



Intestinal Metastasis of Ovarian Adenocarcinoma in a Native Chicken (*Gallus domesticus*)

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ABSTRACT

An aged dead adult native hen was referred for Necropsy. Grossly, pedunculated, firm, greyish-white fleshy growths were found attached to the serosal surface of ovary together with spread over the whole of intestine serosa. Microscopically, the ovarian growths consisted of a tubular pattern confirmed as adenocarcinoma with metastasis on the intestines.

Key words: Intestine, metastasis, ovarian adenocarcinoma and pathological findings

INTRODUCTION

Generally, knowledge on the occurrence of naturally occurring neoplasms among avian species is sparse. Also, reportages on non-viral tumors are very limited in commercial chicken and turkeys due to their short life span (Kumar et al., 2004). Reports on the incidence of ovarian tumors in birds have come from three main sources: descriptions of field cases submitted to diagnostic laboratories, reports of unusual flock problems and slaughterhouse condemnation statistics (Fredrickson, 1987). An evaluation of nodular lesions at slaughter in poultry revealed that 90% of these nodules were tumors and 70% of them were adenocarcinomas, probably derived from the reproductive tract (Reece, 1997). The cell of origin of ovarian adenocarcinoma in poultry is unknown; however, it is speculated that they arise from the germinal epithelium (Reece, 1997). Although ovarian cancer is a rare occurrence in most animals, the domestic hen has been shown to spontaneously develop the disease with an age-related incidence (Johnson and Giles, 2006) and adenocarcinomas with a high degree of morphologic variability are the most common ovarian tumors in hens (Fredrickson, 1987). Although other animal models like bovine species and rodents are used to study ovarian cancers in humans, laying hens are considered as an appropriate animal model, because of the availability and more importantly spontaneous development of ovarian cancers (Barua et al., 2009).

In a study performed by Alfonso et al., 2005, metastatic adenocarcinomas were identified histologically in the lungs of 18.4% of laying hens aged 4 years. These researchers concluded that the lungs are

often involved with metastatic tumors, primarily from the reproductive tract.

Intestinal carcinoma is unusual in the chicken (Campbell, 1969; Fredrickson and Helmboldt, 1991). Metastatic abdominal adenocarcinomas may originate from either the ovary or the oviduct, and their differentiation from oviductal and ovarian carcinoma can be difficult. Both oviductal and ovarian tumors can implant widely throughout the abdominal cavity (Fredrickson, 1987). Malignant cells may shed into abdominal cavity and implant on the lining of the abdominal cavity and grow on the surface of the abdominal organs. The transcoelomic spread of ovarian adenocarcinoma in avian species was reported infrequently (Kumar et al., 2004). The present report, describes a case of ovarian adenocarcinoma and its metastasis to the whole length of intestines in a native hen.

Case History

Total mortality rate reported by the owner was 4 birds out of 30 native chickens with the history of respiratory signs and concomitant drop in egg production. Chickens were kept in a free range and fed with home leftovers and were not vaccinated. A detailed postmortem examination was conducted and the gross findings were recorded. All dead birds had non pathogonomonic respiratory lesions including tracheal hyperemia with mucosal to purulent discharges. Among them, an adult native hen about 3-4 years of age had tumoral lesions which were studied microscopically.

MATERIALS AND METHODS

Tissue samples from ovaries, oviducts and intestines were collected in 10% neutral buffered formalin and embedded in paraffin. Sections were made at five μm thickness and stained by hematoxylin and eosin and studied under light microscope.

RESULTS

On necropsy, the pedunculated, firm, greyish-white fleshy growths were found attached to the serosal surface of the ovary (Fig 1). The walls of the whole intestine also had nodules with variable sizes on the serosal surface (Fig 2). No gross mass was seen in the oviduct.



Figure 1. Ovarian carcinoma in the hen. Gross appearance is characterized by the pedunculated, firm, greyish-white growths. Degenerative, flaccid and hemorrhagic follicles are also seen.



Figure 2. Metastatic nodules of ovarian carcinoma were found attached to the serosal surface of whole of intestines.

On histopathological examination of the tissues, the ovarian growth consisted of a tubular pattern lined by a single layer of cuboidal eosinophilic epithelial cells with round nuclei. Stromal tissue was scanty (Fig 3). Very few mitotic figures were observed. The intestinal nodules on the serosal layer were composed of a tubulo-acinar arrangement of low columnar epithelial cells similar to those observed in the ovarian tissue. No evidence of neoplasia was seen in oviduct.

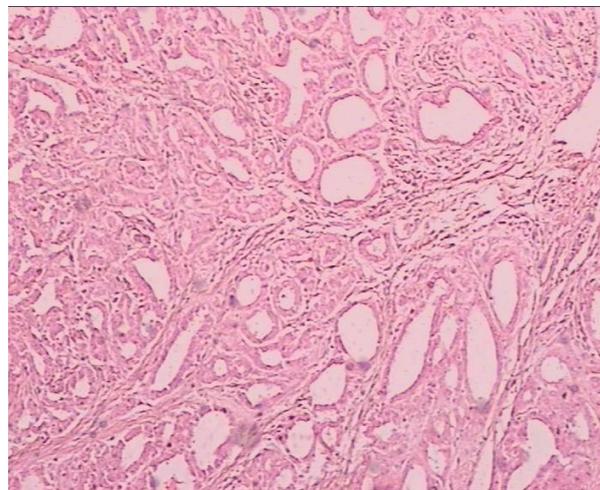


Figure 3. micrograph of ovarian tissue. Tubular pattern lined by a single layer of cuboidal epithelium cells with scanty stroma. HE x180.

DISCUSSION

Laying hens are the only animals that develop spontaneous ovarian cancer similar to humans. The incidence of ovarian adenocarcinomas together with their metastasis in chicken has been reported earlier (Johnson and Giles, 2006). Intestinal adenocarcinoma must be differentiated from metastatic oviductal or ovarian adenocarcinoma by demonstrating that no primary oviductal or ovarian tumor exists and that the tumor of the intestine originates from intestinal mucosal epithelium or glands rather than growing inward from the serosal surface of the intestine. In the present case, failure to detect tumor nodules in the mucosal lining of the oviduct and absence of tumor growing from the epithelium of intestine indicate that the tumor is not of oviductal or intestines origin. So, according to histological appearance of the growth in the ovary, the tumor was diagnosed as an ovarian adenocarcinoma with metastasis on the whole of intestines.

It has been previously demonstrated that hens have a high rate of ovarian tumors, but that such tumors are uncommon in hens less than 2 years of age (Fredrickson, 1987). We have no idea about the exact cause of around 13% mortality in the flock which at least theoretically may be related to the occurrence of ovarian adenocarcinoma.

Although the gross and microscopic findings of ovarian adenocarcinoma and its metastasis to a part of intestine were compatible with earlier reports, this is the first time that its transcoelomic spread over the whole of intestines has been reported in a native chicken.

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