WSC 2014-2015, Conference 8

Case 1. Tissue from a cat.

MICROSCOPIC DESCRIPTION: Long bone: Effacing the cortex and elevating the overlying moderately atrophic skeletal muscle is an infiltrative, multinodular, moderately cellular, poorly demarcated unencapsulated neoplasm **(2pt)**. Neoplastic cells are arranged in short streams and bundles **(1pt)** among on a dense fibrous stroma **(1pt)** scattered among variably sized disorganized lobules of well-differentiated, highly cellular cartilage and bone **(2pt)**. Neoplastic cells are spindled with indistinct cell borders and a small amount of finely granular cytoplasm **(1pt)**. Neoplastic cells have elliptical nuclei with finely stippled chromatin and 1-2 small basophilic nucleoli **(1pt)**. **(**Mitotic figures average 1/400X HPF. **(1pt)** Throughout within the mass, neoplastic cells produce and are often incorporated within abundant osteoid **(2pt)**, and about 80% of the mass is composed of proliferating variably mature islands of cartilage and bone. Osteoclast **(1pt)** s are present within Howship's lacunae lining areas of mature tumor bone. The neoplasm has effaced the majority of the pre-existent cortex **(1pt)**; at one edge, the pre-existent lamellar cortical bone is extensively remodeled. In areas of cortical remodeling There are abundant anastamosing trabeculae of woven subperiosteal new bone oreiented perpendicularly to the overlying periosteum **(1pt)**. Overlying skeletal muscle exhibits marked variation in fiber size and occasional hyalinization and loss of cross striation (atrophy) **(1pt)**

MORPHOLOGIC DIAGNOSIS: Long bone: Osteosarcoma **(4pt)**

O/C: **(1pt)**

WSC 2014-2015, Conference 8

Case 2. Tissue from a dog

(NOTE: I'm not boasting about this description. I hate bone.)

MICROSCOPIC DESCRIPTION: Long bone, cross section through epiphysis and growth plate: There is markedly disordered growth and thickening **(1pt)** of the articular cartilage **(1pt)**, with a lack of normal hyaline cartilage **(1pt)**. The epiphyseal cartilage is composed of a mosaic **(1pt)** of proliferating lobules of chondroid matrix **(1pt)** recapitulating the growth plate with disordered resting, proliferating, and hypertrophic zones **(2pt)**. There are small areas of degeneration filled with basophilic debris scattered randomly throughout these areas **(1pt)**. The lobules of proliferating cartilage are separated by pink areas of poorly formed hyaline cartilage **(1pt)**. These lobules of cartilage extend downward into the epiphysis, occasionally merging with the level of the growth plate **(2pt)**. The growth plate also has randomly scattered areas of disordered growth along its length **(1pt)**, with excessive wedge shaped areas of the hypertrophic zone streaming into the underlying cortex **(2pt)**. Downgrowths of unremodeled, unvascularized primary spongiosa with prominent cartilage cores are present within the metaphysis. **(1pt)**

MORPHOLOGIC DIAGNOSIS: Long bone: Diffuse epiphyseal and growth plate chrondrodysplasia with deficient endochondral ossification **(4pt)**

O/C: **(1 pt.)**

WSC 2013-2014, Conference 8

Tissue from a rat.

MICROSCOPIC DESCRIPTION**:** Proximal femur **(1pt.)**: The proximal half of the femur is present within the slide. There is a transverse angled midshaft **(1pt.)** fracture **(1pt.)** and an immature callus **(2pt.)** at the femoral end (the distal end of the bone is not evident in the slide. Beginning shortly distal to the femoral neck, the periosteum is elevated **(1pt.)** by a proliferation of anastamosing trabeculae of woven bone **(2pt.)** on both sides of the femur. The trabeculae of woven bone increase in length toward the distal end of the femur, and are lined by numerous osteoblasts **(1pt.)** which are incorporated into the woven bone in large numbers, as well as low numbers of osteoclasts **(1pt.)** within Howship's lacunae.. The overlying periosteum is thickened up to 75um and is hypercellular. **(1pt.)** There is a large focus of proliferating cartilage adjacent to the broken end of the bone **(1pt.)**. The broken end of the bone is surrounded by a large multilocular hematoma **(1pt.)** containing abundant hemorrhage **(1pt.)** and anastomosing bands of polymerized fibrin **(1pt.)** which is bounded by a thick bed of granulation tissue **(1pt.)** measuring up to 3mm in thickness, which at its periphery, contains abundant mature collagen. **(1pt.)** The granulation tissue extends into the adjacent skeletal muscle and contains isolated fragments of woven bone. Scattered throughout the granulation tissue are aggregates of low to moderate numbers of neutrophils **(1pt.)**, with fewer macrophages, lymphocytes and plasma cells, and rare multinucleated giant cell macrophages, as well as aggregates of hemosiderin laden macrophages. Entrapped skeletal muscle fibers exhibit one or more of the following changes: marked variation in fiber size (atrophy) **(1pt.)**, hyalinization and loss of cross striations (degeneration) **(1pt.)**, vacuolation **(1pt.)**, proliferation of satellite nuclei, and myofibers are separated by varying amounts of hemorrhage, collagen and proliferating blood vessels.

MORPHOLOGIC DIAGNOSIS: 1. Femur: Midshaft fracture with maturing callus. **(3pt.)**

O/C - **(1pt.)**

WSC 2014-2015, Conference 8

Case 4. Tissue from a horse.

MICROSCOPIC DESCRIPTION:

Kidney: There are changes at all levels of the nephron. Glomeruli exhibit one or more of the following changes: increased size **(1pt)**, hypercellularity **(1pt)**, segmentation **(1pt)**, mild expansion of capillary walls, hyperplasia of parietal epithelium, marked ectasia of Bowman's capsule **(1pt)**, reflux of tubular protein into Bowman's space, and marked periglomerular fibrosis **(1pt)**. 10-15% of glomeruli are fused with the Bowman capsule (synechiae) **(2pt)**. Occasional dilated Bowman's capsules contain protein, small amounts of fibrin, and numerous degenerate neutrophils and cellular debris**(1pt)**. There is a diffuse paucity of tubules both within the cortex and to a lesser extent within the medulla **(1pt)**. Diffusely, tubular epithelium is swollen and vacuolated (degenerate) **(1pt)** and tubules are often ectatic **(1pt)**, containing moderate amounts of protein, fibrin, and neutrophils **(1pt)**, admixed with cellular debris. In some tubules, neutrophils are transmigrating the tubular epithelium **(1pt)**. Medullary tubules are often dilated with moderate amounts of luminal protein and few sloughed epithelial cells **(1pt)**. The interstitium is diffusely expanded by low to moderate amounts of mature collagen **(1pt)**, and is populated by low to moderate numbers of lymphocytes and plasma cells **(1pt)**, admixed with low numbers of plump fibroblasts.

MORPHOLOGIC DIAGNOSIS: Kidney: Glomerulonephritis, mesangioproliferative, diffuse, moderate, with tubular degeneration and necrosis, and tubular proteinosis. **(3pt)**

O/C: **(1pt.)**