Bone – Fracture

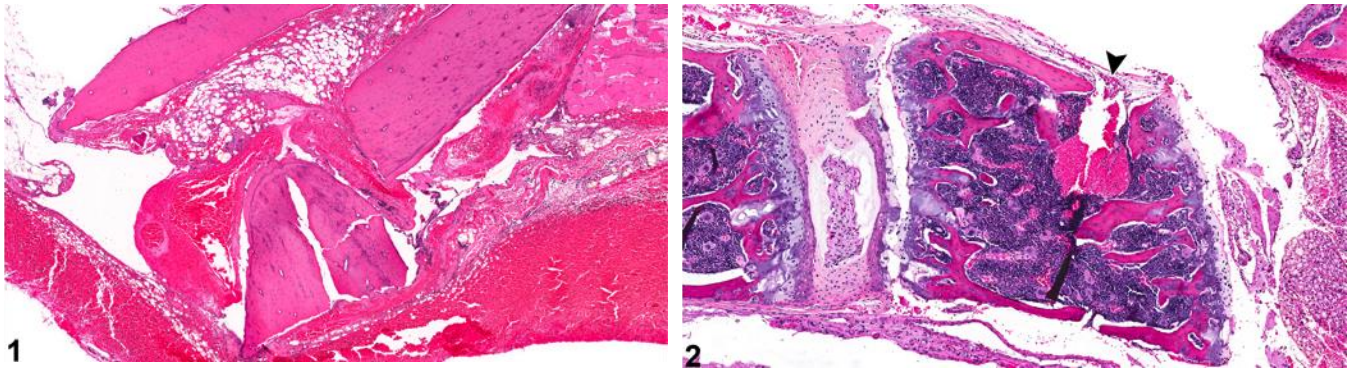


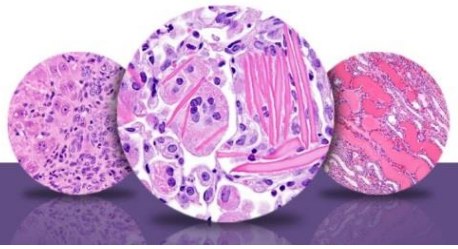
Figure Legend: Figure 1 Bone - Fracture in a female F344/N rat. A section of tibia illustrates a fracture of cortical bone with displacement of the distal tibia and associated hemorrhage and fibrin deposition. **Figure 2** Bone - Fracture in a male B6C3F1/N mouse from a chronic study. In his section of a vertebra, a focal cortical bone fracture (arrowhead) is associated with mild to moderate hemorrhage.

Comment: Bone fractures (Figure 1 and Figure 2) are characterized by discontinuity of cortical bone and/or disruption of medullary trabeculae (microfracture). They are often associated with variable hemorrhage, inflammation, and fibrosis, depending on the severity and chronicity of the lesion. In acute fractures large amounts of hemorrhage are common, and with chronicity increased numbers of inflammatory cells and fibrous tissue response are elicited, with eventual organized fibrosis, bony remodeling, and repair through callus formation.

Fractures may be secondary to severe inflammatory, neoplastic, or metabolic disease. Fractures have been also noted secondary to bone disease due to treatment with some compounds. For example, excessive vitamin A treatment leads to decreased bone formation and degenerative physeal lesions in rats, which result in decreased longitudinal bone growth.

Occasionally, sectioning artifacts can appear as fractures and must be differentiated from true fractures. Artifactual fractures, or pseudofractures, will lack the hemorrhage, fibrin deposition, fibrosis, and callus formation that might be seen with a true fracture.

Recommendation: Primary fractures should be diagnosed when present but need not be graded. When a fracture is secondary to another condition, such as neoplasia, inflammation, or metabolic disease, it should not be diagnosed but should be described in the pathology narrative as a component



Bone – Fracture

and indication of the severity of the primary lesion. Microfractures need not be diagnosed but should be discussed in the narrative as a component of the primary lesion with which they occur.

References:

Leininger JR, Riley MGI. 1990. Bones, joints, and synovia. In: Pathology of the Fischer Rat: Reference and Atlas (Boorman G, Eustis SL, Elwell MR, Montgomery CA, MacKenzie WF, eds). Academic Press, San Diego, 209-226.

Long PH, Leininger JR. 1999. Bones, joints, and synovia. In: Pathology of the Mouse (Maronpot R, Boorman G, Gaul BW, eds). Cache River Press, St Louis, 645-678.

Authors:

Mark J. Hoenerhoff, DVM, PhD, DACVP
Associate Professor
In Vivo Animal Core, Unit for Laboratory Animal Medicine
University of Michigan Medical School
Ann Arbor, MI

Amy Brix, DVM, PhD, DACVP
Senior Pathologist
Experimental Pathology Laboratories, Inc.
Research Triangle Park, NC