



## Pathology of Mycotic Tracheitis in Poultry

Rajinder Singh Brar, Rahul Kumar, Amit Ajit Chogule and  
Harmanjit Singh Banga

*Department of Veterinary Pathology, Guru Angad Dev Veterinary and Animal Sciences  
University, Ludhiana, Punjab, INDIA*

*\*Corresponding author: R Kumar; Email: rahulpoultrypatho@gmail.com*

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### ABSTRACT

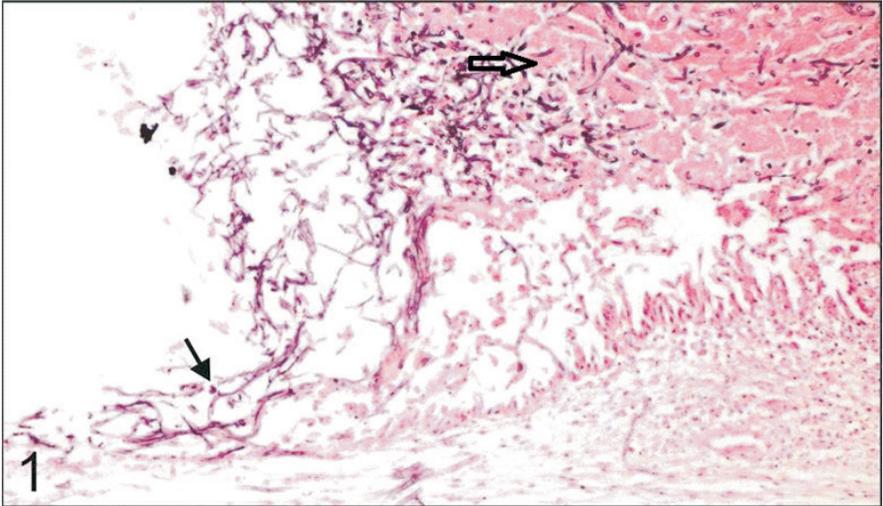
A case of mycotic tracheitis in an adult Rhode Island Red bird of about 20 weeks of age is described here. The bird had a history of dyspnoea, gasping and was dull prior to death. On postmortem examination lungs showed multiple circumscribed granulomatous nodules in the lungs and the trachea was occluded with caseous plugs. Microscopically there were fungal hyphae penetrating the tracheal mucosa together with a caseative plug having central necrotic mass adhering to the tracheal wall, foci of severe congestion and hemorrhage, fungal granuloma surrounded by mononuclear cell infiltration, giant cell, fungal hyphae and fibrous tissues were recorded. The fungal hyphae were also demonstrated by Grocott's methanamine silver stain.

**Keywords:** Grocott's Methanamine Silver Stain, Mycotic Granuloma, Poultry, Tracheitis.

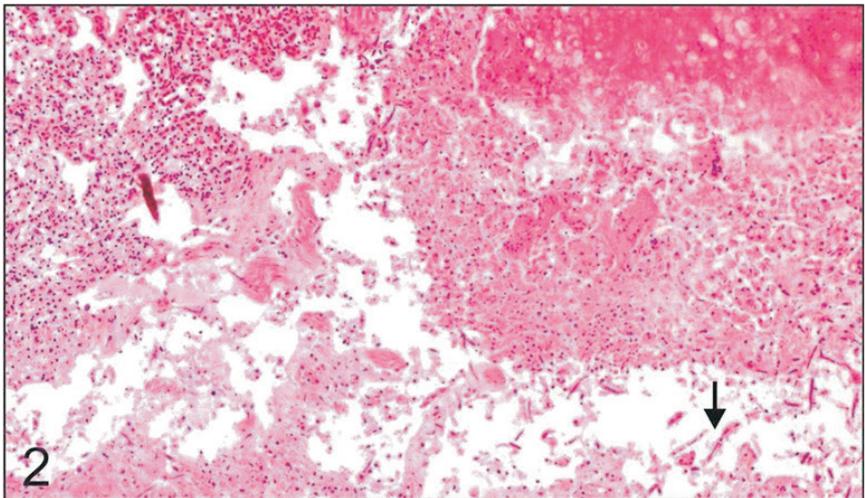
Inflammation of trachea is important because of its potential to obstruct airflow and to lead to aspiration pneumonia. The trachea is commonly affected by infectious diseases of respiratory tract and their extension from the lungs and larynx. Many of the wide variety of fungi found in the poultry houses may be present in the respiratory tract of chickens. To date, fungal infections are commonly been reported to cause acute and severe infections with high mortality in various young avian species. Infection by fungal species is a growing problem in both birds and mammals, including humans (Piérard *et al.*, 1991). Since the symptoms and gross lesions of avian mycoses are fairly nonspecific, most cases remain undiagnosed, or are misdiagnosed as neoplasia or inflammation of uncertain aetiology (Buckley *et al.*, 1992), (Carrasco *et al.*, 1993) and (Jensen *et al.*, 1996)). In the absence of specific findings, most mycotic infections are not recognised until the histopathological evaluation is completed as part of a postmortem examination (Carrasco *et al.*, 1993) (Phillips and Weiner 1987), (Kaufman 1992) and (Carrasco



*et al.*, 1998). Mycotic pneumonia is an important disease affecting the chicks, however, there are scarce reports related to mycotic tracheitis till date. The present report describes pathology of mycotic tracheitis in an adult poultry bird.



**Figure 1.** Section of trachea showing penetrating black colored fungal hyphae (arrow) in the mucous membrane along with caseative plug (thick arrow) attached to the wall of trachea. Grocott's methanamine silver stain. 20X.



**Figure 2.** Section of lung showing hemorrhage, granuloma formation with central caseous mass surrounded by mononuclear cell infiltration, giant cell, fungal hyphae (arrow) and fibrous tissue. There is caseous mass heavily infiltrated with infiltrated cells (thick arrow). H&E. 20X

## MATERIALS AND METHODS

An adult Rhode Island Red bird of about 20 weeks of age was submitted for necropsy to Poultry disease diagnostic laboratory of Department of Veterinary Pathology, GADVASU, Ludhiana, India. A thorough necropsy of the bird was conducted and representative tissue pieces of lung and trachea were collected in 10% neutral buffered formalin. The tissues were washed overnight in running tap water, dehydrated in ascending grades of alcohol, cleared and then embedded in molten paraffin. Paraffin embedded tissue sections of 4 -5  $\mu\text{m}$  were obtained as described by Luna and stained by routine hematoxylin and eosin staining method as well as by Grocott's stain for demonstration fungus in tissue sections.

## RESULTS AND DISCUSSION

Gross examination of the dead bird revealed multiple circumscribed granulomatous nodules in the lungs and caseous plugs in the trachea. These observations corroborated well with the earlier reports of mycotic tracheitis (Singh *et al.*, 1993) (Karunakaran *et al.*, 2010) and pneumomycosis (Islam *et al.*, 2009), respectively in poultry. Histopathological examination of trachea revealed fungal hyphae penetrating the mucous membrane along with caseative plug with central necrotic mass attached to the wall of trachea which might have facilitated the growth of fungus inside trachea. The fungal hyphae and germinating spores tend to cause irritation leading to increased production of mucous. During the expulsion of mucous containing fungus due to coughing or sneezing reflex the fungus can reach to the trachea. The mucous containing fungal hyphae lead to formation of caseous plug which occlude the trachea. Occluded mass had central caseous and degenerating nuclei. Fungal hyphae were observed on the surface of caseous plug, thus, suggestive of spread of infection to the trachea. These hyphae were seen as black colored hyphae in special stain with Grocott's methanamine silver stain, combined with HE stain (Fig. 1). At the site, tracheal epithelium was completely eroded and exposing the submucosa to the hyphae. Microscopic examination of tissue sections of lung revealed severe congestion and hemorrhage, granuloma formation with central caseous mass surrounded by mononuclear cell infiltration, giant cell, fungal hyphae and fibrous tissue (Fig. 2). Most of the lesions observed in lungs were in consonance with that of the reports of Islam *et al.* (2009) and Karunakaran *et al.* (2010). The study suggests that fungal hyphae in lungs can cause mycotic tracheitis leading to difficult respiration and death.

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