



# Histopathological diagnosis of visceral gout in desi fowl

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## Abstract

This case report, describes the gross and histopathological lesions in two desi fowls that were brought for post mortem examination. Necropsy revealed deposition of chalky white material covering the abdominal viscera and heart. Liver was seen enlarged, liver and kidneys had necrotic foci. Histopathologically, kidney revealed typical foreign body granulomas characterised by a central area of necrosis with light bluish uric acid deposits, margined by giant cells, macrophages, occasional lympho mononuclear cells and a few heterophils. In addition, needle shaped urate crystals were found in liver, kidney and lungs. Based on these gross and histopathological findings it was diagnosed as visceral gout.

**Keywords:** Visceral gout, desi fowl, histopathology

Gout is a common metabolic disorder that results in hyperuricemia and deposition of uric acid or urates in tissues. Gout resulting in kidney damage is caused by multi factorial etiology, which may be attributed to infectious, nutritional, toxic, poor management or possibly a combination of these factors (Sathiyaseelan *et al.*, 2018). Causes of avian gout, can be divided into two categories. One category is the excessive production of uric acid in the body, and the other is the disturbance of urate excretion (Chen *et al.*, 2022). Due to the lack of urate oxidase in poultry, oxidation of uric acid into water soluble allantoin is not possible. Due to excessive uric acid production and disorder in uric acid metabolism, a large amount of uric acid is excreted through the kidneys. This results in kidney damage and dysfunction which causes further blockage of uric acid excretion leading to uric acid poisoning, uric acid crystal deposition and gout. Therefore, poultry are more prone to hyperuricemia and gout (Zhang *et al.*, 2018). There are two forms of gout in poultry a) Visceral gout: an accumulation of urate crystals in various organs and b) Articular gout: an accumulation

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of urate crystals in joints, ligaments and tendon sheath. Visceral and articular gout have been reported in pheasants, Japanese quails, ducks, aviary birds and chicken (Nayak *et al.*, 1988, Rao *et al.*, 1993). The present paper describes the histopathological diagnosis of visceral gout in a desi bird.

Dead birds were brought for post-mortem examination at Animal Disease Diagnostic Laboratory, Vijayawada. Post mortem examination was conducted and tissue samples from affected organs were fixed in 10% neutral buffered formalin. The formalin fixed tissues were subjected to routine histopathological processing and paraffin embedding. Sections of 5 micron thickness were made and stained with routine Haematoxylin and Eosin (H & E).

Post mortem examination revealed deposition of chalky white material all over the abdominal viscera (Fig.1). Grossly, liver showed mild enlargement with deposition of chalky white material on the surface. Deposition of chalky white material on heart and spleen was also observed. Histopathologically, kidney showed severe glomerular and tubular degenerative changes and necrosis associated with urate deposits surrounded by inflammatory cells. The urate crystals were surrounded by granulomatous inflammation with numerous epithelioid macrophages, multinucleated giant cells, lymphoplasmacytic cells, and heterophils (Fig.2 & 3). In liver, degenerative changes and necrosis with needle like urate deposition along with inflammatory cells were evident. A few areas of the liver sections revealed fatty degeneration, periportal fibrosis, focal aggregation of lymphocytes together with severe necrosis, and infiltration of mononuclear cells (Fig. 4). Microscopic examination of lungs revealed the presence of a few areas composed of amorphous accumulations of eosinophilic material bordered by fibrous tissue (Fig. 5). As the tissues were fixed in 10% formalin special stains for urate crystals was not performed. Staining with non aqueous dye solution, namely 0.5% alcoholic eosin Y was used to demonstrate the urate crystals in formalin fixed tissues. The paraffin sections were progressively dipped through various reagents as follows, xylene (20 seconds); xylene-absolute alcohol



Fig.1 Chalky white material covering the abdominal viscera

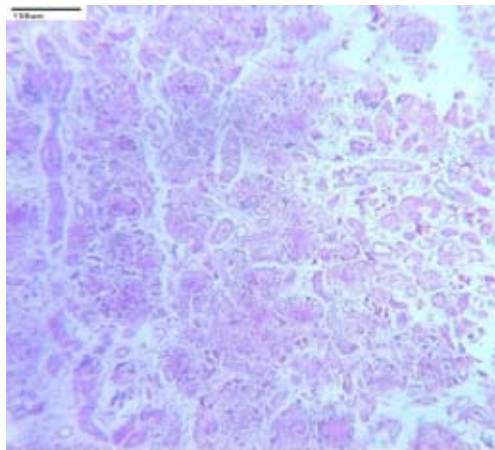


Fig.2 Kidney :Urate deposits surrounded by granulomatous inflammation (H&E x 100)

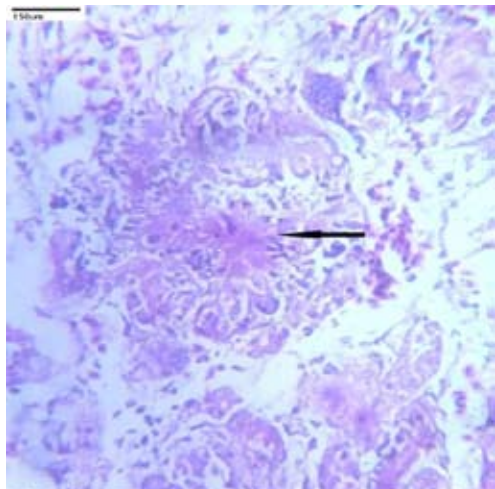
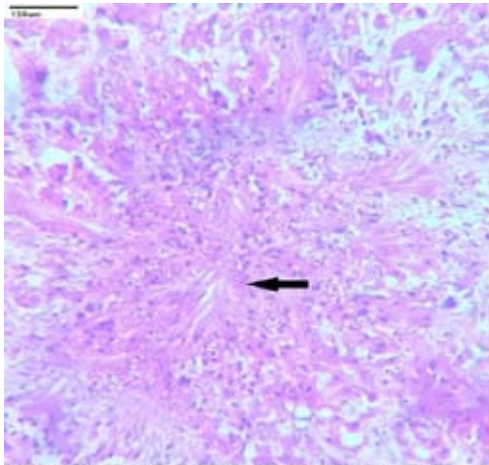
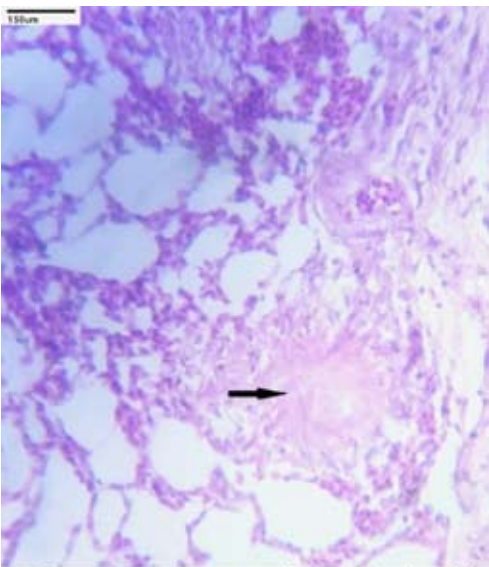


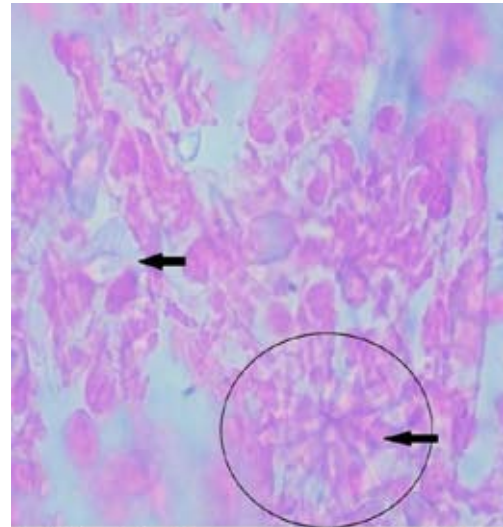
Fig.3 Kidney :Urate deposits were surrounded by granulomatous inflammation (H&E x 400)



**Fig.4 Liver: Necrosis with needle like crystal deposition (H&E x 400)**



**Fig.5 Lung: Amorphous accumulations of eosinophilic material bordered by fibrous tissue (H&E x 400X).**



**Fig.6 Kidney : Rosette arrangement of urate crystals 0.5 % alcoholic eosin Y x 1000**

kidney damage and might be attributed to high concentration of protein and calcium in diet.

### Summary

A case of visceral gout in desi fowl and its histopathological observations are recorded.

### Conflict of interest

The authors declare that they have no conflict of interest.

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