Mycotic Granuloma on the Skin of a Desi Fowl: A Case Report

V. Samatha[1], S. Uma Maheswari[1], B.B. Manasa[2],
V. Ramadevi[1], G. Kamalakar[3], S. Bhavya Jahnavi[1]

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ABSTRACT

Background: A desi fowl with a nodular growth on the skin of the left lateral aspect of the breast region was presented to VCC, NTR CVSC, Gannavaram. The mass was excised surgically and collected for histopathology and ultrastructural studies. Grossly, the tissue appeared as a white nodular growth, but was cheesy on the cut section.

Methods: Fixation and processing of tissue growth for histopathology was done as per routine procedures. The special stains like PAS was carried out to demonstrate the fungal hyphae. Scanning electron microscopy was used to determine the morphology of fungal hyphae.

Result: Histopathological sections revealed caseous necrotic centres with numerous fungal hyphae surrounded by polymorphonuclears, macrophages and Langerhans giant cells. Fungal hyphae in tissue sections measured 9-10 µm on micrometry indicating zygomycetes phylum. These pyogranulomatous lesions revealed pinkish red, broad, rarely septate fungal hyphae on PAS staining. Branched fungal hyphae along with attached terminal spores to few hyphae were evident on scanning electron microscopy (SEM).

Key words: Caseous necrosis, Desi fowl, Fungal hyphae, PAS, Pyogranuloma.

INTRODUCTION

Mycotic granulomas in fowls are quite common, but dermatomycosis cases are rarely reported. However, the growth of fungal mycelia depends on the host immunity and nutritional status. The present case was a mycotic cutaneous granuloma in a desi chicken.

Chronic mycotic infections are generally associated with immunosuppression (Ahamad *et al*., 2018). The fungi (Zygomycetes) is ubiquitous in nature and is found in decaying plant debris, soil and manure of herbivores. Its incidences of fungal mycosis in poultry has been reported earlier and the mode of transmission is usually through inhalation or ingestion of spores or by tissue invasion into the broken skin (Lakshman *et al*., 2009).

MATERIALS AND METHODS

A desi fowl with nodular mass on the lateral aspect of the breast region was presented to veterinary clinical complex(VCC), Gannavaram. The tissue mass was preserved in 10% formalin and 2.5% glutaraldehyde for histopathological and scanning electron microscopic studies respectively after the surgical excision. Tissues were processed and embedded. The sections were prepared for hematoxylin and eosin staining (Luna *et al*., 1972). After microscopic examination, few selected tissue sections were stained with Periodic acid Schiff for the demonstration of fungal hyphae. Micrometry was performed to measure the fungal hyphae in tissue sections. For scanning electron microscopy, the fixed samples were dried to critical point with critical point drier (CPD) unit and were mounted over the stubs with double-sided conductivity carbon tape. Then, the samples were scanned under a scanning electron microscope after platinum coating. (Model: JOEL-JSM 56000) (Lakshman *et al*., 2009).

[1]Department of Veterinary Pathology, NTR College of Veterinary Science, Gannavaram-521 102, Andhra Pradesh, India.
[2]Department of Veterinary Assistant Surgeon, Veterinary Biological Research Institute, Krishna-521 002, Andhra Pradesh, India.
[3]Department of Veterinary Surgery and Radiology, NTR College of Veterinary Science, Gannavaram-521 102, Andhra Pradesh, India.

Corresponding Author: S. Uma Maheswari, Department of Veterinary Pathology, NTR College of Veterinary Science, Gannavaram-521 102, Andhra Pradesh, India. Email: umasakunala.1998@gmail.com

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RESULTS AND DISCUSSION

Grossly, affected chicken showed whitish nodular growth on left lateral aspect of breast region measuring about 4.5×2.5 cm (Fig 1) and revealed cheesy appearance on cut section. No other visible cutaneous lesions or clinical signs were observed. These findings were in agreement with Ahamad *et al.* (2018). Histopathologically, cutaneous mass revealed multiple pyogranulomatous lesions extending subcutaneously (Fig 2). These lesions were characterized by presence of broad fungal hyphae along with spores attached to few hyphae in the necrotic center surrounded by numerous heterophils and mononuclear cells (Fig 3 and 4). Few granulomas revealed formation of langerhan's giant cells towards the periphery of the lesion and moderate to severe fibroblast proliferation (Fig 5). Similar findings were recorded by Sawale *et al.* (2012). Fungal hyphae were sparsely septate, branching type and were demonstrated

as pink coloured hyphae against blue background with periodic acid schiff (PAS) staining (Fig 6 and 7). Similar mycelia was demonstrated by Carrigan *et al* .(1992) and Samatha *et al*. (2021) whereas (Lakshman *et al*., 2009) used periodic acid schiff (PAS) to differentiate zygomycetes hyphae with other fungal hyphae like Aspergillus.

Micrometry of fungal mycelia in tissue sections revealed 9-10µm width and that was considered to be differentiating feature of zygomycetes from other fungal agents (Carrigen *et al*., 1992). On scanning electron microscopy, branched fungal hyphae were evident along with presence of numerous inflammatory cells (Fig 8). Few hyphae revealed



Fig 1: A Whitish cutaneous mass at breast region of a desi fowl.

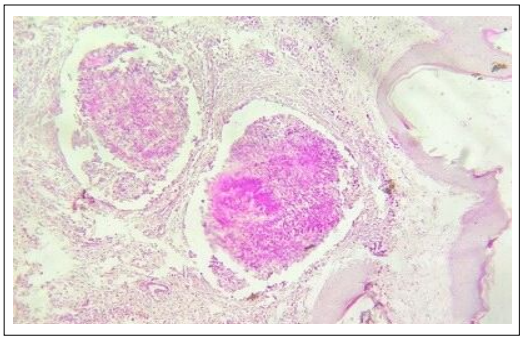


Fig 2: Note multiple pyogranulomas in the cutaneous and subcutaneous regions in tissue sections H and E 100x.

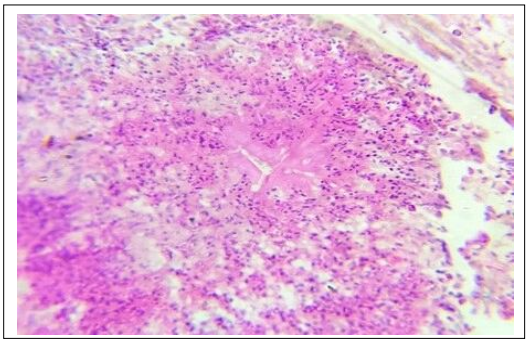


Fig 3: Note branched fungal hyphae in the centre of necrosed area surrounded by numerous Polymorphonuclear cells on higher magnification of pyogranuloma H and E 400x.

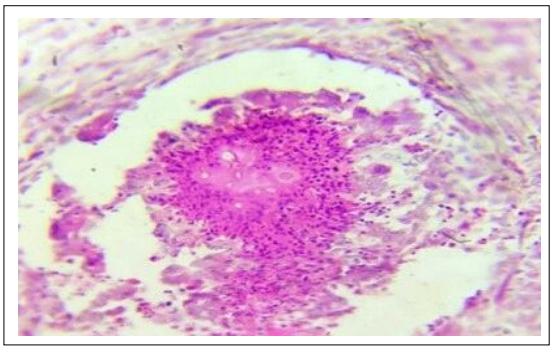


Fig 4: Presence of branched fungal hyphae along with spores in necrotic centre surrounded by numerous PMNs on higher magnification of pyogranuloma H and E 400x.

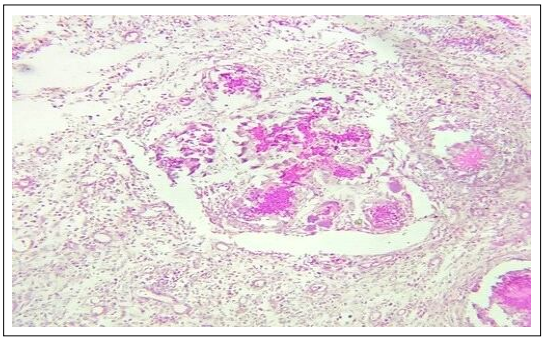


Fig 5: Note Langerhans giant cells towards the periphery of pyogranuloma H and E 400x.

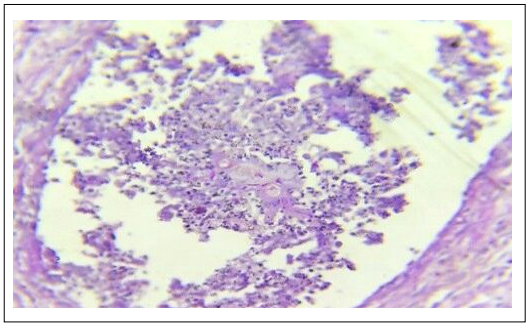


Fig 6: Note pink coloured broad fungal hyphae in the centre of necrosed area on PAS staining of tissue sections PAS 400x.

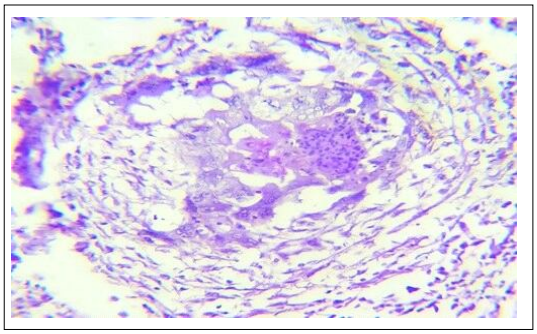


Fig 7: Note pink color fungal hyphae, Langerhans gaint cells, fibroblast proliferation towards the periphery of pyogranuloma PAS 400x.

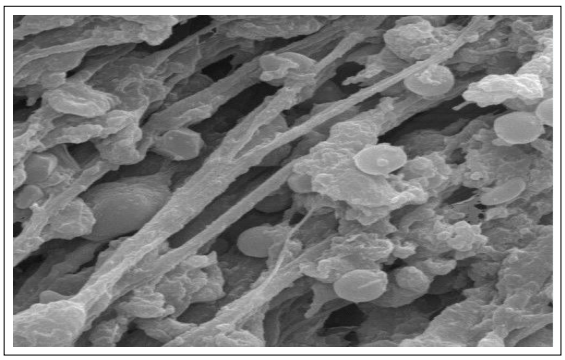


Fig 8: SEM: Branched fungal hyphae and few terminal spores attached to hyphae (arrow) and note fewer inflammatory cells.

terminal spores and these findings were in agreement with (Lakshman *et al*., 2009).

CONCLUSION

The present case report confirms mycotic cutaneous granuloma in a fowl caused by fungi belonging to zygomycetes phylum as the fungal hyphae was broad and branched having few terminal spores.

Conflict of interest

This is to certify that no conflicts of interest on behalf of all authors.

REFERENCES

Ahamad, D.B., Ranganathan, V., Punniyamurthy, N., Sivaseelan, S., Puvarajan, B. (2018). Pathology of systemic aspergillosis in a desi chicken. Shanlax International Journal of Veterinary Science. 5(4): 36-42.

Bozzola, J.J. and Russell, L.D. (1999). Electron Microscopy: Principles and Techniques for Biologists. Second Edition. Jones and Bartlett Publishers.

Carrigan, M.J., Small, A.C., Perry, G.H. (1992). Ovine nasal zygomycosis caused by *Conidiobolus incongruus*. Australian Veterinary Journal. 69(10): 237-240.

Ghule, A. K., Verma, N. K., Cahuhan, A. K., Sawale, P. (2012). An economic analysis of investment pattern, cost of milk production and production and profitability of commercial dairy farms in Maharashtra. Indian Journal of Dairy Science. 65(4). doi: 10.5146/ijds.v65i4.25863.

Lakshman, M., Nagamalleswari, Y., Balachandran, C. (2009). Cutaneous mycotic granuloma (dermatomycosis) in fowl: A pathomorphological observations. Indian Journal of Veterinary Pathology. 33(2): 204-206.

Luna, L.G. (1972). Histological Staining Methods of the Armed Forces Institute of Pathology. 3rd edn. NewYork: Mcgraw Hill Book Co, 12-17.

Samatha, V., Manasa, B.B., Devi, V.R. and Satheesh, K. (2021). Pulmonary mucormycosis in layer birds: A case report. Quarterly Research Journal of Plant and Animal Sciences/ Bhartiya Krishi Anusandhan Patrika. 36(2): 171-172. doi: 10.18805/BKAP314.