

A CASE OF MAREK'S DISEASE IN 20-WEEK-OLD ISA WHITE PULLETS IN A FLOCK OF 500 BIRDS IN JALINGO, TARABA STATE, NIGERIA

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ABSTRACT

Marek's disease (MD) is a lymphoproliferative and neuropathic disease of domestic chickens, and less commonly, turkeys and quails. A client complained that his pullets were showing signs of inappetence, weakness, incoordination, and lameness on both legs. The birds were 20 weeks old from a flock size of 500. On clinical examination of the sick birds the following clinical signs were noticed; incoordination, weakness, anorexia, paralysis of the legs and wings, emaciation and prominent keel. Postmortem examinations conducted on the sick birds revealed nodular formations on the intestine, visceral organs, and generalized nodular formation on the internal organs. Samples of liver, spleen, sciatic nerve, proventriculus, intestine, bursa of Fabricius, kidneys and heart were taken to Histopathology laboratory, in Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria. The histopathology tests revealed enlargement and proliferation of lymphoid cells in kidneys, liver and the spleen and lymphocytic infiltration of the proventriculus and intestine. On the basis of clinical signs, gross lesions and histopathological findings Marek's disease was diagnosed. Neovit® at 1g/ litre of drinking water was administered to the flock for 5 days. Disposal of non-productive birds was recommended; also, the client was advised to keep strict biosecurity measures in the farm and to vaccinate the flock twice against MD. In conclusion paralysis of limbs, and post mortem lesions revealing tumor and nodules in the liver, spleen, heart and visceral organs and lymphocytic infiltration of the proventriculus and intestine were observed in this study and confirmed Marek's disease.

Keywords: Marek's disease, Pullets, Leg paralysis

INTRODUCTION

Marek's disease (MD), first described in 1907 by Jozsef Marek is caused by a highly contagious, cell-associated, oncogenic herpesvirus (Cauchy & Coudert 1986; Calnek & Witter, 1997; Calnek, 2001). Marek's disease poses a severe threat to the poultry industry. This oncogenic serotype 1 Herpes virus has been said to cause high economic losses globally, up to \$1-2 billion (Morrow & Fehler, 2004). Developing strategies for the control of MD remains a significant challenge. The disease is associated with tumours in the liver, spleen, kidneys, skin, gonads, iris, and paralysis linked to mononuclear cells infiltration of peripheral nerves. It is becoming a serious concern because of the evolution of its etiologic agent towards higher virulence

(Dunn *et al.*, 2019). The Marek's disease virus is now classified into four pathotypes: the mild (mMDV), virulent (vMDV), very virulent (MDVvv), and very virulent plus (vv+MDV) (Bertzbach *et al.*, 2020).

The virus is transmitted by the respiratory route from the inhalation of infected 'dander' and dust in poultry houses. The disease occurs more commonly in birds between 10 to 15 weeks of age and more often in females (Churchill & Biggs 1967; Abdu & Musa 2019). The classical form is characterized by paralysis produced by nerve lesions and a high level of visceral tumours (acute Marek's disease) or the cutaneous form. The disease is characterized by T cell lymphoma and nerve and organ infiltration by lymphocytes (Goyal 2008; Abdu & Musa, 2019). Marek's disease virus is

transmitted through inhalation of infected dander and dust, Outbreak of Marek's disease can occur even after vaccinations (Oladele *et al.*, 2023). Revaccination of birds with HVT Marek's vaccine in the midst of Marek's disease outbreak was reported successful (Olarinmoye *et al.*, 2014).

CASE HISTORY

On the 25th of August, 2024, a client brought three live ISA White pullets to Jada's Veterinary Clinic in Jalingo with complaints of the birds showing signs of inappetence, weakness, incoordination, and weakness of the legs. The flock size was 500 at the age of 20 weeks. Birds were reported to have been vaccinated against Marek's, Newcastle and infectious Bursa diseases at 1st, 2nd and 3rd weeks respectively. History also revealed that Newcastle disease vaccine (NDV Komarov) was administered at 5th week of age, fowl typhoid vaccine at 6th week, Fowl pox vaccine at 7th week while fowl cholera was administered at 8th week. Also reported was NDV Komarov vaccine (EDS 3-in-1 vaccine) being administered at the 12th week. Medical history also revealed that the birds were given Gentamycin and vitamins at the onset of the disease.

PHYSICAL EXAMINATION

On a visit to the farm the following clinical signs were observed; incoordination, weakness, anorexia, paralysis of the legs and wings. The birds were emaciated with prominent keel.

POSTMORTEM EXAMINATION

Post mortem examination was conducted on the sick birds and the following lesions observed; Emaciation, prominent keel in the sick birds, nodular growths on visceral organs and other internal organs (Figure I), enlarged liver with nodular growth (Figure II), enlarged spleen with nodular growth (Figure III).

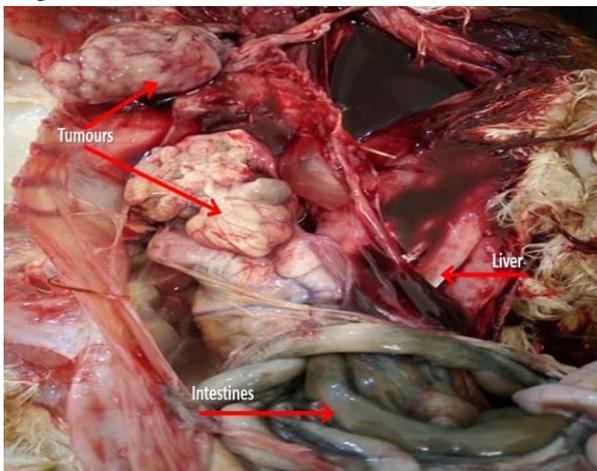


Figure I: Generalized nodular formation on the internal organs

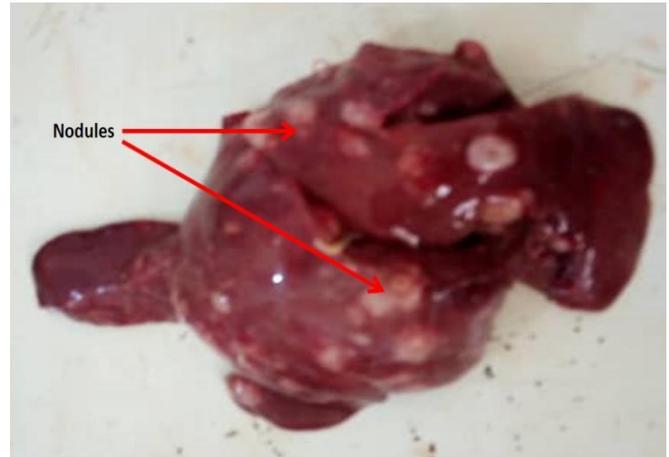


Figure II: Prominent generalized formation of nodules on the liver



Figure III: Prominent and generalized nodules on the enlarged spleen.

SAMPLES

The following samples were taken to Histopathology laboratory of the Faculty of Veterinary Medicine, Ahmadu Bello University, Zaria: heart, liver, spleen, proventriculus, intestine, kidneys, bursa of Fabricius and sciatic nerves.

DIAGNOSIS

Differential diagnoses were Marek's disease, Lymphoid leucosis and Newcastle disease. Tentative diagnosis was Marek's disease.

HISTOPATHOLOGY TEST

Results from the Histopathology laboratory revealed; enlargement and proliferation of lymphoid cells in kidneys, liver and the spleen, lymphocytic infiltration of the proventriculus (Figure IV), intestine (Figure V) and liver (Figure VI). Demyelination and gliosis in the peripheral nerves.

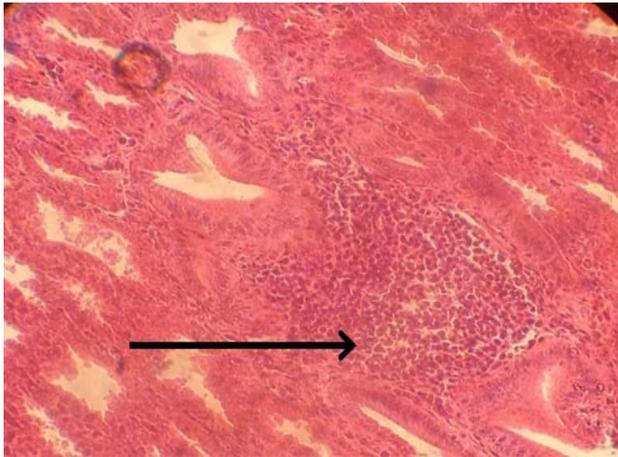


Figure IV: Photomicrograph showing lymphocytic infiltration of the proventriculus (arrow)

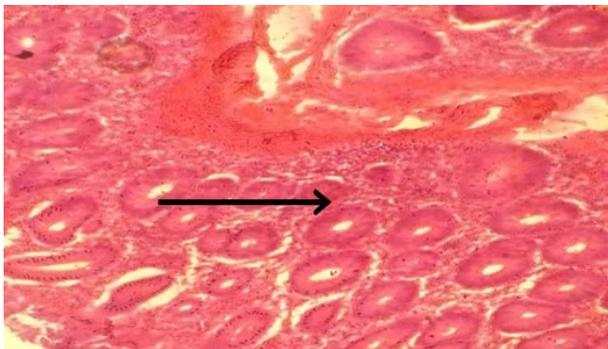


Figure V: Photomicrograph showing lymphocytic infiltration of the intestine (arrow)

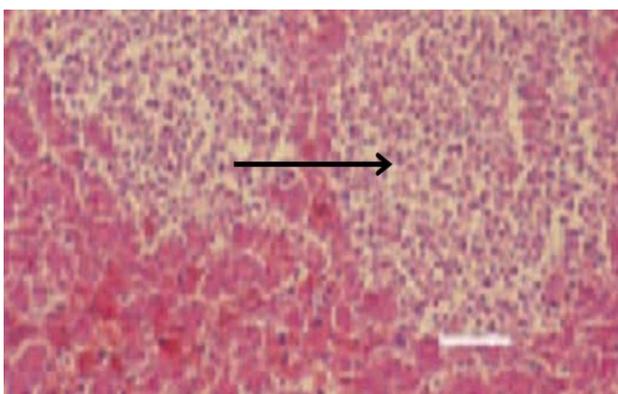


Figure VI: Photomicrograph of the liver showing symmetrical neoplastic foci of pleomorphic hepatocytes (arrow)

CONFIRMATORY DIAGNOSIS

Marek's disease

MANAGEMENT

Neovit® (containing nicotinamide, dexpanthenol, cyanocobalamin, riboflavin sodium phosphate, thiamine

hydrochloride and pyridoxine hydrochloride) at 1g/ litre of water was administered for 5/7 days. Disposal of non-productive birds was recommended. The client was advised to keep strict bio security measures in the farm and to vaccinate twice against MD.

DISCUSSION

Marek's disease is characterized by T-cell lymphomas and nervous system involvement. Nodular lesions consistent with MD are often seen in the proventriculus, skin, intestines and the eye. According to Schat *et al.* (1981) Marek's disease tends to often cause regression of the bursa of Fabricius, in this study also bursa of Fabricius was not quite prominent in the carcasses posted. Newcastle disease may manifest nervous signs of paralysis of the legs and wings similar to MD but in addition it is often characterized by respiratory, reproductive and gastrointestinal signs and lesions (Jarosinski, 2012). Lymphoid leucosis is characterized by B-cell lymphomas in the bursa of Fabricius with similar nodular lesions in the liver and spleen as observed in MD but is not usually connected with sciatic nerve involvement and there is therefore no paralysis in the birds. In this study the birds showed the characteristic paralysis of limbs associated with Marek's disease. T-cell lymphoma: Malignant transformation of T-lymphocytes, leading to tumor formation in various organs is pathognomonic of Marek's disease. Paralysis of legs and wings observed during the physical examination of the sick birds in this case align with findings by Abdu and Musa (2019) who reported paralysis as classical form of Marek's disease. The lymphocytic infiltration of the proventriculus and intestines indicates that immune response to Marek's disease is being elicited and this can lead to tissue damage and invariably affecting their digestive functions. There was a history of vaccination of the flock against Marek's disease but the birds still came down with Marek's disease, this agrees with the report by Oladele *et al.* (2023) who reported that outbreak of Marek's disease could occur even after vaccination at day old. With no mortality reported from this case, this might be the mild form of MD as reported by Bertzbach *et al.* (2020) who classified Marek's disease into mild, virulent, very virulent and very virulent plus. The Postmortem lesions which revealed tumor and nodules in the liver, spleen, kidney and visceral organs agree with Dunn *et al.* (2019) who reported that the disease is associated with tumors in the liver, spleen, kidney, skin, gonads, iris and paralysis linked to mononuclear cell infiltration of the peripheral nerves. The client reported the case at the 20th week of age in his flock, this slightly disagrees with the finding by Abdu and Musa (2019) who reported that the disease occurs more often in birds between 10 and 15 weeks, but considering the sex of the chicken involved in this case, this agrees with their report that the disease occurs more often in female chickens.

CONCLUSION

Paralysis of limbs, and post mortem lesions revealing tumor and nodules in the liver, spleen, heart and visceral organs and lymphocytic infiltration of the proventriculus and intestine were observed in this study and confirmed Marek's disease. There is no specific treatment for Marek's disease, but supportive care and management practices can help alleviate symptoms and reduce mortality. Prevention of Marek's disease is possible by effective repeated vaccinations using live attenuated vaccines and through strict biosecurity.

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