



ISSN: 2456-2912

VET 2023; 8(1): 28-31

© 2023 VET

www.veterinarypaper.com

Received: 12-11-2022

Accepted: 19-12-2022

Daniel Thomas Yoksa

Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria

Dauda Luka Mohzo

Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria

Raymond Habila Gapsiso

Department of Animal Health and Production Technology, Federal Polytechnic Mubi, P.M.B. 35 Mubi, Adamawa, Nigeria

Yusuf Abba

Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria

Corresponding Author:

Daniel Thomas Yoksa

Department of Veterinary Pathology, Faculty of Veterinary Medicine, University of Maiduguri, PMB 1069, Maiduguri, Borno State, Nigeria

Dry and diphtheritic pox in an adult turkey associated with suprainfection with *Escherichia coli* and *Salmonella* spp.: A case report

Daniel Thomas Yoksa, Dauda Luka Mohzo, Raymond Habila Gapsiso and Yusuf Abba

DOI: <https://doi.org/10.22271/veterinary.2023.v8.i1a.462>

Abstract

Fowl pox is an important viral disease of avian species which have been identified in over 60 species of wild birds. It is caused by a virus belonging to the family Poxviridae and the genus Avipoxvirus. Transmission within a flock tends to be rapid in seasons when mosquitoes are abundant. Pox is a slow-spreading disease which exists in two forms; the first form of the disease also known as the cutaneous or dry pox is spread by biting insects (especially mosquitoes), which cause discrete nodular proliferative skin lesions on the combs, wattles, beak and shank. The second form is spread by inhalation of the virus and causes fibrinonecrotic diphtheritic membrane to form in the mouth, pharynx, larynx, trachea and oesophagus. A client brought a carcass to the necropsy unit of the Veterinary Teaching Hospital, University of Maiduguri, Borno State, Nigeria. Physical examination revealed dry nodular lesions on the head and shanks. The oral cavity revealed creamy-white nodular lesion. Esophagus, proventricular and testicular serosa also had a focal nodule. Histological in the skin there was ballooning degeneration of the keratinocytes with eosinophilic cytoplasmic inclusions. The testes also had degeneration with lymphocytic infiltration of the seminiferous tubules. Secondary bacterial infections are as a result of immunosuppression due to virus. This case report is the first presentation of both dry and diphtheritic pox with lesions extending to the visceral organs.

Keywords: Fowl pox, diphtheritic membrane, eosinophilic, nodular, necropsy

Novelty Statement: Lesions of dry pox are mostly located on the skin while that of the diphtheritic pox are located in the oral cavity. In this case presentation lesions are seen in rare anatomic locations such as the esophagus, Proventricular and testicular serosal surfaces making it the first case presentation in turkeys.

Introduction

Fowl pox is a common and economically important viral disease of avian species which have been identified in over 60 species of wild birds. The disease is caused by a virus belonging to the family Poxviridae and the genus Avipoxvirus (Fenner, 1993) [5]. It is a large double stranded DNA virus that replicates in the cytoplasm of the cell, it is resistant and may remain alive in a dried scab for up to ten years. Photolyase and A-type inclusion body protein genes in the genome of fowl pox virus appear to protect the pox virus from environmental abuse (Kahn, 2010) [6]. Although fowl pox has widespread range in backyard and to some extent intensively reared poultry flocks in Nigeria, the epidemiologic details of the disease are not quite clear in free range indigenous chickens and turkeys (Adene and Fatumbi 2004) [3]. Transmission within a flock tends to be rapid in seasons when mosquitoes are abundant. Lesions initially appear as raised, blanched, nodular areas which progresses to a thick, dark scab. Multiple lesions usually becomes coalesced to form scabs (Musa, 2017) [7]. Mouth lesions interfere with feeding while tracheal lesions cause difficulty in breathing. The host of the fowl pox virus include chickens, turkeys, quails, canaries, pigeons and many other species of wild and domestic birds (Tripathy, 2003) [10]. Pox is a slow-spreading disease which exists in two forms; the first form of the disease also known as the cutaneous or dry pox is spread by biting insects (especially mosquitoes), which cause discrete nodular proliferative skin lesions on the combs, wattles,

beak and shank (Musa, 2017) [7]. The second form is spread by inhalation of the virus and causes fibrinonecrotic diphtheritic membrane to form in the mouth, pharynx, larynx, trachea and oesophagus (Abdu, 2014) [1]. Diphtheritic form of pox lesions is usually more severe as it causes significant mortality and economic losses in affected flocks (Adebajo *et al.*, 2012) [2]. Virulent strains of the virus may cause lesions in the internal organs (systemic form) (Kahn, 2010) [6]. In Turkey little information about the prevalence of pox is available (Ohore *et al.*, 2007) [8]. However, the overall seroprevalence of 23% fowl pox antibody level in indigenous chicken in North Central Nigeria was reported (Adebajo *et al.*, 2012) [2]. A similar work in Zaria (North West Nigeria) by Saidu *et al.*, (1994) [9] using agar gel immunodiffusion test (AGID), however, indicated 5% seroprevalence. This case report is the presentation of both dry and wet pox in a local Turkey.

Case history and observation

On the 25th of September 2019 a client brought a carcass to the Veterinary Pathology Unit of the Veterinary Teaching Hospital University of Maiduguri, Nigeria requesting for necropsy. The history revealed that the turkey was not vaccinated against fowl pox. Upon physical examination the carcass was emaciated with prominent keel bone. There was multiple grey dried nodular lesions around the head, neck, nostrils and around the beak. Round creamy white nodules were also seen in the oral cavity (roof & floor) and within the esophageal mucosa. Serosal surfaces of the proventriculus contained a focal creamy nodule which was adherent to the ventricular serosa. The right testis had a white focal creamy nodule on the serosal surface and looked comparably smaller than the left testis.

Necropsy Findings

Gross Findings

Carcass was emaciated with prominent keel bone (Figure 1.2). A grey dried nodular lesions were seen around the head, neck, nostrils and around the beak (Figure 1.3). Creamy white nodules were seen in the oral cavity (roof & floor) and within the esophageal mucosa (Figure 1.4 & Figure 1.5). Serosal surfaces of the proventriculus contained a focal creamy nodule which was adherent to the ventricular serosa (Figure 1.6). The right testis had a white focal creamy nodule on the serosal surface and looked comparably smaller than the left testis (Figure 1.7).

Samples Collected

Deep Swab from the liver was taken for Microbiological culture and identification.

Tissue samples of the skin and Testes fixed in 10% buffered Formalin.

Sample Analysis

Bacterial Swab: sample was inoculated on Salmonella-Shigella agar for isolation of *Salmonella* and also on Eosin Methylene Blue for *Escherichia coli*. The media were positive

Histopathology: Tissue sections of the skin, testis and kidney in 10% buffered formalin were routinely processed, embedded in paraffin wax, sectioned at 5µm and stained with hematoxylin and eosin. Examination of tissue sections was performed using a light microscope (Armscope® model BNJY 120, United Scope Inv., USA) mounted with 5-megapixel digital eyepiece camera (Armscope® model

MD500, United Scope Inc., USA) and photomicrographs were taken.



Fig 1.1: Carcass presented for Necropsy

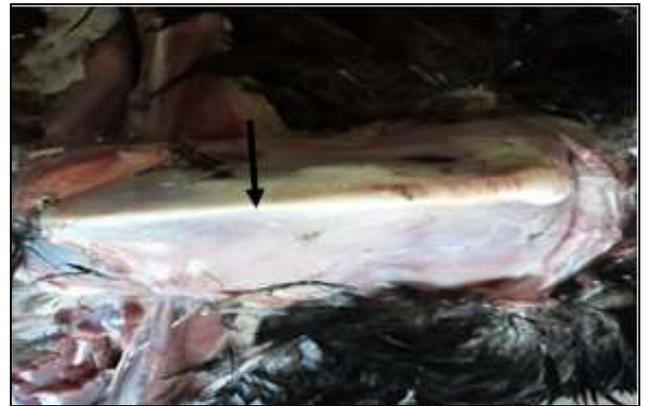


Fig 1.2: Carcass was emaciated with prominent keel bone (arrow)



Fig 1.3: Grey dried nodular lesions on the head neck and beak (arrow)



Fig 1.4: Creamy nodules in the oral cavity (arrow)



Fig 1.5: Focal creamy nodule within the esophageal mucosa (arrow)



Fig 1.6: Focal creamy nodule on the proventricular serosa (arrow)

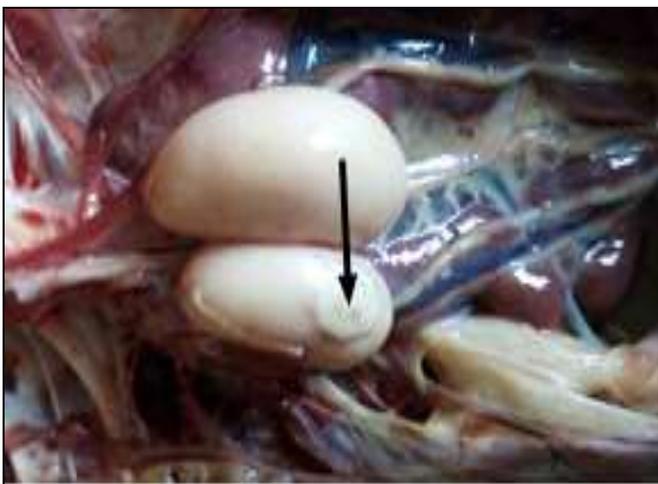


Fig 1.7: Focal creamy nodule on the testes (arrow)

Differential Diagnosis

- Turkey Pox
- Bacterial dermatitis

Tentative Diagnosis

- Turkey (Avian) Pox

Laboratory Results

Bacteriology: Swab samples from the liver were positive for *scherichia coli* and *Salmonella* spp. following incubation at 37 °C for 24hrs.

Histopathological Results

Skin

Fixed tissue samples of the skin and testes with nodular lesions were stained with Hematoxylin and Eosin. The skin tissue had cords and large clusters of markedly hypertrophied and hyperplastic epidermal stratified squamous epithelium which is keratinized (Figure 2.1). The keratinocytes had undergone ballooning degeneration (Figure 2.1). There was a single round dense eosinophilic intracytoplasmic inclusion body (Bollinger bodies) within the keratinocytes (Figure 2.2). This inclusion distended the cytoplasm of the cell producing cell necrosis.

Testis

The seminiferous tubules were undergoing ballooning degeneration appearing as clear vacuoles which extends to the interstitium with lymphocytic infiltrations within the tubules (Figure 2.4). The interstitial cells appeared with some round clear vacuoles which displaced the nucleus to the periphery (Figure 2.3). There is also a caseous necrosis of the seminiferous tubules (Figure 2.3)

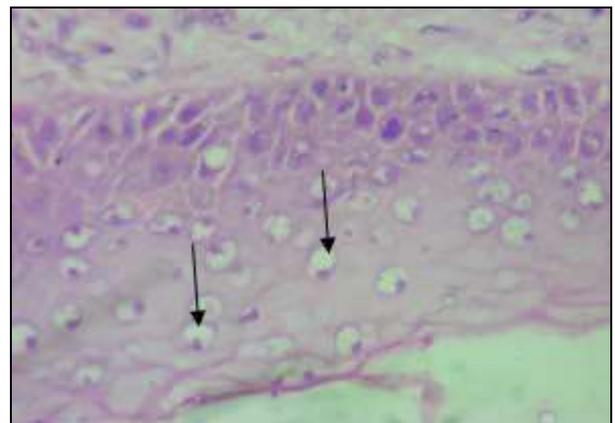


Fig 2.1: Photomicrograph of the skin showing ballooning degeneration of keratinocytes (arrows) H&E x400

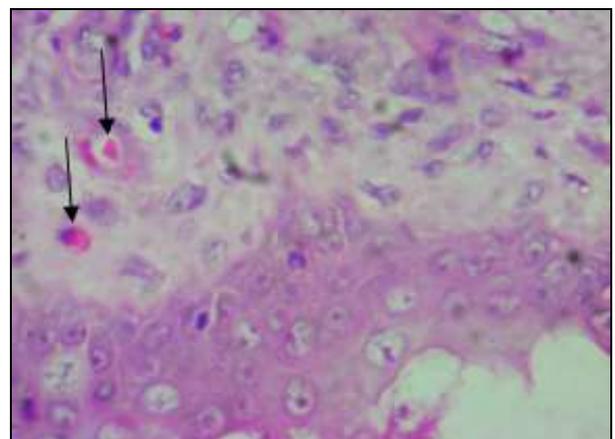


Fig 2.2: Photomicrograph of the skin showing Bollinger bodies (arrows) H&E x400

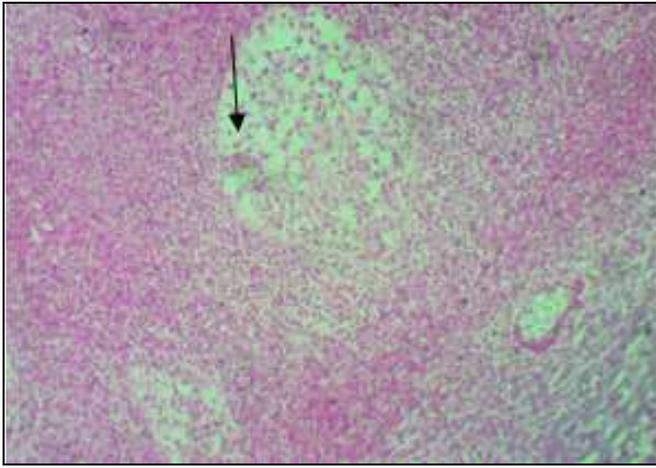


Fig 2.3: Photomicrograph of the testes showing an area of caseous necrosis in seminiferous tubules (arrow) H&E x100

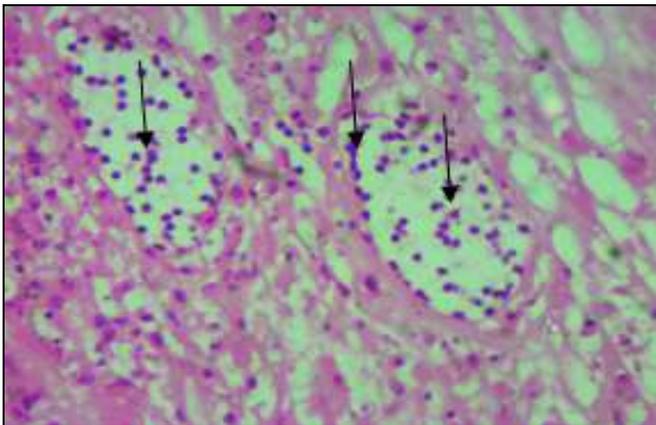


Fig 2.4 Photomicrograph of the testes showing lymphocytic infiltration of the seminiferous tubules and in the interstitium with fibrosis (arrows) H&E x400

Confirmatory diagnosis

Based on the gross and histopathological evaluations the disease was confirmed as:

Turkey (Avian) pox.

Discussion

In the present case the appearances of gross lesions were suggestive of Turkey pox. However, the diphtheritic lesions which extend from the oral cavity to the proventriculus and testes, with the evidence confirmed at histopathology level. The virus is not fatal *per se* in all affected birds but it can increase the chances of secondary bacterial infection, in this case the carcass was positive for both *Salmonella* and *Escherichia coli*. Turkey pox is transmitted through the bite of mosquitoes (Bolte, 1999) ^[4]. Mosquitoes are believed to carry the virus from one host to the other during feeding (Musa, 2017) ^[7], with the disease being rampant in the rainy season when the activities of mosquitoes are at the peak. There is no specific treatment for the disease, however, immune boosters have been found to be effective in alleviating the condition and the use of antibiotics to combat secondary infection has been reported. Vaccines are effective in preventing the disease as it gives lifelong immunity. This case is the first reported case of diphtheritic pox with lesions extending to the proventricular and testicular serosal surfaces.

References

1. Abdu PA, Musa U. Textbook of Avian Medicine. Zaria, Nigeria: P.A Ndahi Press; c2014.p.94-94.

2. Adebajo MC, Ademola SI, Ouwaseun A. Seroprevalence of fowl pox antibody in indigenous chickens in Jos north and south council areas of Plateau State, Nigeria: implication for vector vaccine. International Scholarly Research Network. 2012;2012:01-04. Doi:10.5402/2012/154971
3. Adene DF. Case Review and Lesions on Poultry Disease Control in South West Nigeria. Poultry Health and Production: Principles and Practice, Oyo, Nigeria: Stirling Horden Publishers; c2004.
4. Bolte AL. Avian host spectrum of Avipoxviruses. Avian Pathology. 1999;28(5):415-432.
5. Fenner FJ. Veterinary Virology. (2nd, Ed.) Academic Press, Inc.; c1993. p. 432-437
6. Kahn CM. Merck Veterinary Manual. Whitehouse Station, U.S.A: Merck & Co., Inc.; c2010.
7. Musa U, Mera UM. A case of Cutaneous and Diphtheritic Pox in a Five Weeks-Old Turkey Poults. Scholar Journal of Agriculture and Veterinary Science. 2017;4(5):205-208.
8. Ohore OG, Emikpe BO, Oluwayelu DO, Adeyemi RO, Ockiya MA. Seroprofiling of antibodies to fowl pox in commercial and indigenous chickens in Southwestern Nigeria. Journal of Animal and Veterinary Advances. 2007;5(6):697-701.
9. Saidu L, Abdul PA, Umoh JU, Abdulahi US. Diseases of Nigerian indigenous chickens. Bulletin of Animal Health and Production in Africa. 1994;40:19-23.
10. Tripathy DN. Pox In Diseases of Poultry. (11th, Ed.) Saif. Ed. Iowa State University Press; c2003. p. 259.