WSC 2015-2016, Conference 9
Case 1. Tissue from a sheep.

MICROSCOPIC DESCRIPTION: Long bone: The physeal cartilage is markedly thickened **(1 pt.)**, up to 10 times normal and grossly scalloped in outline, with expansion of the zone of proliferation **(1 pt.)** and the zone of hypertrophy **(1 pt.)**. The zone of hypertrophy extends into the metaphysis as thick tongues of retained cartilage with disordered vascular ingrowth **(1 pt.)**. The metaphysis is markedly flared **(1 pt.)** and unilaterally, is expanded by a large area of proliferating cartilage adjacent to the endosteum **(1 pt.)**, which extends into the diaphysis. Cartilaginous trabeculae are discontinuously bordered by varying combinations of degenerate/necrotic cartilage matrix **(1 pt.)** and thick osteoid seams up to 60um in diameter **(1 pt.)** and often connect horizontally. There is a diffuse lack of osteoclasts within the zone of mineralization **(1 pt.)**. Vascular spaces between tongues of proliferating cartilage are markedly congested, and contain moderate amounts of fibrous connective tissue **(1 pt.)**. There is a mild decrease in trabecular bone within the diaphysis (osteopenia) **(1 pt.)**. The periosteum is diffusely and mildly thickened up to 250um by fibrous connective tissue. **(1 pt.)**.

MORPHOLOGIC DIAGNOSIS: Long bone: Physeal chondrodysplasia, with excessive proliferation and disorganization of the zone of hypertrophy, lack of mineralization, and mild myelofibrosis. **(3 pt.)**

CAUSE *:* Vitamin D Deficiency **(3 pt.)**

NAME THE CONDITION: Rickets **(1 pt.)**

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

WSC 2015-2016, Conference 9
Case 2. Tissue from a donkey.

MICROSCOPIC DESCRIPTION: Long bone: The physis is moderately compressed **(1 pt.)**, and chondrocytes in the zone of hypertrophy **(1 pt.)** are arranged in irregularly spaced nests **(1 pt.)**, which often lack a vertical orientation **(2 pt.)**. Within the zone of calcification, hypertrophied chondrocytes are arranged in horizontal as well as vertical columns of chondrones **(1 pt.)**, and forms interconnecting, trabeculae of primary spongiosa **(1 pt.)**. Disordered primary spongiosa extends into and essentially fills the diaphysis **(1 pt.)**, markedly effacing the marrow space **(1 pt.),** which commonly contain retained cartilage cores including hypertrophic chondrocytes . There is no discernable cut-off zone; the metaphyseal cortical bone is severely reduced in thickness (osteopenia) **(1 pt.)**. Trabeculae are lined by a wide osteoid seams; osteoblasts are markedly diminished **(1 pt.)** in number, and osteoclasts are rare to absent **(1 pt.)**. The bone marrow is markedly hypocellular **(1 pt.)**, and there is multifocal hemorrhage throughout the marrow spaces.

MORPHOLOGIC DIAGNOSIS: Long bone: Physeal dysplasia, diffuse, severe, with failure of chondroclasis, diffuse osteosclerosis, cortical osteopenia, and severe osteoclast depletion. **(3 pt)**

NAME THE CONDITION: Osteopetrosis **(3pt)**

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

WSC 2015-2016, Conference 9
Case 3. Tissue from a rat.

MICROSCOPIC DESCRIPTION: Sagittal section through spinal column: There is a moderate decrease of the intervertebral disk space **(1 pt.)** in the middle vertebra on the slide, with effacement of the nucleus pulposus **(1 pt.)** and compression of the remaining annulus fibrosis. Within the apical and lateral aspects of the remaining annulus fibrosis, there is a diffuse eosinophilia (loss of glycosaminoglycans) **(1 pt.)** as well as fissuring **(1 pt.)**, and there is disordered proliferation and clumping of nests of chondrocytes (chondrones.) **(2 pt.)** At either edge of the compressed disk, there is thickening and disorganization of the cartilaginous endplates of the adjacent vetebrae with marked disorganization **(1 pt.)** and proliferation of chondrocytes **(1 pt.)** in a diffusely pink cartilaginous matrix. The most apical aspect of the disk is fragmented, with similar changes as previously described for the annulus fibrosus, but with fewer and more widely spaced chondrones. **(1 pt.)** The overlying intervertebral ligament is hypercellular **(1 pt.)**. Between the spinal cord and intervertebral ligament is a focally extensive proliferation of spinal nerve roots which are sectioned in several planes (neuroma) **(2 pt.)**. Within the neuroma, there is a fragment of lamellar bone (presumably a resorbing fragment of the vertebral body, or possibly an osteophyte). **(1 pt.)** The annulus fibrosis is displaced dorsally and surrounded by a large venous sinus; these two structures compress the overlying spinal cord **(1 pt.)**. Overlying the protruding annulus fibrosus, the cord/spinal nerve roots, contain low to moderate numbers of dilated axon sheaths **(1 pt.)** and mild increase in glial cells and Schwann cells.

MORPHOLOGIC DIAGNOSIS: Intervertebral disk: Disk prolapse with degeneration of the annulus fibrosus, neuroma formation, vertebral osteophytosis, and mild focal cord compression. **(3pt)**

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

WSC 2015-2016, Conference 9
CASE 4. Tissue from a giraffe.

(There is considerable slide variation in this particular case.)

MICROSCOPIC DESCRIPTION: Joint capsule with joint space and flexor tendons: Expanding the fibrotic **(1pt.)** joint capsule, there is a focally extensive aggregate of large numbers of macrophages **(1pt.)** admixed with fewer neutrophils **(1pt.)**, lymphocytes **(1pt.)**, and rare plasma cells **(1pt.)**, dispersed on a background of loosely arranged fibroblasts **(1pt.)**, moderate amounts of mature collagen, and moderate amounts of cellular debris **(1pt.)**. The inflammatory infiltrate contains low numbers of multinucleated giant cell macrophages **(1pt.)** which range up to 60um in diameter and contain up to 30 nuclei. Multinucleated cells are most commonly seen in areas of hemorrhage **(1pt.)** and rare siderophages **(1pt.)** are present within the lesion. Inflammatory cells as previous described extend into the surrounding fibrous connective tissue in lamellations. **(1pt.)** Vessels within the joint capsule are often surrounded by moderate numbers of histiocytes and few lymphocytes. **(1pt.)** The synovial lining of the adjacent joint capsule is multifocally villous **(1pt.)**, with mild hyperplasia of synoviocytes and an infiltrate of low to moderate numbers of histiocytes, plasma cells and lymphocytes within the fibrous core of the synovial villi **(1pt.)**.

MORPHOLOGIC DIAGNOSIS: Joint space with tendon: Tenosynovitis, villous and nodular, histiocytic and neutrophilic, focally extensive, severe, with multinucleate giant cell macrophages and multifocal hemorrhage. **(3 pt.)**

NAME THE CONDITION: Pigmented villonodular synovitis. **(2pt.)**

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