



Diagnostic Exercise

From The Davis-Thompson Foundation

Answer sheet



Case: **190**; Month: **June**; Year: **2022**

Title: *Enterococcal spondylitis in broilers*

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Clinical History:

Two male 40-day-old Cobb broilers from a commercial farm in Victoria were submitted for necropsy and diagnostic work up following euthanasia by cervical dislocation. The farm was culling 200 birds/shed (approximately 0.5% of birds) at the time. The submitting veterinarian reported that birds have normal mentation but have paresis or paralysis. The broilers were sitting back on their hocks with legs extended in front of them. Wing walking was also observed. Previous post-mortem examination of one bird one site by the submitting veterinarian showed a small bursa and femoral head necrosis.

Gross Findings:

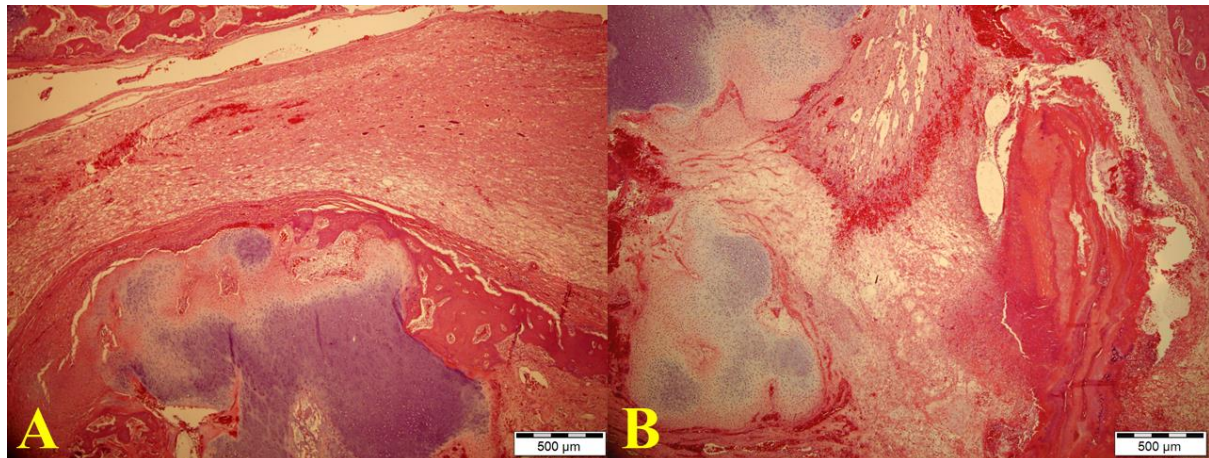
Both birds examined were well preserved and in good body condition. The free thoracic vertebra (FTV) was expanded and effaced by a yellow-tan multinodular mass that appeared to be inflammatory, be associated with a presumably pathologic fracture and focally severely compressed the spinal cord. The bisected T4-T5 vertebral sections of both subjects revealed focal red discoloration of the hypaxial muscles surrounding the cord compression focus. The left femoral head was diffusely markedly red on the articular surface and appeared enlarged compared to

the right in both birds. There was some soiling (brown, soft material) of the vent of one bird. The bursa and other organs including other vertebrae examined showed no noteworthy changes grossly.

Gross and Microscopic images:



Figure 1. (A) (B) Gross findings: vertebral abscess, pathologic fracture and compression of the spinal cord shown.



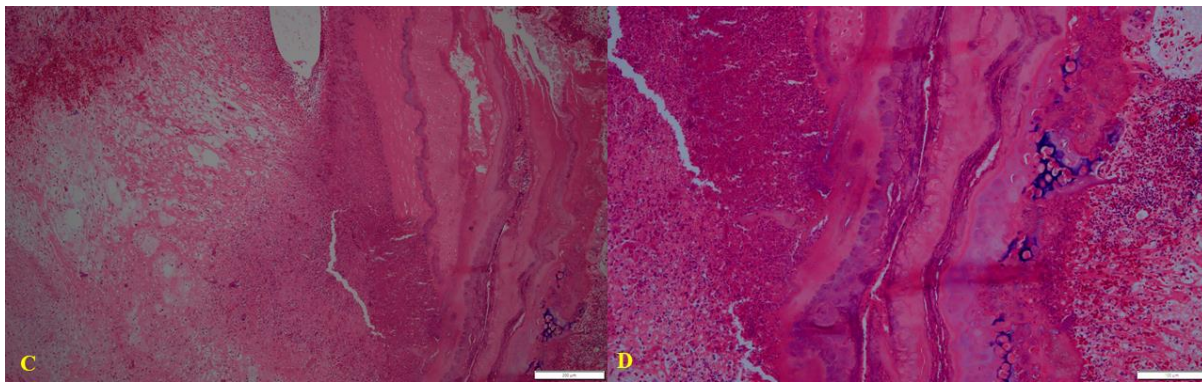


Figure 2. (A-D) T4-T5 vertebrae. Haematoxylin and eosin.

Microscopic Description:

Histologically, the femur, bursa and other organs apart from the FTV showed no changes. In both birds, covering over 70% of the sagittal plane examined, the architecture of the vertebral bodies of T4/T5 was largely obliterated and replaced by extensive multinodular callus formation. The spinal cord was severely compressed at this level by the callus. There was mild to moderate Wallerian degeneration characterized by vacuolation of the adjacent white matter, with spheroids, degenerate macrophages or axonal debris in some vacuoles. Within the vertebra, there was extensive necrosis, oedema, fibrin deposition, haemorrhage, and moderate infiltration by heterophils, histiocytes, lymphocytes and plasma cells. Multifocally within these areas of necrosis and remodelling there were large numbers of small monomorphic bacterial aggregates (mainly cocci). On Gram-stained sections, these were shown to be gram positive cocci.

Morphologic Diagnosis: Spondylitis, severe, heterophilic, lymphoplasmacytic, haemorrhagic, necrotizing with extensive remodelling, pathologic fracture, callus formation and focal spinal cord compression; T4/T5 vertebrae; chicken.

Etiologic diagnosis: Bacterial spondylitis.

Aetiology: *Enterococcus cecorum*.

Colloquial Name of the Condition: Kinky back.

Discussion:

In this case, aerobic culture (vertebral abscess swabs) yielded a lightly contaminated growth with predominance of *Enterococcus cecorum*. *E. cecorum* is a gram-positive enteric commensal of poultry. Strains of *E. cecorum* causing outbreaks have been

reported worldwide (1,6,7,8) and have significantly smaller genomes than commensal *E. cecorum*. Colleagues may refer to the recommended literature for a more detailed discussion on the pathogenic strains of this bacterium, which is beyond the scope of this exercise (2,3,4,5). Pathogenic *E. cecorum* can also cause disease in Pekin ducklings and pigeons. The posture of the broilers (sitting back on their hocks) is characteristic, although not pathognomonic. Wing walking is used for locomotion, and this also limits their access to food. A feature of this condition that we find interesting is the characteristic lesion localization at the FTV. FTV has greater weight-bearing articulations compared to the notarium and the synsacrum, potentially predisposing it to infection with pathogenic *E. cecorum*.

Nomenclature:

Also referred to as “kinky back” (6,7,9), spondylolisthesis (Ancient and Modern Greek: Spondylo- (noun, genitive): of the vertebra; and olisthesis (noun, nominative): the action of sliding) is caused by subluxation of fourth thoracic vertebra (T4). Ventral displacement of the cranial end of T4 also results in compression of spinal cord via narrowing of the vertebral canal (dorsal projection of its posterior extremity). Aetiology is primarily genetic, but occurrence is influenced by increased growth rate.

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