

VISCERAL GOUT IN A LITTLE PENGUIN CHICK (*Eudyptula minor novaehollandiae*) (CASE 884.1)

CASE HISTORY

An adult little penguin and two chicks were found outside the opening of a penguin burrow. The plumage of the adult and chicks is coated with dirt and caked faeces. The plumage of the adult bird may be lightly contaminated with an oily substance. This chick had apparently been trapped with its head between rocks outside the burrow. Upon examination the bird was in extreme respiratory distress and it died before treatment could be initiated.

The remaining chick was treated with subcutaneous fluids and then hand raising protocols were initiated. The adult bird appeared to be in good physical condition and was washed and recovered.

GROSS PATHOLOGY

External examination: The plumage is diffusely coated with a crusty brown/black material. The conjunctivae appear mildly swollen.

Hydration: good, Muscle mass: good

Fat deposits: good subcutaneous and pericardial fat deposits

Internal examination: The epicardium is diffusely coated with a film of white material. The renal parenchyma is diffusely pale, mottled and friable. The stomach is distended with brown slurry. Small flecks of similar looking material coat the oral cavity and proximal tracheal mucosa. The pulmonary parenchyma is mildly congested. The ovary is very small and inactive.

The white material coating the surface of the heart is refractile when examined using light microscopy and polarised light.

HISTOPATHOLOGY

Lesions are not evident within the following tissues: oesophagus, myocardium, brain, adrenal gland, pancreas, small intestine, trachea, proventriculus.

Cervical spinal cord: Nerve cell bodies have foamy cytoplasm and occasionally have cytoplasmic vacuoles.

Bone marrow: The bone marrow is highly cellular. Granulopoiesis is prominent within the marrow cavity.

Skin: Bacteria and brown granular material are evident within the keratin surrounding feather follicles and within epidermal sulci.

Bursa of Fabricius: The bursal follicles are mildly

involved and they contain large quantities of pyknotic and karyorrhectic debris. Tingible body macrophages are evident throughout the bursal follicles.

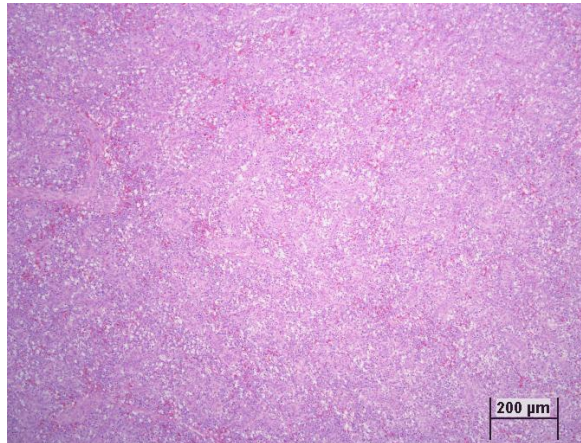


Fig 1. Spleen. H&E 10x

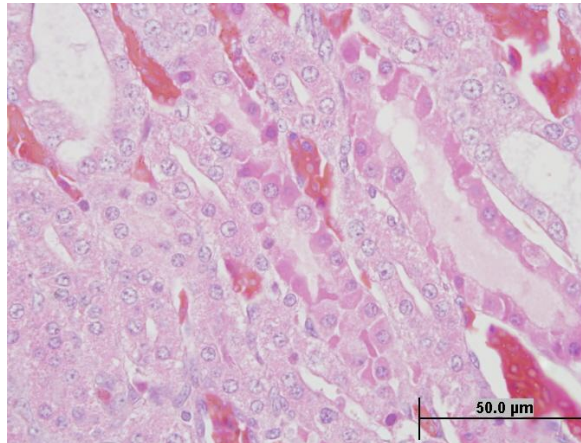


Fig 2. Renal tubules. H&E 100x

Cloaca: The cloacal lumen contains bacteria and black granular material.

Lung: The pulmonary parenchyma is mildly congested

Oesophagus: The ingesta contains numerous black granules.

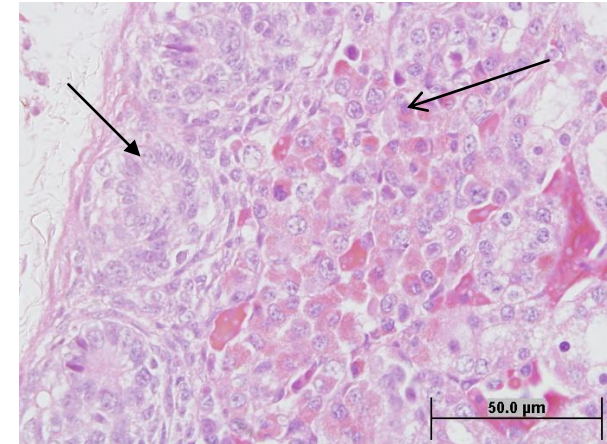


Fig 3. Kidney, germinal rests (closed arrow) and granulopoietic tissue (open arrow). H&E 100x

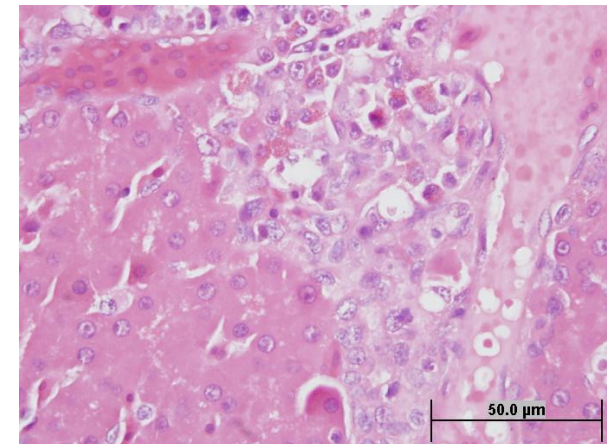


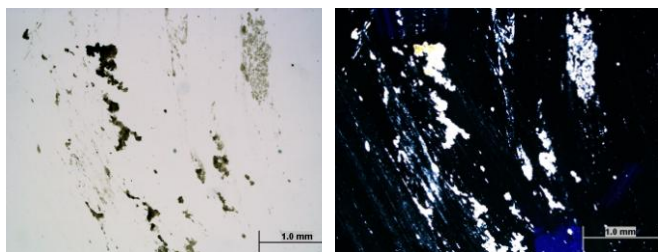
Fig 4 Hepatic portal triad. H&E 100x

Task: Describe the changes in the sections above and, with reference to history and other post-mortem findings, comment on their significance.

Kidney: The subcapsular renal parenchyma contains abundant germinal rests and granulopoietic tissue. Multifocal renal tubules have epithelial cells that are shrunken, have hypereosinophilic cytoplasm and condensed nuclei. Some of these tubules contain luminal eosinophilic globular material. Affected tubules are primarily located at the corticomedullary junction. Small numbers of tubules also contain one or two necrotic epithelial cells.

Liver: The sample is fragmented (microtome artefact). Portal tracts contain granulopoietic tissue.

Spleen: The splenic parenchyma contains no discrete lymphoid follicles. Pyknotic and karyorrhectic debris are scattered throughout the splenic interstitium



a) b)
Fig 5. Urate crystals under normal (a) and polarized (b) light microscopy. (see case 711.1)

BACTERIOLOGY

Lung: *Escherichia coli* 3+

Liver: No growth

MORPHOLOGICAL DIAGNOSIS

Acute renal tubular necrosis

Visceral gout

Terminal aspiration of ingesta

Acute lymphoid necrosis - bursa of Fabricius, spleen

COMMENTS

The white material coating the heart is uric acid, as confirmed by light microscopy with polarised light. The chick's kidneys were diffusely pale and acute necrosis of tubular epithelium was evident upon microscopic examination. Renal disease has most likely resulted in a build up of uric acid in the blood stream with subsequent deposition on body tissues, such as the surface of the heart. Renal disease in young birds can result from dehydration,

shock or toxic insult. The bird was well hydrated upon post mortem examination; however, the insult to the kidneys can occur several days prior to death. Lymphoid necrosis is a non-specific finding that can accompany bacteraemia, viraemia, toxic insult, or excessive quantities of endogenous or exogenous corticosteroids.

It is not clear whether the bird or the adult penguin were contaminated with oil. Behavioural and physiological effects have been noted when some species of birds are experimentally oiled with as little as 50 ug of crude oil.

Toxicologic testing would be required to determine if exposure to hydrocarbons occurred and whether the renal lesion can be associated with hydrocarbon residues in the tissues.

Germinal rests are a fragment of embryonic tissue retained after embryonic development. In humans, two distinct categories of nephrogenic rest are recognized on the basis of their topographical relation to the renal lobe. Intralobar nephrogenic rests occur within the renal lobe and develop as the result of events early in renal development. Pelilobar nephrogenic rests are confined to the periphery of the renal lobe and are related to late kidney development. Germinal rests are typically incidental findings, though nephrogenic rests can be precursors of Wilms tumour, or nephroblastoma.

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