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## Visceral and articular gout in aseel birds

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### Abstract

Carcasses of two-years-old two male Aseel birds were presented to the Department of Veterinary Pathology, Veterinary College, Bidar, Karnataka. A Post-mortem examination was conducted and grossly white urate deposits were noted on the heart, lung, liver, kidney, ureters, and joints. For histopathological examination samples from the liver and kidney were collected and preserved in 10% neutral buffered formalin. The tissues were processed and stained with haematoxylin and eosin staining method as per standard protocol. Based on gross and histopathological findings it was confirmed as both visceral and articular gout in aseel birds.

**Keywords:** Aseel, gout, urate crystals, tophi, histopathology

### Introduction

Gout is a common metabolic disorder characterized by the retention of uric acid or urates in the body tissues. Gout has a wide range of etiological variables that contribute to kidney injury. These factors are categorized as dietary, metabolic, managemental, infectious, and other causes such as mycotoxins (Mudasir *et al.*, 2017) <sup>[1]</sup>. Higher dietary protein intake results in an excess generation of uric acid (Li *et al.*, 1998) <sup>[2]</sup>. Visceral and articular gout are often two distinct symptoms that can occur simultaneously or separately. Visceral gout is the build up of uric acid in any tissue, including the kidney, liver capsule, air sacs, and the serosal layer of the pericardium. (Amaravathi *et al.*, 2015; Sahu *et al.*, 2017) <sup>[3, 4]</sup> Articular gout is characterized by urate build up in the tendon sheath and synovial capsule of the joints, especially in the foot and hock. (Mudasir *et al.*, 2017) <sup>[1]</sup>. The present necropsies describe a rare case of both articular and visceral gout in Aseel birds.

### Case history and Observations

Carcasses of two year old two male Aseel birds, weighing around 2.5 kg was brought to the Department of Veterinary Pathology at the Veterinary College in Bidar, Karnataka for a necropsy examination during the month of December 2022. According to the farmer, a total nine birds were rearing in the backyard farming system among them two birds were showed the clinical signs of poor appetite and diarrhoea.

### Materials and Methods

Necropsies were conducted on the birds, and multiple gross lesions were recorded in different organs. Samples from the liver and kidney were fixed in 10% neutral buffered formalin, dehydrated in ascending grades of alcohol, and then embedded in paraffin for histopathological analysis. Tissue sections of 4-6 um thickness were prepared by using a microtome and stained with routine Haematoxylin and Eosin method (H & E) to study the microscopic lesions. (Luna, 1968) <sup>[5]</sup>.

### Results and Discussion

#### Gross and Microscopic lesions

The Post-mortem examination revealed that bruises were noticed on the breast region and on opening of the abdominal cavity, the liver showed significant enlargement and congestion as well as white chalky deposits of urate crystals were pasted all over the surface. Pericarditis along with white, chalky urate deposits encircles the heart (Fig. 1).

Kidneys were swollen, deposited with white urates and ureters were mildly dilated with white pasty material (Fig.2&3). White chalky urate deposits were also seen on the cut surfaces of the kidney parenchyma. Both the Lungs were consolidated along with white urate deposits (Fig. 4). Intestine showed haemorrhagic enteritis. Pasty white urates deposits known as tophi were found in the hock joint (Fig. 5). Gross pathological alterations in several organs seen in this investigation were consistent with previous observations (Sathiyaseelan *et al.*, 2018; Sah *et al.*, 1988) [6, 7].

Histopathology of the kidneys revealed that multiple areas of large radiating needle-shaped uric acid crystals surrounded by intense inflammatory reaction were recorded in both cortex and medulla and were completely replaced the renal parenchyma (Fig. 6 & 7). The renal tubules showed degeneration, necrosis and desquamation with the deposition of hyaline casts along with the moderate to severe infiltration of heterophils and mononuclear cells in interstitial space of the both cortex and medulla (Fig. 8).

Histopathology of the Liver showed two to three areas of uric acid crystal deposits along with moderate infiltration of heterophils and mono nuclear cells. Central vein congestion, vacuolar and granular degeneration of hepatocytes were also noticed (Fig. 9). In this study the histopathological changes in the liver and kidney section are similar with the previous reports (Behtari and Feizi, 2015; Hedao *et al.*, 2018; Lakshmi Namratha *et al.*, 2019) [8, 9, 10].



**Fig 3:** White urate crystal deposition in the kidney lobes



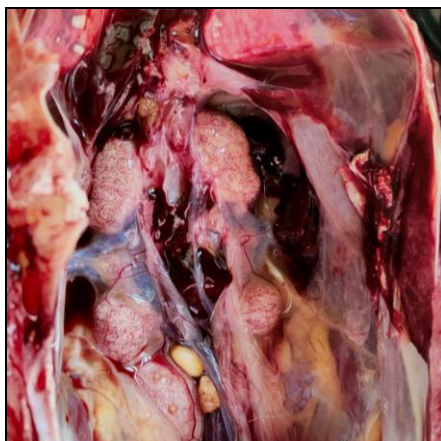
**Fig 4:** Consolidated lungs along with white urate crystal deposits



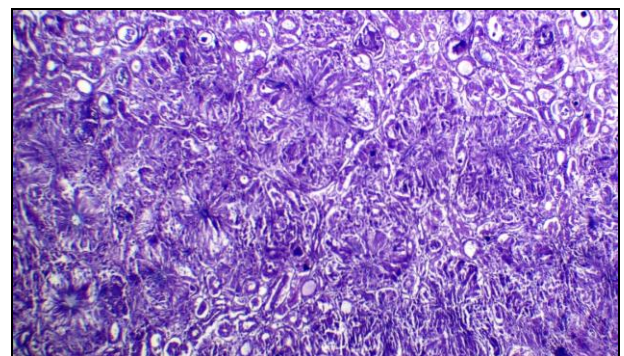
**Fig 1:** Liver and heart showing white chalky urate deposits



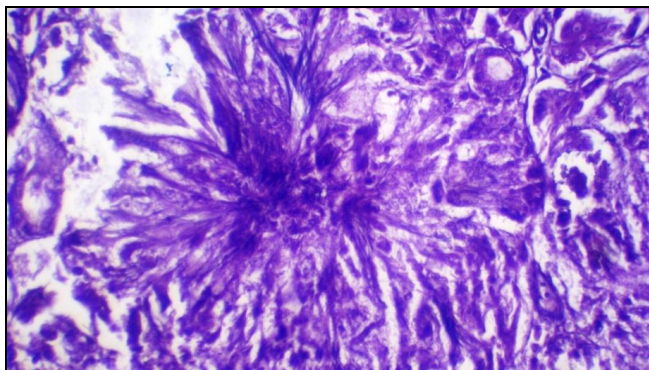
**Fig 5:** Hock joint showing pasty chalky white urate deposits



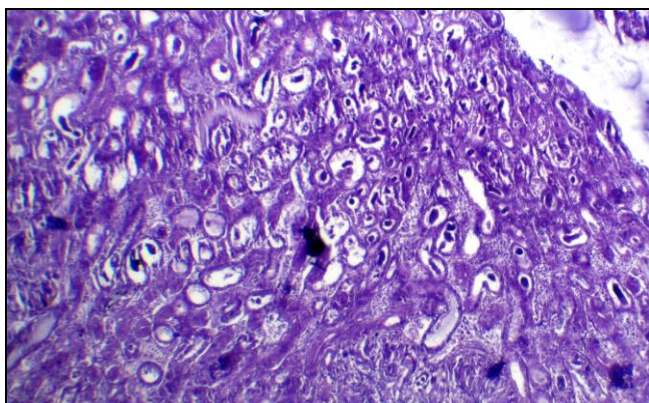
**Fig 2:** Kidney lobes showing chalky white urate deposits and mild distended ureters



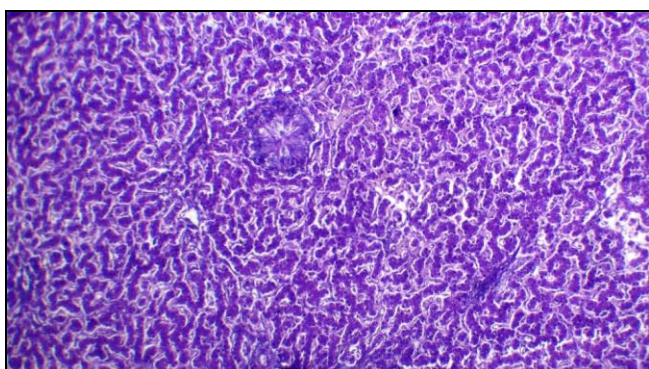
**Fig 6:** Kidneys section showing multiple areas of urate crystals and infiltration of inflammatory cells along with degeneration of the renal tubules (H&E, 100X)



**Fig 7:** Kidney section showing Large radiating needle shape urate crystal (H&E, 400 X)



**Fig 8:** Kidney section showing degeneration, necrosis and desquamation of renal tubules and hyaline deposits along with inflammatory cells (H&E, 100 X)



**Fig 9:** Liver: showing urate crystal deposition, sinusoidal congestion and moderate infiltration of inflammatory cells (H&E, 100 X)

## Conclusion

In India, gout is still one of the leading causes of high rates of mortality and morbidity in poultry, which results in significant financial losses for the farmers. There may be several reasons for gout. An excessive amount of uric acid in the body causes gout. Small crystals of urate are formed as a result of the overproduction of uric acid and settle in the tissues and joints. These crystals damage joints and inflict severe pain when they become lodged in the joints. Additionally, they can lodge in the kidney, impairing renal function and perhaps hastening mortality in poultry.

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