



Latin Comparative Pathology Group

The Latin Subdivision of the CL Davis Foundation

Diagnostic Exercise

LCPG Case #: 100 Month: July Year: 2018

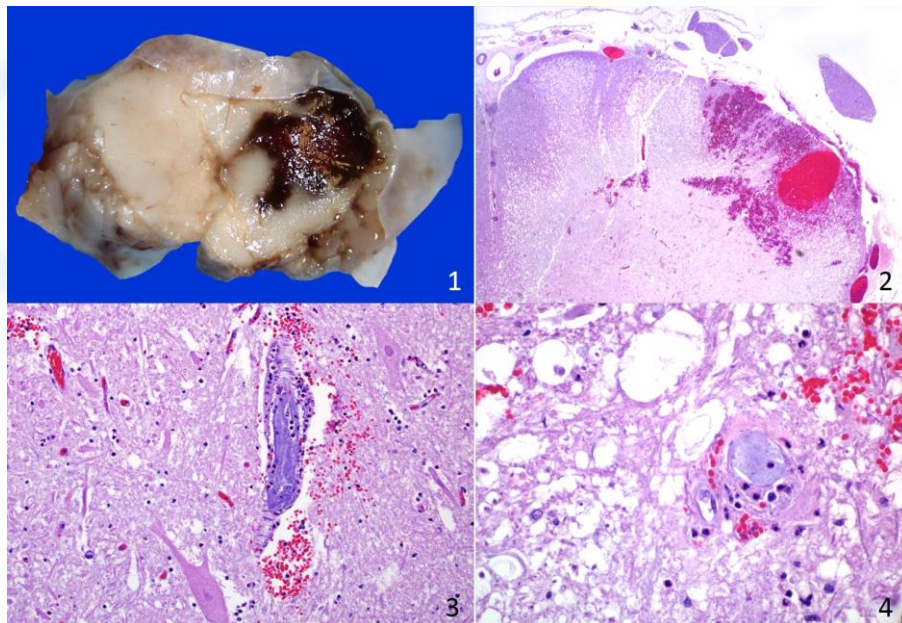
Answer sheet

Title: Fibrocartilagenous embolism in a pig.

Contributor: Francisco R Carvalho, MV, DSc, Dipl. ACVP. – California Animal Health and Food Safety Laboratory, San Bernardino branch. 105 W Central Ave, San Bernardino, CA 92408.

Clinical History: A 15-year-old male Potbelly pig had a history of loss of control of the back legs, not being able to empty the bladder, and constipation. Due to poor prognosis and no response to treatment, the pig was euthanized and submitted for necropsy.

Macroscopic Exam: The carcass was in good body condition. The pressure points of the skin of the hind limbs had focal areas of congestion and hemorrhages. The trachea contained small amounts of white stable foam. The lungs were diffusely red and wet. In the abdomen, there were approximately 500 ml of transparent fluid. The urinary bladder was markedly distended and had focal hemorrhages along the serosa. The cecum, colon and rectum were dilated with firm pelletized feces and the mucosa was congested with a reticular pattern. Other internal organs were unremarkable. The brain and spinal cord were removed and analyzed. Mild degeneration and protrusion of few intervertebral discs were identified in the lumbar segment.



Microscopic Findings: Representative images from a Potbelly pig. 1. Focally extensive area of hemorrhage located at the dorsolateral aspect of the lumbosacral spinal cord. 2. Spinal cord, lumbosacral area. Extensive hemorrhage of the white matter and severe axonal degeneration (H&E, 4X). 3. Spinal cord, lumbosacral area. One vessel is occluded by pale basophilic fibrillar to homogeneous material. There is degeneration of the adjacent neuropil and necrosis of neurons (H&E, 20X). 4. Spinal cord, lumbosacral area. In the white matter, multiple vessels are occluded by similar pale basophilic material. The adjacent white matter has markedly dilated axons and focal hemorrhages (H&E, 40X).

Spinal cord, lumbosacral area: In the white and gray matter, there were multifocal extensive hemorrhages and malacia. In the adjacent white matter, there was marked axonal swelling, with occasional digestion chambers. In the gray matter, there was vacuolation of the neuropil and areas with necrotic neurons, which were pink, angular and displayed a pyknotic nucleus. Focal infiltrates of neutrophils were identified in the lumen, wall and periphery of blood vessels. Multiple blood vessels of the white and gray matter were partially or totally occluded by pale basophilic amorphous to fibrillar material, interpreted as fibrocartilage.

Similar changes were also identified in multiple segments of the thoracic spinal cord.

Morphologic Diagnosis: Spinal cord: Myelomalacia, multifocal, severe, with extensive hemorrhages, neuronal necrosis, axonal degeneration, neutrophilic infiltrates and intravascular fibrocartilaginous emboli.

Name the disease: Fibrocartilaginous embolism (FCE).

Discussion: The cause of the clinical signs and of most of the gross findings was a focal area of myelomalacia with the presence of numerous fibrocartilaginous emboli (ischemic infarction). Fibrocartilaginous embolism (FCE) is a rare type of embolism (sudden blocking of a blood vessel) that occurs in the spinal cord. This condition is uncommon in pigs, but common in dogs and humans, frequently associated with exercise or vigorous activity. FCE occurs when fragments of tissues that are usually found within the vertebral discs of the spine gain access to the nearby vessels (veins and arteries) and block one or more spinal cord vessels. There is still controversy about this event, as the mechanism by which fragments of the nucleus pulposus enter the circulation is not clearly understood. Perhaps the most acceptable explanation is the prolapse of nucleus pulposus into the marrow space of the vertebra and its subsequent entry into the arteriolar system. Pigs will develop ambulatory problems because of the lesion and pain. The signs of FCE often develop after a minor or even unnoticed "triggering event", such as trauma. In this case, protrusion and degeneration of some intervertebral discs of the spine were noted during gross examination.

FCE has been rarely reported in pigs and it is most common in mature animals. Nevertheless, FCE has also been described in young weaner pigs. In addition to trauma and age, the risk factors associated with this condition are body conformation and weight, but genetic, performance, behavioral and possibly nutritional factors should also be considered in the equation. Although rare in pigs, FCE should be considered as a possible cause in cases of acute paralysis, particularly when no lesions are identified at necropsy.

References:

Benson JE, Schwartz KJ. Ischemic myelomalacia associated with fibrocartilaginous embolism in multiple finishing swine. J Vet Diagn Invest 1998; 10: 274-277.

Hayes MA, Creighton SR, Boysen BG, Holfeld N. Acute necrotizing myelopathy from nucleus pulposus embolism in dogs with intervertebral disc degeneration. J Am Vet Med Assoc 1978; 173: 289-295.

Robinson WF, Robinson NA. Cardiovascular system. In: Jubb, Kennedy and Palmer's Pathology of Domestic Animals; Maxie MG, editor. Vol 3, Sixth edition. Elsevier, St. Louis, MO. 2016: 1-101.

Tessaro SV, Doige CE, Rhodes CS. Posterior paralysis due to fibrocartilaginous embolism in two weaner pigs. Can J Comp Med 1983; 47: 124-126.

*The Diagnostic Exercises are an initiative of the Latin Comparative Pathology Group (LCPG), the Latin American subdivision of The Davis-Thompson Foundation. These exercises are contributed by members and non-members from any country of residence. Consider submitting an exercise! A final document containing this material with answers and a brief discussion will be posted on the CL Davis website (http://www.cldavis.org/diagnostic_exercises.html).

Editor-in-chief: Vinicius Carreira

Associate Editor for this Diagnostic Exercise: Francisco Carvalho