



Diagnostic Exercise

From The Davis-Thompson Foundation*

Case #: 82 Month: July Year: 2017

Answer Sheet

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Diagnosis: Bovine Tuberculosis

Etiology: *Mycobacterium bovis*

Differential diagnoses for granulomatous pneumonia in equine: *Nocardia* sp., *Rhodococcus equi*.

Microscopic findings: The lungs had multifocal to coalescing granulomatous inflammation composed of epithelioid macrophages, lymphocytes and many Langhans giant cells with mild fibrosis. Areas of alveolar edema were also present. The tracheobronchial lymph nodes had multifocal aggregates of similar inflammatory cells with moderate fibrosis and necrosis. The nodules on the surface of the diaphragm, in the liver, spleen and intestine and within the omentum were composed of such inflammatory cell aggregates and fibrosis as well, consistent with chronic granulomatous inflammation.

The lesions in all organs were associated with a high number of acid-fast bacilli both within the cytoplasm of Langhans multinucleate giant cells and epithelioid macrophages and free in the caseous debris.

Morphologic Diagnosis: Lungs: Severe, multifocal-to-coalescing, chronic, granulomatous pneumonia with large number of intralesional acid-fast bacilli. Tracheobronchial lymph node: Severe, multifocal-to-coalescing, granulomatous lymphadenitis with large number of intralesional acid-fast bacilli.

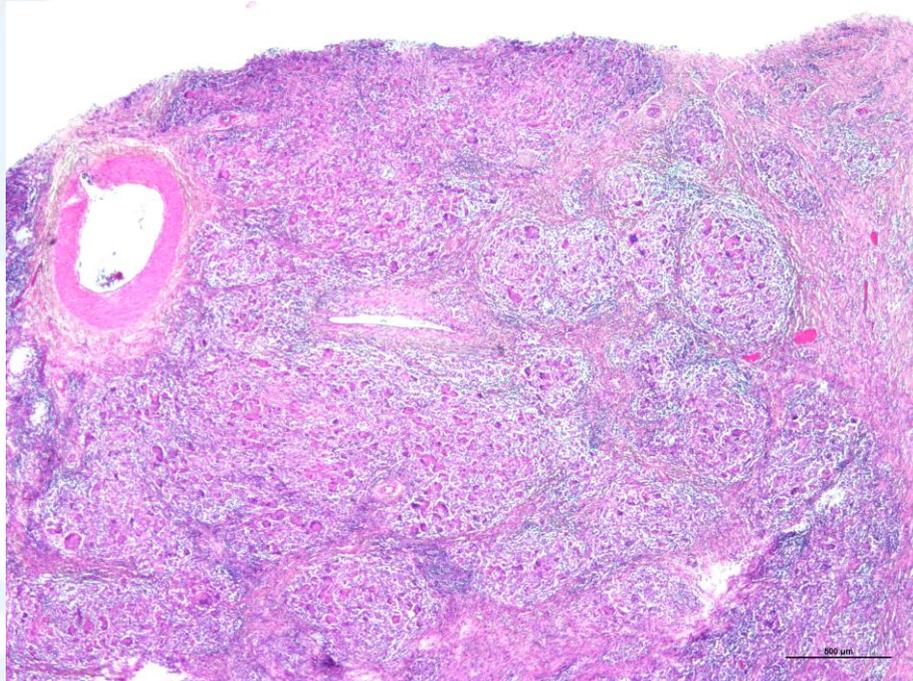


Figure 4. Donkey, tracheobronchial lymph node: Multifocal to coalescing granulomas with multinucleated Langhans giant cells and moderate fibrosis at low magnification (Hematoxylin & eosin [H&E], 2x).

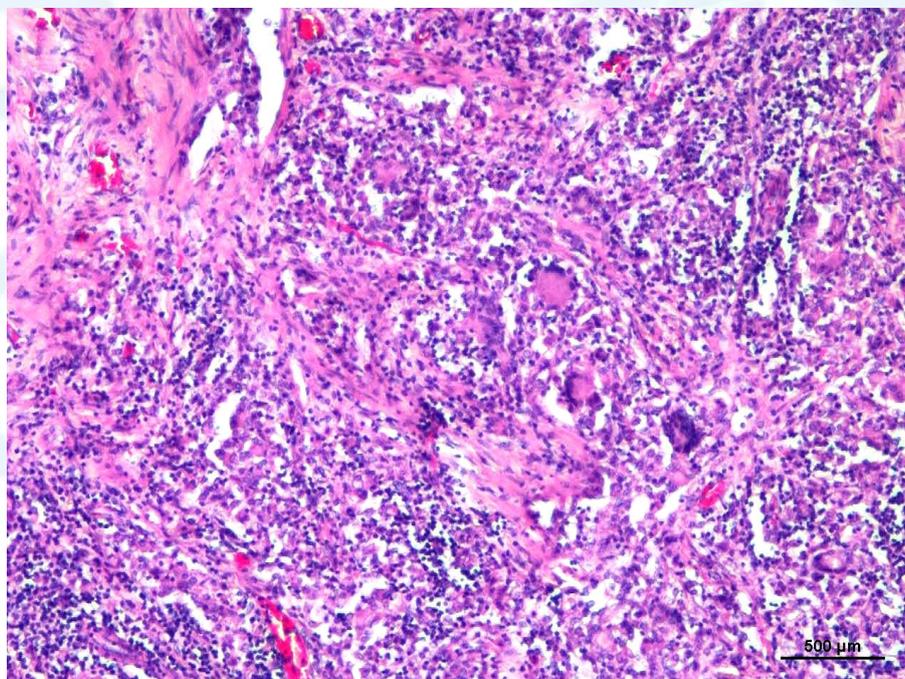


Figure 5. Donkey, tracheobronchial lymph node: Lung: Epithelioid macrophages, lymphocytes and multinucleated Langhans giant cells with mild fibrosis at intermediate magnification (H&E, 10x).

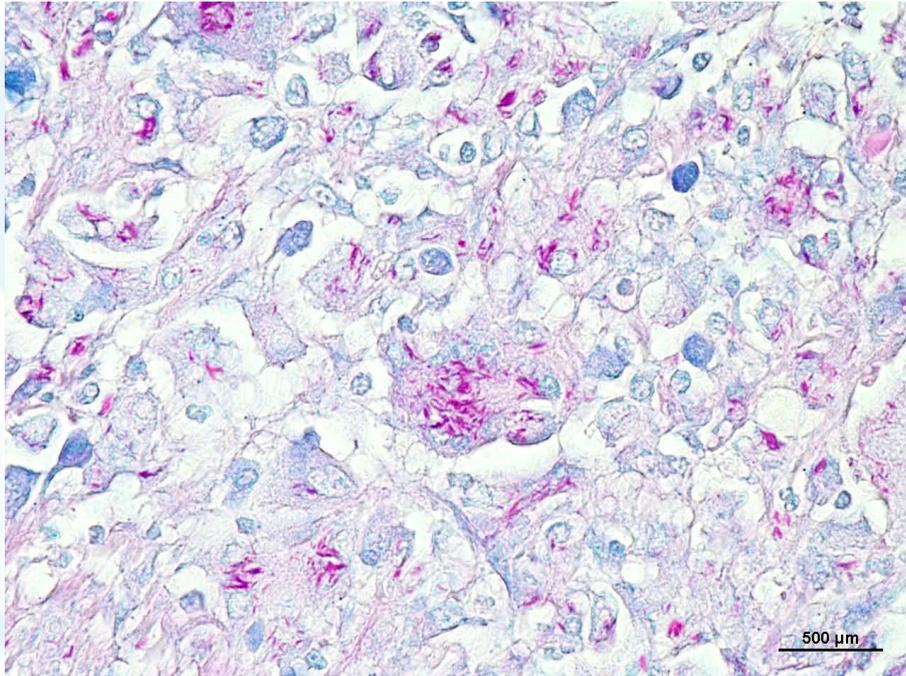


Figure 6. Donkey, tracheobronchial lymph node: Multinucleated Langhans giant cells and epithelioid macrophages with a large number of intracellular acid-fast bacilli (ZN, 40x).

Diagnostic techniques to confirm your diagnosis: IS6110-targeted PCR on tissue samples to detect bacteria of the *Mycobacterium tuberculosis* Complex. Bacterial culture on tissue samples using egg-yolk based media such as Stonebrink and Lowenstein-Jensen.

Discussion: Horses are considered highly resistant to mycobacterial infections. When it occurs, the infection is generally transmitted by cattle. The most frequent route of transmission to horses is by ingestion. Typically, preliminary lesions occur in the mesenteric lymph nodes and, once the infection is established, tends to spread to other organs in the abdomen and involving other anatomical systems. Some authors reported granulomatous lesions characterized by caseous necrosis of most of the lymph nodes of thorax and abdomen, particularly in the lungs. In case of advanced stages of disease, hematogenous dissemination of mycobacteria determines the appearance of miliary or nodular tubercles in spleen, liver, pancreas and kidney.

References:

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*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).

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