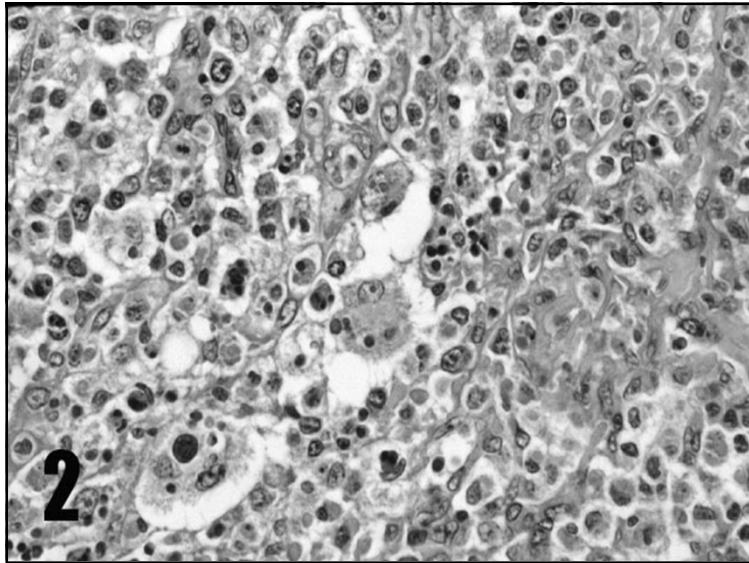
- Asian
- Female > male, 27-40 yrs
- Slowly lymph node enlargement
- Head and neck → auricular area
- Eosinophilia
- Increased serum level of IgE



Kikuchi-Fujimoto lymphadenopathy

- Asian, female
- Painless cervical lymphadenopathy with fever and myalgia

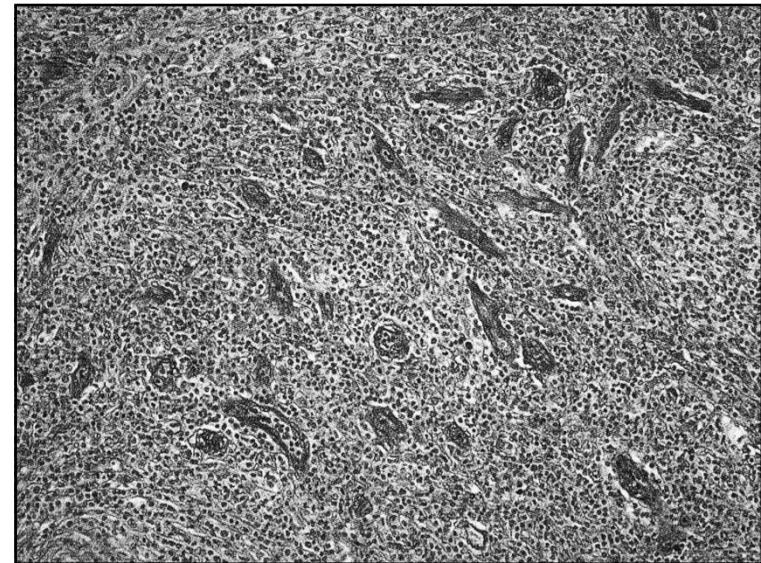
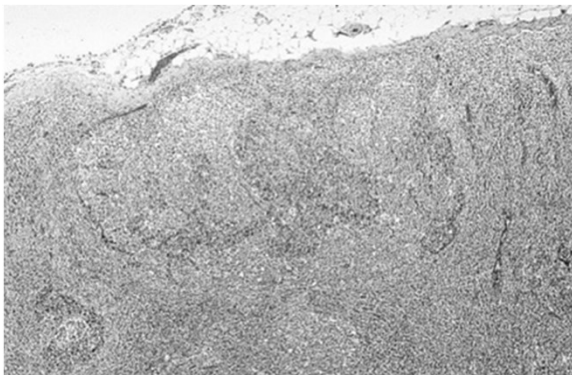


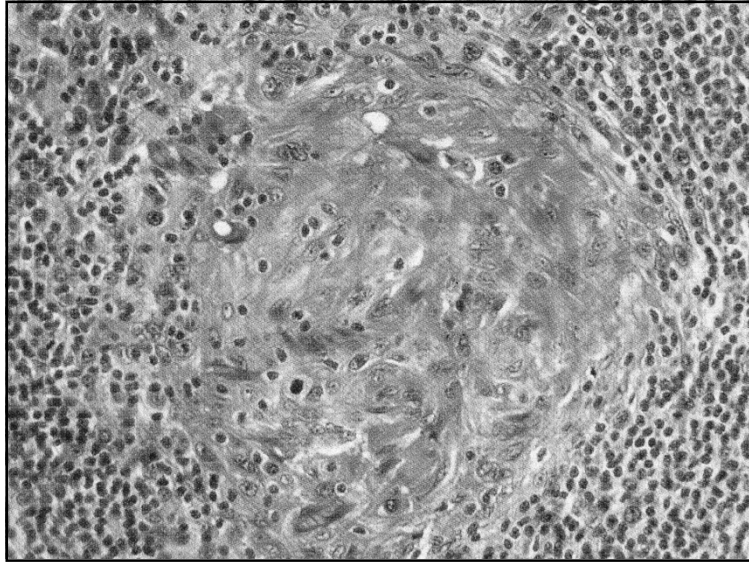


INFECTIOUS LYMPHADENITIS

- Viral lymphadenitis
 - *HIV lymphadenitis*
 - *Infectious mononucleosis lymphadenitis*
- Bacterial lymphadenitis
 - *Ordinary bacterial lymphadenitis*
 - *Mycobacterium lymphadenitis*
 - *Cat-scratch disease*
- Fungal lymphadenitis

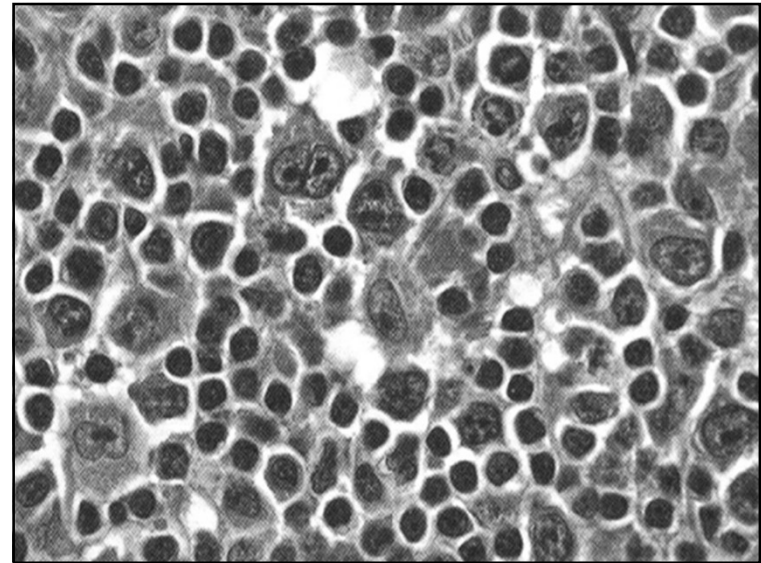
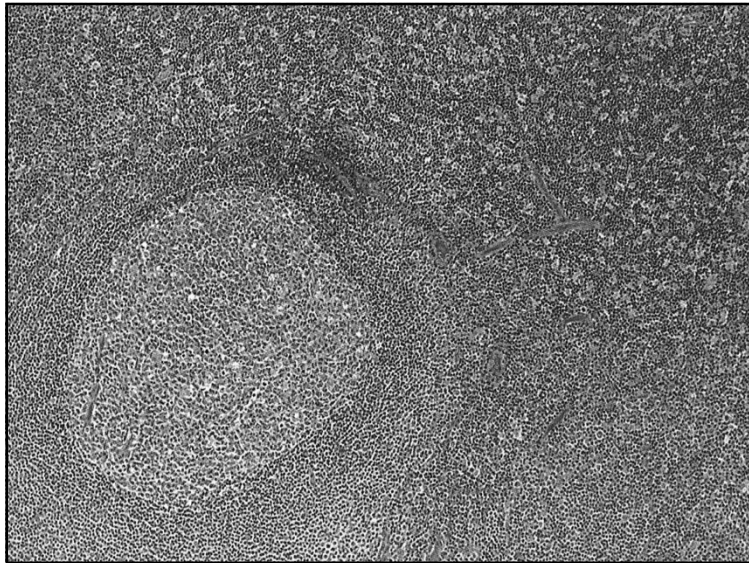
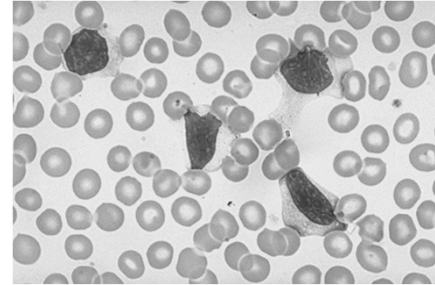
HIV lymphadenitis





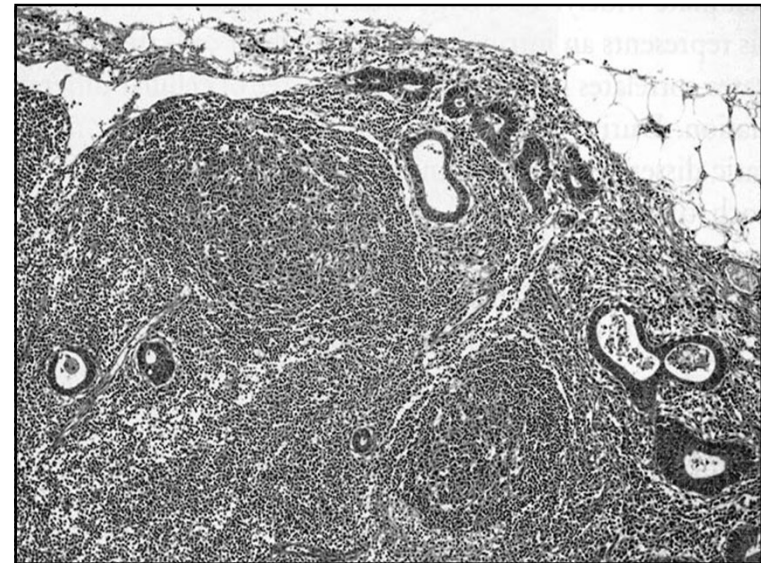
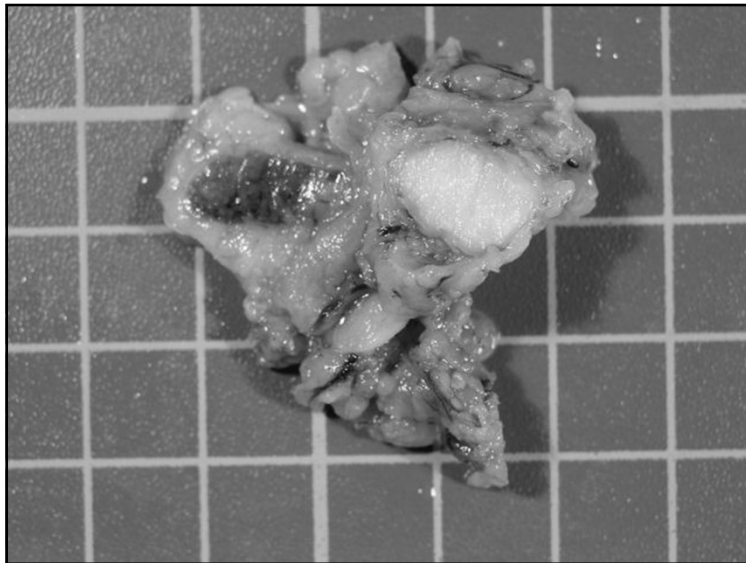
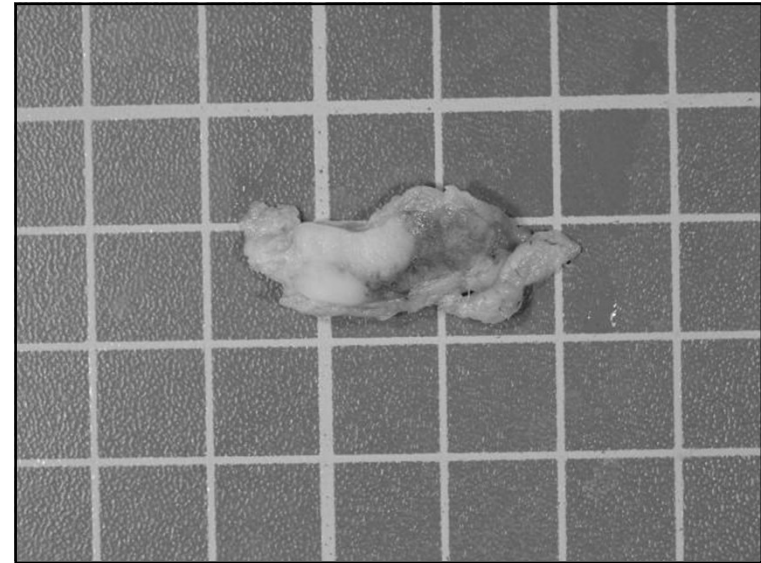
Infectious mononucleosis lymphadenitis

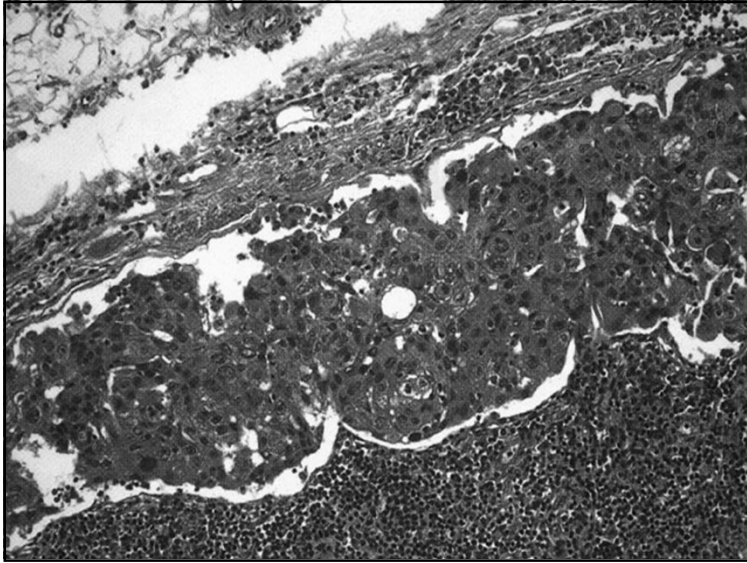
- Epstein-Barr virus
- Fever, pharyngitis, lymphadenopathy
- Teenagers and young adults
- Peripheral blood → atypical lymphocytes (monocytoid lymphocytes, Downey cells)



TUMOR METASTASIS

- Adjacent to or distant foci from primary site
- Movable or fixed to soft tissue
- Soft to firm consistency

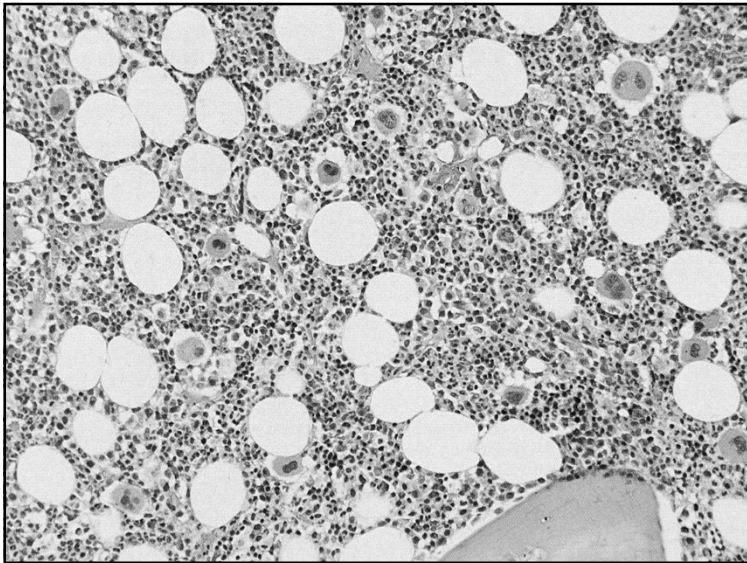




MYELOID NEOPLASMS

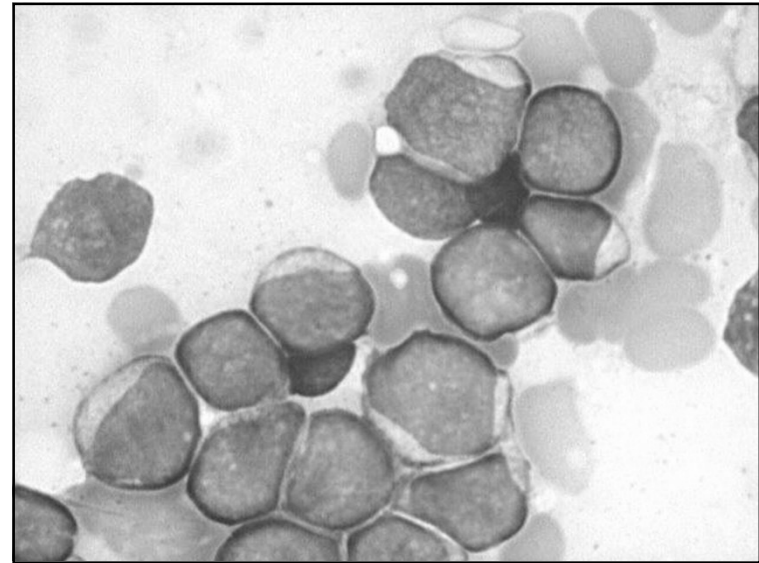
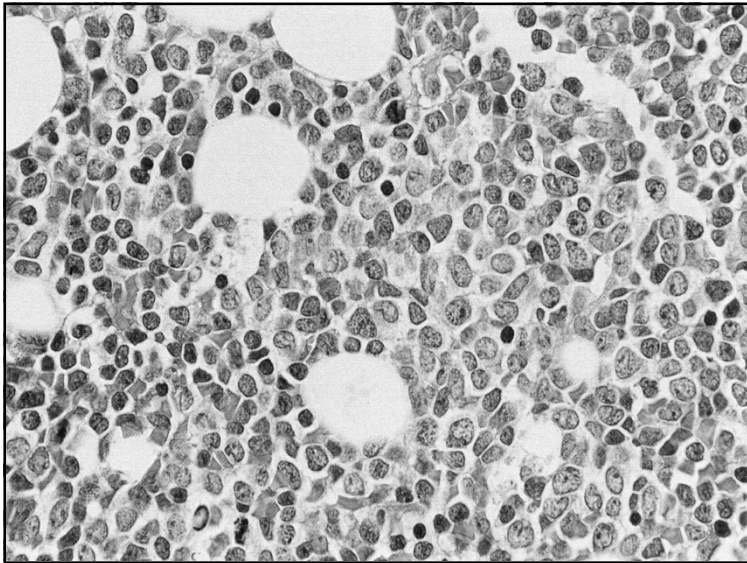
Neoplasms of hematopoietic stem cells

- Acute myelogenous leukemia (AML)
 - *accumulation of immature myeloid cells in bone marrow*
- Myelodysplastic syndrome (MDS)
 - *ineffective hematopoiesis*
- Chronic myeloproliferative disease (MPD)
 - *increased production of terminally differentiated myeloid cells*



ACUTE MYELOGENOUS LEUKEMIA (AML)

- Inhibition of terminal differentiation → accumulation of immature myeloid cells in bone marrow
- Clinical features
 - Adult, peak incidence 15-39 yrs.
 - Anemia, leukopenia, thrombocytopenia, pancytopenia
 - Infiltrate to gum or spleen → gum hypertrophy, splenomegaly



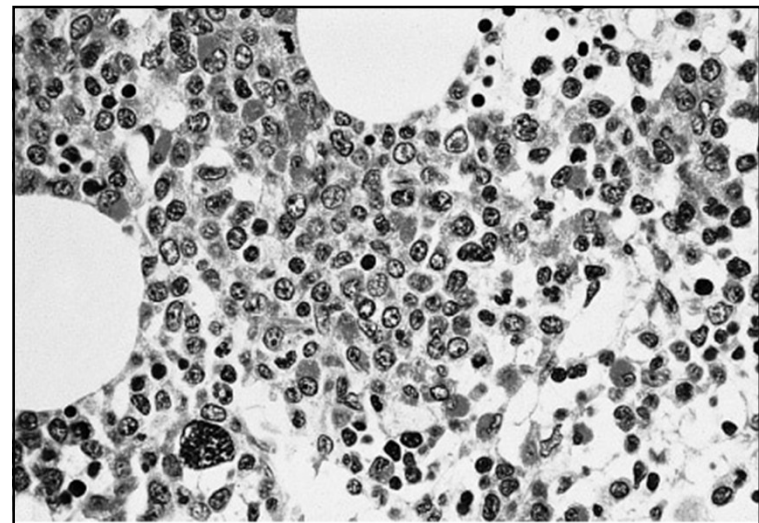
MYELOYDYSPLASTIC SYNDROME (MDS)

○ Group of clonal stem cells disorders characterized by maturation defects

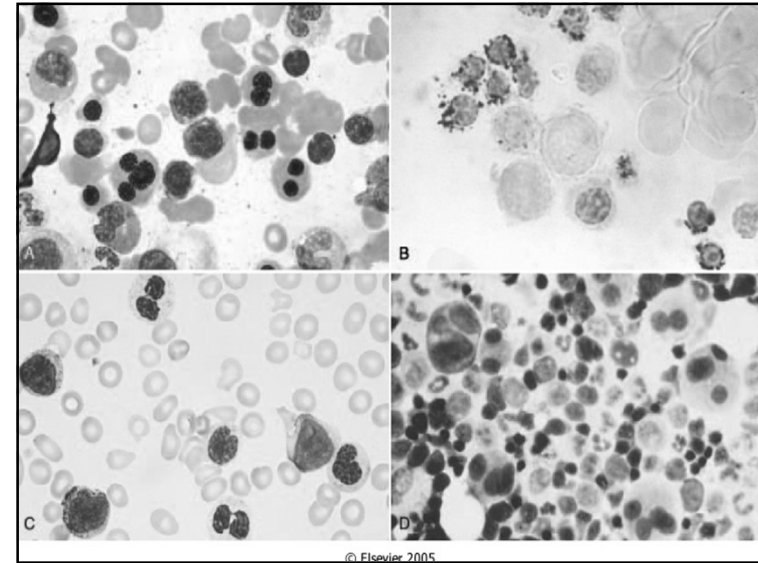
- Ineffective hematopoiesis
- Increased risk of transformation of AML

○ Clinical features

- Old age ~ 60 yrs
- Anemia, leukopenia, thrombocytopenia



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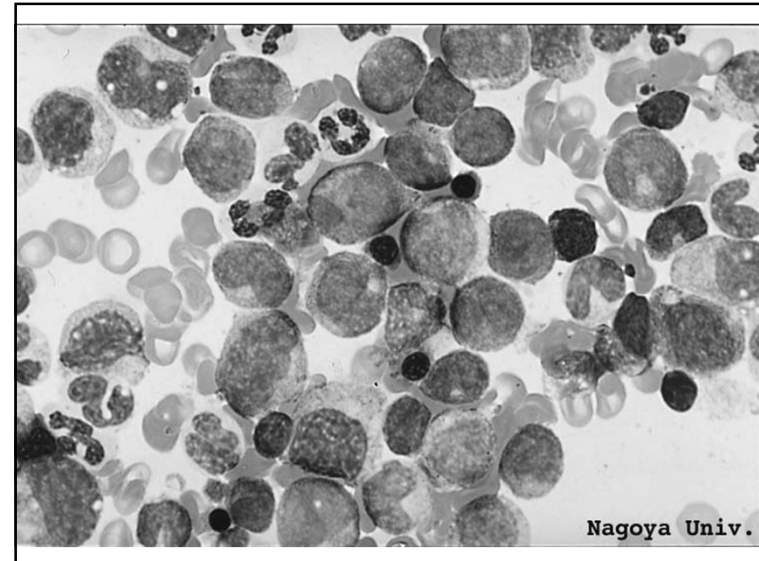
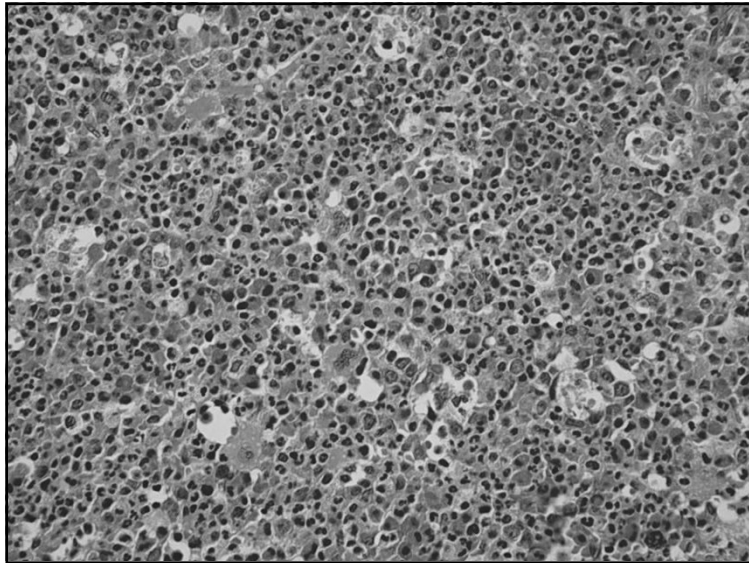


CHRONIC MYELOPROLIFERATIVE DISEASES (Chronic MPD)

- Neoplastic disease of stem cells
 - Chronic myelogenous leukemia
 - Polycythemia vera
 - Essential thrombocythemia
 - Chronic idiopathic myelofibrosis

Chronic myelogenous leukemia (CML)

- Peak incidence 30-50 yrs
- Philadelphia chromosome
 - $t(9;22)(q34;q11)$
- Clinical features
 - *Chronic phase* : fatigue, weakness, weight loss anorexia, cytopenia, splenomegaly
 - *Accelerated phase* : increasing anemia and thrombocytopenia
 - *Blast phase* : acute leukemia



LYMPHOID NEOPLASMS

○ Lymphocytic leukemia

Lymphoid neoplasms present with widespread involvement of the bone marrow, occasionally in peripheral blood

○ Lymphoma

Lymphoid neoplasms present with discrete tissue mass

Lymphoid neoplasm

○ Lymphadenopathy

○ Extranodal mass → skin, stomach

○ B-symptoms

○ Fever

○ Weight loss

○ Night sweat

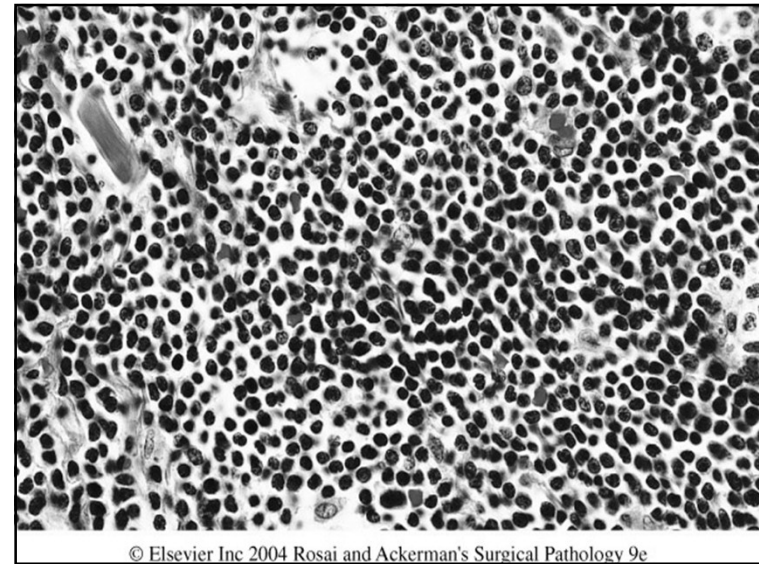
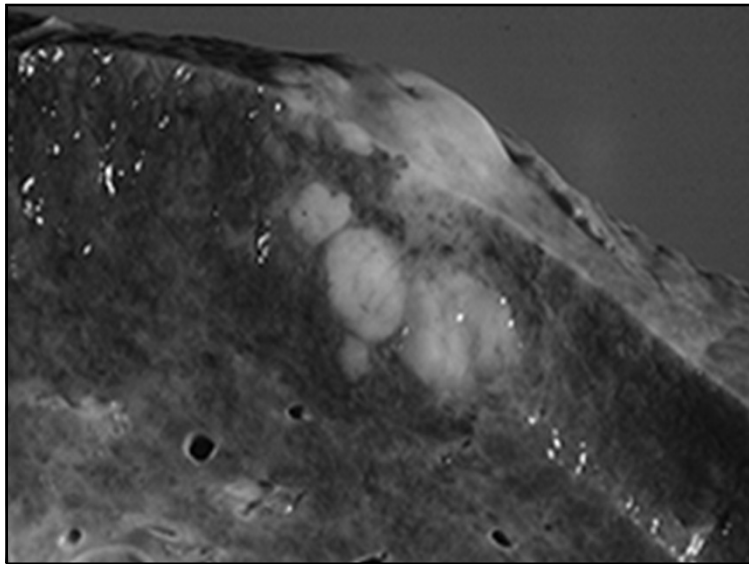
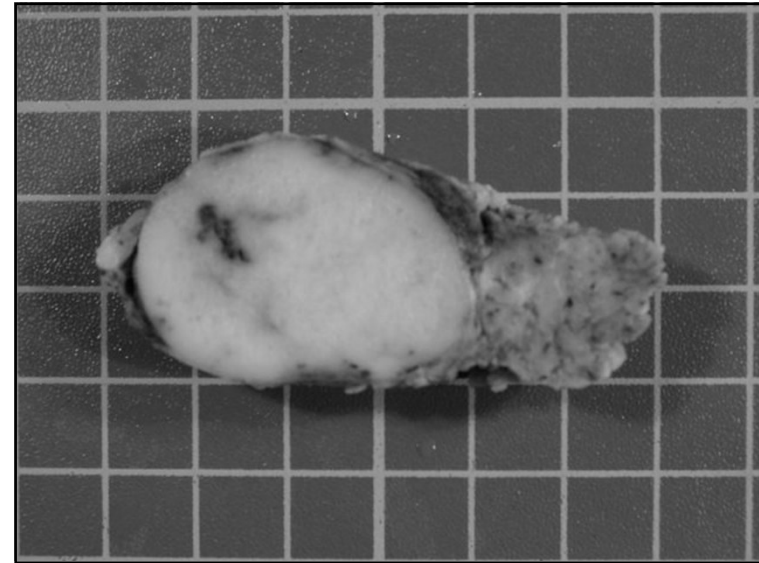
○ Hodgkin lymphoma

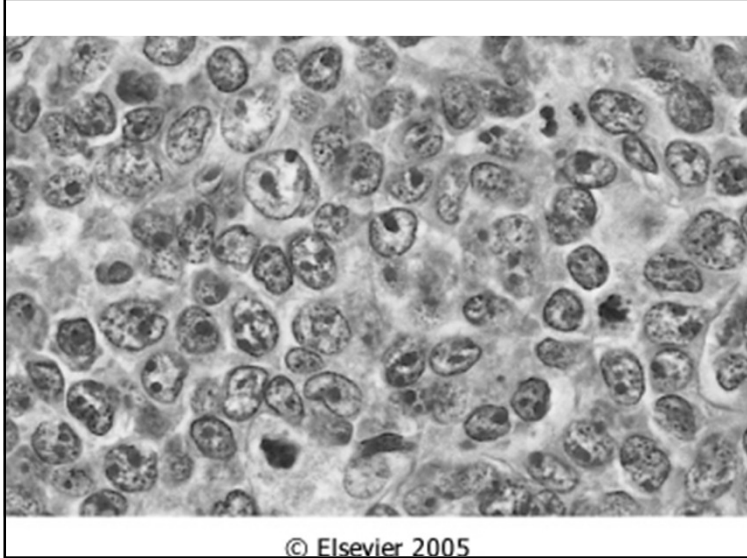
○ Non-Hodgkin lymphoma

NON-HODGKIN LYMPHOMA

○ B-cell ~ 75%, T-cell ~ 25%, NK-cell <1%

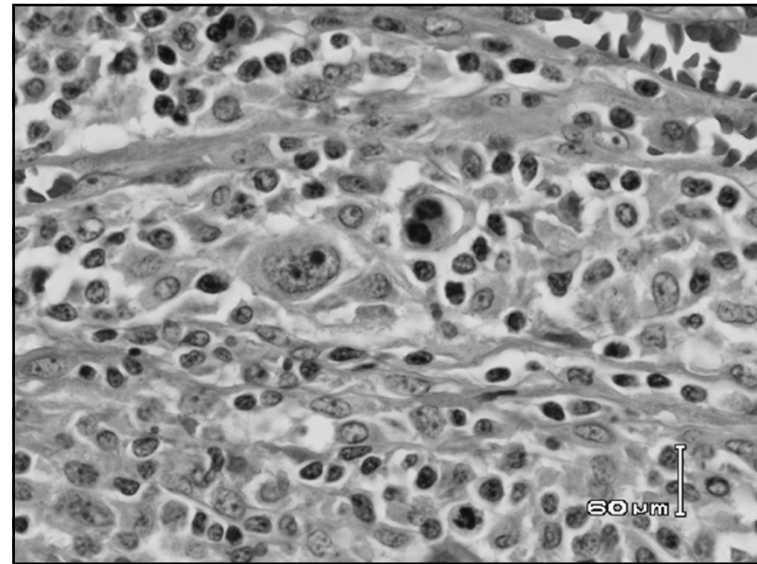
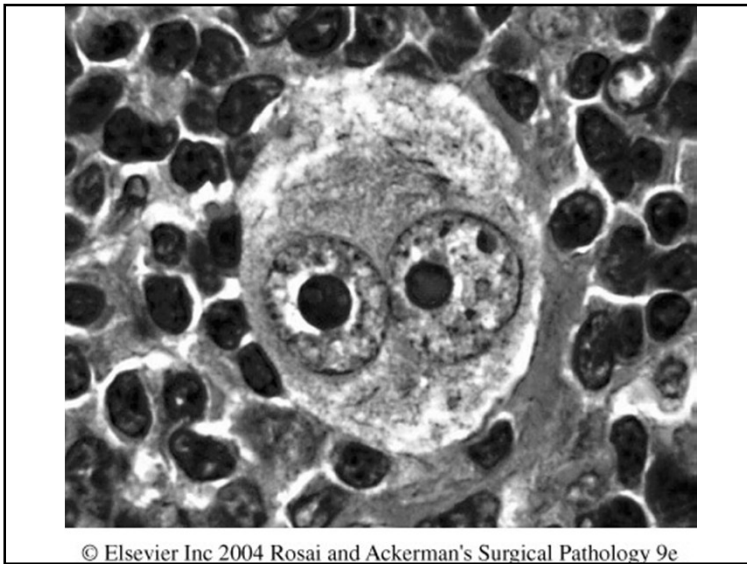
1. Diffuse large B-cell lymphoma
 2. Peripheral T-cell lymphoma, unspecified
 3. Follicular lymphoma
 4. Extranodal marginal zone B-cell lymphoma
- Precursor T-lymphoblastic lymphoma
 Burkitt lymphoma





HODGKIN LYMPHOMA

- Tumor cell → Reed-sternberg cells
- Painless lymphadenopathy
 - Single or multiple
 - Cervical, supraclavicular, mediastinum
- B-symptoms : fever, weight loss, night sweat
- Pruritus
- Pain → after alcohol ingestion



PLASMA CELL NEOPLASMS

○ Peripheral B-cell neoplasms secrete single homogeneous immunoglobulin or its fragments

Plasma cell myeloma

Bone marrow-base multifocal plasma cell neoplasms :
vertebra, ribs, skull

- Anemia
- Serum monoclonal protein
- Skeletal destruction → osteolytic lesion or pathologic fracture

