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CASE REPORT

A rare case of Aspergillosis in a goat

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ABSTRACT

A goat of 2 years was presented for necropsy examination. Postmortem examination of the animal revealed lungs with multiple firm creamish nodules which were observed in both the lungs. Histopathological examination of lungs revealed a typical pyogranulomatous reaction with fungal hyphae in a central necrotic area. The hyphae were demonstrated by Grocott's and PAS staining. Cultural examination revealed bluish-green colonies on Sabouraud dextrose agar, indicating Aspergillosis. Lactophenol cotton blue staining revealed conical heads with a uniseriate row of phialides on the upper two-thirds of the vesicle.

Keywords: Aspergillosis, goat, lungs, pneumonia

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In India, pneumonia is the biggest cause affecting both organized and nomadic small ruminant flocks. It is the cause of death in goats of all ages, with mortality being more in young kids. According to one study there was 22.8% mortality in goats due to pneumonia in an organised farm[1], the numbers can be much high in unorganised sector. Pneumonia is best understood as a disease complex that involves interactions between the host (physiological and immunological), many agents (bacterial, viral and fungal) and environmental variables. When invasive microorganisms reach a threshold dosage compared to host sensitivity, non-specific defence systems are activated and proliferation takes place, compromising the lung's defence mechanisms. The hallmark of pneumonia is inflammation of the pulmonary parenchyma and surrounding bronchioles[2]. Although fungus infections can occur in healthy animals, they are more frequently opportunistic infections in immunocompromised and disabled hosts with reduced natural defences. Mostly it leads to deadly consequence since the fungal infection can go undetected[3]. The primary source of mycotic infections is spore inhalation, which can result in hemo-lymphatic spread. The primary cause of mycotic pneumonia has been identified as Aspergillus species, *Cryptococcus neoformans*, *Pseudoallescheria boydii* and Candida species[4,5].

A two-year-old male carcass with a history of respiratory trouble, dyspnea, and a moderate fever before death was brought to the Postmortem Hall, Department of Veterinary Pathology, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana. A thorough necropsy was performed. Swabs from the lungs were taken aseptically, processed and cultured on Sabouraud dextrose agar (SDA). For mycological analysis, the plates were inverted and incubated for a week at 25 to 35^{O}Celsius. Using a drop of lactophenol cotton blude stain (LPCB), the fungal growth observed on SDA was teased on the clean glass side, covered with glass slip and under a light microscope[6]. Tissue sample from lungs were collected in 10% neutral buffered formalin as per the method described[7]. 4 μm tissue sections were cut using a semi-automatic microtome (Leica, Germany) and stained with hematoxylin and eosin (H&E)[7]. Grocott and Periodic Acid Schiff (PAS) staining was used to duplicate paraffin slices to reveal the presence of bacterial or fungal etiological agents[8].

Macroscopic lesion of lungs showed multifocal, often exhibiting purple-consolidated regions with white or cream colour nodules varied from 2-4 cm containing semi-liquid white or cream colour pus (Fig. 1). Multiple firm, cream to yellow-colored granulomas that ranged in diameter from a few millimeters to several cm (5 mm to 2 cm) were seen throughout the consolidated lungs. Similar findings were reported in lungs of goat and sheep[1]. Blue-green to grey mould colonies with suede-like surface consisting of conidiophores on SDA plates were observed (Fig. 2A), indicating *Aspergillus*. The fungal colonies of Aspergillus on staining by LPCB stain revealed conidial heads with a uniseriate row of phialides on the upper two-thirds of the vesicle (Fig. 2B) in agreement with earlier study[9]. On histological examination, the lung revealed pyogranulomas (Fig. 3A), core necrotic regions with a large no. of neutrophils and eosinophils and the epithelioid macrophages, lymphocytes and plasma cells that surround them. Aspergillus species have slender hyphae (Fig. 3B) that vary in

Fig. 1. Lung surface showing cream coloured, multiple, firm, granular nodules of different size.

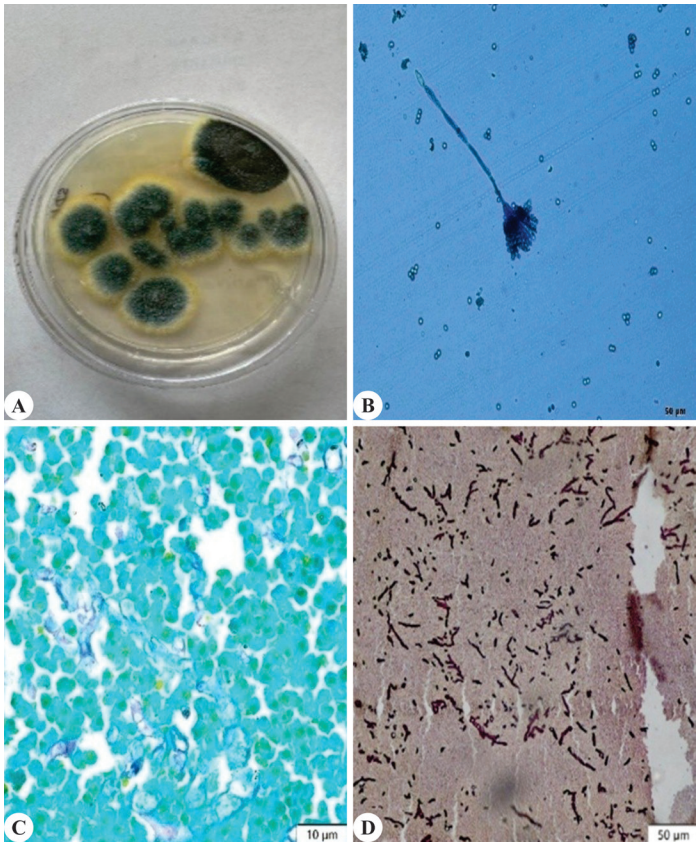

Fig. 2A. Showing isolation of fungus on SDA agar Blue-green, powdery and pale yellow on the reverse. **B.** Lactophenol cotton blue staining showing the spores of fungus, suggestive of *Aspergillus* (LPCB x50 µm). **C.** Lung showing unstained fungal hyphae (Periodic acid-Schiff x10 µm). **D.** Lung showing black colour fungal hyphae (Grocott methenamine silver x50 µm).

width from 3 to 12 µm. They may be identified by their distinct separation, dichotomous branching pattern and parallel edges and it has been confirmed by periodic acid-Schiff[10] (Fig. 2C) and Grocott methenamine silver (GMS) stain method (Fig. 2D). Histopathological analysis of the lung tissue of infected sheep and goats revealed that the hallmark of mycotic pneumonia was the presence of multiple focal mycotic granulomas, septate hyphae of Aspergillus scattered in the centre of the granuloma, surrounded by polymorphonuclear cells, lymphocytes and macrophages, as well as proliferation of fibrous connective tissue[11]. The present findings in this study were in accordance with previous observations of[1,12,13].

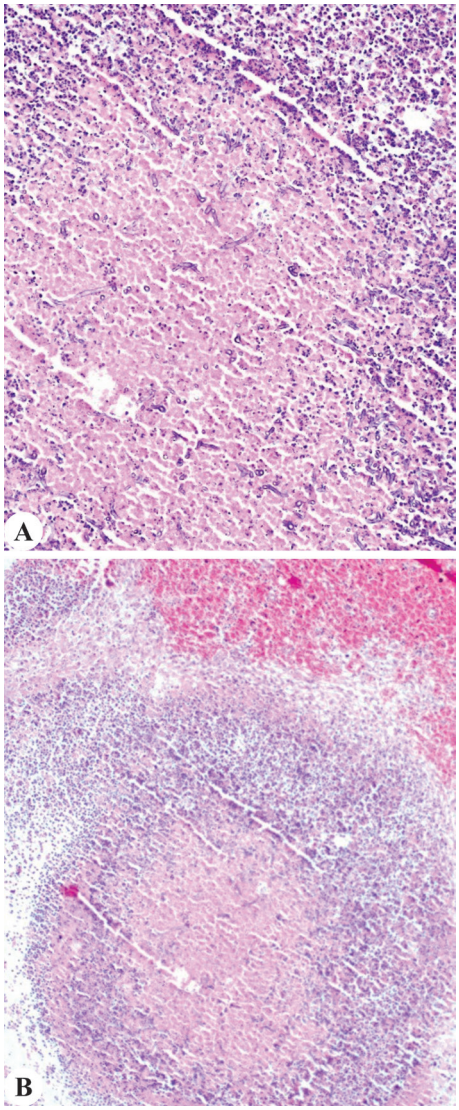

Fig. 3A. Lung showing granuloma formation with a necrotic centre surrounded by polymorphonuclear cells (H&E x100 µm). **B.** Lung showing granuloma formation with a necrotic centre containing fungal hyphae surrounded by polymorphonuclear cells especially neutrophils macrophages, lymphocytes and multinucleated giant cells (H&E x50 µm).

CONCLUSION

The present case was diagnosed as Aspergillosis in goat after taking into consideration of gross lesions,

histopathological examination, special staining and cultural findings.

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