

Pathology of Older Laying Hens

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Summary

The pathology in various organ systems of 2274 laying hens between 2 and 4 years of age was identified at necropsy as part of a study on chemoprevention of ovarian cancer. Lesions of the reproductive tract, which included developmental, inflammatory, and neoplastic disorders were most common. Lesions in the musculoskeletal and urinary systems were less common than those in the reproductive system, but still frequently occurred. Systems in which occasional lesions were seen included the integumentary, special senses, digestive, cardiovascular, and hemopoietic systems. Lesions were rarely identified in either the respiratory or endocrine systems. The nervous system was not evaluated.

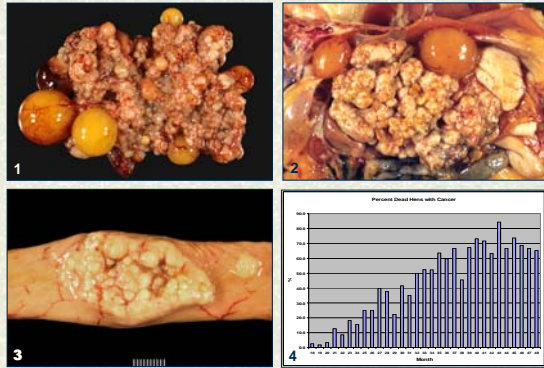
Introduction

Commercial laying hens are typically marketed after their second lay cycle at around 2 years of age. Other than an increased occurrence of ovarian and oviductal tumors in older hens, there is little information on diseases that affect laying chickens older than 2 years. The objective of this study was to document the pathology in hens between 2 and 4 years of age as part of a study on ovarian cancer chemoprevention. Examples of some lesions that were either common or unusual are described.

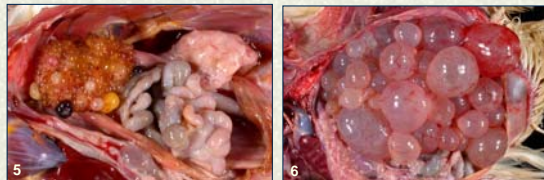
Methods

Two-year-old commercial laying hens (n = 2274) were evaluated for 2 years in an ovarian cancer chemoprevention trial. No differences in the occurrence of reproductive tract tumors according to treatment have been identified. Effect of treatments on other diseases has not been analyzed. Hens were maintained in cages under commercial conditions and fed a commercial layer ration. Mortality was picked up twice daily. Dead birds were placed into an ice-water bath for approx. 2 hours to lower core body temperature to <10° C, refrigerated, and necropsied weekly. Mortality between 2 and 4 years of age were euthanized and necropsied.

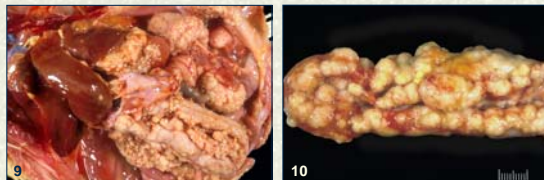
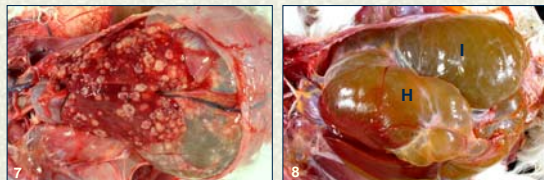
Reproductive System



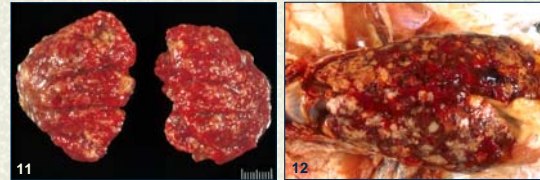
Adenocarcinomas of the ovary (Figs. 1,2) and/or oviduct (Fig. 3) were a major cause of mortality. 51.3% of hens that died and 40.8% of hens that survived to 4 years of age were affected. Occurrence of lesions increased with age (Fig. 4). It was common for hens to have lesions in both the ovary and oviduct.



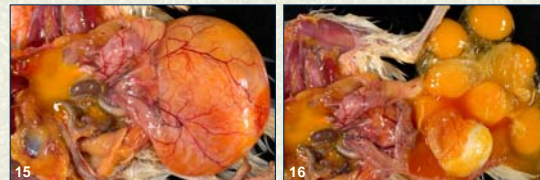
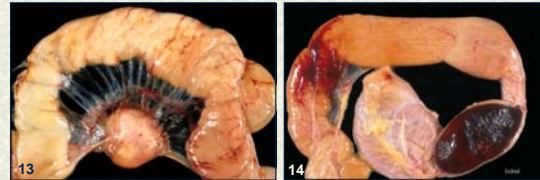
Ovarian tumors were generally solid and lobular but, occasionally they occurred as cystadenocarcinomas composed of small (Fig. 5) or large (Fig. 6) cysts. The hen in Figure 5 also has an oviductal tumor and involvement of the intestines.



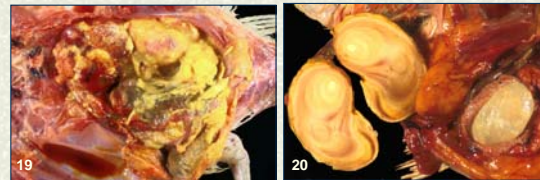
Marked ascites typically occurred in hens with advanced adenocarcinomas (Fig. 7). This hen also had extensive liver metastases. If the intestinal [I] peritoneal cavity communicated with any of the hepatic [H] cavities, they also filled with ascitic fluid (Fig. 8). Generalized tumor growth was common in affected hens (Fig. 9). The duodenal loop and pancreas were most frequently involved (Fig. 10).



Metastasis of reproductive tract tumors to the lungs (Fig. 11) and liver (Fig. 12) occurred in about 20% of affected hens. Other organs were less frequently affected except indirectly when tumors on the serosa invaded the underlying organ.

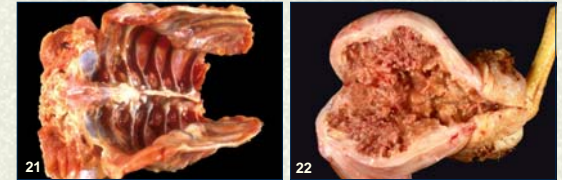


Other reproductive tract pathology included: leiomyoma in mesosalpinx (Fig. 13), oviductal hemorrhage (Fig. 14), oviductal obstruction (egg-bound, but tumors also caused obstruction) (Figs. 15, 16), and oviduct torsion (Figs. 17, 18). In this hen, the oviduct is massively distended with yolk and albumin, vessels are not occluded, and there is a 90° counter-clockwise rotation of the mesosalpinx (arrow).



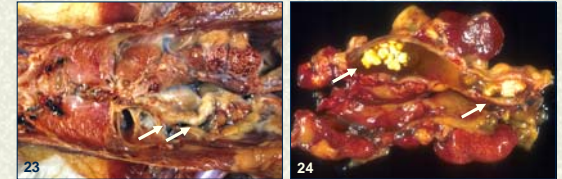
Salpingitis, often accompanied by peritonitis and/or oophoritis, was the most frequently identified inflammatory disorder of the reproductive tract (Fig. 19). Typically the left oviduct was affected, but salpingitis in the vestigial right oviduct was not uncommon. Infrequently lesions occurred in both oviducts (Fig. 20).

Musculoskeletal System



Osteoporosis affected most of the hens but was not considered to be significant unless there was marked folding of the ribs as seen in this bird (Fig. 21) and/or fractures of the leg(s) or spine. Osteosarcoma (Fig. 22) was identified in 1 hen.

Urinary System

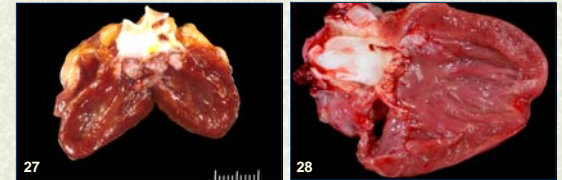


Visceral gout due to urolithiasis was a frequent cause of mortality. Note calculi in dilated ureters (arrows) and urate deposits in kidneys and lungs. Other lesions in these birds were urates filling the pericardial sac and deposits in serous membranes. Joints were rarely involved.

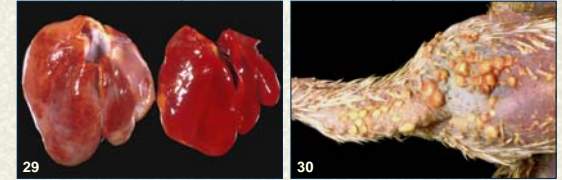
Other Systems



Gastrointestinal. 19 hens that died had an intussusception of the proventriculus.



Cardiovascular. Endocardiosis (Fig. 27) was common, especially in hens with adenocarcinoma, but vegetative valvular endocarditis (Fig. 28) was infrequent.



Liver. Hepatitis vs. Normal.

Skin. Epidermal cysts.