

2015-12-3

Appendix and liver, rabbit

SHAHID KHAN
(Avian Pathology Lab.)

Signalment: Juvenile (< 1yr), male, European brown hare
(*Lepus europaeus*)

History: Found dead in a forest in January

Gross Pathology: The hare was in a good body condition. The spleen was moderately enlarged, swollen, dark (weight 3.4 g). The distal part of the caecum (vermiform appendix) was distended; the wall was swollen and hemorrhagic. On cross section, multiple white foci could be seen in the wall. Similar foci were seen in intestinal lymph nodes. The lungs had large hemorrhages. No gross lesions were observed in the liver.

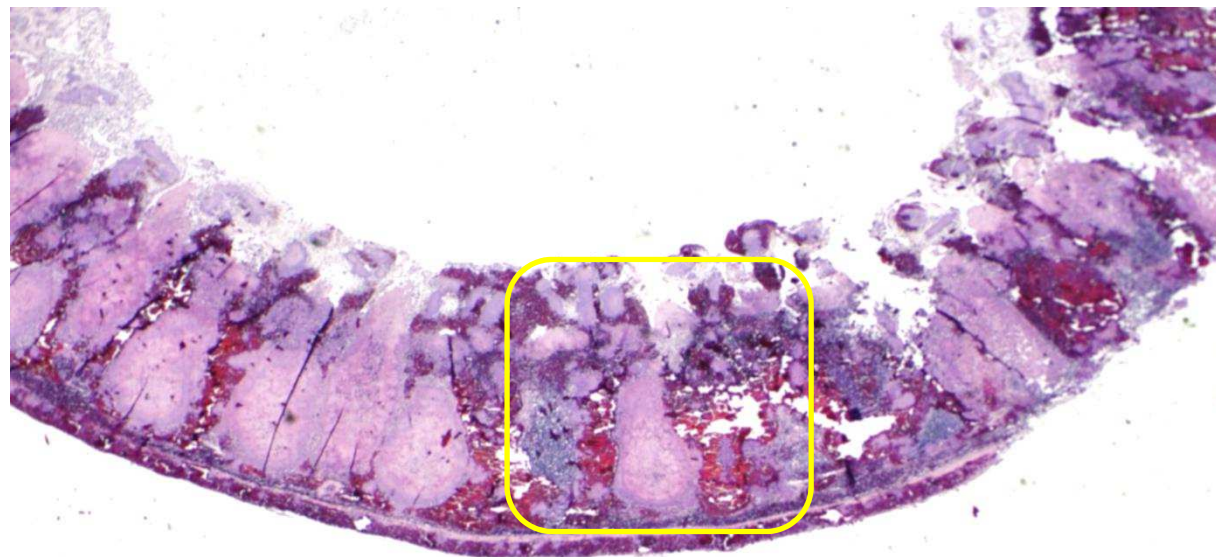
Laboratory Results:

Bacteriology: aerobic culture on blood agar: *Yersinia pseudotuberculosis* in lung, liver, spleen, intestinal lymph node and caecum.

Histopathologic Description:

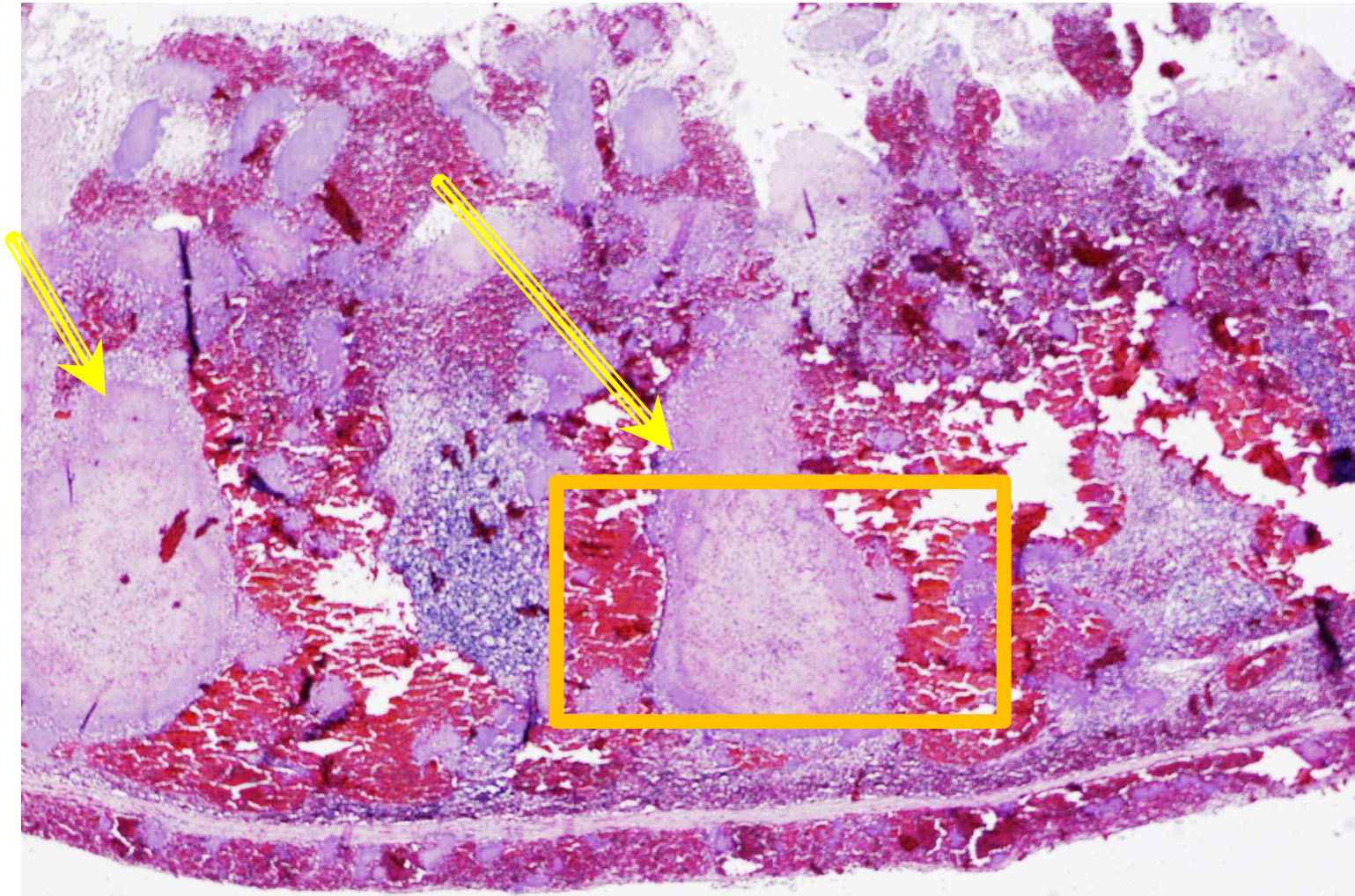
Caecum: The mucosa and the normal lymphatic tissue are mostly replaced by large hemorrhages and large focal areas of necrotic debris, mixed inflammatory cells and colonies of rod bacteria. The lesions extend to the submucosa, muscular layer and serosa.

Appendix, hare. Sub gross view.

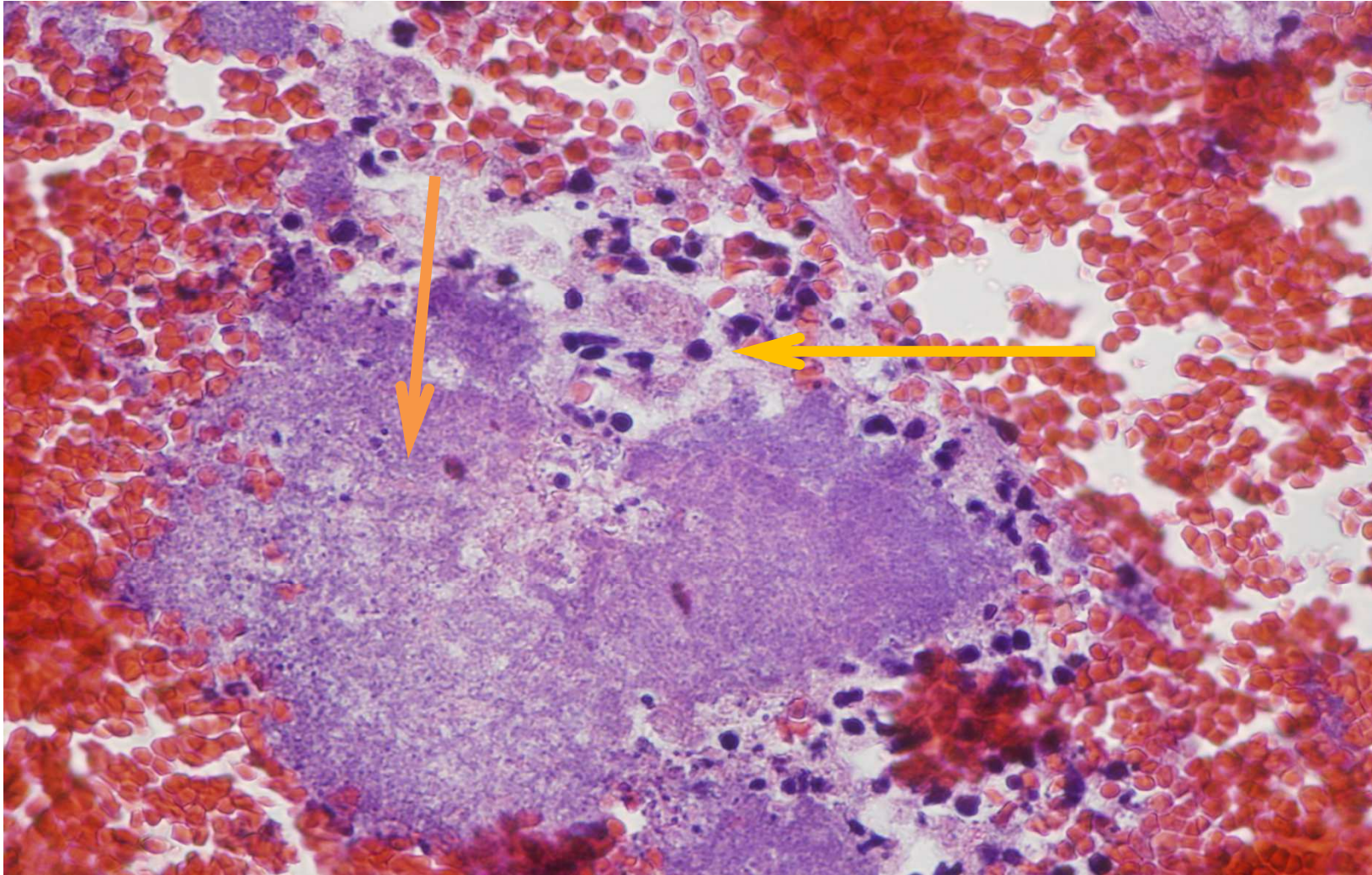


Appendix:

There is transmural necrosis of the colonic wall which focuses on lymphoid tissue of the cecal tonsil. There is marked hemorrhage of the intervening lamina propria. Scattered throughout the tissue but most visible in the overlying autolytic mucosa.

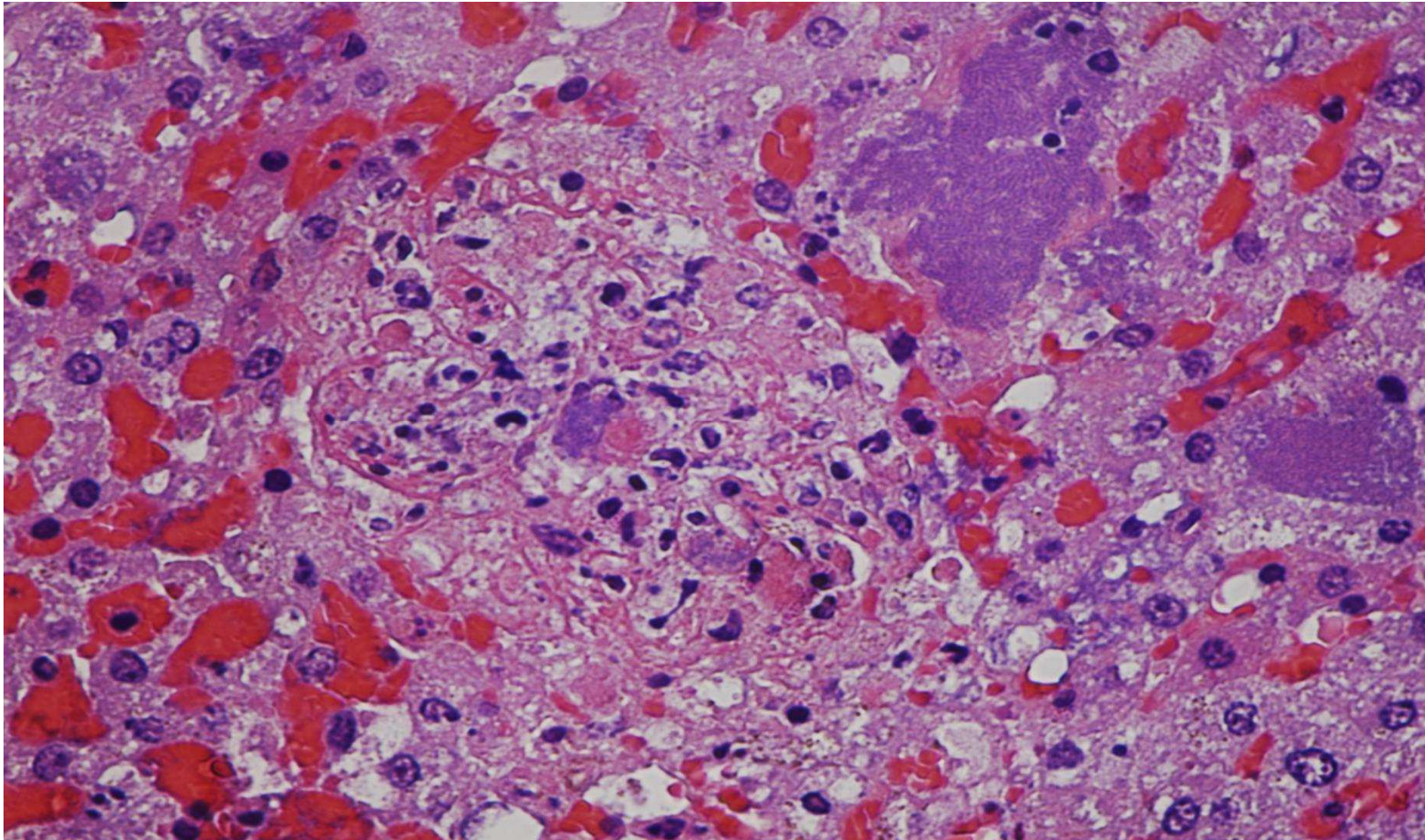


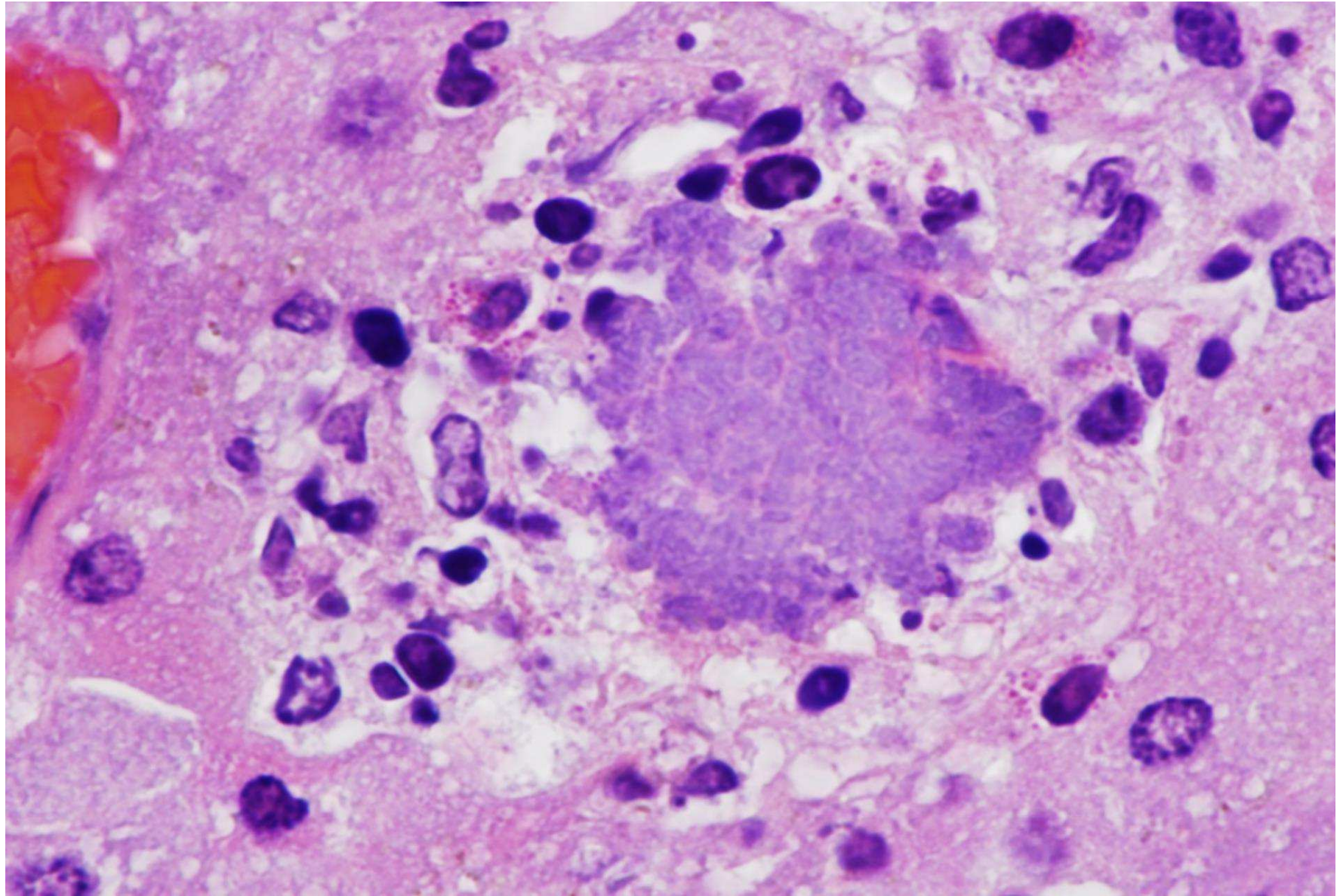
Appendiceal serosa and adjacent mesentery:
Large colonies of small bacilli are present both within vessels and in the surrounding tissue.

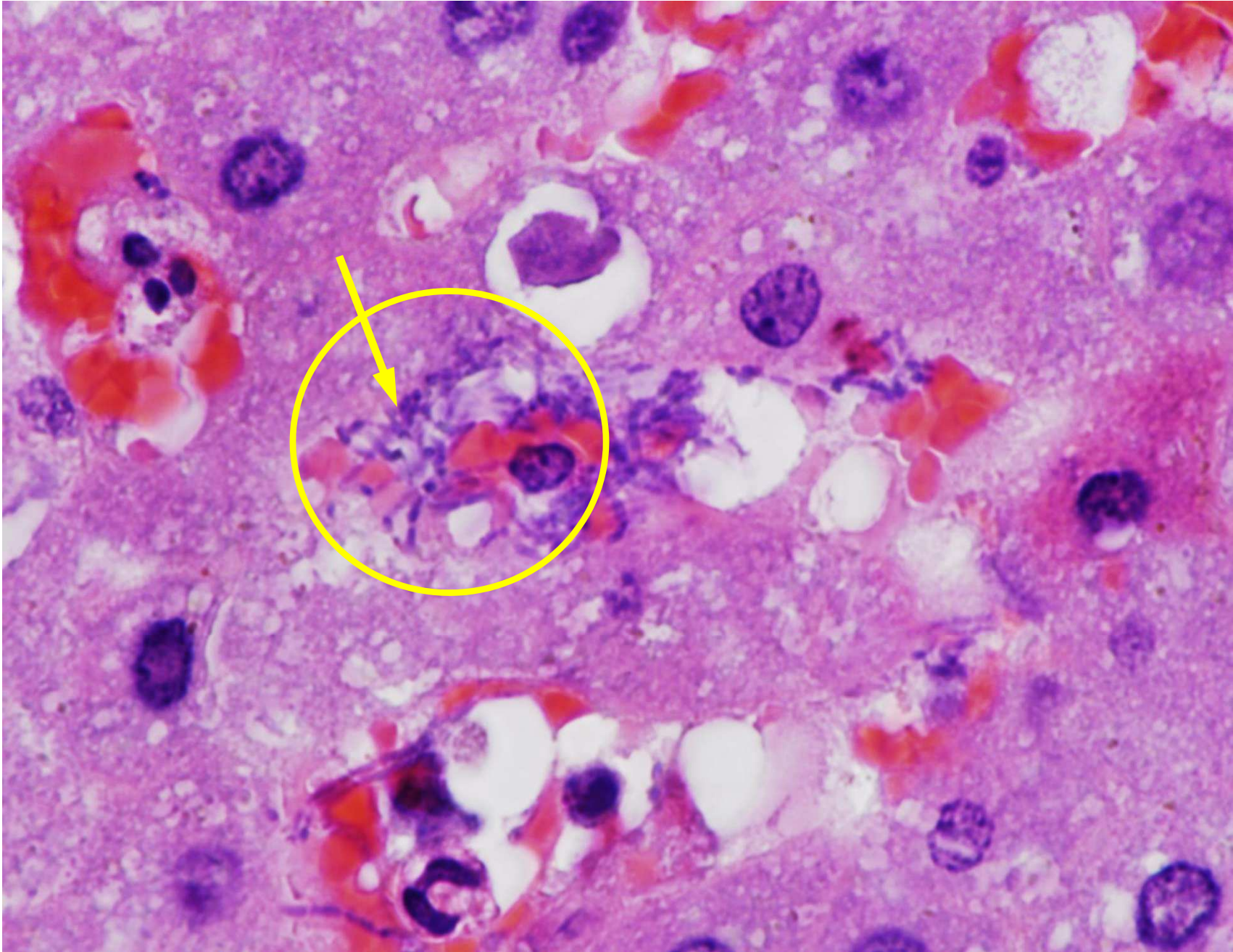


Liver:

There are multiple, small, often coalescent necrotic foci with colonies of rod bacteria in the middle. Bacterial emboli are also present widely in hepatic sinuses.







Contributor's Morphologic Diagnosis:

Severe, subacute, bacterial typhlitis, hepatitis and splenitis consistent with *Yersinia pseudotuberculosis* septicemia.

JPC Diagnosis:

Appendix: Appendicitis, necrotizing, transmural and hemorrhagic, diffuse, severe with marked lymphoid necrosis, vasculitis and numerous large colonies of gram negative bacilli.

Liver: Hepatitis, necrotizing, multifocal to coalescing, severe with numerous large colonies of gram negative bacilli.

Contributor's Comment: *Y. pseudotuberculosis* is a gram-negative rod or cocco-bacillus closely related to *Y. pestis*, the etiological agent of sylvatic plague. Wild hares (*Lepus* spp.) are known to be susceptible to *Y. pseudotuberculosis* infection. Birds and rodents are considered as reservoirs of the bacterium. Infection is acquired orally by fecally contaminated food or water and bacteria invade the intestinal epithelium in the jejunum or ileum. Bacteria can infiltrate the liver and spleen and less commonly also other organs (lungs, kidneys, bone marrow). Infection can be acute, subacute or chronic. The disease typically occurs in nature in the cold season. In humans, *Y. pseudotuberculosis* has caused outbreaks of food poisoning related to contaminated vegetables.

Conference Comment: Enteropathogenic *Yersinia* species bacteria are primarily thought to be contracted via oral infection which is followed by colonization of intestinal lymphoid tissue/Peyer's patches; entry is facilitated through the membrane protein invasin, attaching to $\beta 1$ integrins expressed on M cells. Bacteria can then spread to regional lymph nodes and to the liver and spleen. Virulence factors include a type III secretion system which plays a role in delivering the Yersinia outer proteins (YOPS) to target cells such as macrophages and neutrophils, which interferes with signaling pathways, phagocytosis and the inflammatory response.

The bacteria also produce other proteins such as YadA and Ail that protect against phagocytosis and the host immune response. *Yersinia* largely resides extracellularly as small colonies in suppurative foci in the lamina propria of the intestine as well as in lymph nodes, but may also be found intracellularly.