LYMPHOID TISSUE AND SKIN

The focus of this week’s lab will be pathology of the lymphoid tissue and skin. The lymphoid organs include the thymus, spleen, and lymph nodes. Abnormalities in the lymph nodes account for the vast majority of lymphoid tissue pathology.

LYMPH TISSUE

Infections and nonmicrobial inflammatory stimuli can cause leukocytosis (as seen in Lab 1) as well as lymph node enlargement (lymphadenopathy).

The cases we will cover are:

A. Follicular Lymphoma
B. Hodgkin Lymphoma (Nodular Sclerosis Type)

SKIN

The skin is an important protective layer against foreign materials. It is comprised of the dermis, epidermis, and hypodermis. The epidermis is composed of five (four in thin skin) layers. These layers are: 1) Stratum Corneum, 2) Stratum Lucidum (only in thick skin), 3) Stratum Granulosum, 4) Stratum Spinosum, and 5) Stratum Basale. The dermis lies deep to the epidermis and is separated from the epidermis by a basement membrane. The dermis is composed of two layers, a superficial papillary layer and a deep thicker area called the reticular dermis. The hypodermis lies deep to the dermis.

The cases we will cover are:

C. Actinic Keratosis
D. Basal Cell Carcinoma
E. Dysplastic Nevus Syndrome
A. FOLLICULAR LYMPHOMA

CC/HPI: A 54 year old white female notices painless lumps bilaterally in her neck that have slowly enlarged over the past three months. She denies any pain, but complains of a few episodes of mild fever, night sweats, and weight loss in the past three months.

PE: Physical exam reveals bilateral cervical firm lymphadenopathy, pallor, and splenomegaly.

Labs: CBC demonstrates Coombs-positive hemolytic anemia and thrombocytopenia. Elevated serum LDH; hypergammaglobulinemia.

Pathology: A lymph node biopsy sample is shown:

Questions for everyone to consider:

What do the circular structures seen in the image on the left look like? What lymphocyte type are these structures mainly composed of?

Does the picture on the left have a normal number of these structures?

Questions if you have been assigned this case:

The cells in these structures express CD20. This is a marker for what type of cells?

These cells also express excess Bcl2 as a result of a translocation, specifically t(14; 18), between the Bcl2 gene on chromosome 18 and the IgH locus on chromosome 14. Do these cells normally express Bcl2?

How does the function of Bcl2 correlate with the pathology seen here?
B. HODGKIN LYMPHOMA (NODULAR SCLEROSIS TYPE)

CC/HPI: A 25 year old white female complains of a painless lump in her neck that has grown over the past two months. She also complains of rapid enlargement of her abdomen, intermittent fever, night sweats, pruritis, and significant weight loss.

PE: Physical exam reveals pallor, unilateral nontender, rubbery, enlarged cervical lymph nodes; splenomegaly.

Labs/Imaging: CBC demonstrates neutrophilic leukocytosis with lymphopenia; normocytic anemia. Elevated ESR and LDH. Chest X Ray shows bilateral hilar lymphadenopathy. CT shows mediastinal lymphadenopathy, splenomegaly, enlarged lymph nodes and mild hepatomegaly.

Pathology: A lymph node biopsy sample is shown:

Questions for everyone to consider:

Collagen stains pink (eosinophilic) in the image on the left. What type of collagen is normally found in lymph node?

Two cell types are seen in the image on the right. Which one is NOT normally seen in a lymph node?

Questions if you have been assigned this case:

What is the large cell with empty space within it?

The presence of the large cells seen in the image on the right is diagnostic for…

What is the other cell type seen in the image on the right?
C. ACTINIC KERATOSIS

CC/HPI: A 60 year old white farmer presents with skin lesions on his forehead, above his upper lip, and on the dorsum of his hands. He does not smoke, drink alcohol, or chew tobacco.

PE: Physical exam reveals round irregularly shaped lesions; tan plaques with adherent scaly or rough surface on forehead, skin over upper lip, forearms, and dorsum of hands; lesions range in size from several millimeters to 1 cm or more.

Pathology: A skin biopsy reveals thickened epidermis with basal cell hyperplasia; dermis shows thickening and fibrosis (elastosis):

Questions for everyone to consider:

What layer of the epidermis is thickened in the middle image?

What is abnormal about the cells in this outermost epidermal layer?

Questions if you have been assigned this case:

What is parakeratosis?

Cells in the deepest layer of the epidermis look abnormal in the second image. What is abnormal about them and what is this layer called?

What is the function of the stratum basale?
D. BASAL CELL CARCINOMA

CC/HPI: A 68 year old red-haired white man presents with a three month history of a progressively raised, bleeding, ulcerated lesion in front of his ear that has not responded to various ointments. He is a sailor and has always sailed without a hat; he occasionally smokes but does not drink.

PE: Physical exam reveals a large ill-defined, telangiectasic and ulcerated nodule (“pearly papule”) with heaped-up borders located anterior to the right ear; no regional lymphadenopathy.

Pathology: A skin biopsy reveals nodular lesions of basaloid cells with scant cytoplasm and hyperchromatic nuclei:

Questions for everyone to consider:

What kind of cells do the cells in the nodules shown in the middle and right images look like?

The nodules in the middle image are in what part of the skin?

Questions if you have been assigned this case:

Basal cell carcinoma is associated with mutation of which gene? How is this mutation inherited?

Describe the signaling pathway that this gene is involved in and how it results in carcinoma.
E. DYSPLASTIC NEVUS SYNDROME

CC/HPI: A 16 year old girl complains of multiple nevi on her skin. She is concerned because an aunt who had a similar condition developed malignant melanoma and died of metastatic complications.

PE: Multiple nevi measuring 6 to 15 mm noted; nevi are variegated shades of pink, tan, and brown and seen on back, chest, buttocks, scalp, and breasts; borders are irregular and poorly defined but lack the scalloping of malignant melanoma; no regional lymphadenopathy noted.

Pathology: A skin biopsy reveals melanocytes with cytologic and architectural atypia, enlarged and fused epidermal nevus cell nests, lentiginous hyperplasia, and pigment incontinence:

Questions for everyone to consider:

The cells at the base of the epidermis have irregular, dark-staining nuclei. What skin layer are they present in?

What is abnormal about the dermis in this patient?

Questions if you have been assigned this case:

The presence of dysplastic nevi predisposes a patient to what malignancy?

Should this patient be worried that her aunt had a similar condition--is this condition heritable? What genes are associated with dysplastic nevus syndrome?

What is the mode of heritability? What are the chances her children will have dysplastic nevus syndrome if she has it?