



Latin Comparative Pathology Group

The Latin Subdivision of the CL Davis Foundation

Diagnostic Exercise



Answer Sheet

Case #: 53 Month: February Year: 2015

Contributor: Karina C. Fresneda, DVM. Pathology resident, California Animal Health and Food Safety Laboratory, UC Davis, San Bernardino, California, USA.

Clinical History: Adult hen with a history of sudden death.

Gross and/or microscopic image:



Follow-up questions: Morphologic diagnos(e)s, name the condition, and proposed pathogenesis.

Answers

Morphologic diagnoses:

- 1-Liver, rupture with severe hemorrhage, multifocal to coalescing
- 2-Coelomic hemorrhage (hemocoelom/hemoperitoneum)
- 3-Liver, fatty change, diffuse

Name the condition: Fatty liver hemorrhagic syndrome (FLHS)

Potential pathogenesis/contributing factors:

- 1-Consumption of a high energy diet
- 2-Deficiency of antioxidant/lipotropic agents such as vitamin E, vitamin B12, biotin, methionine or choline combined
- 3-Lack of physical activity
- 4-Aflatoxin in laying hen diets

Microscopic findings: Variably-sized, single or multiple, round, well-defined, smoothly contoured vacuoles that displace the nucleus with hepatocellular dissociation, multifocal foci of hemorrhage and fibrin deposition (Figures 1 and 2). Disorganization and disruption of reticular fibers (reticulolysis) was evident on Gomori's stained sections (Figure 3).

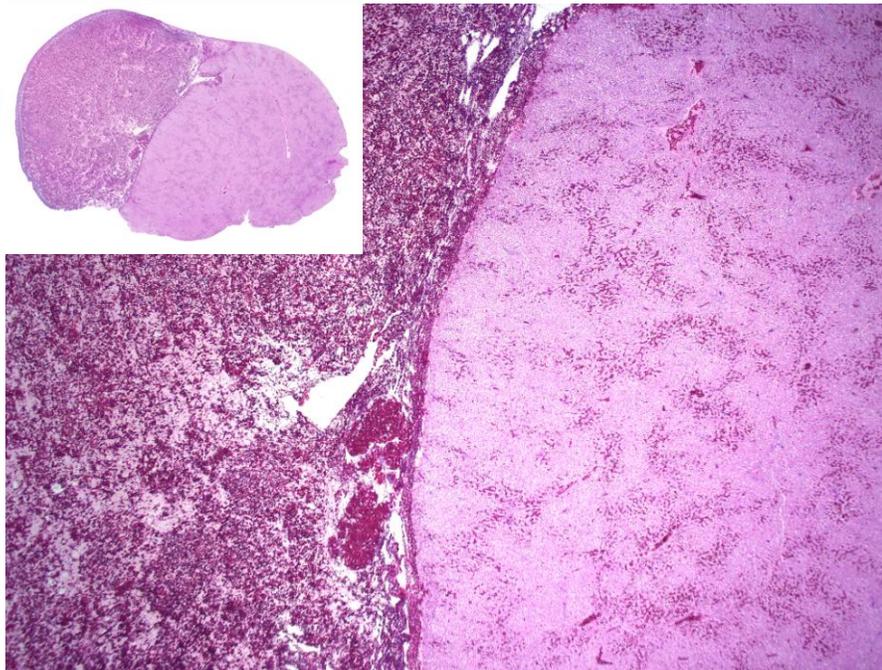


Fig. 1. Focally extensive, delimited hemorrhage. H&E. 10X (inset 2X).

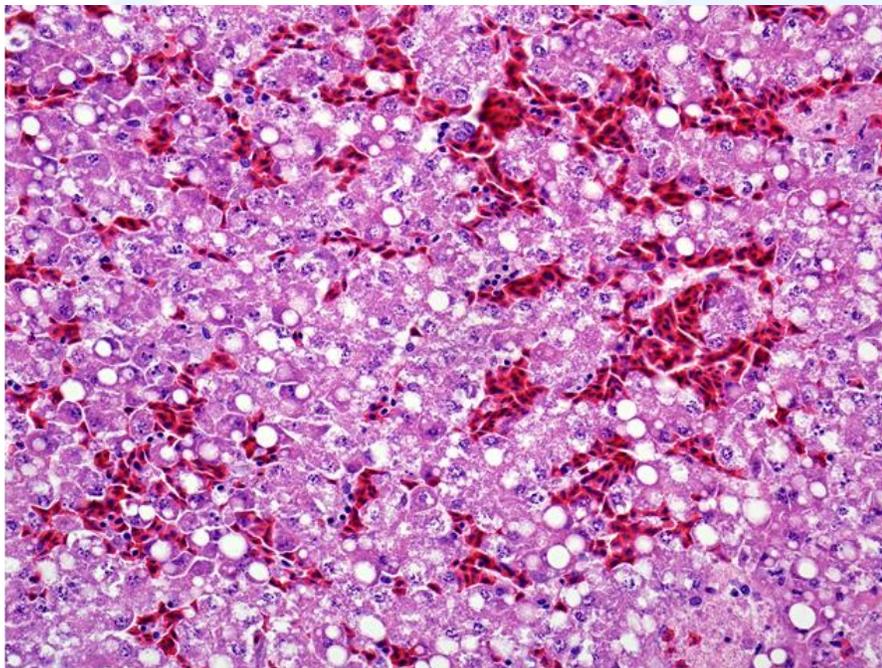


Fig.2. Diffuse moderate vacuolization of hepatocytes with multiple random foci of hemorrhage and disorganization of hepatic cords.

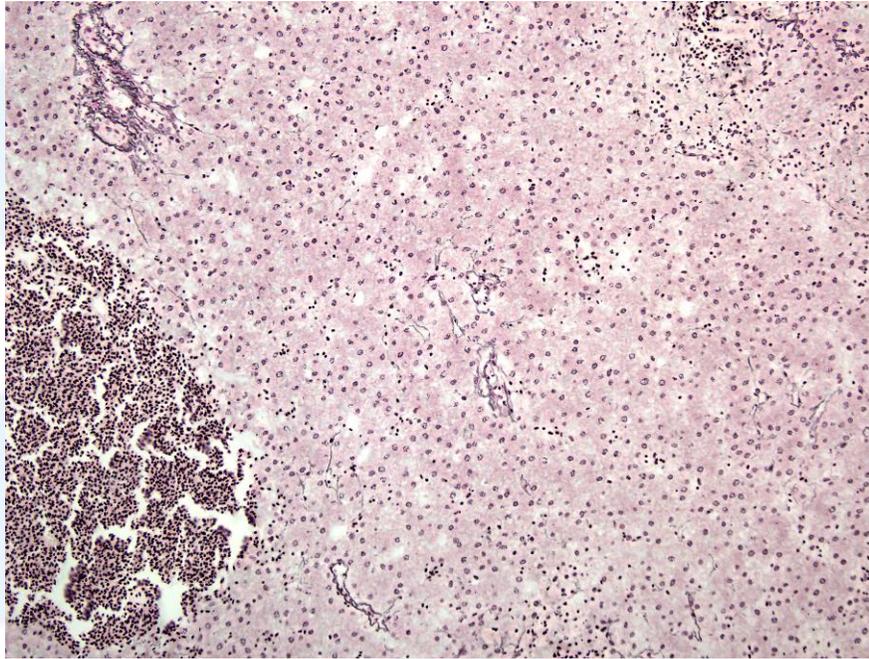


Fig. 3. Disruption of the reticulin framework of the liver (reticulolysis). Gomori Methenamine-Silver Nitrate Stain; 20x.

Comments: FLHS is a sporadic disease with worldwide distribution that occurs primarily in caged layers. Outbreaks are most common in high-producing flocks during hot weather. The cause of this syndrome is still not completely understood although it is believed that nutritional, genetic, hormonal and environmental predisposing factors are involved. Obesity or a very good body condition seems to be almost always involved. The suggested pathogenesis involves disruption of hepatic cords associated with vacuolar changes in the hepatocytes. This is supposed to induce the hemorrhage typically observed in this syndrome. It has also been proposed that the excessive lipid metabolism taking place in overfed laying hens may facilitate oxygen radical-mediated destruction of the reticulin fibers in the liver.

Recommended Literature

Trott, K.A., Giannitti F., Rimoldi, G., Hill, A., Woods, L., Barr, B., Anderson, M. and Mete, A. Fatty Liver Hemorrhagic syndrome in the Backyard Chicken: A retrospective Histopathologic Case Series.

Veterinary Pathology 2014. Vol. 51 (4) 787-795.

Randall, CH., Reece, R. Color Atlas of Avian Histopathology. Mosby Wolfe. 1996.

American Association of Avian Pathologists. Avian Histopathology. Third Edition.2008.

Shivaprasad, H. Pathology of Birds - An Overview. California Animal Health and Food Safety Laboratory System, Fresno Branch. School of Veterinary Medicine, University of California, Davis.

Saif YM, Barnes HJ. Diseases of Poultry. 12th ed. Ames, Blackwell. 2008.

American Association of Avian Pathologists. Avian Disease Manual. 7th edition. 2013.

Please send your comments/questions to the whole LCPG list by hitting "reply to all". A final document containing this material with answers and a brief discussion will be posted on the C. L. Davis website by the end of the current month (http://www.cldavis.org/lcpg_english.html).