A case report of haemangiosarcoma form of leukosis complex in birds effected with Marek’s disease

Y Vishnu Prasanth Reddy, A Anand Kumar, P Amaravathi, A Nasreen, CH Srilatha and K Sujatha

Abstract
Six BV 380 layer strain birds of 100 day old were presented to department of Veterinary Pathology, College of Veterinary Science, Tirupati for necropsy examination. Birds had shown the clinical signs of dullness, depression, anorexia, emaciation and nervous signs prior to death as informed by the owner. Grossly, nodular lymphoid masses of varied sizes in heart, lungs, spleen, kidney, proventriculus, intestine, ovary were noted. Impression smears revealed the presence of mixed population of pleomorphic small to large lymphocytes, lymphoblasts, plasma cells. Histopathological examination revealed focal to diffuse infiltration of the pleomorphic lymphoid cells in the liver, spleen, lung, proventriculus and loss of normal architecture was observed. Huge cavernous spaces lined by neoplastic endothelial cells packed with the RBC were noticed and confirmed as haemangiosarcoma a form of leucosis complex in the birds affected with Marek’s disease affected birds.

Keywords: hemangiosarcoma, histopathology, marek’s disease, poultry

Introduction
Neoplastic disease conditions of poultry fall into two broad classes, with infectious and non-infectious etiologies. The neoplasms with the infectious etiology are of greater economic importance as commercial poultry stock are being affected. Three main classes of virus causing neoplasms of lymphatic tissues in poultry are a) Marek's disease virus (MDV), a herpes virus b) Avian leukosis virus (ALV), a retrovirus c) Reticuloendotheliosis virus (REV) (Biswa et al., 2018). Marek’s disease (MD) is a lymphoproliferative disease of chicken and other domesticated and wild birds caused by herpes virus. Marek's disease of fowls is a panzootic caused by a herpesvirus which induces tumorous growths in various organs and tissues. It cause major economic threat to flocks of young adult fowls. In chickens, MD can occur at any time, beginning at 3–4 weeks of age or older, sometimes even well after the onset of egg production. Hemangiosarcomas are malignant tumors and they typically metastasize widely, especially in to the lungs (Meuten, 2002) [3].

Material and Methods
Six dead BV 380 layer strain 100 day old birds were presented for necropsy to the Department of Veterinary Pathology, College of Veterinary Science, Tirupati. Impression smears of liver and spleen were taken and stained with Leishman’s stain for cytological study. Tissues like proventriculus, liver, spleen and lungs where the lesions observed were collected and preserved in 10% neutral buffered formalin for histopathological examination. Then preserved tissues were processed through various steps dehydration, clearing and embedding and 5 microns thick sections were cut with the help of microtome and these sections were mounted on a clear glass slide. Then sections were stained with Hematoxylin and Eosin and examined under microscope (Culling, 1974) [3].

Results
A small commercial growing unit having 2000 birds with history of approximately 80 birds died over the previous 5-6 weeks and mortality rate was 2-5 birds per day presented six dead birds of 100 day old for necropsy at department of Veterinary Pathology, College of Veterinary Science, Tirupati. The birds showed the clinical signs of dullness, depression, anorexia, emaciation and showed nervous signs immediately before death as informed by the owner.
Grossly, the birds were emaciated with poor body condition and up on internal examination revealed lymphoid nodular growths of varied sizes mainly in the liver, heart, lungs, spleen, kidney, proventriculus, ovary. Liver was enlarged, bright red in color and completely filling the whole abdominal cavity with nodular to diffuse multifocal lymphoid masses of various sizes. Spleen was enlarged along with multifocal nodular growths on the surface. Thickened proventriculus along with haemorrhages. Lungs were enlarged and consolidated along with blonchy areas of haemorrhages. Grossly no lesions were observed in the brain and peripheral nerves.

Impression smears were collected from the organs showing the lymphoid growths and on staining and examination revealed mixed population of pleomorphic small to large lymphocytes, lymphoblasts, plasma cells in the heart, liver, spleen.

Histologically, in the liver revealed focal to diffuse infiltration of the pleomorphic lymphoid cells, degeneration and necrosis was noted in the hepatocytes and also there was proliferation of the neoplastic endothelial cells were observed in between the hepatic cords in the liver. Fibrous tissue proliferation was observed in the spleen along with infiltration of the pleomorphic lymphoblast cells. Pleomorphic lymphoid cells were observed in between the proventricular glands. Loss of normal architecture was observed in the organs affected. Huge cavernous spaces lined by endothelial cells and packed with the RBC were observed in the lungs. Infiltration of the neoplastic endothelial cells along with pleomorphic lymphoid cells was observed in the proventriculus.

Discussion

These observations of dullness, depression, anorexia, emaciation and nervous signs before death were similar to clinical signs reported by Fujimoto et al. (1971) [3], Ali et al. (2014) [1], Sawale et al. (2014) [8] with Marek’s disease and Rajkhowa and Arya (2016) [7] with haemangiomias in chicken. Impression smears were collected form the organs showing the lymphoid growths and on staining and examination revealed mixed population of pleomorphic small to large lymphocytes, lymphoblasts, plasma cells in the heart, liver, spleen are in line with previous reports on Marek’s disease by Das et al. (2018) and Kumar et al. (2018) [4]. Grossly, enlargement of organs with lymphoid nodular growth was similar to the observations by previous authors Ali et al. (2014) [1] and Vishnuvinayagam et al. (2019), Kumar et al. (2018) [4], Namratha et al. (2019) [6] with respect to Marek’s disease. Bright red color organs with blonchy haemorrhages on the lungs and haemorrhages in the proventriculus was similar to the observations of Vamsi krishna (2015) [10] in relation to hemangisarcoma. Focal to diffuse infiltration of the pleomorphic lymphoid, proliferation of the neoplastic endothelial cells, fibrous tissue proliferation was observed in the liver, spleen and proventriculus and huge cavernous spaces lined by endothelial cells and packed with the RBC in the lungs were similar to observations of Marek’s disease affected birds by Swathi et al. (2012) [9], Ali et al. (2014) [1] and Visnuvinayagam et al. (2019) [11] the neoplastic endothelial cells prolferation was similar to the findings of the previous records by Vamsi krishna (2015) [10] and Meuten (2002) [5].

Fig 1: Photograph showing bright red color liver with diffuse focal nodules, blonchy hemorrhages and consolidated areas on the lungs, cauliflower like growths on the ovary, pale heart.

Fig 2: Photograph of liver showing bright red color liver with nodular growths on the surface.
Fig 3: Photograph showing the thickened proventriculus along with hemorrhages in the mucosa and pale heart.

Fig 4: Cytological smear of liver showing pleomorphic lymphoid cells. Leishman’s stain x 1000

Fig 5, 6: Histological section of liver showing severe infiltration of pleomorphic lymphoid cells along with neoplastic endothelial cells in between the hepatocytes. H&E: X400.

Fig 7: Histological section of lungs showing severe hemorrhages along with spindle shaped plumpy neoplastic endothelial cells in the lung parenchyma. H&E: X400.

Conclusion
The present study indicated haemangiosarcoma a form of leucosis complex is an incidental finding in the birds affected with Marek’s disease.

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References


