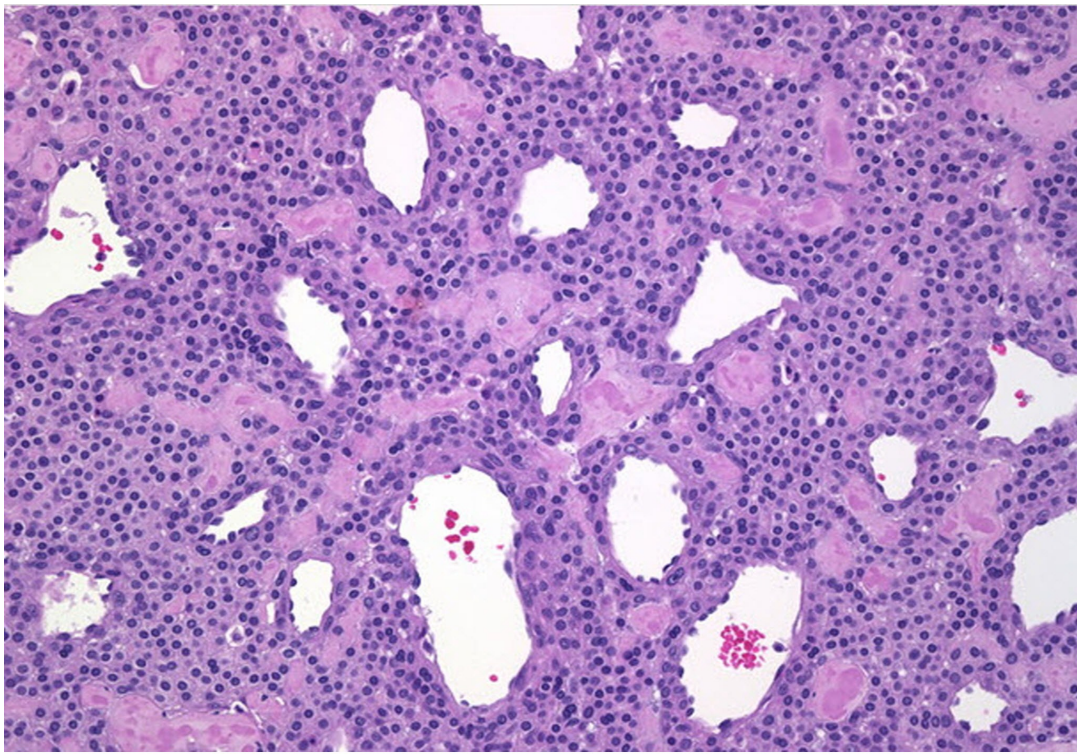
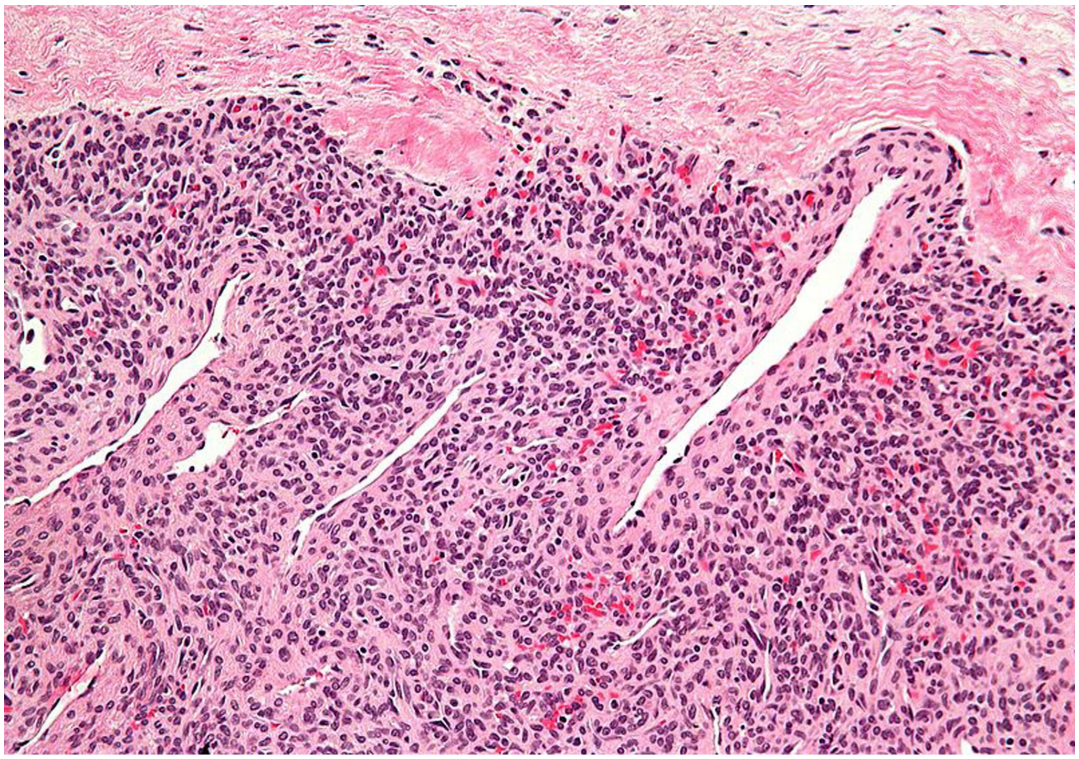
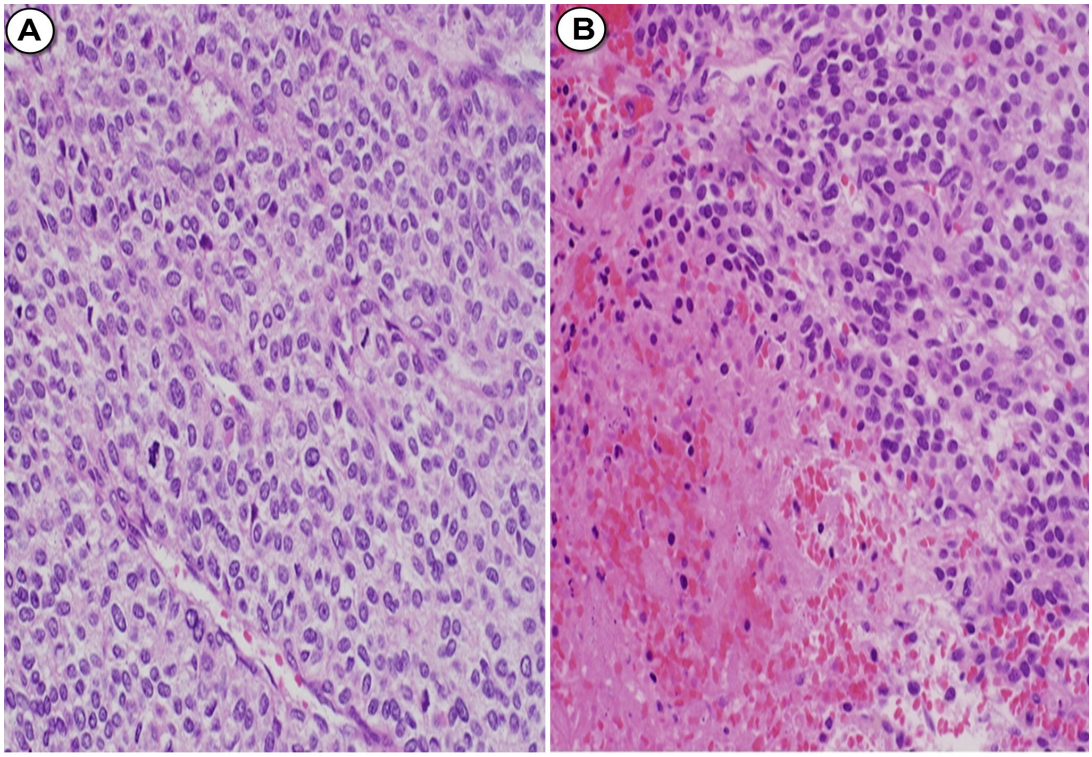


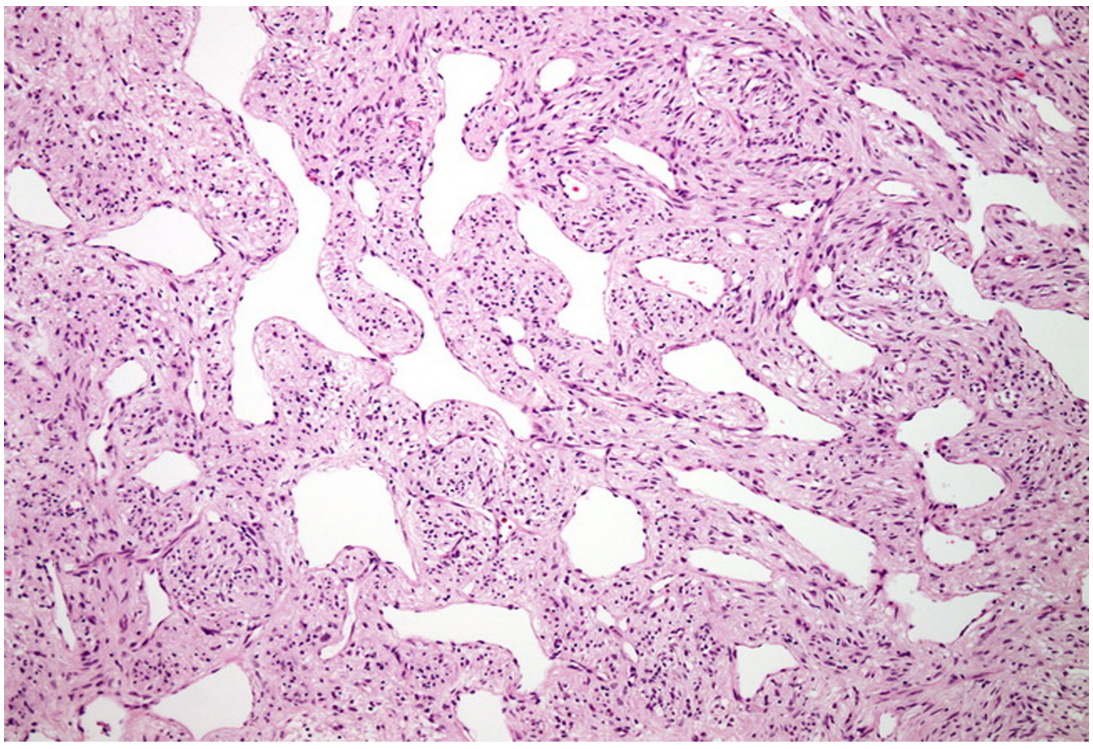
P 13-61 Glomus tumor. vascular channels surrounded by glomus cells and seprated by stroma. Glomus cells are small rounded regular cells with indistinct nucleoli. Tumor cells are positive for SMA and h-caldesmon and negative for CD31. (Courtesy of PathologyOutlines.com)



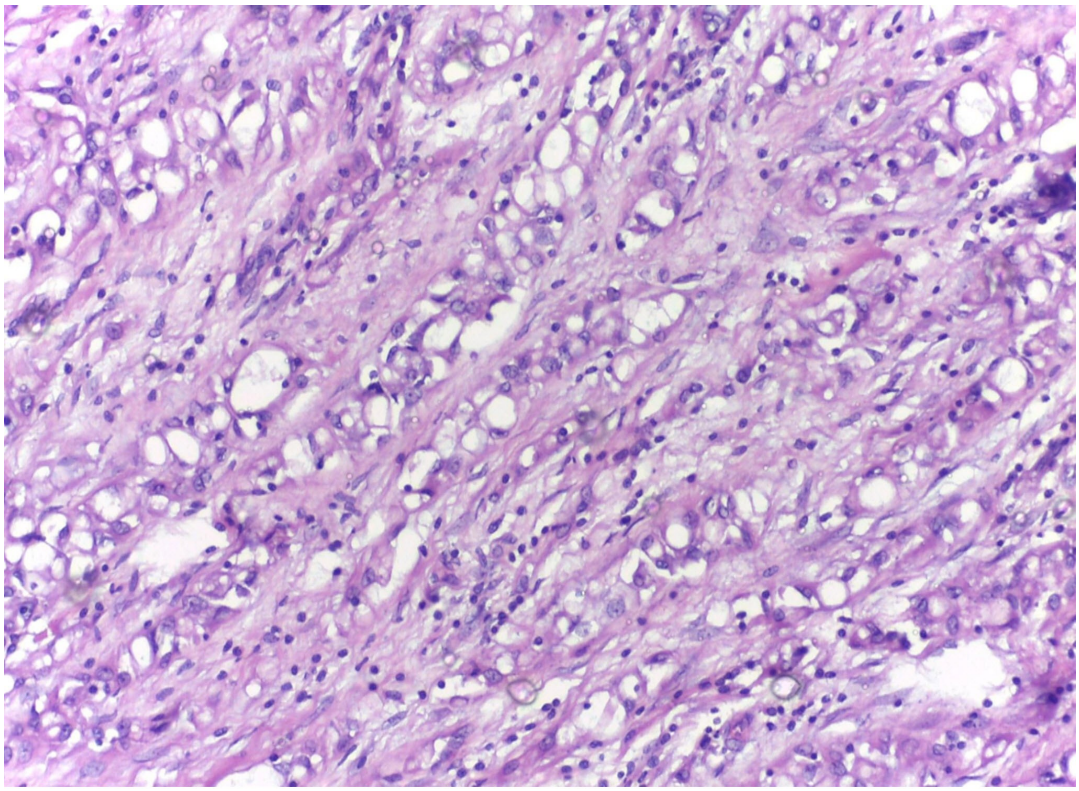
P 13-62 Myopericytoma (a benign pediatric tumor). Compressed blood vessels, often thin walled and branching, increased perivascular cellularity with small bland unequally spaced epithelioid / spindle cells with moderate eosinophilic cytoplasm.Tumor cells are positive for SMA, h-caldesmon and CD34. (Courtesy of PathologyOutlines.com)



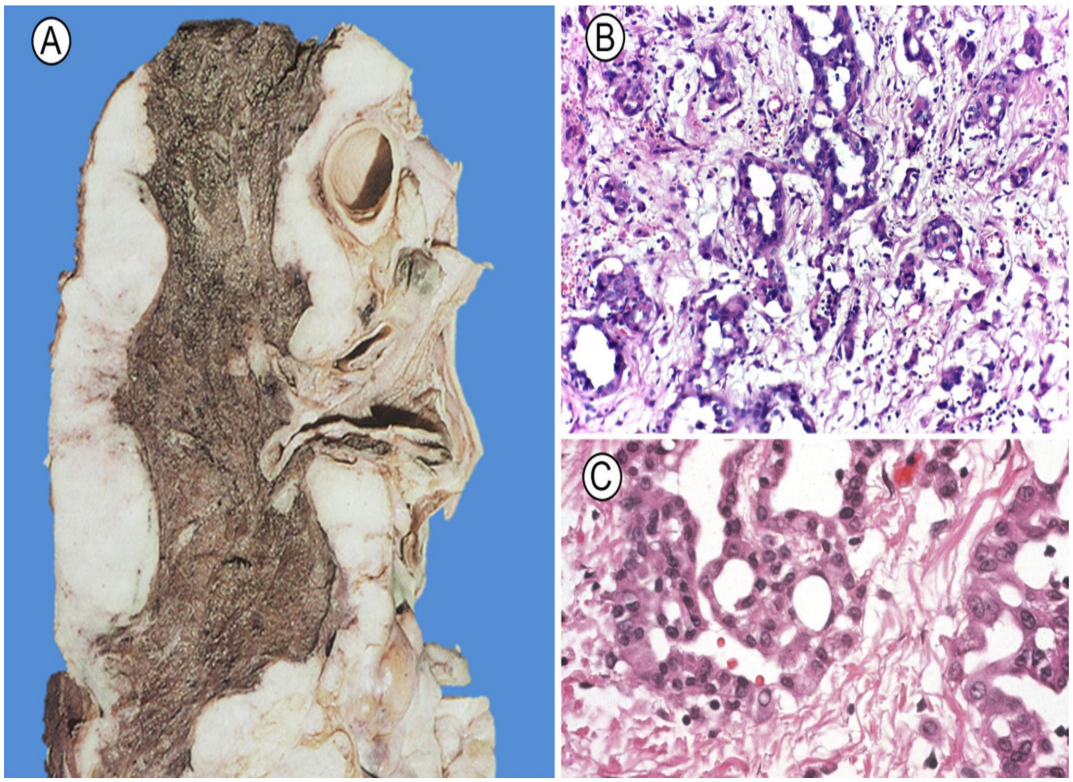
P 13-63 Malignant glomus tumor. **A.** Marked nuclear atypia any level of mitotic activity and atypical mitotic figures are required for diagnosis of malignant glomus tumor. **B.** Tumoral necrosis. Immunohistochemical staining for SMA as well as pericellular type IV collagen is confirmatory. (Courtesy of PathologyOutlines.com)



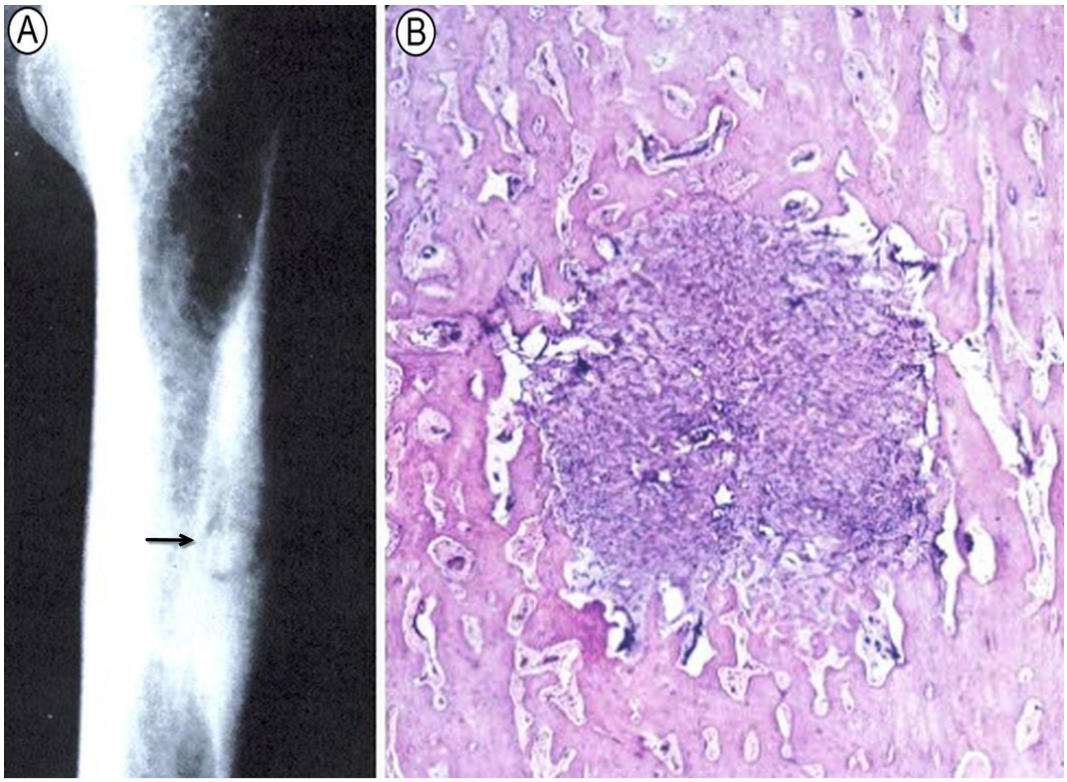
P 13-64 Pericytoma. only recognized in meninges and pharynx. Spindled to round tumor cells with little cytoplasm, indistinct cell borders arranged around branching thin walled blood vessels (Staghorn configuration). Immunostaining for CD34 and reticulin special stain surrounding individual cells are diagnostic. (Courtesy of PathologyOutlines.com)



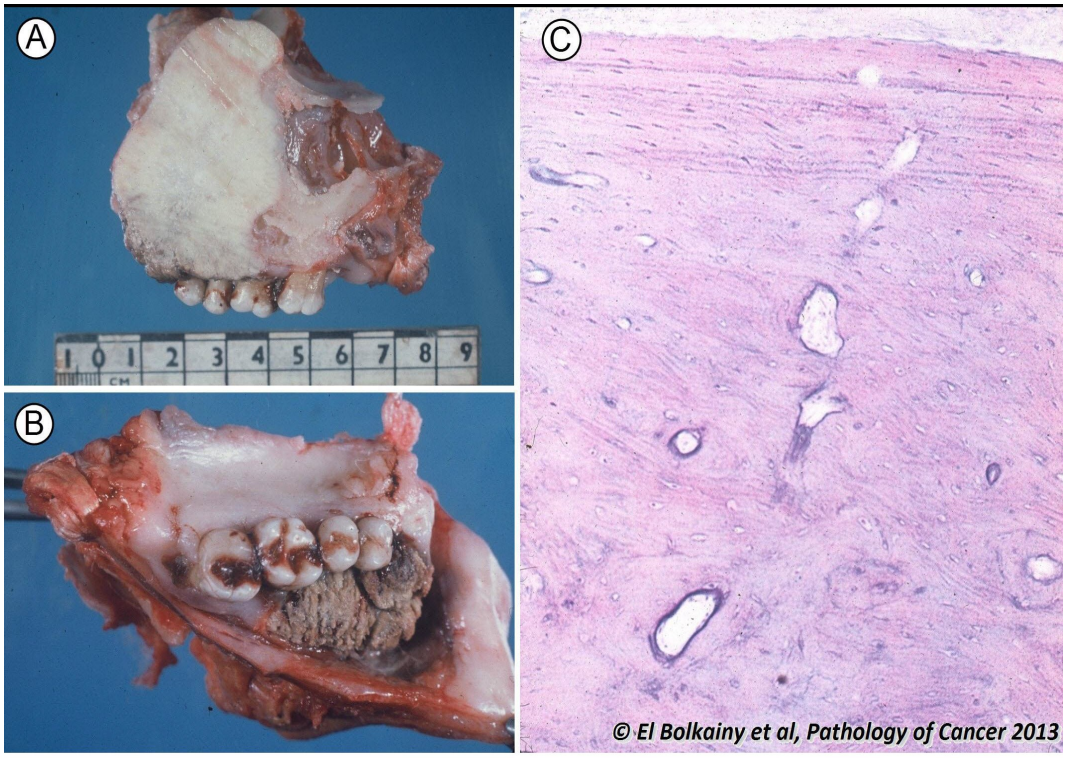
P 13-65 Epididymis. Adenomatoid tumor. A mesothelial tumor composed of variable sized tubular structure, lined by bland low cubical cells, set in a fibrous stroma.



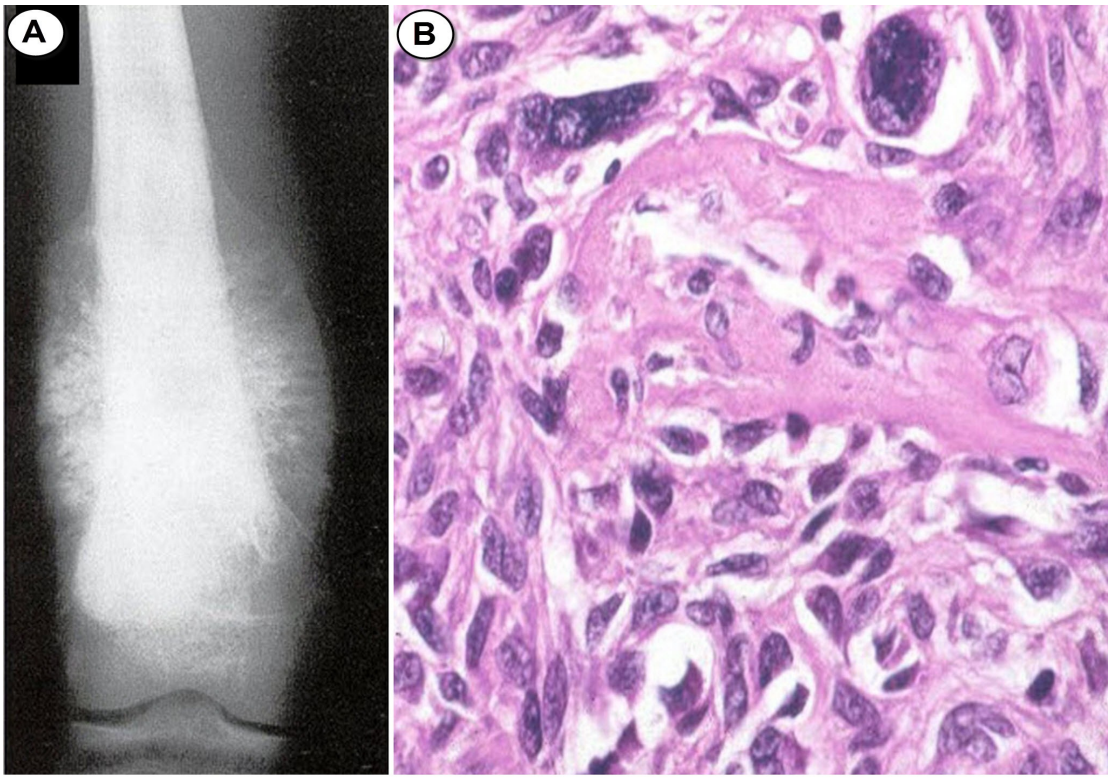
P 13-66 Pleura. Mesothelioma. **A**. Gross; a surface tumor growing along the pleura and encasing the lung. **B.** and **C**. Histology, a biphasic tumor composed of tubulo-papillary mesothelial cells associated with spindle cell component in the stroma.



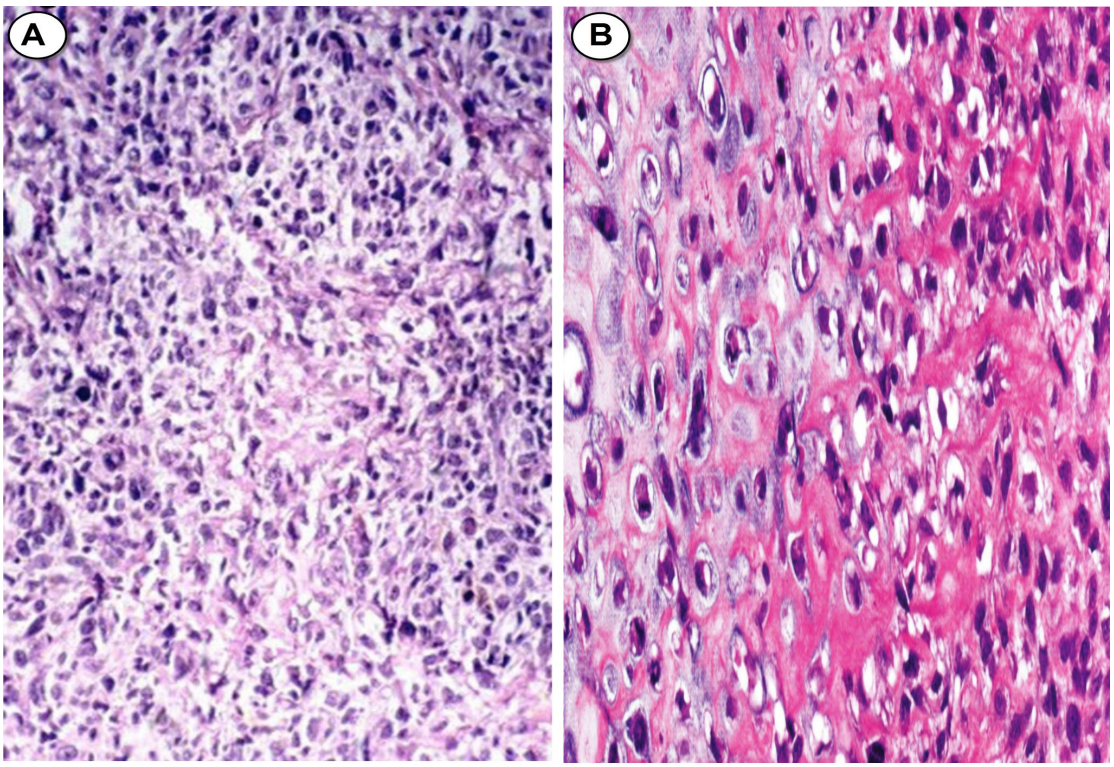
P 13-67 Bone. Osteoid osteoma. **A**. Radiography note the cortical location and dense nidus (arrow). **B**. Histology. The niddus is composed of osteoid tissue with osteoblastic rimming surrounded by dense sclerotic bone. The tumor is small in size(<2 cm).



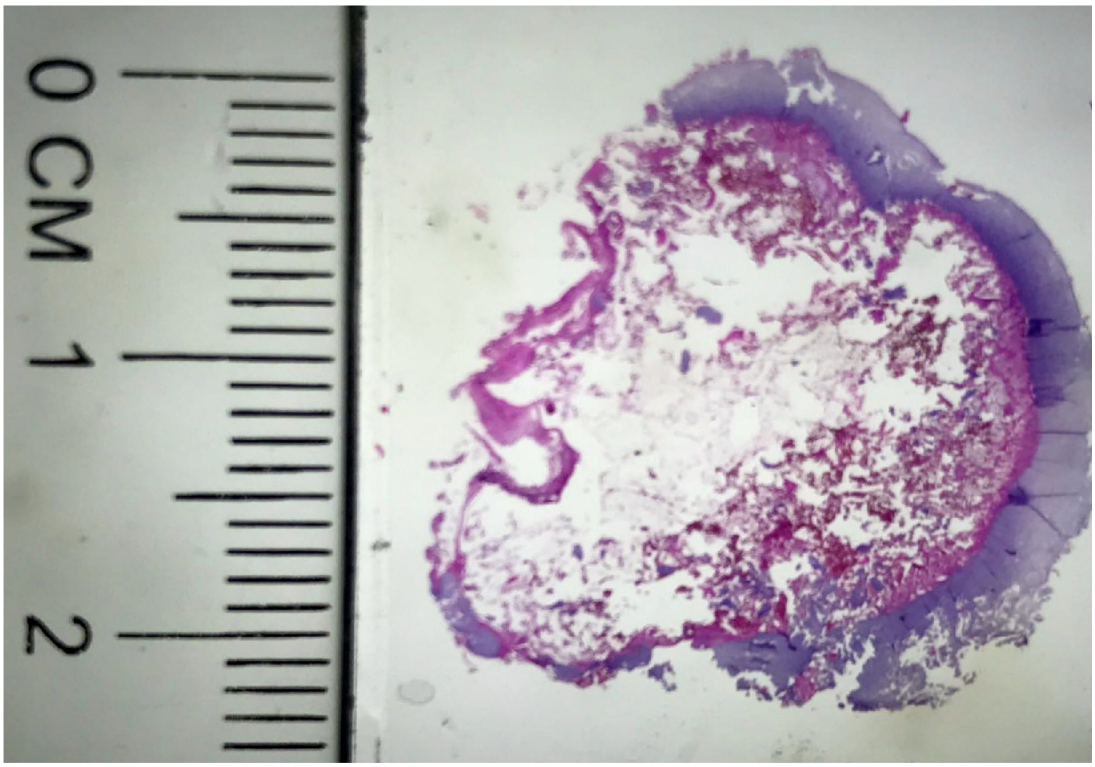
P 13-68 Maxillary (Ivory) osteoma. **A.** Grossly it appears ivory white hard mass obliterating maxillary sinus. **B.** The tumor protrude from hard palate to oral cavity. **C.** Histology, very dense lamellar bone with obliterated marrow spaces which appears hypocellular.



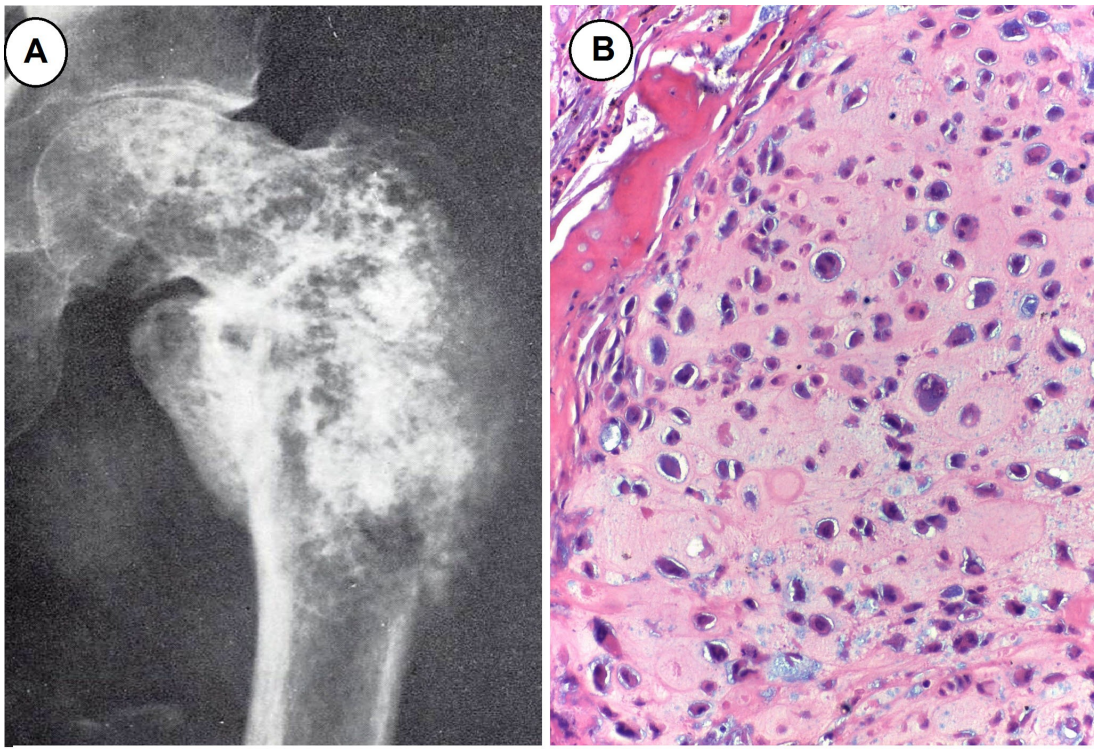
P 13-69 Bone. Osteosarcoma. **A.** Radiography shows destructive lesion with subperiosteal bone formation. **B.** Histology, spindle and stellate malignant cells forming neoplastic osteoid (fine, anastomosing, lacking lacunae and osteoblasts).



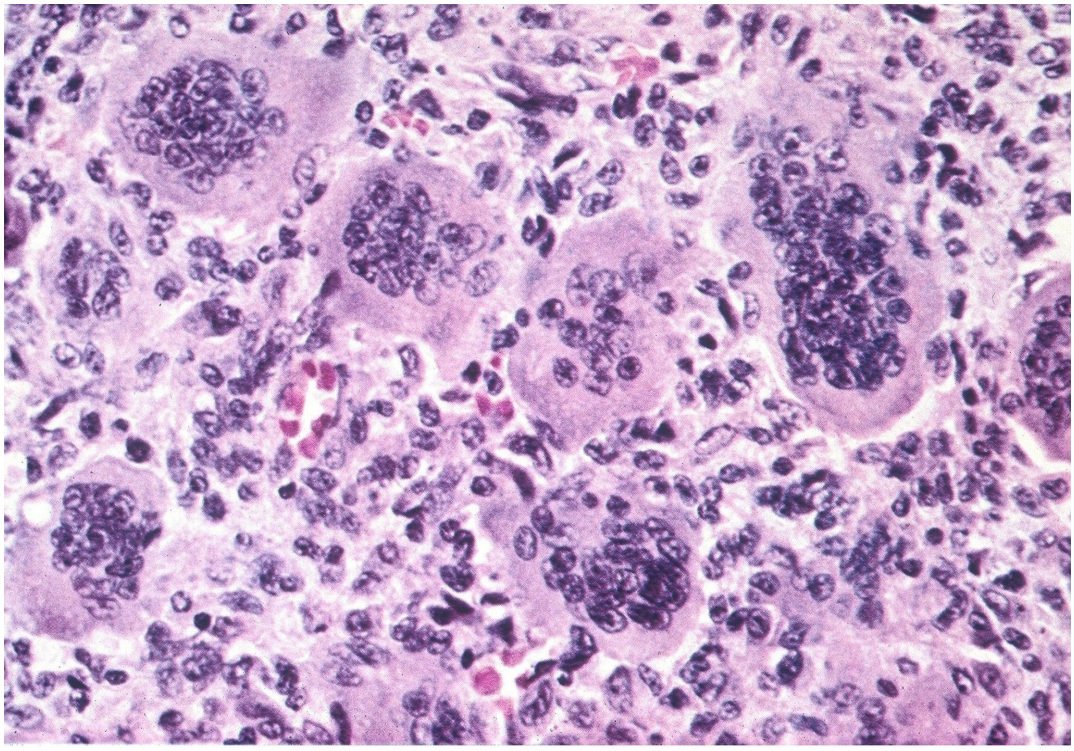
P 13-70 Bone. Osteosarcoma. **A.** Small cell(Osteolytic type), Sarcoma cells with minimal osteoid in the stroma. The small cell size may simulate Ewing sarcoma or lymphoma. **B.** Periosteal (juxtacortical type), this rare surface osteosarcoma is of intermediate grade, commonly located at diaphysis and shows chondrogenic differentiation.



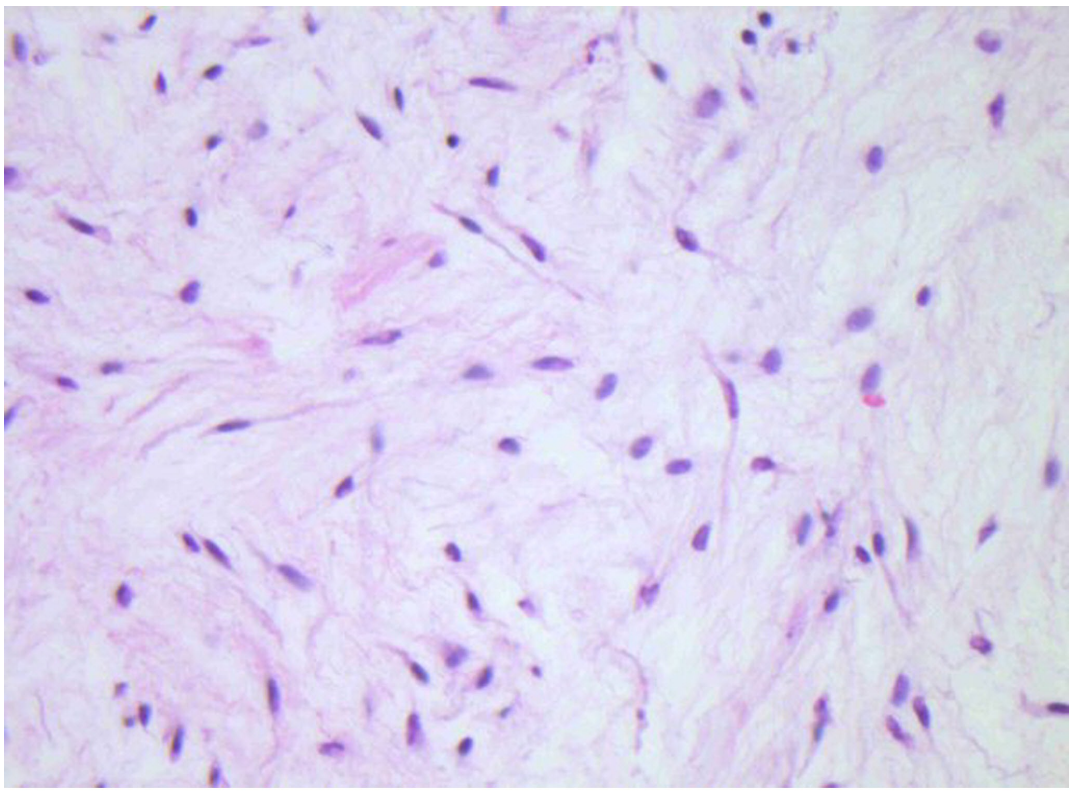
P 13-71 Bone. Osteochondroma. Benign osteochondroma has thin uniform cartilaginous cap (usually < 1 cm). Invasion of cancellous bone by cartilage or focal thicknining of cartilaginous cap (1-3 cm) should raise the suspicion of malignant changes.



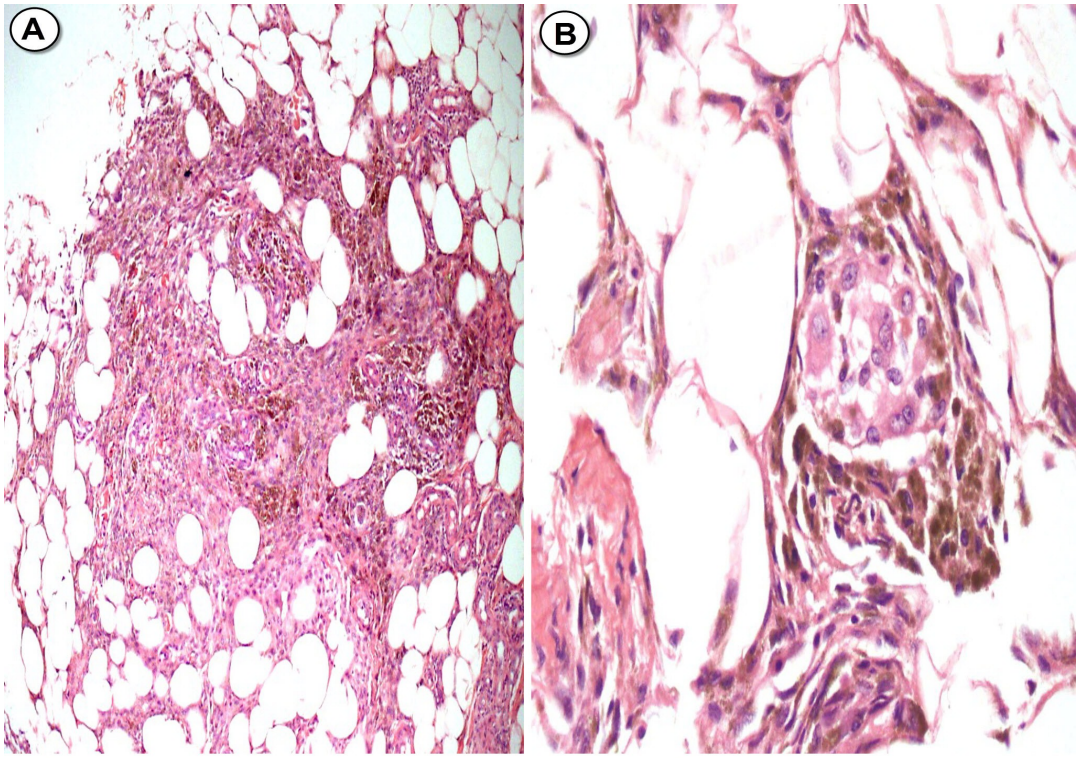
P 13-72 Bone. Chondrosarcoma. **A**. Radiography, the tumor arise centrally, invading soft tissue, and shows characteristic mottled calcification. **B**. Histology, moderate cellularity and anaplasia, with multiple cells in lacunae. Cartilagenous tumors larger than 5 cm are usually malignant.



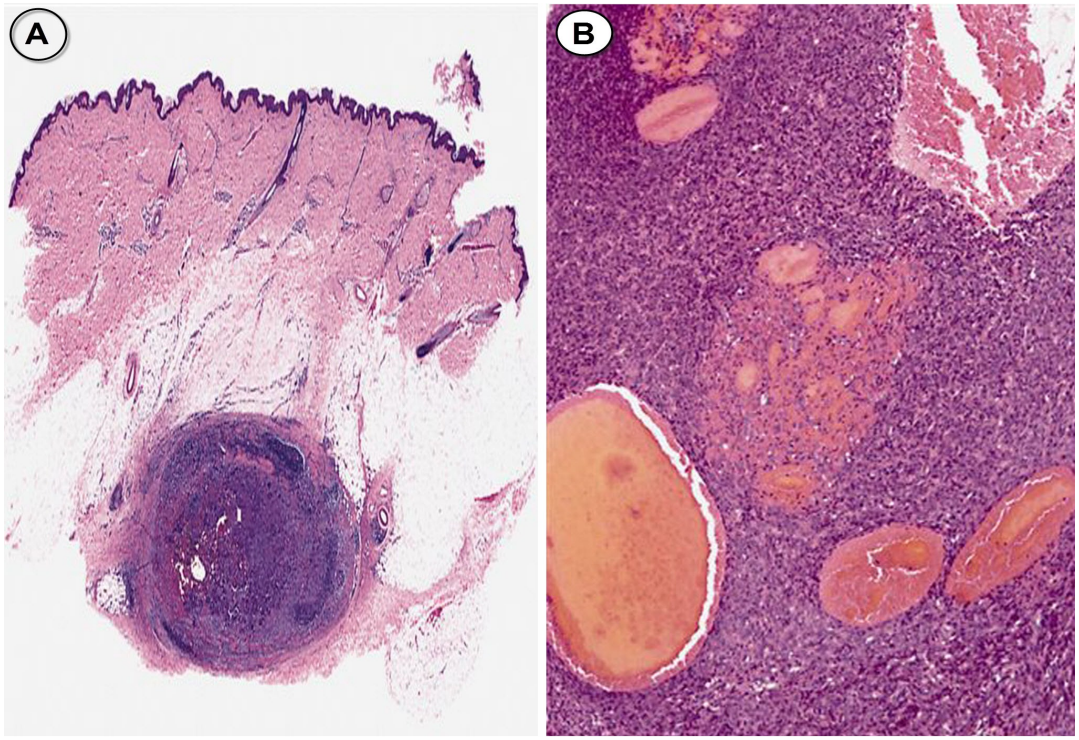
P 13-73 Bone. Giant cell tumor of bone. The neoplastic component of the tumor is the ovoid mononuclear cells, showing mitosis and P63 positivity. The multinucleated osteoclastic like giant cells are neumerous and evenly distributed.



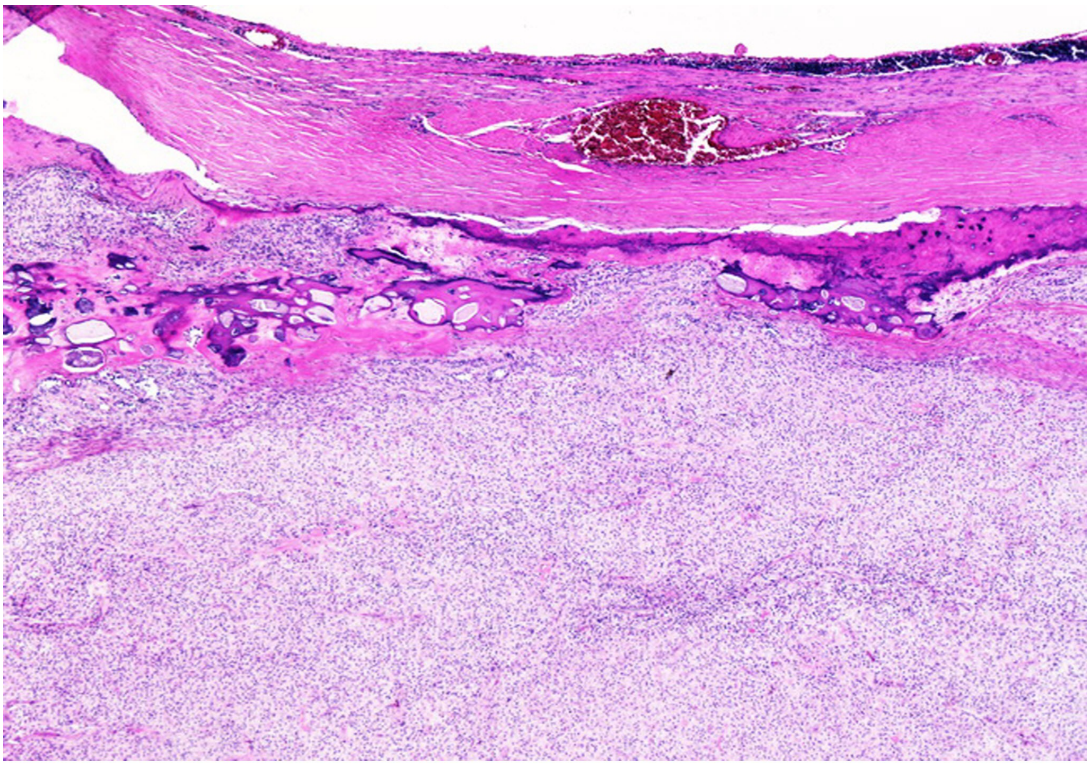
P 13-74 Soft tissue, Myxoma. A tumor of borderline malignancy, composed of stellate cells in myxoid stroma. Its positive for vimentin and alcian blue.



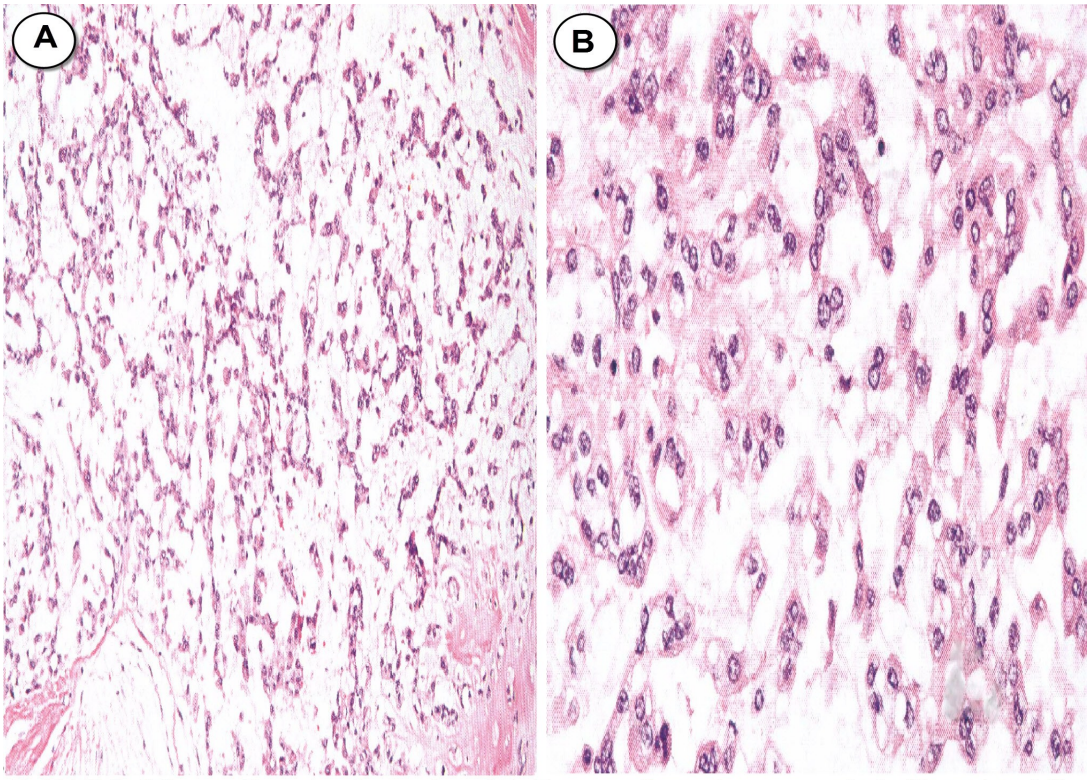
P 13-75 Soft tissue. Haemosidrotic fibrolipomatous tumor. Multiphasic tumor composed of fascicles of fibroblastic spindle cells containing hemosidrin admixed with proliferating adipocytes and hemosidrin laden macrophages with occasional osteoclasts-like giant cells. **A.** High power. **B.** Low power. (Courtesy of PathologyOutlines.com)



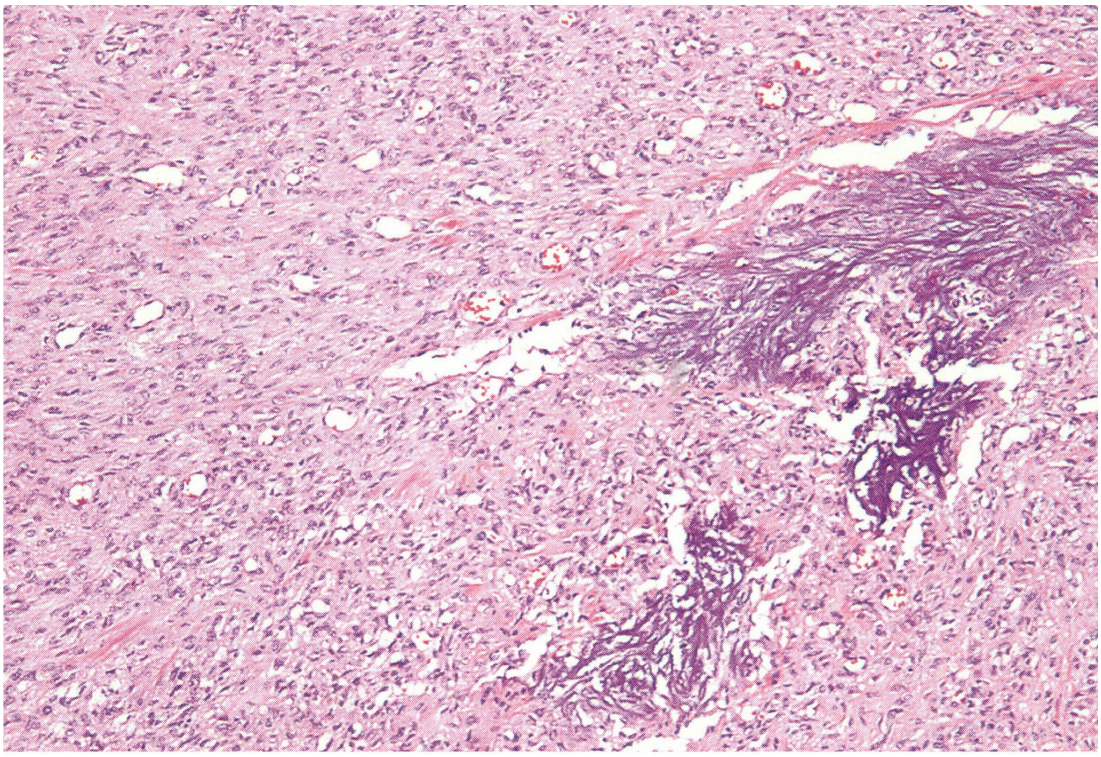
P 13-76 Soft tissue. Angiomatoid fibrous histiocytoma. **A**. Low power, subcutaneous tumor appears vascular and hemorrhagic. **B**. High power, pseudovascular spaces, not lined by endothelium, filled with blood, there is associated lymphoplasma cell infiltrate in the stroma. The tumor has a very low recurrence rate (6%) and metastatic (1%) potentials. (Courtesy of PathologyOutlines.com)



P 13-77 Soft tissue. Ossifying fibromyxoid tumor. Lobules of ovoid to fusiform cells surrounded by a partial shell of mature lamellar bone. The stroma is fibromyxoid. Tumor cells are positive for vimentin, S100 and desmin.(Courtesy of PathologyOutlines.com)



P 13-78 Soft tissue. Parachordoma. **A** and **B**. Tumor cells are large, rounded with eosinophilic cytoplasm in myxoid background. The tumor is similar to chordoma in histology and immunoreactivity but affects soft tissue.



P 13-79 Soft tissue. Phosphaturic mesenchymal tumor. Bland spindle to stellate cells, producing hyalinized matrix and shows a very well developed capillary network. (Courtesy of PathologyOutlines.com)

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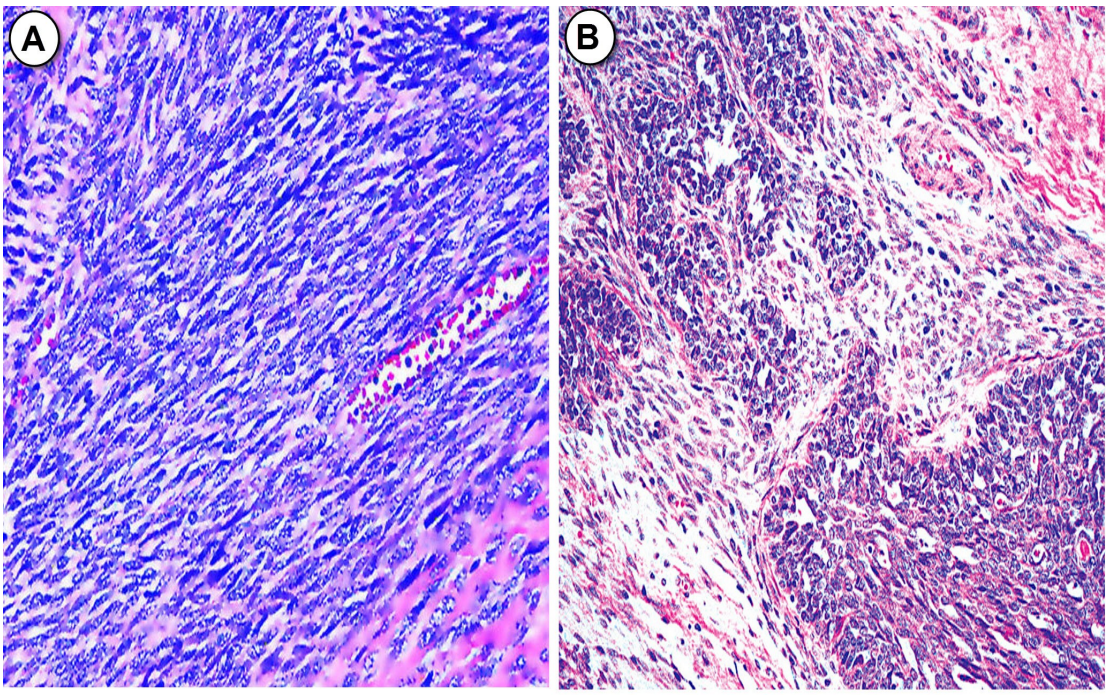
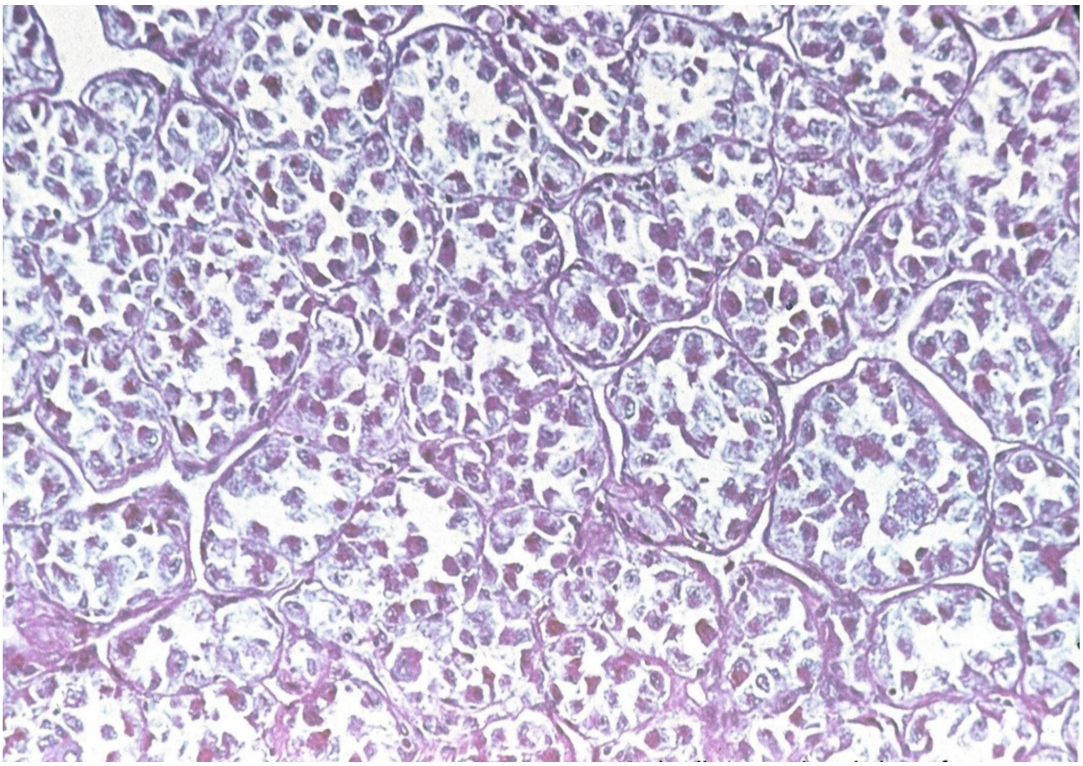
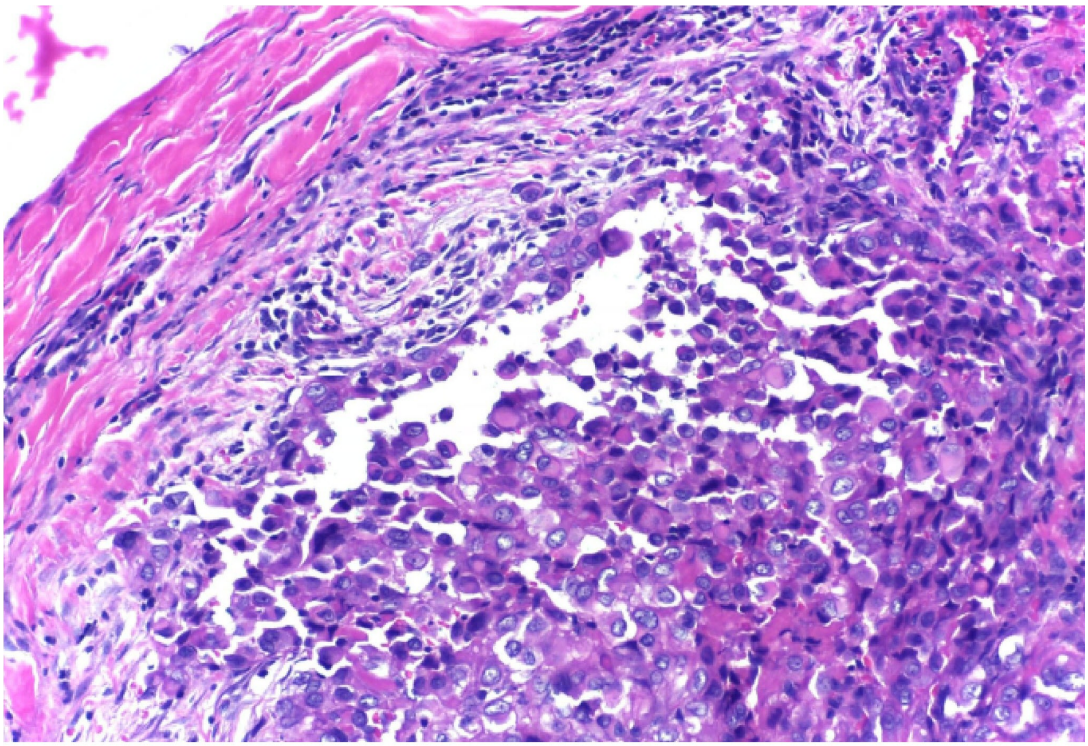


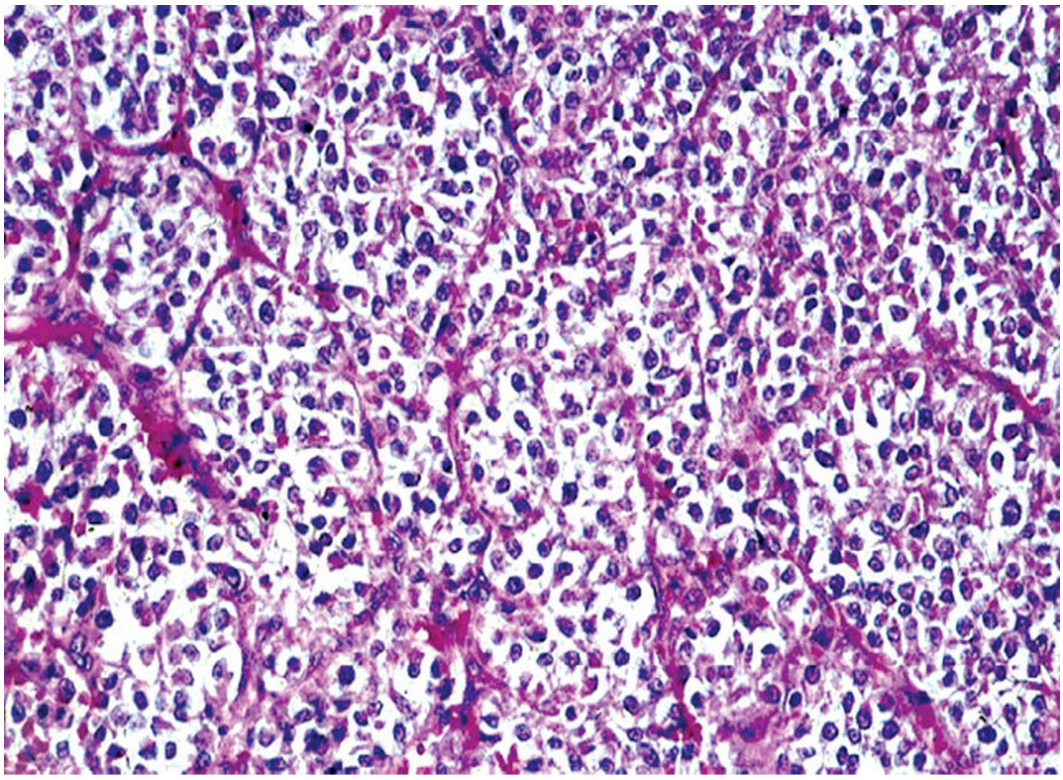
P 13-80 Soft tissue. Synovial sarcoma. **A**. Monophasic, Spindle cells arranged in plump fascicles with hyalinization and distinct lobulation, may have hemangiopericitic vascular pattern. **B**. Biphasic, Spindle cell component is accompanied by plump epithelial cells forming glands/cords. Both components are positive for CK, CD99, and TLE1 and negative for CD34. t(x;18) translocation is confirmatory. (Courtesy of PathologyOutlines.com)



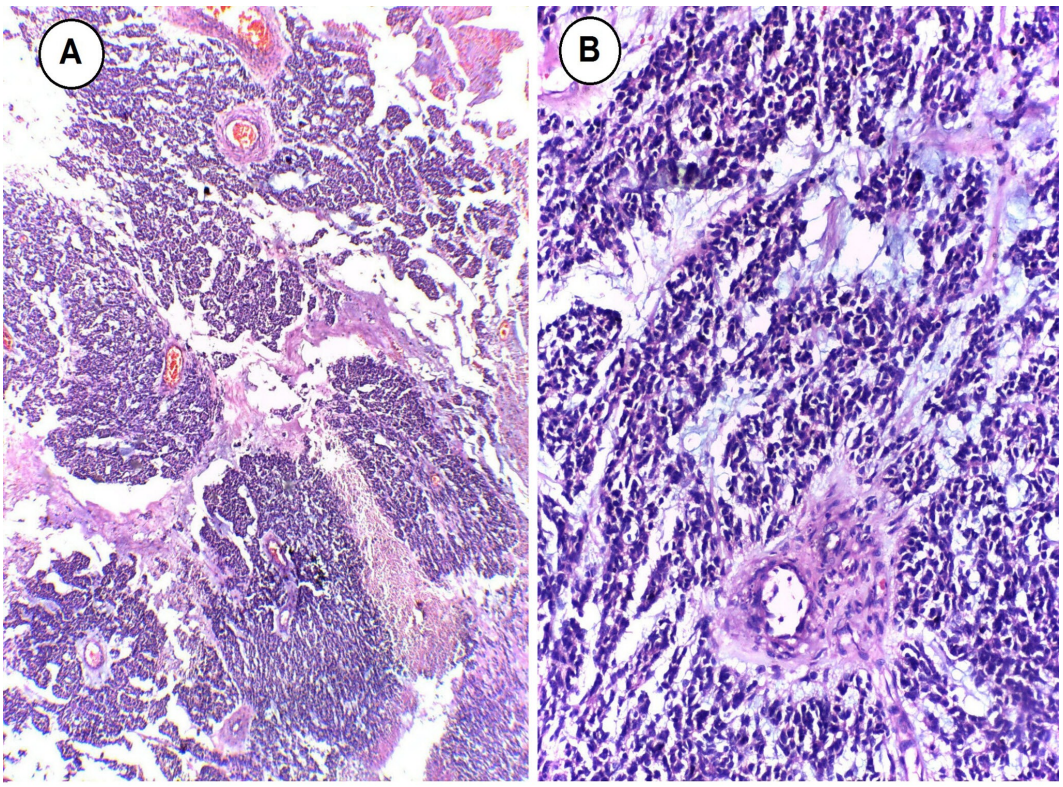
P 13-81 Soft tissue. Alveolar soft part sarcoma. Nests of polygonal cells with abundant eosinophilic granular cytoplasm, eccentric nuclei with prominent nucleoli. Nuclear immunorecativity to TEE-3 is helpful in diagnosis. (Molecular genetics: ASPL-TFE3; t(x;17)(p11;q25)).



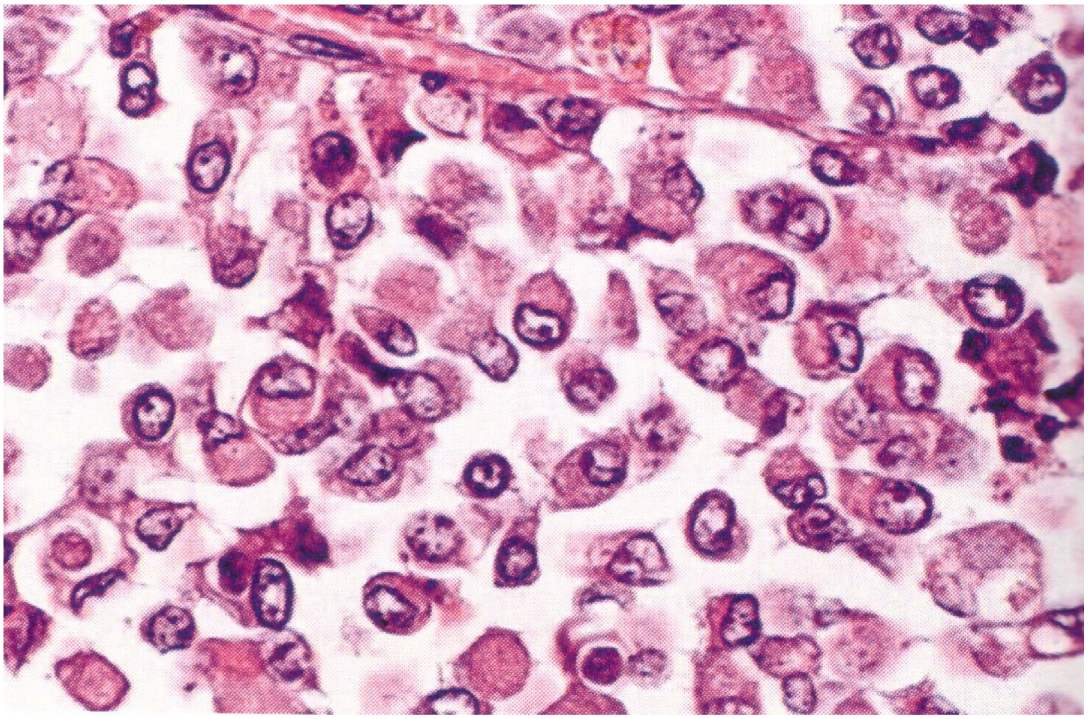
P 13-82 Soft tissue. Epithelioid sarcoma. Proliferating spindle and epithelioid cells with marked necrosis. Co-expression of CK, vimentin and CD34 is characteristic. Loss of INI-1 protein expression helps to differentiate it from squamous cell carcinoma and other sarcomas which usually express cytokeratin.



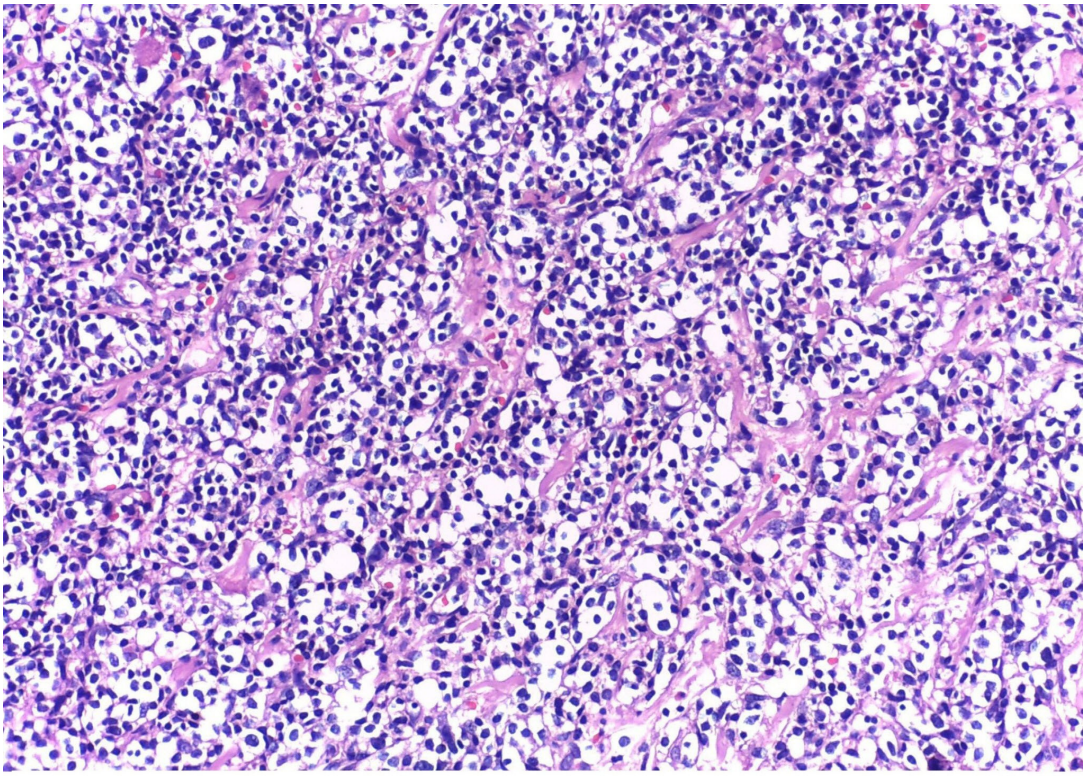
P 13-83 Soft tissue. Clear cell sarcoma (melanoma of soft parts). Spindle and epithelioid cells with clear cytoplasm. diagnosis is confirmed by positive melanoma markers. (Courtesy of PathologyOutlines.com)



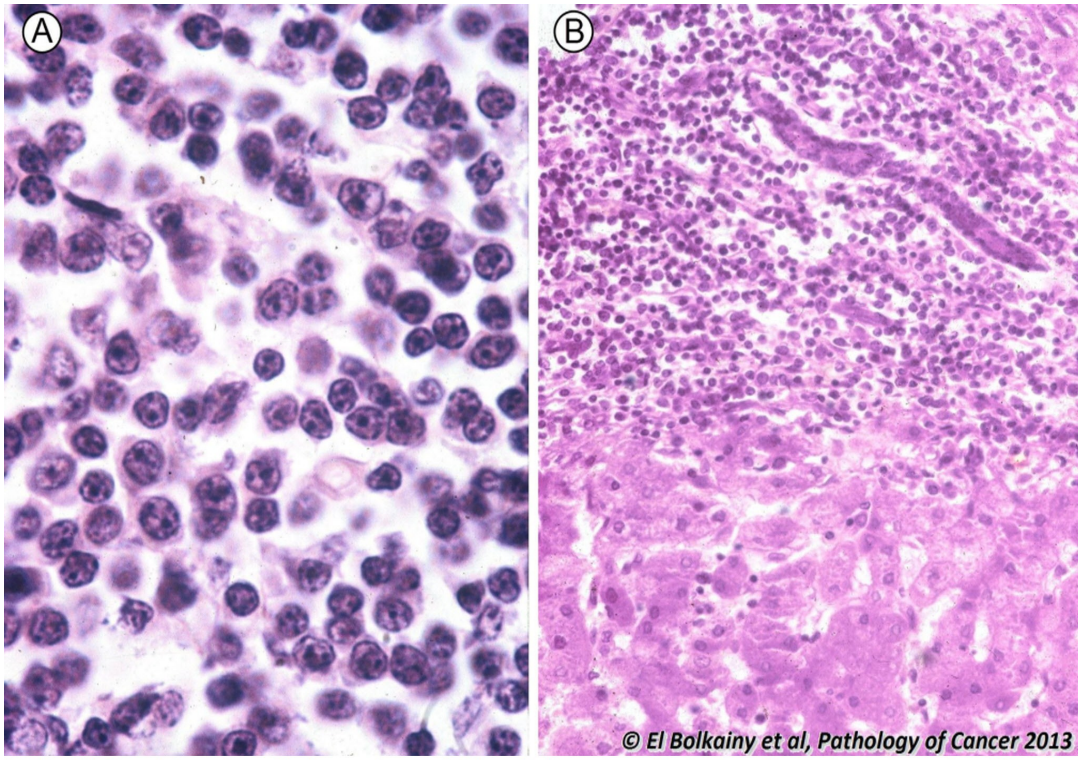
P 13-84 Soft tissue. desmoplastic small round cell tumor. Nests of small round cells in abundant fibrotic stroma. Co-expression of desmin and CK (dot-like pattern) is characteristic, t (11;22) and positive EWS-WT1protein are confirmatory. (Courtesy of PathologyOutlines.com)



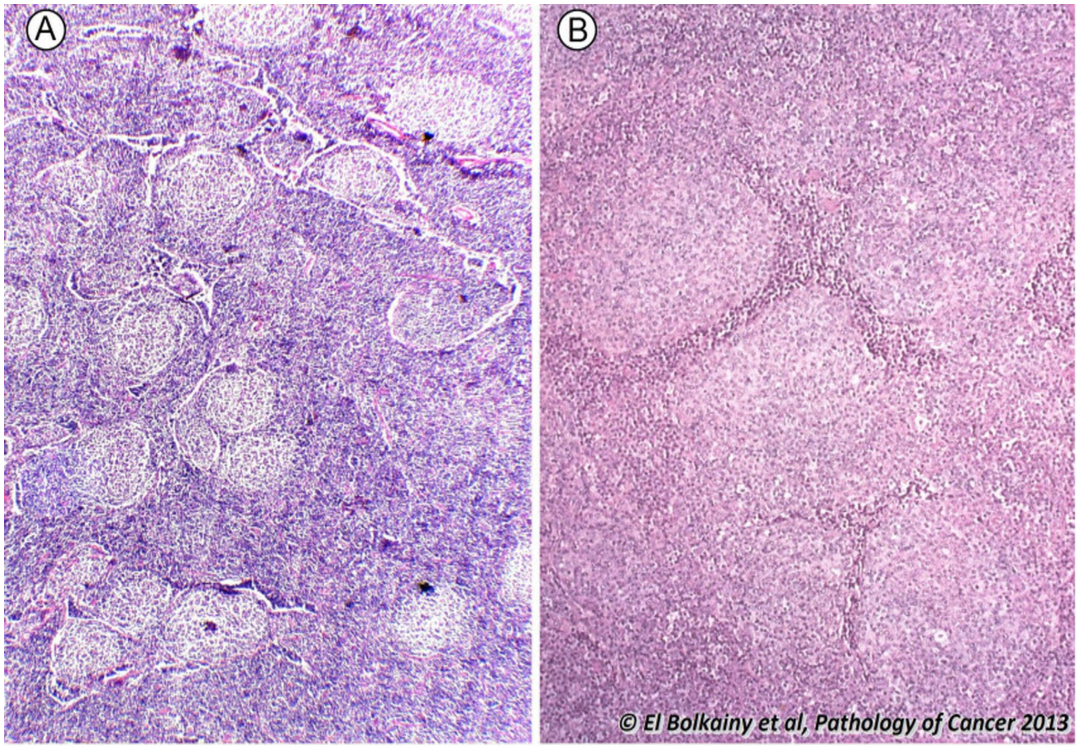
P 13-85 Soft tissue. Extra-renal rhabdoid tumor. Usually in infants and children. Shows phenotype of multiple paradoxical differentiation. Histologically formed of solid sheets of rhabdoid cells with myxoid, hyalinized and pseudoalveolar areas. Tumor cells are positive for vimentin, CK, EMA and Desmin. (Molecular genetics: INI-1; 22q) (Courtesy of PathologyOutlines.com)



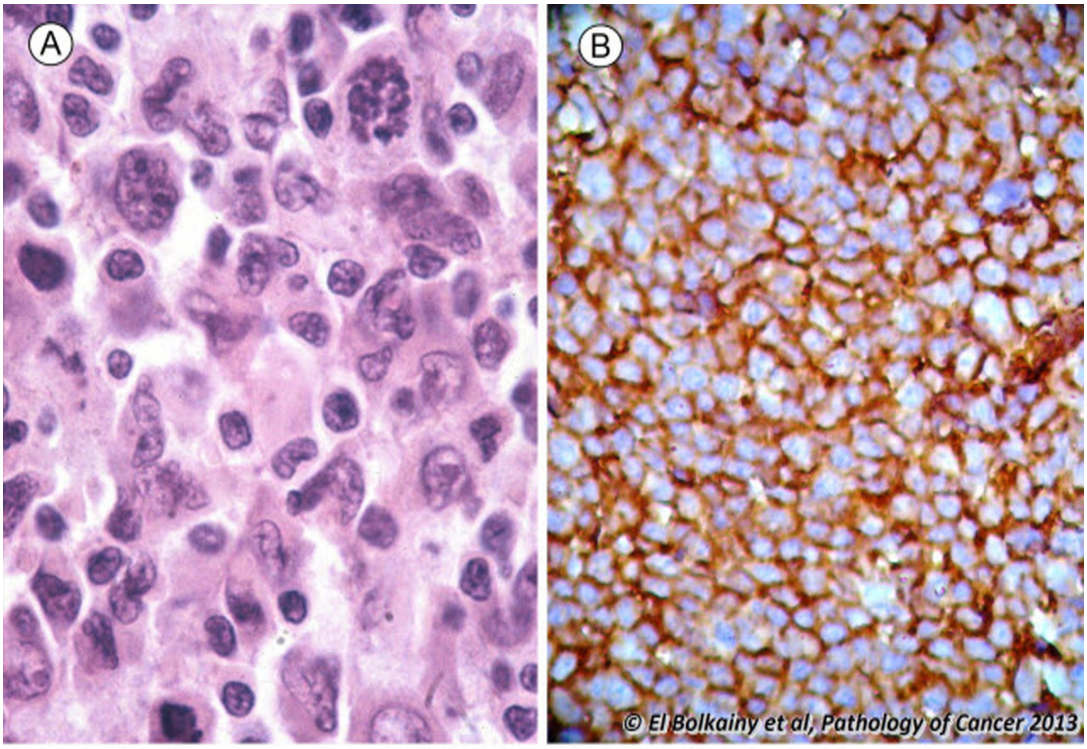
P 13-86 Soft tissue. Perivascular epithelioid cell tumor, PEComa. Perivascular arrangement of epithelioid cells with clear or granular cytoplasm.The co-expression of actin and melanocytic markers (Melan-A and HMB-45) is diagnostic.



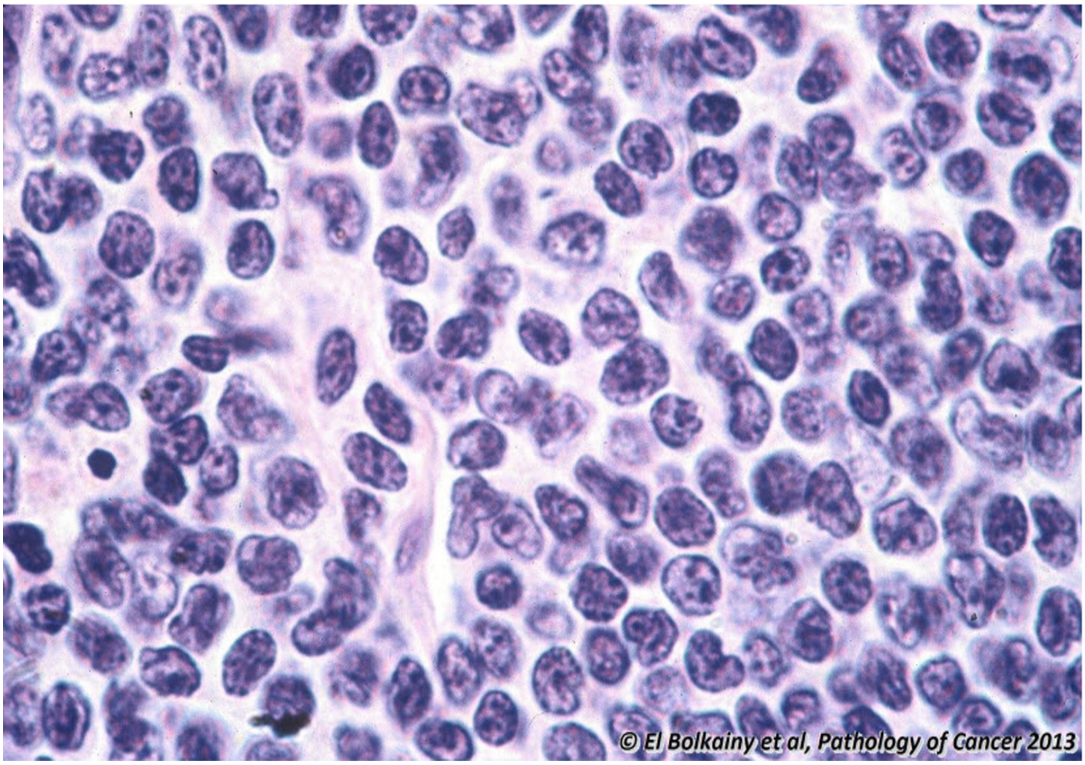
P 13-87 Small lymphocytic lyomphoma/ Chronic lymphocytic leukemia. **A.** Lymph node. diffuse infiltrate of small round lymphocytes with dense chromaatin. Immunostain, CD20+, CD5+, CD23 +, BCL-6 -. **B.** Liver. The lymphocytic infiltrate involves portal areas. There is associated (CLL) leukemia in 20%of cases. (Molecular genetics: BCL-1(PRAD1); T(11;14) (q13;q32)).



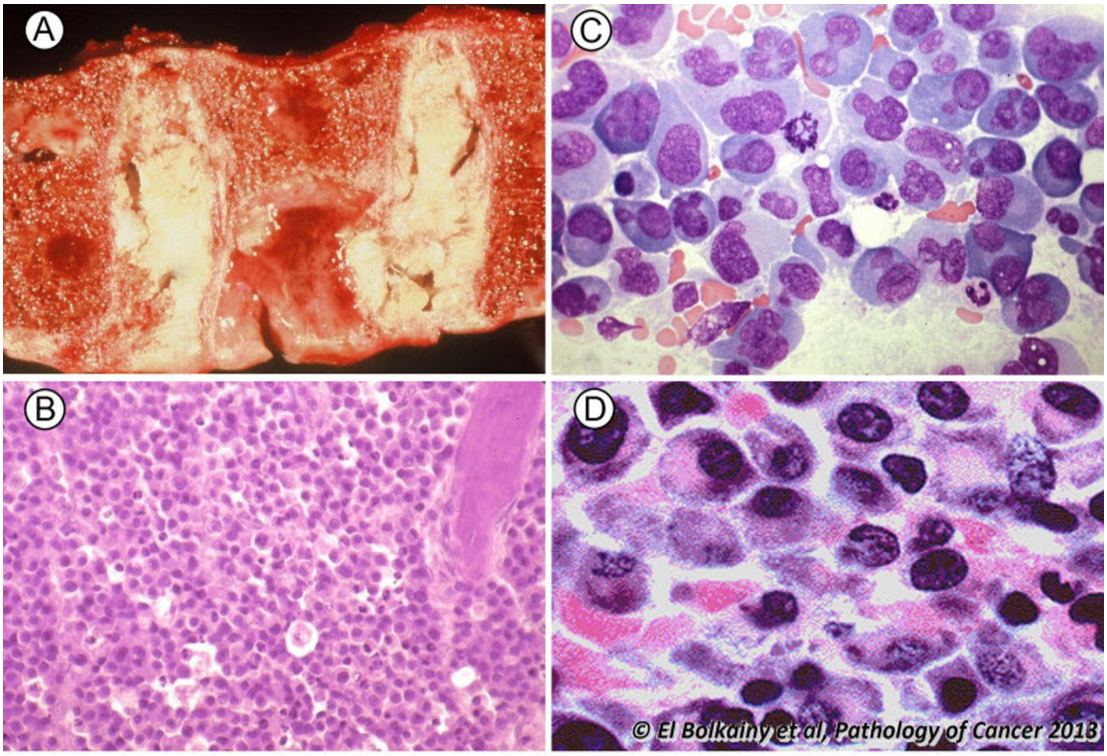
P 13-88 Lymph node. Follicular lymphoma. **A**. Low power numerous small crowded round follicles are evident. **B**. High power showing the characteristic back to back patter. Immunostain: CD20+ and BCL2 +. Ki-67 is <10 in low grade and >30% in high grade.



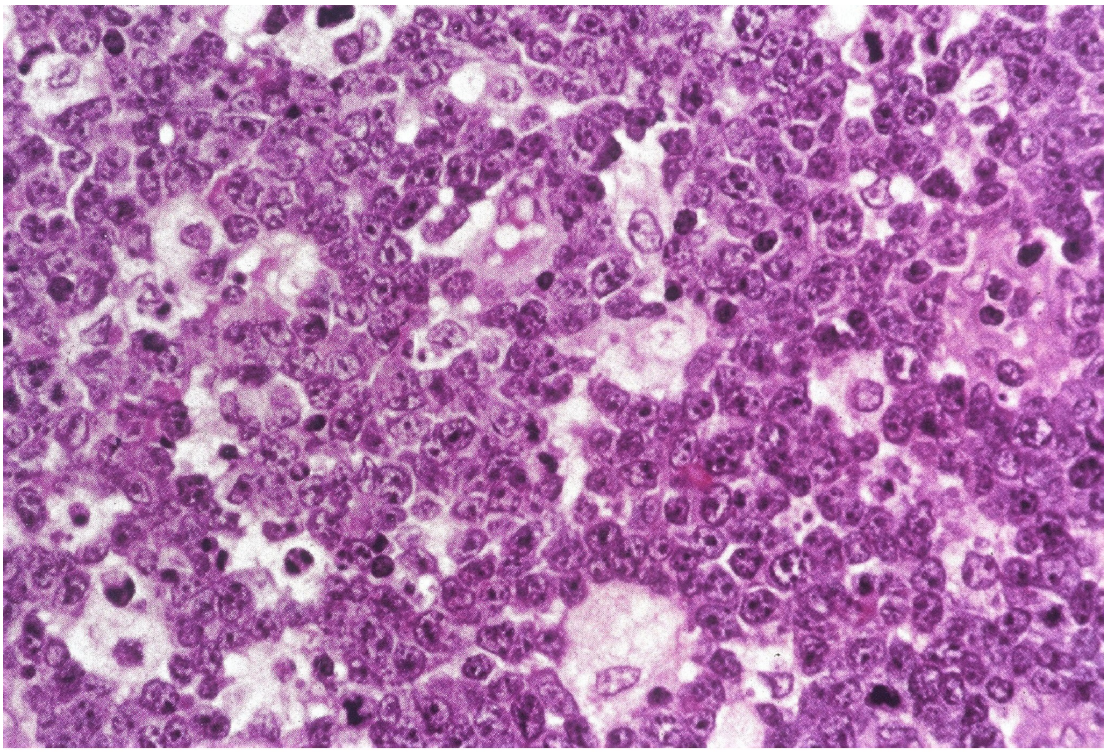
P 13-89 Lymph node. Diffuse large B cell lymphoma. **A.** Diffuse infiltrate of large lymphoid cells with clumped chromatin and prominant nucleoli with cytoplasmic rim. **B.** The cells shows positive membranous immunoreactivity for CD20 (B phenotype). Ki-67 is >30%. (Molecular genetics: BCL2-IGH; t(14;18) (q32;q21) / MYC-IGH; t(8;14) (q24,q32)).



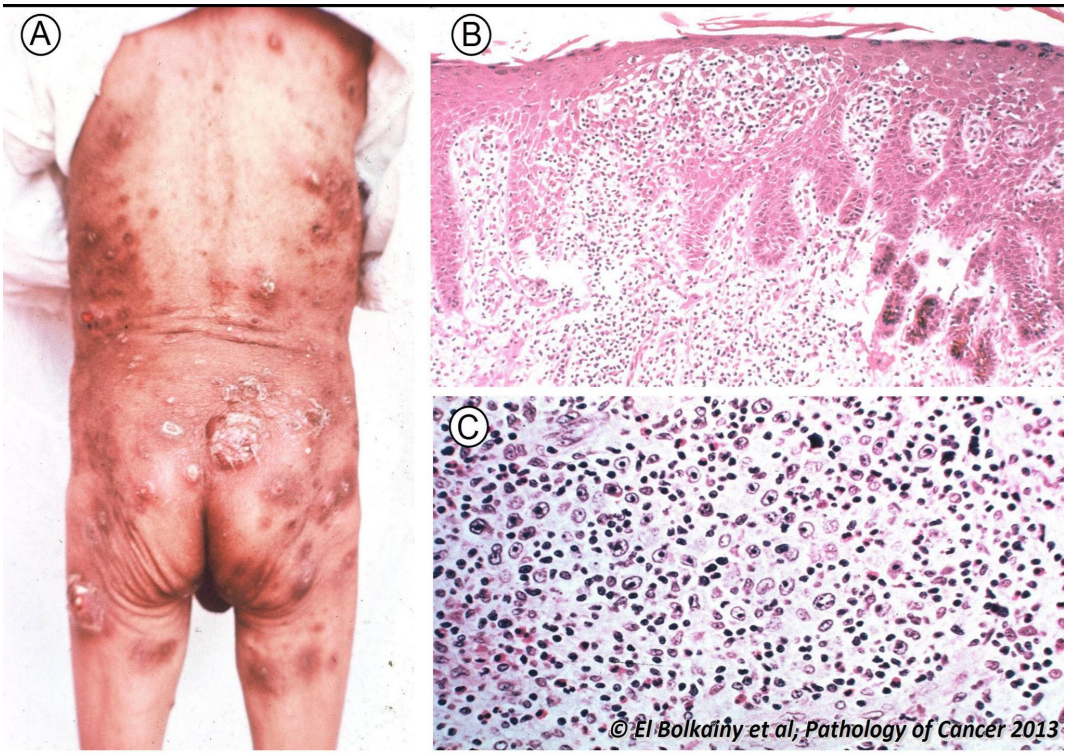
P 13-90 Lymph node. Mantle cell lymphoma. The lymphocytes are small and irregular (indented or kidney shaped). Immunostain: CD5+, CD23- and cyclin D-1+. Ki-67 is > 30%. (Molecular genetics: CCND1-IGH; t(11;14) (q13;q32)).



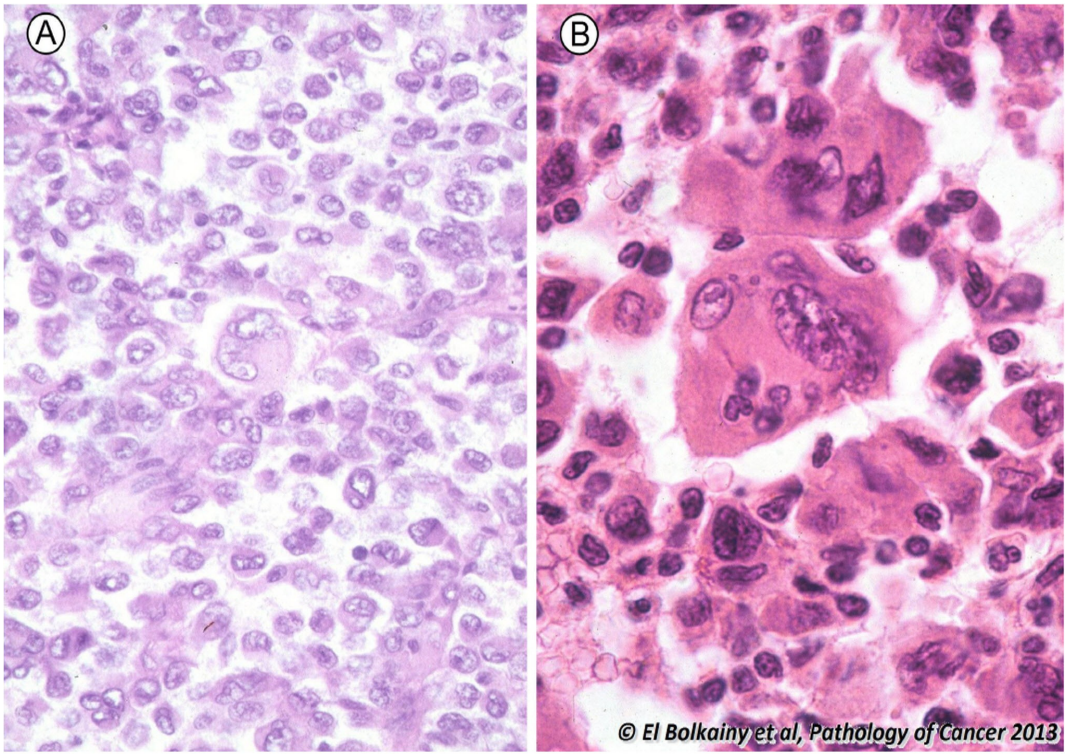
P 13-91 Multiple myeloma (MM). **A.** Multiple defects in vertebral column. **B**. Well differentiated MM, a pure dense population of plasma cells. **C.** Geimsa stain atypical binucleated plasma cells and mitotic figures. **D.** Anaplastic MM showing pleomorphic plasmablasts. Immunostain: CD38+, CD138+, PAX5 +. (Molecular genetics: CCND1-IGH; t(11;14) (q13;q32)).



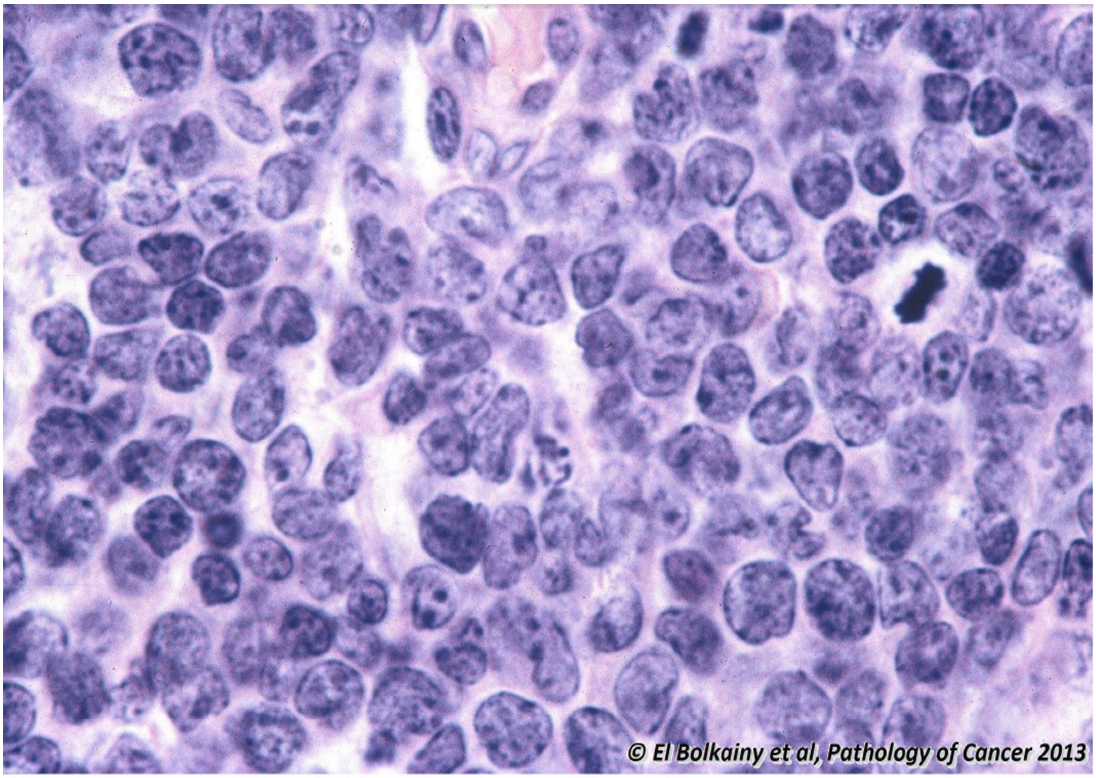
P 13-92 Lymph node. Burkitt lymphoma. Tumor cells are medium size, nuclei with clumpy chromatin and multiple nucleoli, active mitosis, marked appoptosis and scattered histiocytes (starry sky). Immunostain: CD20+, CD10+, BCL6+, TdT-, ki-67 + in almost 100% of cells. (Molecular genetics: MYC-IGH; t(8;14) (q24;q32)).



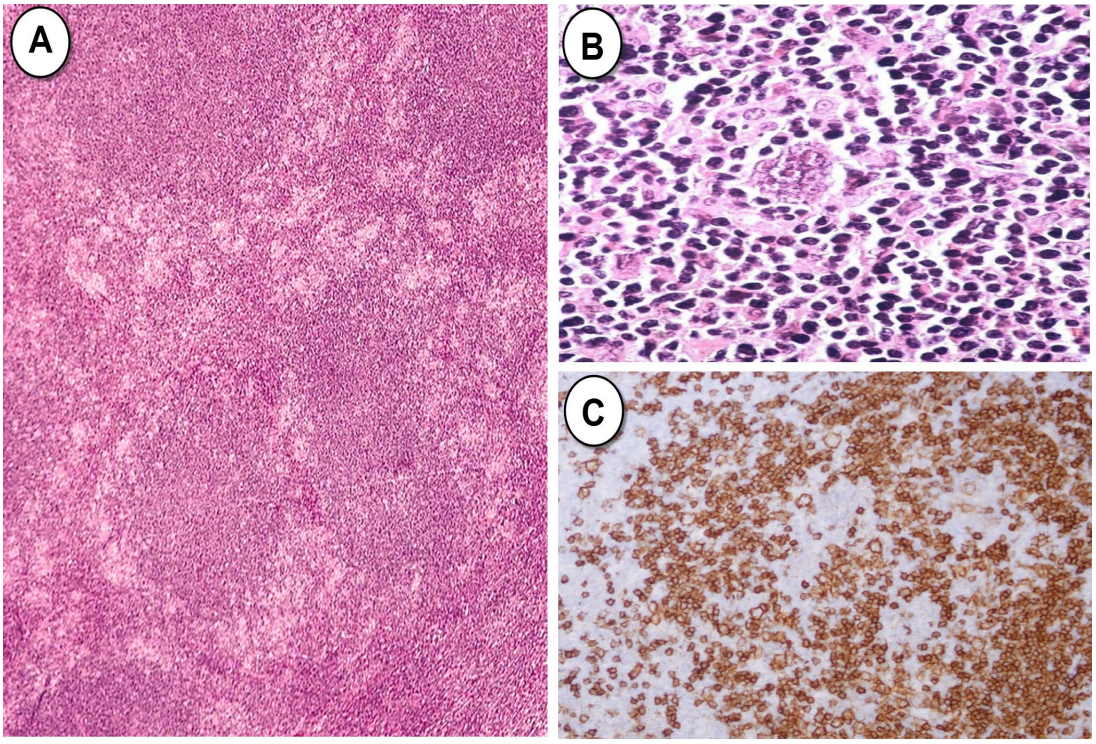
P 13-93 Mycosis fungoids. **A.** Gross, multiple erythematous patches, plaques and nodules. **B.** Histology, shows a mixed population of small and large lymphocytes (CD3+, with predominance of T-helper cells CD4) infiltrate in the upper dermis with epidermal infiltration (epidermotropism). **C.** High power.



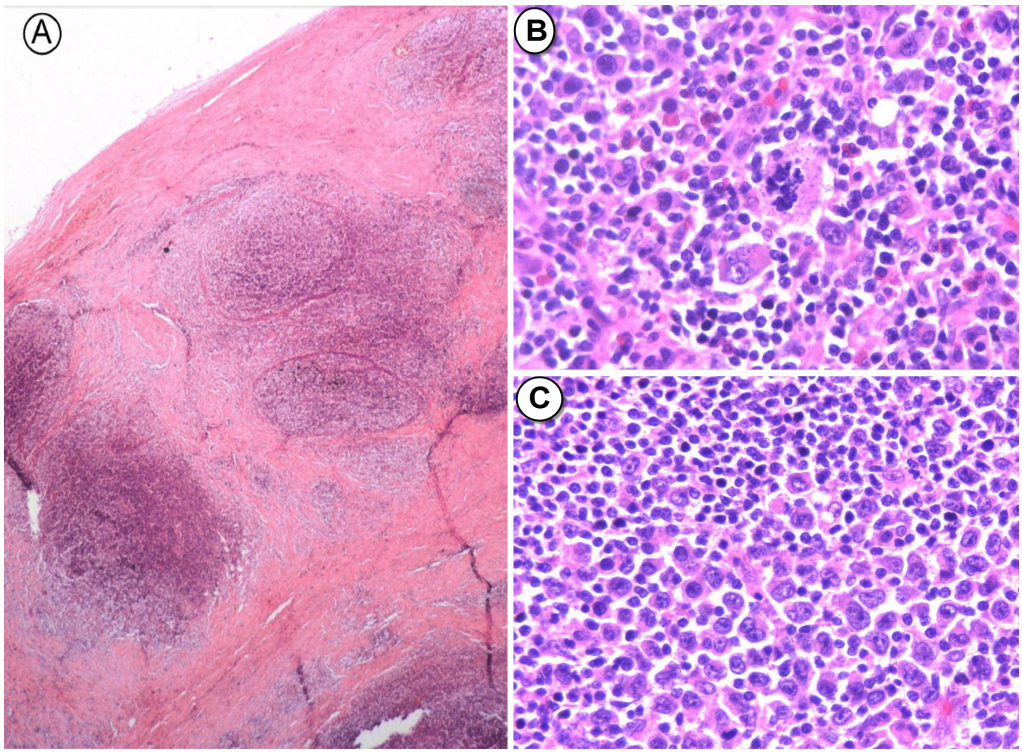
P 13-94 Anaplastic large cell lymphoma. **A.** A pleomorphic cellular infiltrate usually involve sinuses. **B.** Giant cells have multiple nuclei with horse shoe pattern. Immunostain: CD30+ (100%), CD3+ (85%) and ALK-1 + (75%). ALK-1- tumors have unfavorable prognosis. (Molecular genetics: ALK; t(2;5) (p23;q25)).



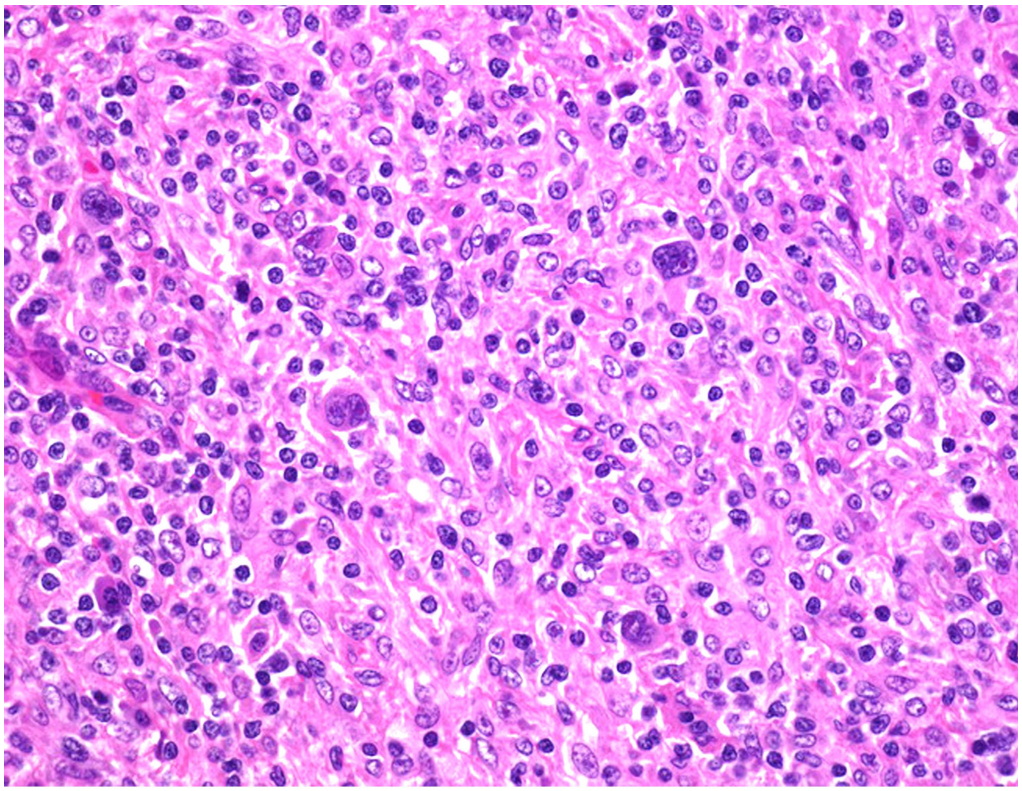
P 13-95 Lymph node, lymphoblastic lymphoma. Diffuse infiltrate by moderate size lymphoblasts with blastoid features(fine disspersed chromatin and indistinct nucleoli), streaming pattern. Immunostain: CD3+ (85%) CD20+ (15%), Alk-1 - and TdT+ .



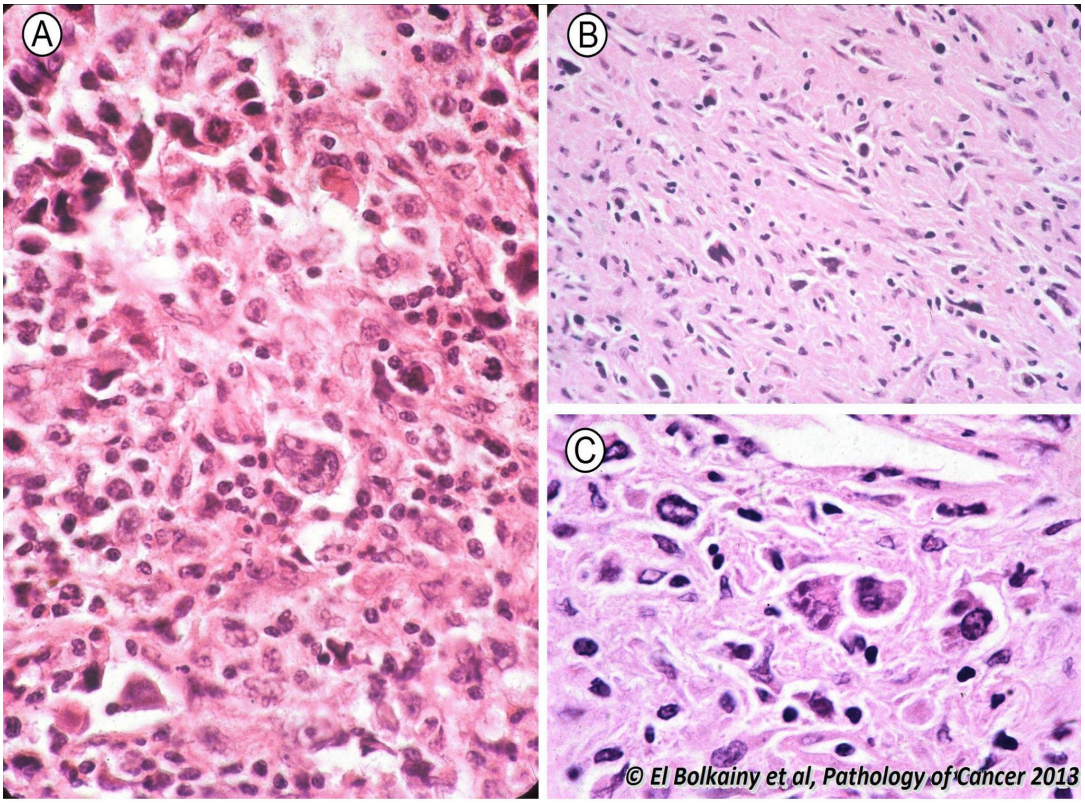
P 13-96 Nodular lymphocyte predominant Hodgkin lymphoma. **A.** Low power, vague nodules of small lymphocytes. **B.** High power, large multilobulated tumor cells within the pseudonodules called LP cells or popcorn cells. **C.** CD20 highlights positive pseudonodules with indistinct margins containing the tumor cells. Popcorn cells are CD30 -ve.



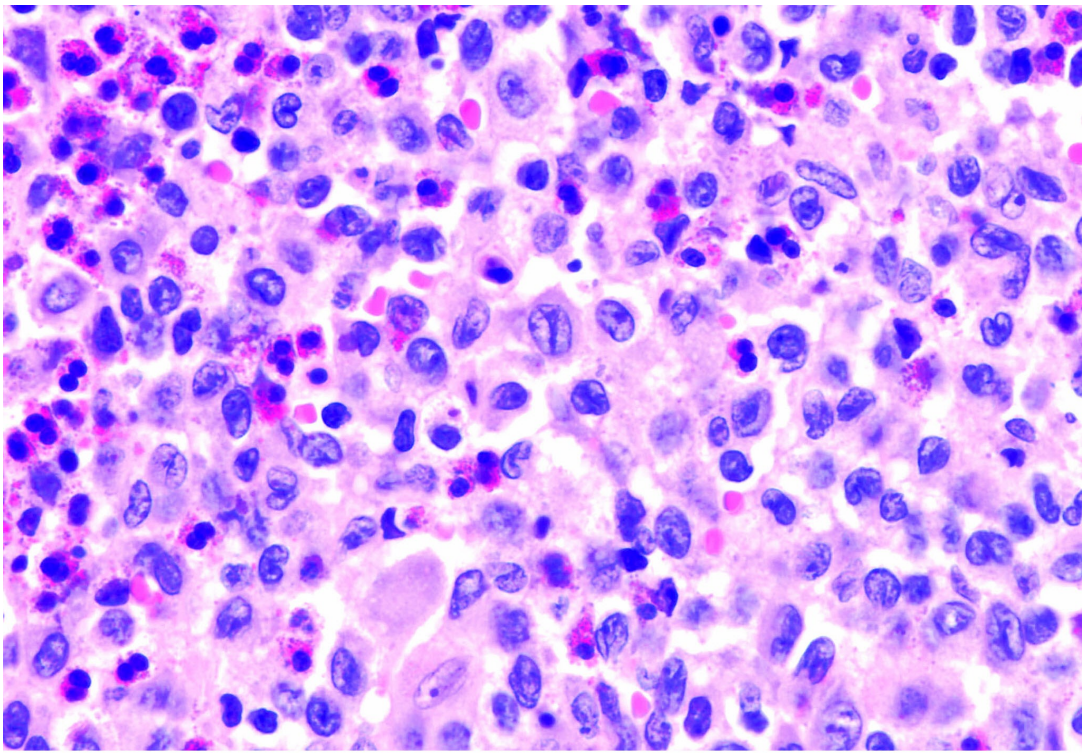
P 13-97 Hodgkin lymphoma, nodular sclerosis. **A.** Low power, nodular architecture with fibrous bands. **B.** Lacunar cell showing abnormal mitosis, Lacunar cells are CD30+, and CD15+. **C.** Nodular sclerosis, syncytial type , note the solid sheets of lacunar cells wich may be mistaken for metastatic carcinoma.



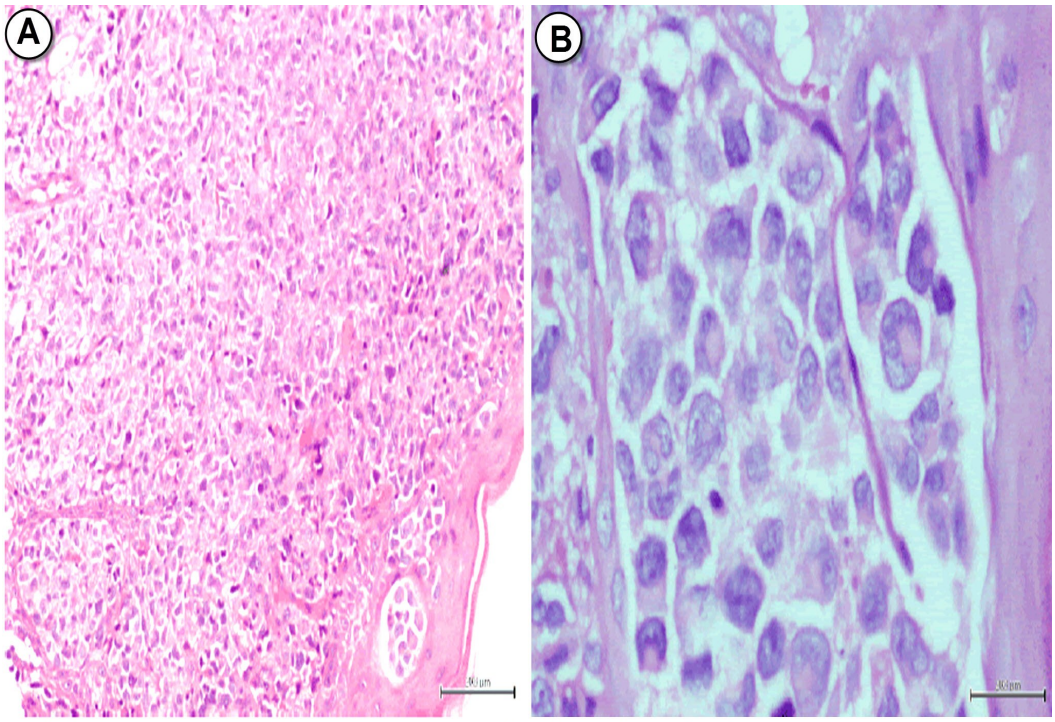
P 13-98 Lymph node, Hodgkin lymphoma, mixed cellularity. Classic Reed-Sternberg cells, mononuclear and binuclear cells with very prominent nucleoli. Background cells include reactive lymphocytes, eosinophils and histiocytes.



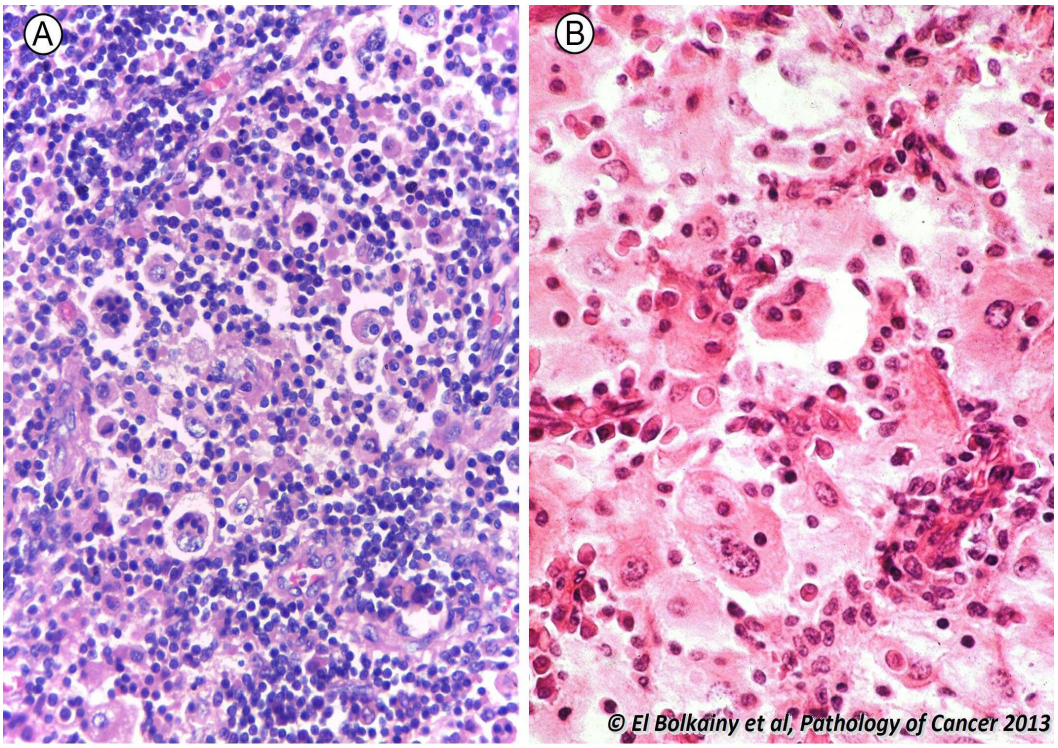
P 13-99 Hodgkin lymphoma, lymphocyte depletion, a rare subtype. **A.** Reticular type rich in histiocytes. **B.** and **C** fibrous type rich in fibrosis. In both R-S cells are diagnostic.



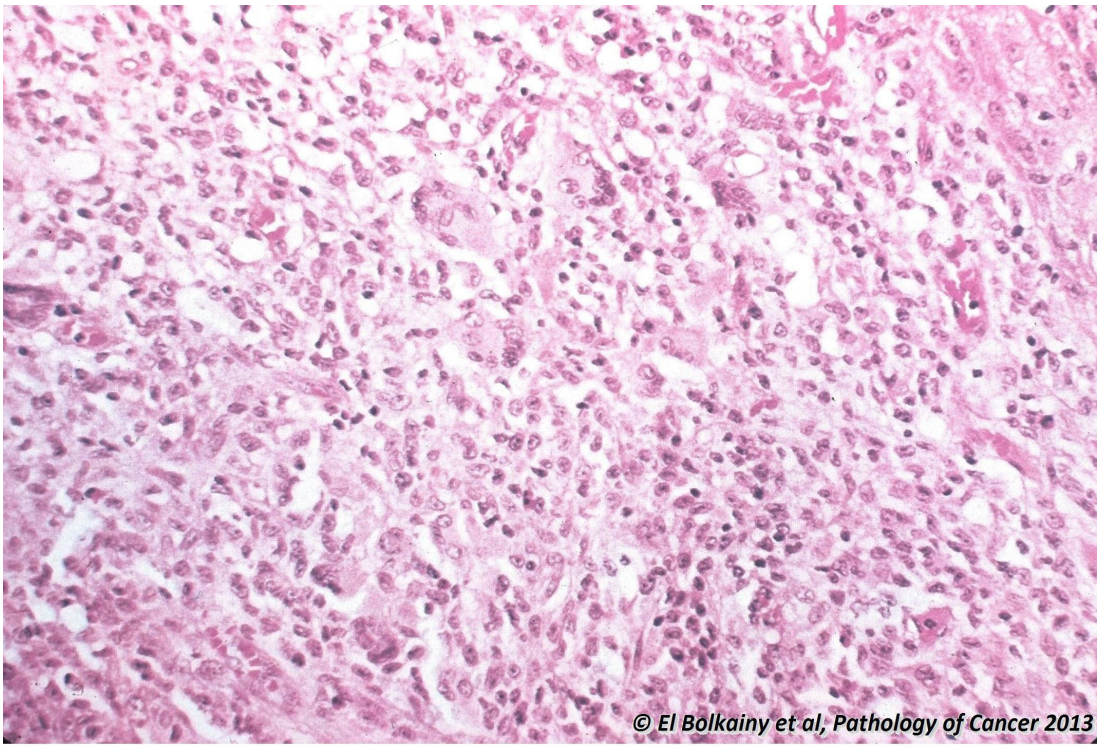
P 13-100 Langerhans cell histiocytosis. Langerhans cells are charachterized by abundant eosinophilic cytoplasm, non-denteritic surface, eccentric indented and folded nucleus with grooves. The cells are immunoreactive to langerin, CD1a and S100.(Courtesy of PathologyOutlines.com)



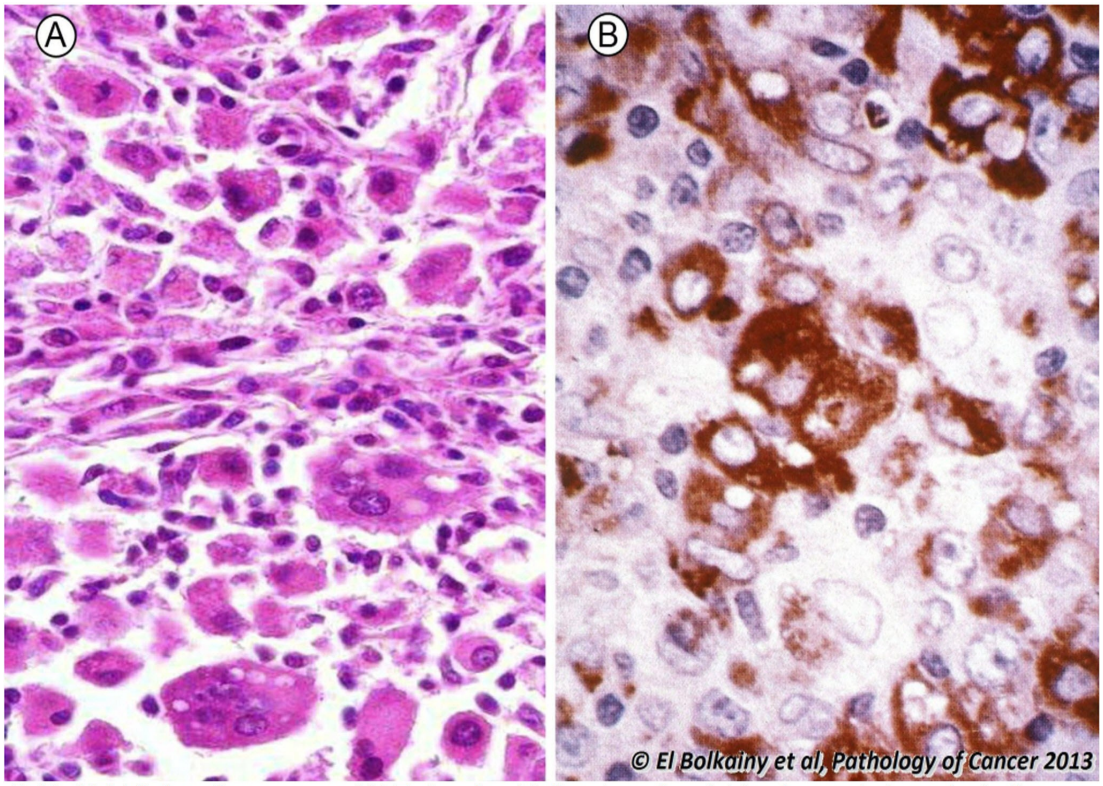
P 13-101 Langerhans cell sarcoma. Large cells with malignant features; chromatin abnormalities, prominent nucleoli, high mitotic rate. There is rare eosinophils and rare cells with nuclear grooving reminiscent of Langerhans cells. **A.** Low power. **B.** High power. (Courtesy of PathologyOutlines.com)



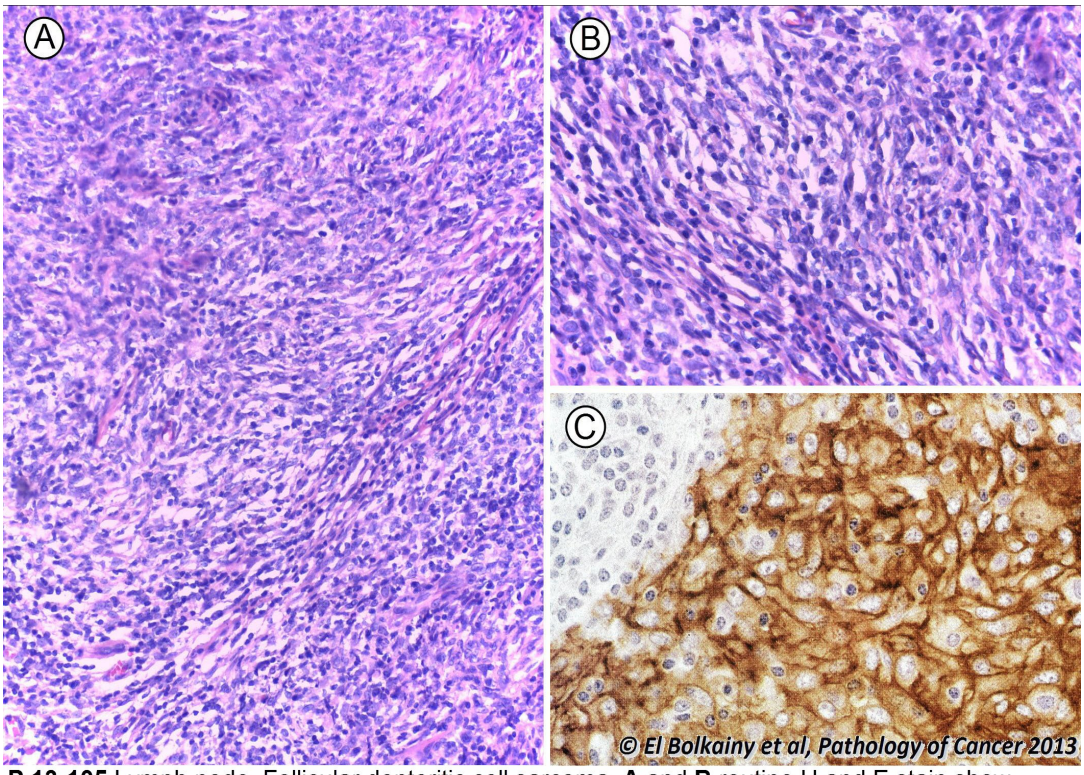
P 13-102 Lymph node. Sinus histiocytosis with massive lymphadenopathy (Rosi-Dorfman disease). **A**. Sinuses are mainly affected. **B.** The diagnostic feature is the prescence of intact lymphocytes in the cytoplasm of large histiocytes (emperiopolisis) The cells are immunoreactive for CD163 and CD68.



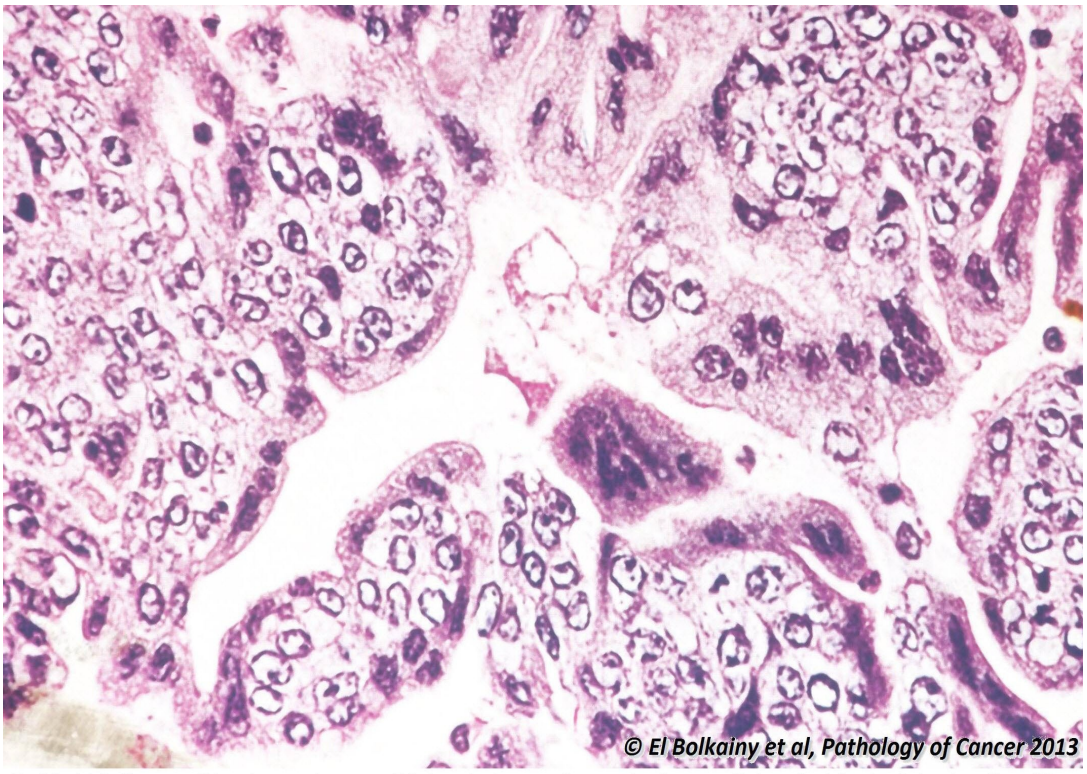
P 13-103 Juvenile xanthogranuloma of skin. Benign non-langerhans cell histiocytosis. The tumor is rich in histiocytes (CD68+, S100-), with eosinophilic cytoplasm and oval non-indented nuclei. Touton giant cells identified by multiple peripherally located nuclei are characteristic.



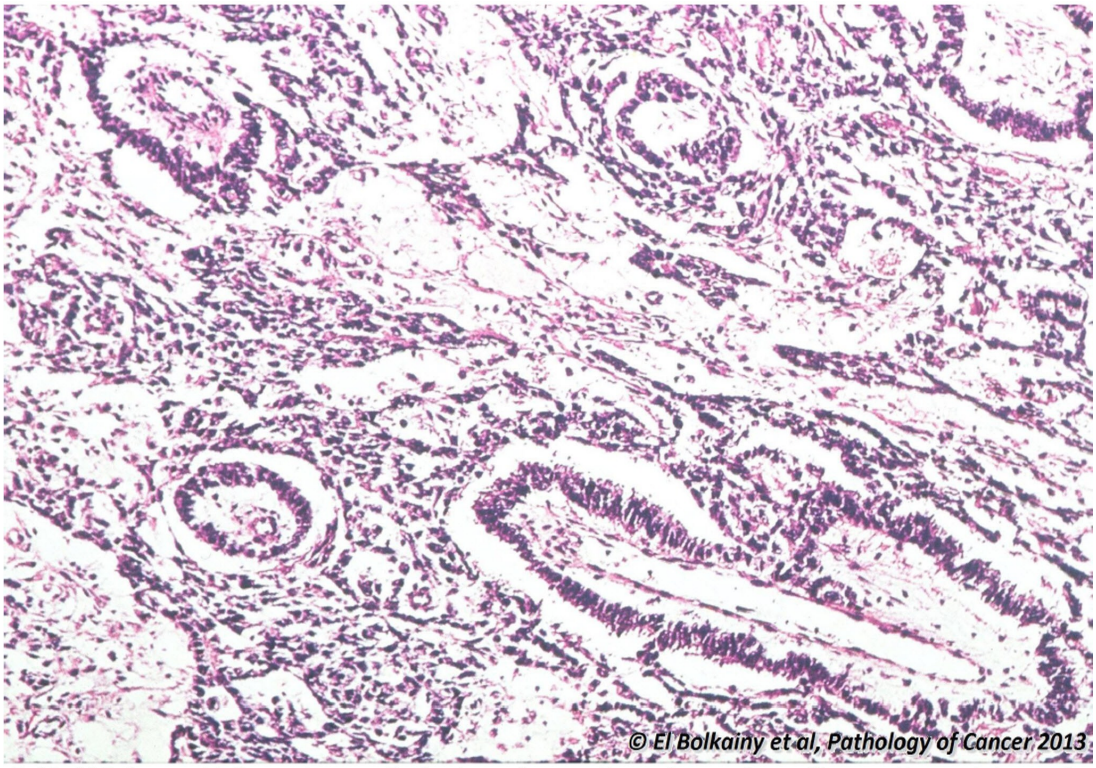
P 13-104 Histiocytic sarcoma. H&E showing histiocytes of variable size and shape including giant forms. Cytoplasm is eosinophilic and nuclei are multiple and atypical with prominent nucleolei. B Immunostains: CD68+, and CD163+, (but negative for S100 and CD30).



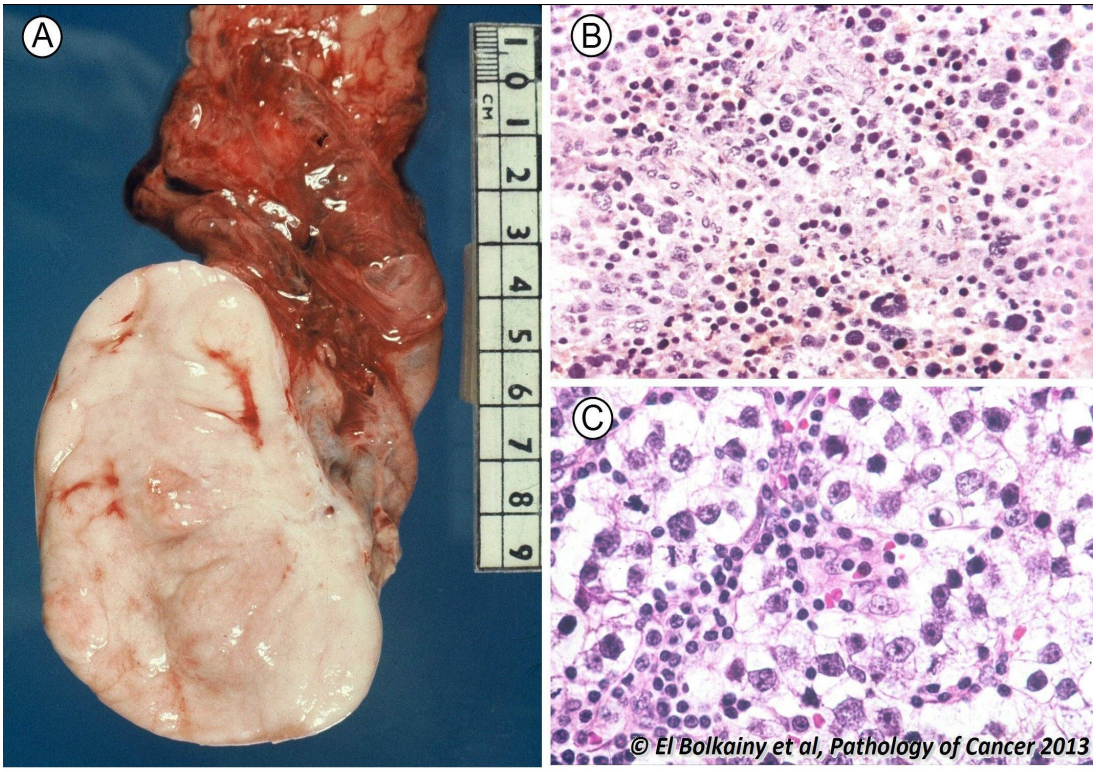
P 13-105 Lymph node. Follicular denteritic cell sarcoma. **A** and **B** routine H and E stain show spindle cells with whorled pattern associated with lymphocytes. **C**. Immunostains: positive for CD21 and CD23 (but negative for other histiocytic and lymphoma markers)



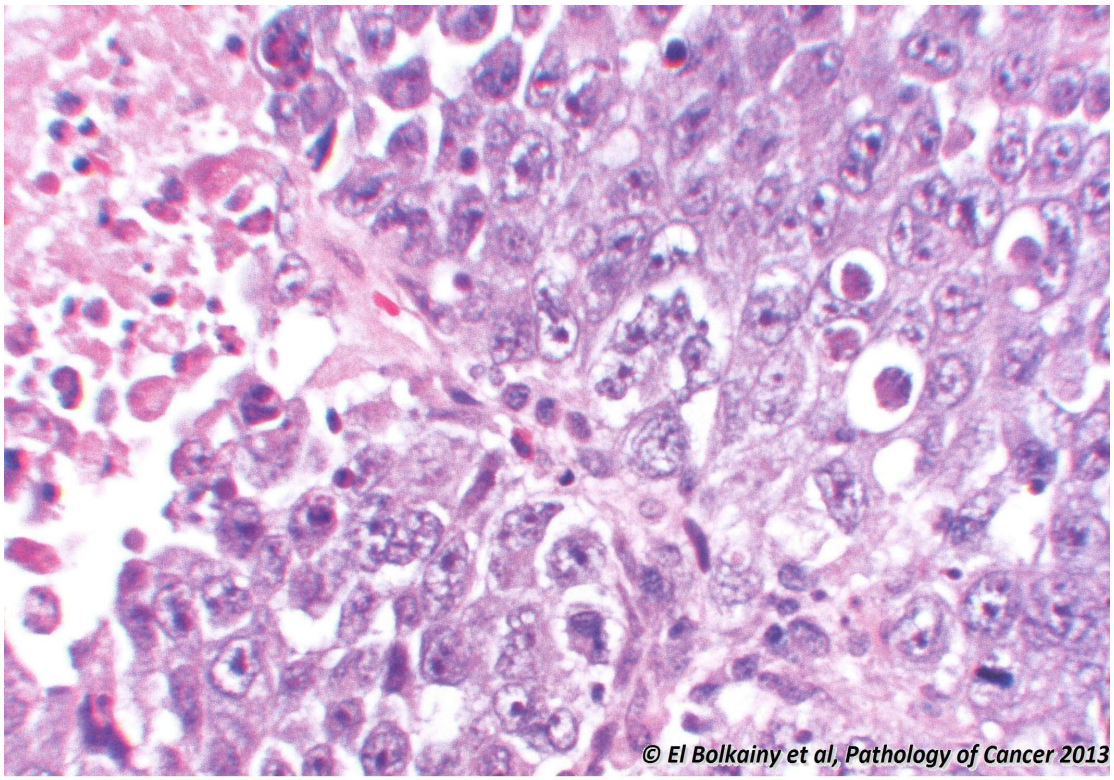
P 13-106 Ovary. Choriocarcinoma. Biphasic tumor formed of syncytiotrophoblasts (giant cells with eosinophilic cytoplasm) and cytotrophoblasts (round cells with vesicular nuclei, prominant nucleolei and active mitosis. Immunostain: beta-HCG+, CK+, PLAP+ in only 50% of cases.



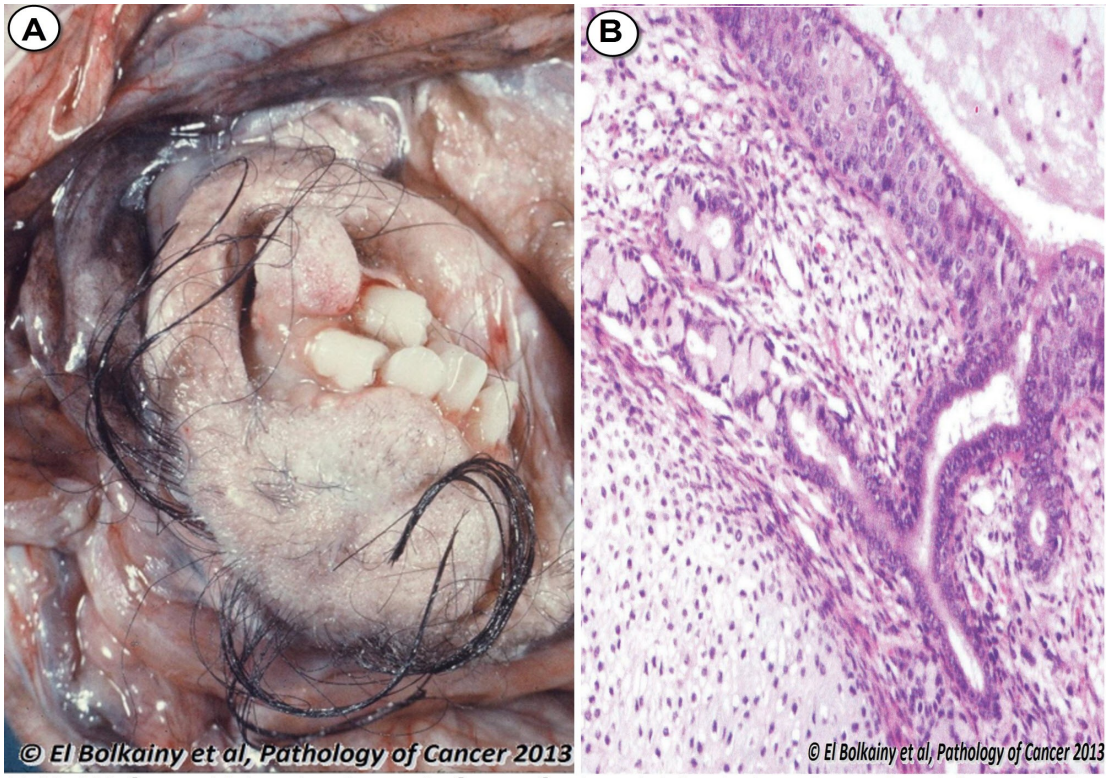
P 13-107 Ovary. Yolk sac tumor. Reticular, microcystic and pseudopapillary patterns, intracystic glomeruloid structures (Schiller-Duval bodies) in 30% of cases and hyaline globules (PAS+). Immunostain: AFP+, CK+ and CD34+. Cytogenetics : isochromosome 12 (i12p).



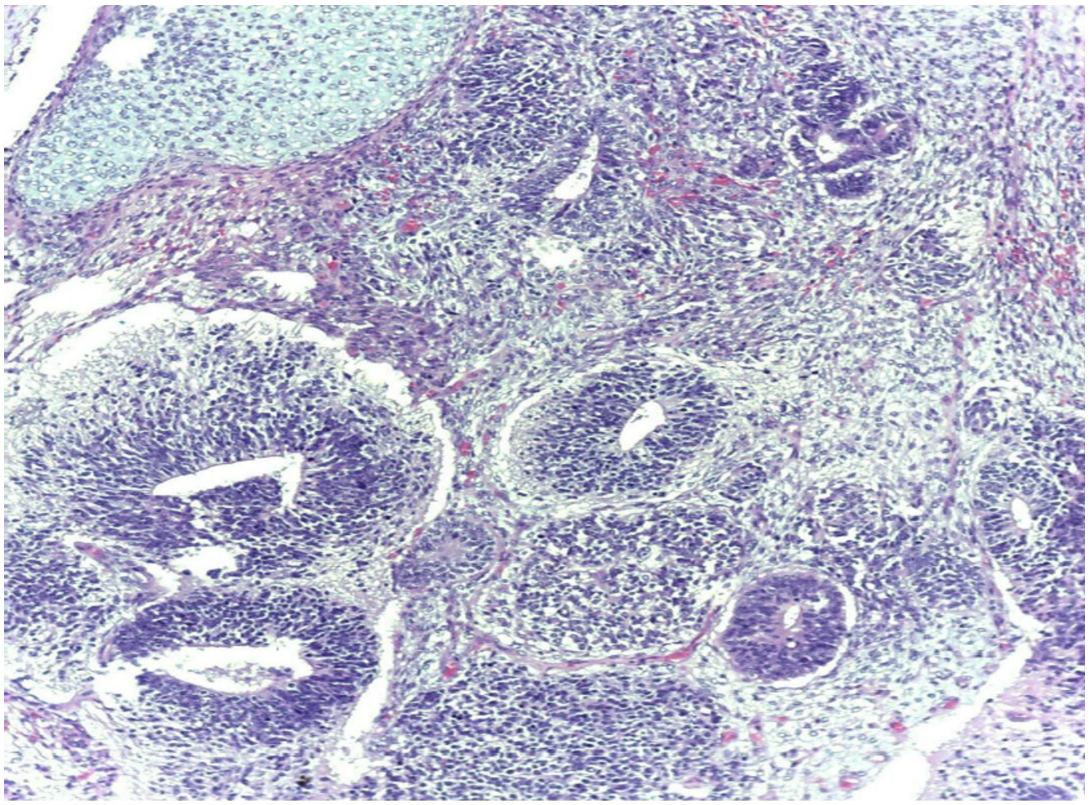
P 13-108 Testis. Seminoma. **A.** grossly it shows multinodular bulging creamy tan fleshy cut section. **B.** Diffuse sheets of loosely cohesive tumor cells with intervening lymphocytes. **C.** High power, tumor cells are round with clear cytoplasm and well defined borders



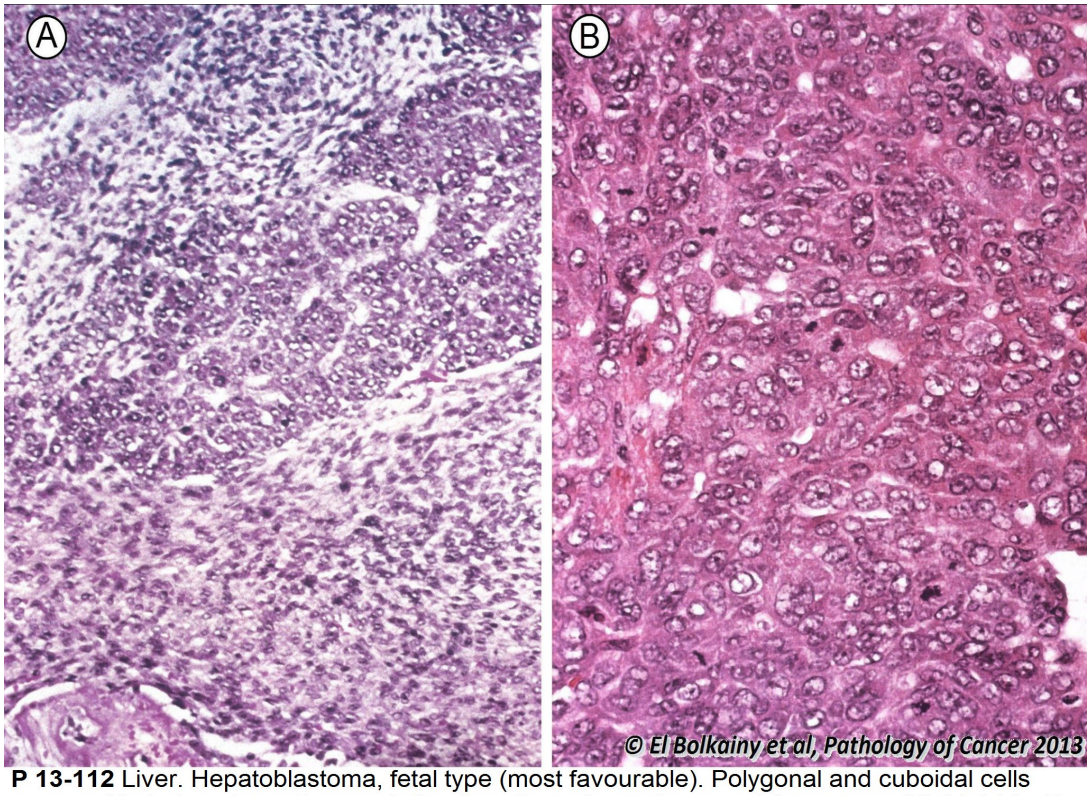
P 13-109 Ovary. Embryonal carcinoma. Solid sheets of undifferentiated epithelium, marked anaplasia and mitosis, pseudoglandular pattern and focal necrosis. Immunostain: PLAP +, CD30+, and CK+.



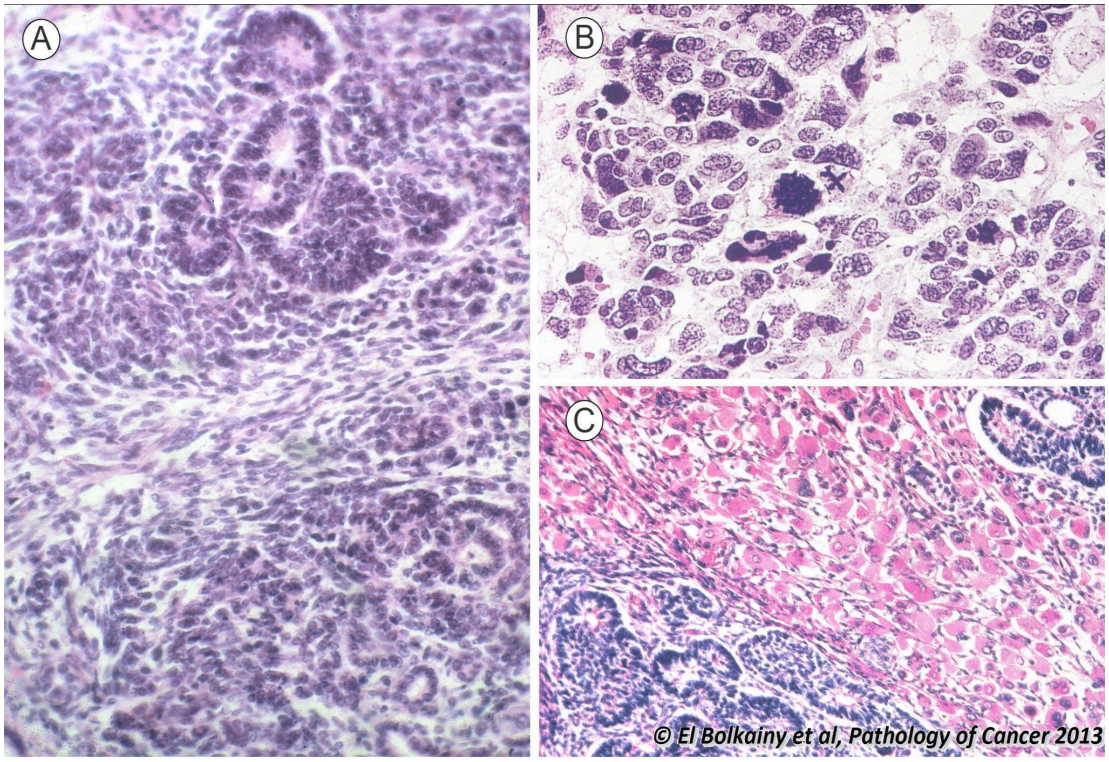
P 13-110 Ovary. Mature teratoma. **A.** Gross, Cyst containing hair and mural nodule containing tooth and bone. **B.** Microscopic, complex structure of mature glands and hyaline cartilage, the cyst lining is mostly squamous epithelium with skin adnexal structures.



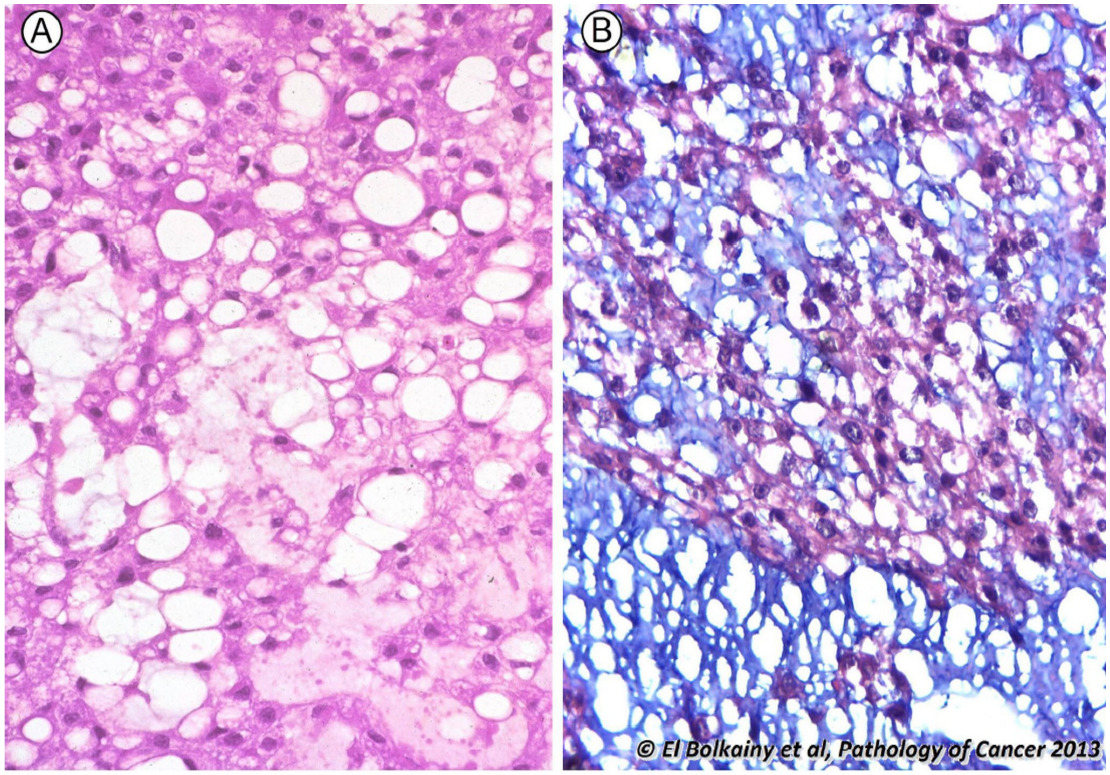
P 13-111 Ovary. Immature teratoma. The diagnostic criterion is the prescence of primitave neural tube differentiation (Right field).



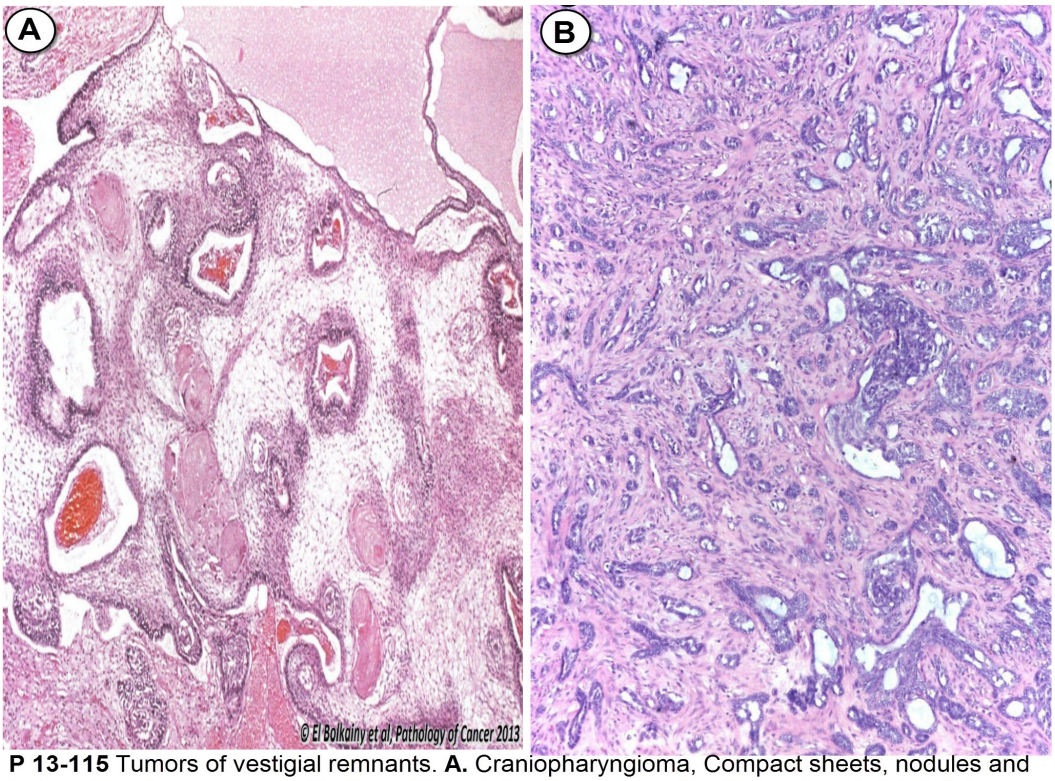
P 13-112 Liver. Hepatoblastoma, fetal type (most favourable). Polygonal and cuboidal cells arranged in trabecular pattern and showing alternating pale areas (glycogen and lipid rich) with dark areas. Tumor cells are immunoreactive for alpha-fetoprotien and beta-catenin. **A.** low power. **B.** High power



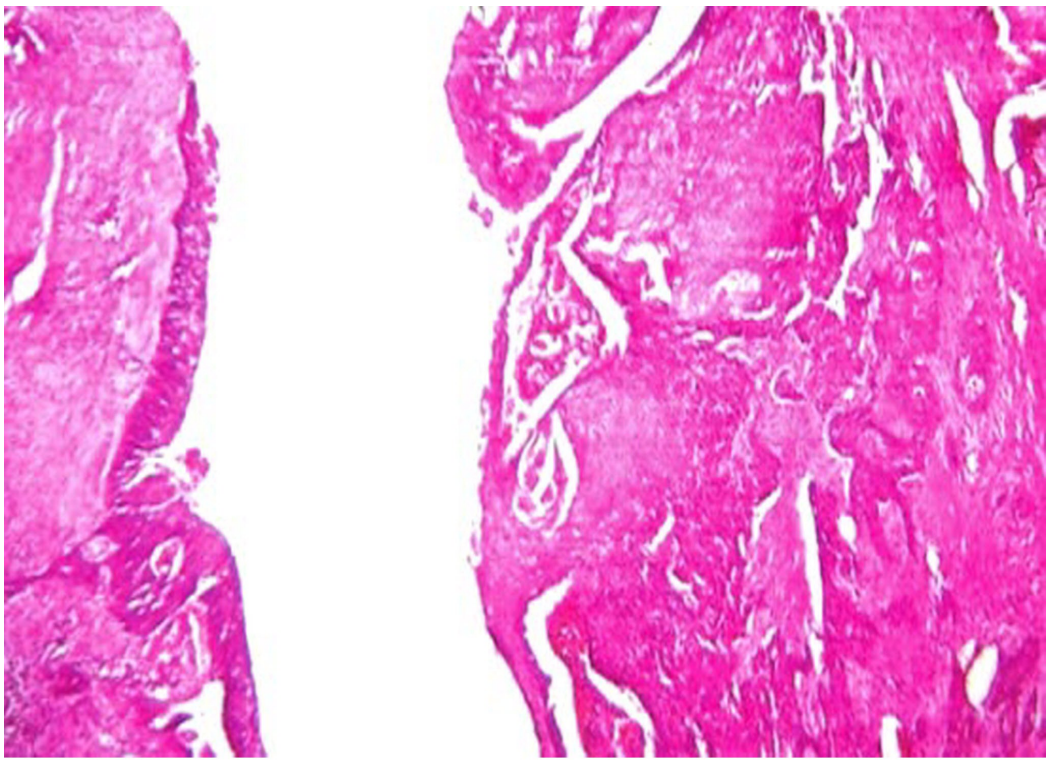
P 13-113 Kidney. Wilms tumor. **A.** Biphasic structure of blastemal, tubular and stromal cells. **B** Anaplasia (large hyperchromatic neuclei) is unfavourable feature. **C**. Epithelial (tubules) and rhabdomyoblastic differentiation. (Molecular genetics: WT1; (11p13), WT2 (11p15.5)).



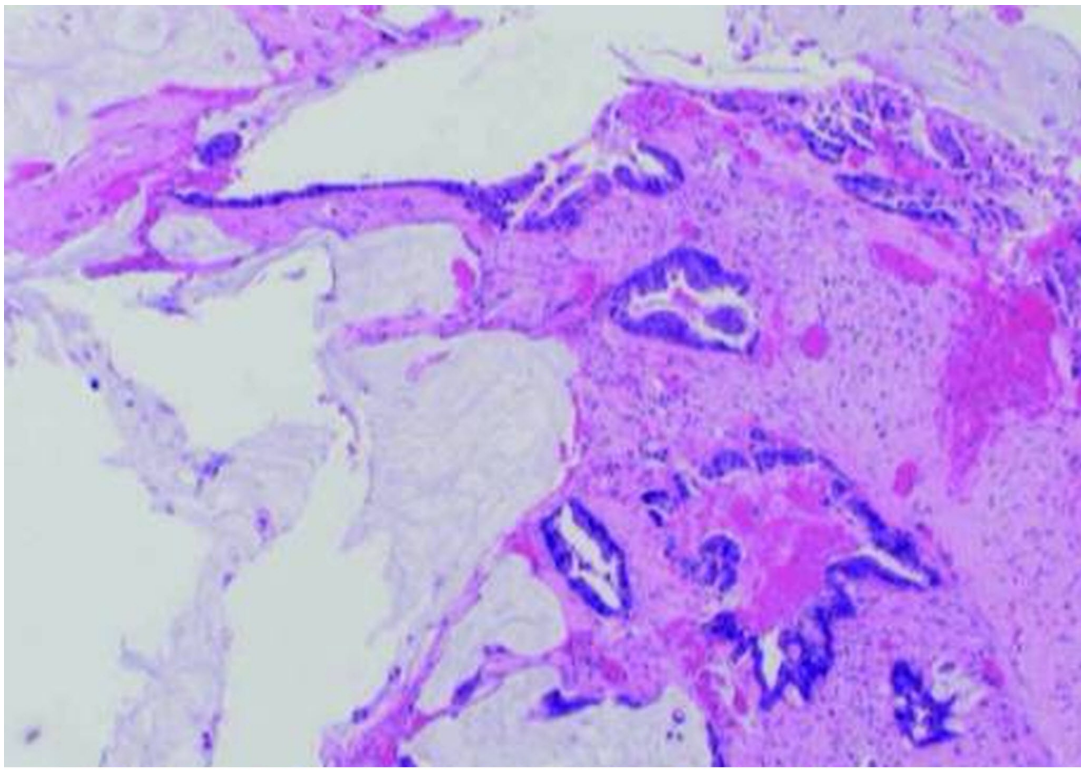
P 13-114 Bone. Chordoma. A. Hematoxylin and eosin, groups of cells with multiple cytoplasmic vacuoles (physalliferous cells), CK+, with myxoid stroma. B Alcian blue stain, markedly positive in stroma.



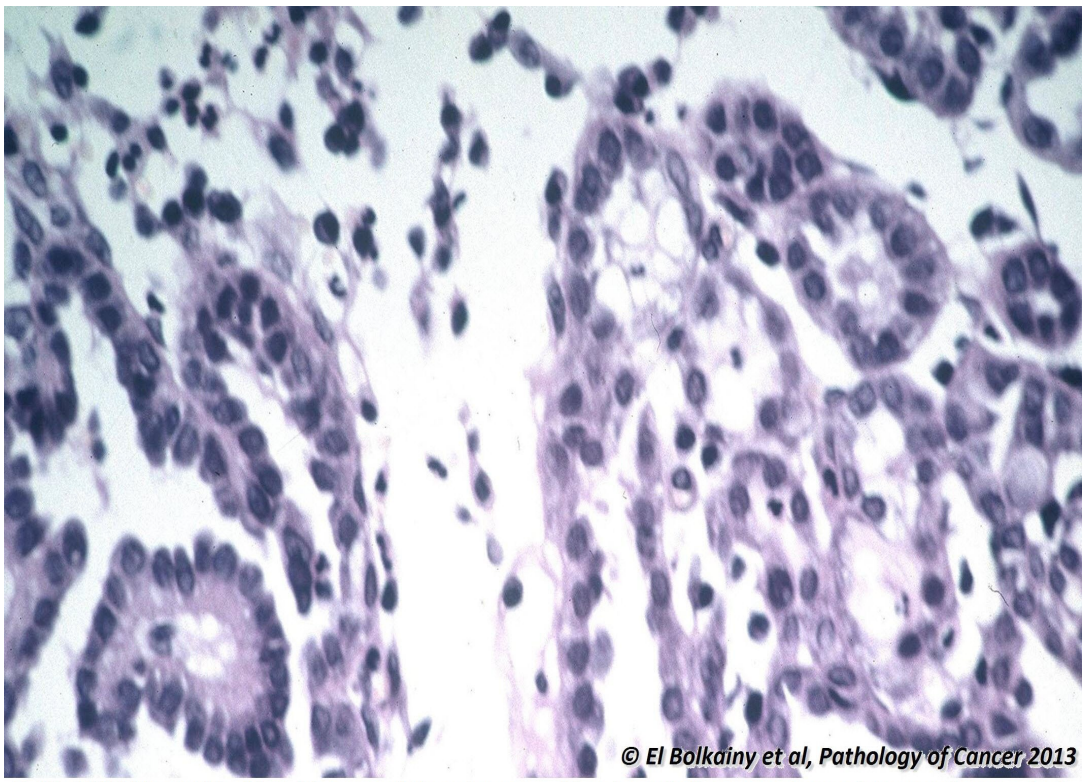
P 13-115 Tumors of vestigial remnants. **A.** Craniopharyngioma, Compact sheets, nodules and trabeculae of squamous epithelium with peripheral nuclear palisading and centeral stellate reticulum. **B.** Adamantinoma of tibia, Nests of epithelail cells in tubular pattern, in fibrous stroma.



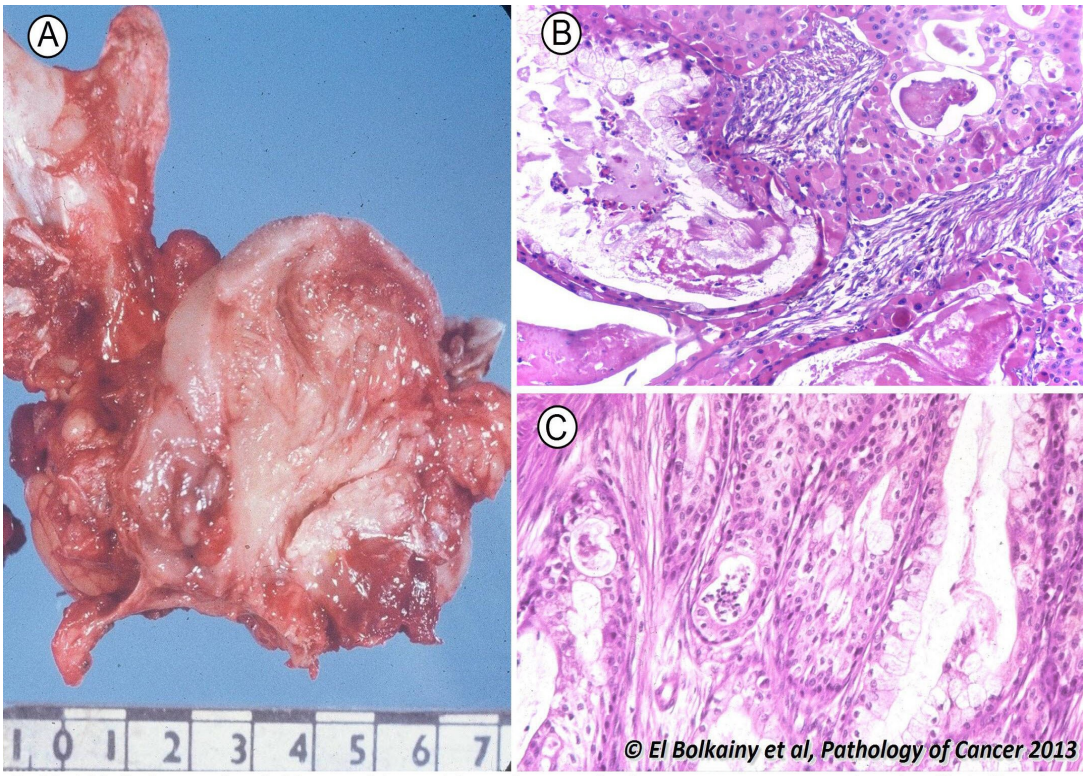
P 13-116 Squamous cell carcinoma complicating branchial cyst, squamous cyst lining, (left field) and invasive squamous cell carcinoma, (right field). (Courtesy of PathologyOutlines.com)



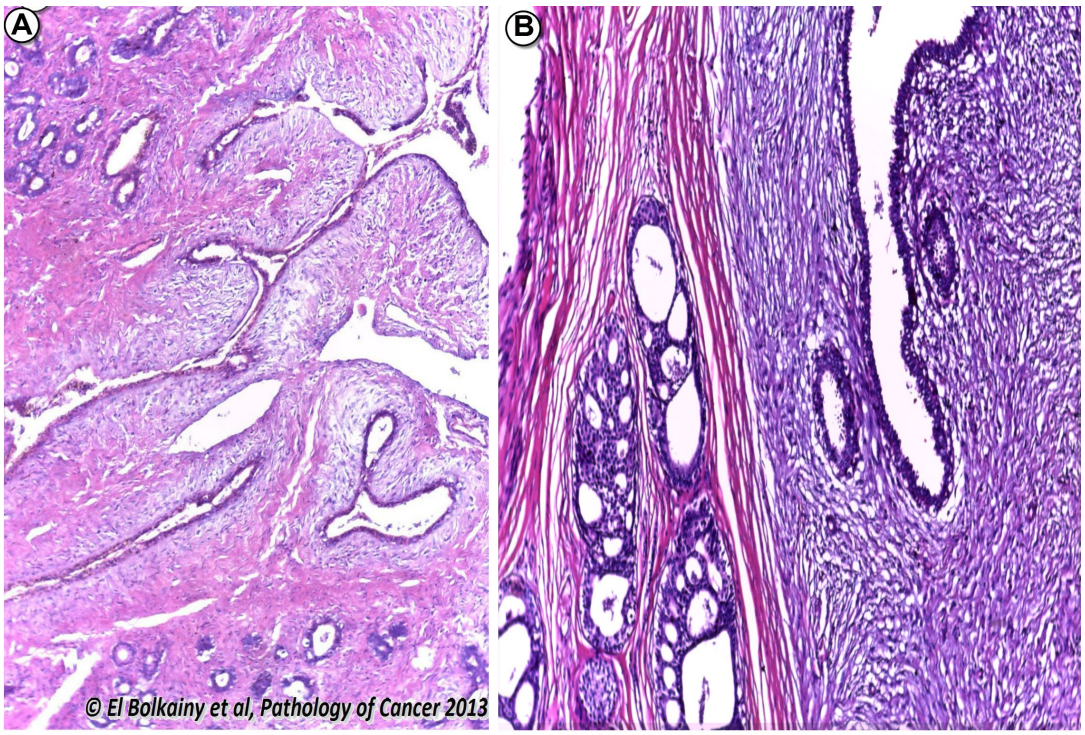
P 13-117 Urachal carcinoma, developed from urachal remnants. Occurs in midline, dome of the bladder and along a tract from bladder to umblicus. Mucinous adencarcinoma is the most common histological type. (Courtesy of PathologyOutlines.com).



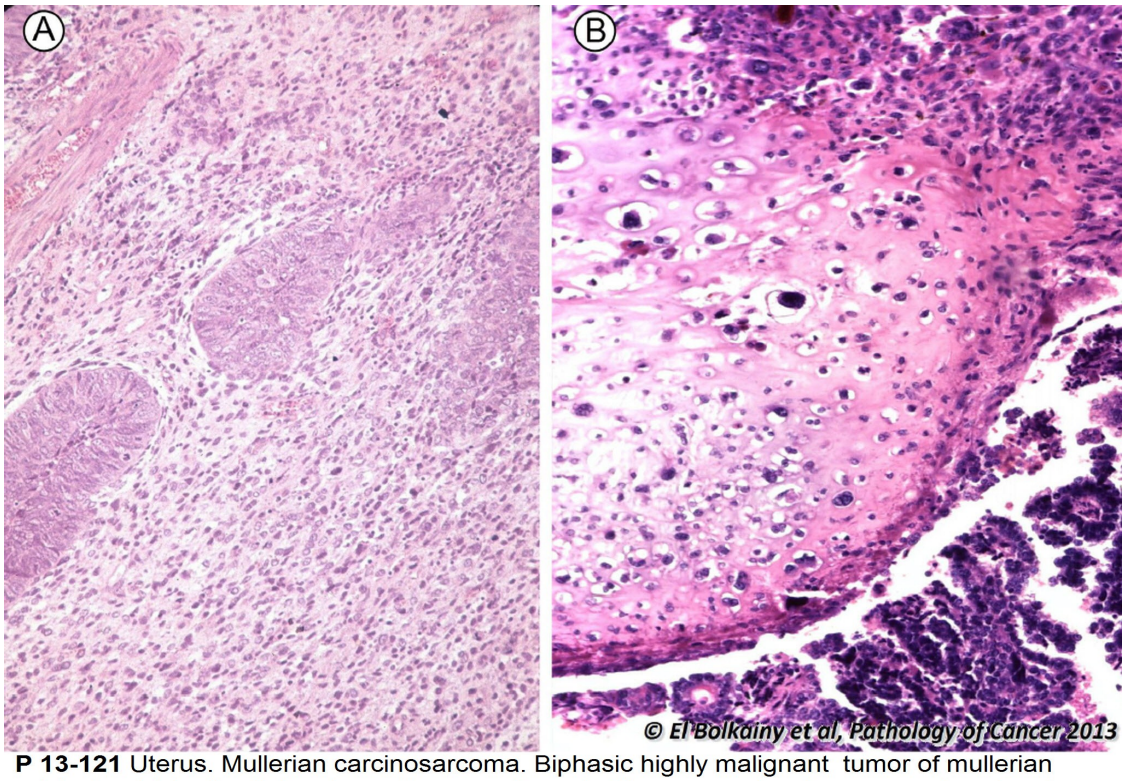
P 13-118 Urinary bladder. Mesonephric adenoma. May be misdiagnosed as adenocarcinoma, but note the bland nuclei and hobnail feature (left side of the picture).



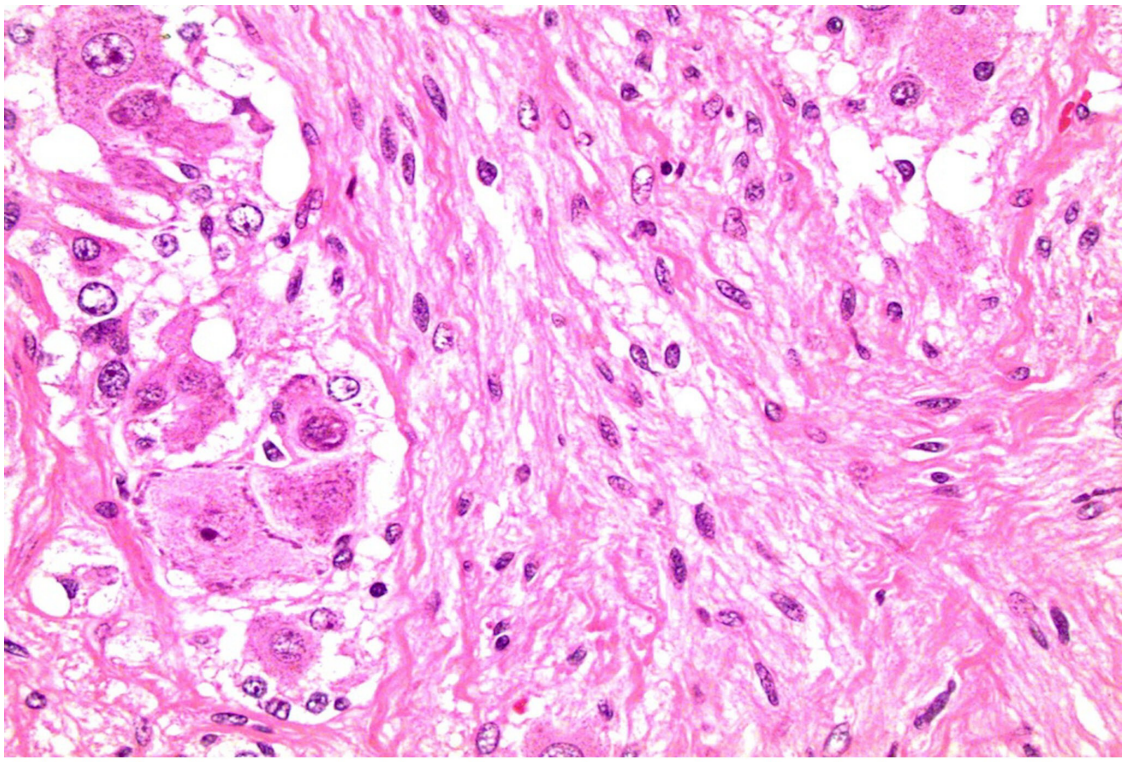
P 13-119 Salivary gland. Mucoepidermoid carcinoma. **A.** Grosss appearance showing ill deffined tumor with mucoid and cystic changes. **B** and **C** A biphasic tumor showing well differentiated columnar and squamous cells . Clear cells are evident (mucinocytes).



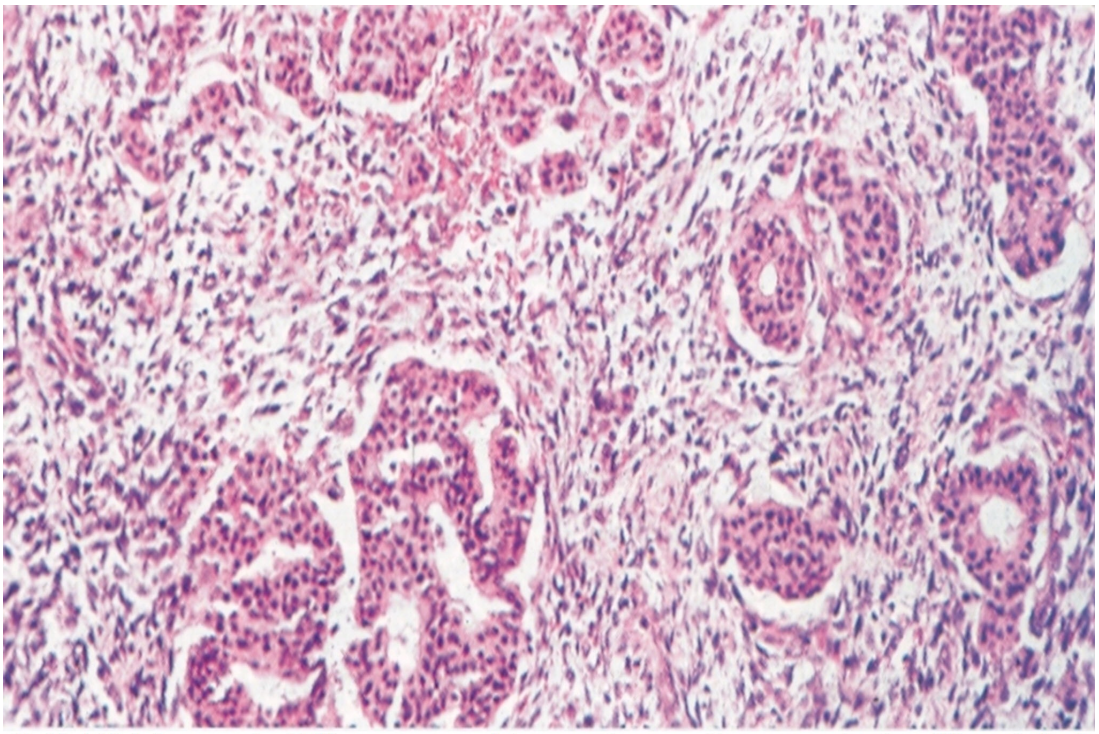
P 13-120 Breast. **A.** Fibroadenoma. Intracanalicular pattern with distinct periductal specialized stroma (bluish color) and uniformity of stromal/epithelial pattern through out the tumor. **B.** Phyllodes tumor. Moderate stromal cellularity and mitotic activity with variation of stromal/epithelial ratio in different parts of tumor. Ki-67 is < 2% in benign, 2-5% in borderline and > 5% in malignant tumors.



P 13-121 Uterus. Mullerian carcinosarcoma. Biphasic highly malignant tumor of mullerian origin, in which all cellular elements are malignant> The mesenchyml component my be, **A.** native to the location or homologous (fibrosarcomaor leiomyosarcoma) or **B.** foreign (hetrologuss) to the uterus (rhabdomyosarcomaa, chondrosarcoma or osteosarcoma).



P 13-122 Ganglioneuroma. A mixture of large mature ganglion cells and schwann cells. The former have eosinophilic cytoplasm and eccentric neuclei and prominent nucleolei. Phenotype: nerve cells (calretinin and nerve filament protein +ve) and schwann cells (S-100 +ve).



P 13-123 Adenocarcinoid (Synonemous: Adenocarcinoma with neuroendocrine differentiation) . Islands of carcinoid tumor surrounded by undifferentiated spindle cell carcinoma. This biphenotypic tumor is positive for both panCK and chromogranin.