



E-ISSN: 2320-7078

P-ISSN: 2349-6800

JEZS 2018; 6(5): 553-555

© 2018 JEZS

Received: 15-07-2018

Accepted: 16-08-2018

N Pazhanivel

Professor, Department of
Veterinary Pathology, Madras
Veterinary College, Chennai,
Tamil Nadu, India

R Saahithya

Graduate Assistant, Department
of Veterinary Pathology, Madras
Veterinary College, Chennai,
Tamil Nadu, India

M Thangapandiyan

Assistant Professor, Department
of Veterinary Pathology, Madras
Veterinary College, Chennai,
Tamil Nadu, India

Ganne Venkata Sudhakar Rao

Professor and Head, Department
of Veterinary Pathology, Madras
Veterinary College, Chennai,
Tamil Nadu, India

K Sridhar

Veterinary Assistant Surgeon,
Arignar Anna Zoological Park,
Vandalur, Chennai, Tamil Nadu,
India

Pulmonary aspergillosis in a seventeen-day old ostrich chick (*Struthio camelus*)

N Pazhanivel, R Saahithya, M Thangapandiyan, Ganne Venkata Sudhakar Rao and K Sridhar

Abstract

Aspergillosis is an acute fatal to chronic disease in birds. Tissues of lung and liver from 17 days old ostrich chicks submitted to the Department of Veterinary Pathology, Madras Veterinary College, Chennai – 7 for histopathological examination from Arignar Anna Zoological Park, Vandalur, Chennai. History of sudden death and subsequent conduction of post-mortem examination was reported. Gross examination of the lung revealed multifocal grey white coloured nodules measuring about 0.5 cm to 3 cm diameter. Nodule extended deep into the parenchyma upon incision. Liver was pale in appearance. Histopathological examination revealed multiple granulomatous nodule with central caseo-necrotic areas surrounded by inflammatory cells predominantly lymphocytes, macrophages and heterophils in the lung. Multinucleated giant cells were seen. Fungal mycelia was seen with routine Haematoxylin and Eosin and special stain of Gomori's Grocott silver stain (GG) which showed black colored fungal septate branching hyphae and was suggestive of *Aspergillus* spp. Liver showed congestion, micro vesicular to macro vesicular fatty degenerative changes. Based on the gross and histopathological examination, it was confirmed as Aspergillosis.

Keywords: Ostrich chick, pulmonary aspergillosis, histopathology, fungal hyphae, gomori grocott stain

1. Introduction

Ostrich (*Struthio camelus*) is a large flightless bird used in semi-arid and desert areas, some African countries [1]. Aspergillosis is one of the common respiratory tract infections in poultry due to managerial problems [2]. Aspergillosis is caused by *Aspergillus fumigatus* which is the primary species responsible for infection in different avian species. Aspergillosis is an acute fatal to chronic disease in birds [3]. Aspergillosis is also caused by high population density, poor ventilation, excessive administration of antibiotics, nutritional deficiency and immunosuppressive agents are important factors for the development [4, 5]. Aspergillosis is mainly caused by *aspergillus fumigatus* [4]. Acute aspergillosis in young chicks produces higher morbidity and mortality and chronic form particularly in older birds causes sporadic morbidity and mortality [4]. In addition to that, reduction in body weight, difficulty in respiration [6], encephalitis, ophthalmitis, osteomyelitis, dermatitis, systemic forms [7] were observed in birds.

2. Materials and Methods

Tissues of lung and liver from a 17 days old ostrich chicks submitted to the Department of Veterinary Pathology, Madras Veterinary College, Chennai – 7 for histopathological examination from Arignar Anna Zoological Park, Vandalur, Chennai. History revealed that the bird suddenly died and post-mortem examination conducted. Samples were received in 10 per cent neutral buffered formalin (NBF). The formalinised tissue samples were processed and paraffin embedded tissue sections were cut into 4-6µm thickness and stained with haematoxylin and eosin stain (H&E) [8]. The stained slides were examined under light microscope (Olympus CX20).

3. Results

Gross examination of the lung revealed multifocal grey white coloured nodules measuring about 0.5 cm to 3 cm diameter. Upon incision, the nodule was found to extend deep into the parenchyma. Liver was pale in appearance. Microscopical examination of the lung revealed multiple granulomatous nodule with central caseo-necrotic areas (Fig.1) surrounded by

Correspondence

N Pazhanivel

Professor, Department of
Veterinary Pathology, Madras
Veterinary College, Chennai,
Tamil Nadu, India

inflammatory cells predominantly lymphocytes, macrophages and heterophils. Multinucleated giant cells were also seen (Fig. 2). Fungal mycelia was seen with routine Haematoxylin and Eosin (Fig. 3) and special stain of Gomori's Grocott methanamine silver nitrate stain (GG) showed black colored fungal septate branching hyphae suggestive of *Aspergillus* spp. (Fig. 4). Liver showed congestion, micro vesicular to macro vesicular fatty degenerative changes (Fig. 5). Based on the gross and histopathological examination (H&E staining and GG stain), it was confirmed as Aspergillosis.

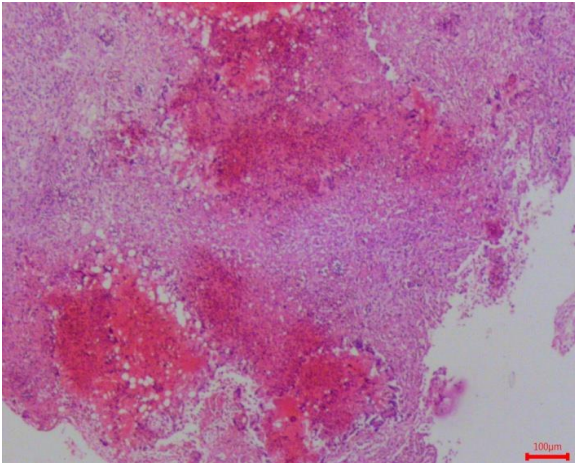


Fig 1: Lung – Histopathology - Multiple granulomatous nodule with central caseo-necrotic areas H&E 100µm

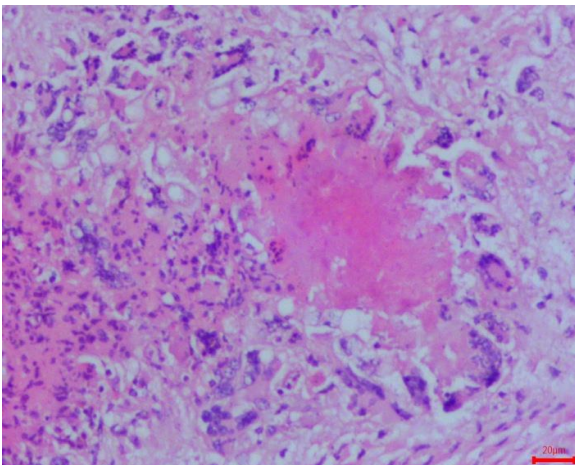


Fig 2: Lung – Histopathology - Multinucleated giant cells H&E 20µm

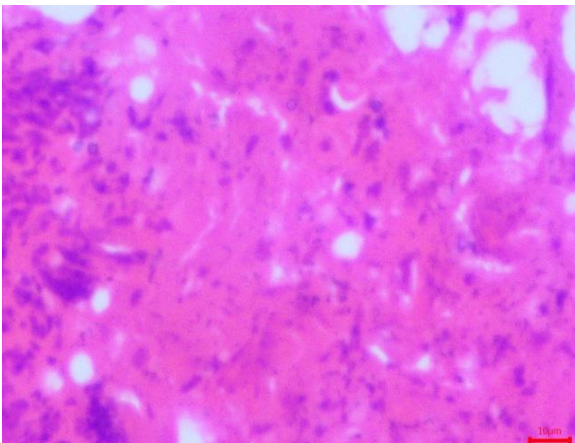


Fig 3: Lung – Histopathology - Fungal mycelia with routine Haematoxylin and Eosin stain - 10µm

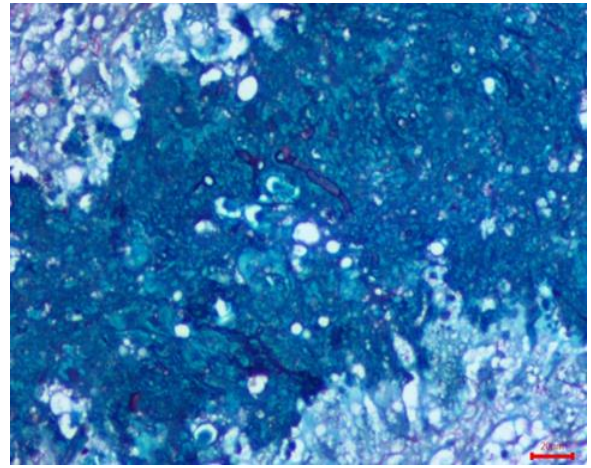


Fig 4: Lung – Special stain - Gomori's Grocott methanamine silver nitrate stain (GG) showed black colored fungal septate branching hyphae suggestive of *Aspergillus* spp. H&E 20µm

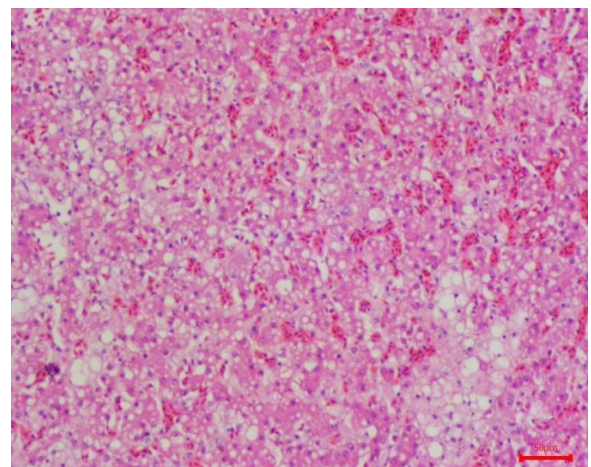


Fig 5: Liver – Histopathology - Congestion, micro vesicular to macro vesicular fatty degenerative changes H&E 50µm

4. Discussion

Aspergillus can be seen in soil, plant debris, wood and air and the most common pathogenic species is *Aspergillus fumigatus*. In addition to that, other aspergillus species including *Aspergillus flavus*, *Aspergillus terreus*, *Aspergillus niger* and *Aspergillus versicolor* might cause aspergillosis [9, 10]. Aspergillosis generally develops in birds due to secondary causes such as stress, immunosuppression, infected hatchery, contaminated feed and water [11, 7]. In the present case, the infection could have occurred due to immunosuppression.

Gross examination revealed grey white nodules of about 0.5 to 2 cm diameter. Similar gross findings were recorded by previous workers [12-14]. Histopathological examination revealed multifocal granulomatous nodule with central caseo-necrotic areas and infiltration of lymphocyte, macrophage and heterophils with multinucleated giant cells, fungal hyphae were also seen. Histopathological findings in the present study is in agreement with earlier reports of Khosravi *et al.* (2008); Araghi *et al.* (2014); Fitzgerald and Moisan (1995); Perelman and Kuttin (1992) [13, 5, 7, 14]. Gomori grocott methanamine silver nitrate stain (GG) also revealed black coloured fungal hyphae in the present study which was also reported by Khosravi *et al.* (2008); Fitzgerald and Moisan (1995) [13, 7].

In the present study, acute aspergillosis was recorded in a 17 day old ostrich chick. However, aspergillosis sporadically occurs in adult with outbreak of high morbidity and mortality

in young birds ^[13, 14]. Yokota *et al.* (2004) ^[15] reported two year old ostrich affected with aspergillosis in lung and air sacs. Sancak and Paracikoulu (2005) ^[16] recorded aspergillosis in air sac of 3 months old ostrich. Perelman and Kuttin (1992) ^[14] recorded aspergillosis due to brooder borne infection with pulmonary involvement.

5. Conclusion

In the present study, to conclude, the acute aspergillosis observed in the seventeen day old ostrich could be caused by the toxins released by the fungus causing immunosuppression effects followed by death.

6. Acknowledgements

The authors sincerely thank the facilities provided by the Tamil Nadu Veterinary and Animal Sciences University, Chennai - 51 in conducting the study.

7. References

1. Azizi S, Ghalebi SR, Kheirandish R, Ghasemi N, Mohajeri FA. Journal of Coastal Life Medicine. 2014; 2(8):662-664.
2. Brown T, Jordan FT, Wood AM. Fungal diseases. In: Poultry Diseases, Sixth edn, Saunders Elsevier. 2008, 428.
3. Oglesbee BL. Mycotic Diseases, 1st edition, W.B. Saunders, Philadelphia, 1997.
4. Arné P, Thierry S, Wang D, Deville M, Loc'h L, Desoutter A *et al.* Aspergillus fumigatus in poultry. International Journal of Microbiology. 2011, 1-14.
5. Araghi M, Ghaniei A, Heidari T. Aspergillosis Outbreaks in Ostrich Flocks of Eastern Iran During 2010 – 2012. Bulgarian Journal of Veterinary Medicine. 2014; 17(4):325-330.
6. Kyoung OH. Aspergillosis in an ostrich (*Struthio camelus*). Journal of Veterinary Clinics. 2001; 18:174-177.
7. Fitzgerald SD, Moisan PG. Mycotic rhinitis in an ostrich. Avian Diseases. 1995; 39:194-196.
8. Bancroft JD, Gamble M. Theory and practices of histological techniques. 6th edn. Churchill Livingstone, Philadelphia. 2006, 99-112.
9. Chute HL. Fungal infections: thrush (mycosis of the digestive tract). In: Calnek BW, Barnes HJ, Beard CW, Mc Dougald LR, Saif YM, editors. Diseases of poultry. 10th edn. Ames, Iowa: Iowa State University Press. 1997, 361-363.
10. Patterson TF, Kirkpatrick WR, White M, Hiemenz JW, Wingard JR, Dupont B *et al.* Invasive aspergillosis. Disease spectrum, treatment practices, and outcomes. I3 Aspergillus Study Group. Medicine. 2000; 79(4):250-260.
11. Marks SL, Stauber EH, Ernstrom SB. Aspergillosis in an ostrich. Journal of American Veterinary Medical Association. 1994; 204:784-785.
12. Sasani F, Khosravi AR, Dordari S, Moghadam RM, Hajjibabaie A. Pulmonary Aspergillosis in Ostrich. Archives of Razi Institute. 2003; 55:117-120.
13. Khosravi AR, Shokri H, Ziglari T, Naeini AR, Mousavi Z, Hashemi H. Outbreak of severe disseminated aspergillosis in a flock of ostrich (*Struthio camelus*). Mycoses. 2008; 51:557-559.
14. Perelman B, Kuttin ES. Avian Pathology. 1992; 21:159-163.

15. Yokota T, Shibahara T, Wada Y, Hiraki R, Ishikawa Y, Kadota K. Aspergillus fumigatus infection in an ostrich (*Struthio camelus*). Avian Pathology. 2004; 66: 201-204.
16. Sancak AA, Paracikoglu J. Aspergillosis and gastric impaction in an ostrich. Turkish Journal of Veterinary and Animal Sciences. 2005; 29:933-935.