

PATHOLOGY REPORT
Australian Registry of Wildlife Health

Taronga Zoo

Status: Final
Report Date: 23/01/2020

Submitter

Submission Details

WIRES - Northern Rivers P.O.BOX 1356 LISMORE 2480 Business Phone: Mobile Phone: Fax: Email: wiresnr@wiresnr.org	Submitter's Ref: Date Submitted: 13-Dec-2019 00:00:00 Date Received: 13-Dec-2019 00:00:00 Lab. Case/Spec ID: Previous Lab. ID: Specimen ID: TARZ-13390.1
--	---

Animal Detail

Epidemiology

Animal ID: ARKS No: Rehab ID: Animal Name: Marmalade Species: Macropus rufogriseus banksianus Common Name: Red-necked Wallaby Sex Class: Female Age Class: Pouched Young Enclosure No:	Number Dead: 1 Number At Risk: Number Sick: Number Submitted: Date Died: 12-Dec-2019 00:00:00 Death Circumstance: Found Alive and Died
---	---

Parameter measurements were not included in report.

SPECIMEN HISTORY

Marmalade – Red-necked Wallaby Female <ul style="list-style-type: none">• Came into care 24/9/19 with Renata Phelps and Don Metcalfe – WIRES Northern Rivers• From Nimbin, NSW – Circumstances not known. Assume MVA and mum killed.• Initial weight 850g – upper 0.6 (upper velvet)• Marmalade has been a somewhat interesting and slightly different "case". After about 2-3 weeks in care she started to be "grumpy"... we were wary of the illness but there were no other particular symptoms so we put her hissing and kicking down to personality.... The grumpiness probably continued from late October to mid November• Mid November she presented with symptoms more typical of the illness... panic attack, hypersensitivity, trembles.... we treated her with doxycycline but she kept getting the regular "1pm syndrome" (tremors at the same time each afternoon) so we also did 5 days on Flagyl concurrently and continued the Doxy for a further 4 days.• What is interesting is that once we started treatment of her she was a completely different personality... no more hissing etc.• 21st Nov – 1690g• 29th Nov – 1915g• 8th Dec - After 5 days symptom free we stopped the antibiotics. She seemed very healthy, but like others before her she become a sucker... her pouch and her best friend's ear....

• 12th Dec - After 3 days off the treatment we found her having a panic attack at around 11am. She was terrified of us. We caught her and put her in a pouch and she seemed fairly calm. Checked her in half hour and she had fairly mild tremors (leg shakes) so we gave her Diazepam and started Doxy again. Checked her again in 1/2 hour and she was sedated and OK. Checked again in 1 hour and she was dead.

So Marmalade is one of the first joeys where we felt there must have been a low level issue for some time prior. She was also unusual because she died very unexpectedly. The ones that die usually have major fits/seizures and we assume they die from heart attack. But Marmalade didn't really have a "racing heart".

Note that she has not gone down to our release yards but had been housed in a large snake-proof enclosure. Companions with two swamp wallabies, another red-neck wallaby and a red-necked pademelon. None of the others display any symptoms.

Hasn't been any sign of ticks on these joeys. There are some mosquitos but not as many as wet years

Temperatures have been high 30s however we have been evacuating them on the hot days into an air conditioned room (then back to their enclosure in the evenings and mornings when cooler).

Milks – Raised on Wombaroo with impact.

GROSS PATHOLOGY

Gross examination by Andrew Hill, Currumbin Sanctuary Wildlife Hospital.

Case #91170

Date 13/12/19

Species Red-necked Wallaby

Submitter Renata Phelps

Juvenile furred joey with no evidence of external trauma.

Body Condition Score: 7/10

Weight: 2003g

External exam

Head (Ears, Eyes, Nostrils & Oropharynx): Eyes and nostrils clear, no dental issues, glottis clear, ears clear

Integument: NAD, no ticks/external parasites evident, no signs of fly bite/irritation

Musculoskeletal exam: NAD

Abdomen: NAD, half gut fill

Cloacal/pouch NAD.

Internal exam

Spleen: Six 3-14mm confluent petechiae diffusely distributed on surface of spleen. Spleen appeared otherwise normal and did not appear rounded or enlarged.

Kidney: mild congestion, otherwise nad

Reproductive tract: NAD

Liver: All lobes normal in shape and size with diffusely pale areas

Lungs: Marked generalised congestion with patchy haemorrhagic and pale areas

Heart: Mild haemorrhage in pericardial sac with variable erythema/congestion of epicardium interspersed by pale areas

Skull: mild accumulation of blood over dorsal surface of skull

Brain: patchy erythema/congestion of meninges, brain appears normal

GIT: single 3cm maroon discoloured segment of small intestine, ingesta appeared to be passing through normally with normal faecal pellets developing in colon, no other abnormalities

LNs: mesenteric lymph node mildly enlarged (included in formalin with GIT sections), others appeared normal

Requested aseptic frozen sampled stored at -80C at CWH

Formalin fixed tissues and cytology to be express mailed to Registry on Tuesday 17/12

HISTOPATHOLOGY

Tissues are generally well preserved.

Heart (slide 1A, D): The myocardium is diffusely congested and multifocal areas of subendocardial haemorrhage are present throughout the left and right ventricles.

Kidney (slide 1B, 1C): Randomly scattered clusters of renal tubules are dilated and lined by variably attenuated or plump, karyomegalic epithelial cells with slightly basophilic cytoplasm and coarse to marginated chromatin. Rare tubules are lined by necrotic epithelial cells with luminal clusters of pyknotic debris and small numbers of neutrophils. Occasionally small numbers of lymphocytes and rare multinucleate giant cells cluster in the surrounding interstitium. Rarely, the walls of small blood vessels are smudged by fibrin and lined by plump endothelial cells.

Lung (slide 1C): The pulmonary parenchyma is diffusely congested and small to moderate numbers of extravasated erythrocytes are frequently present in alveolar spaces. The tunica adventitia of pulmonary arteries and arterioles is variably loosened by clear space (oedema) and delicate strands of fibrin are occasionally adhered to the surface of alveolar septa (hyaline membrane). Small caliber arterioles are multifocally lined by plump, hyperchromatic endothelial cells and obscured by fibrin.

Lymph node; NOS (slide 1C): Lymphoid follicles are mildly expanded with distinct germinal centres marginated by a darker mantle zone. Small numbers of macrophages and neutrophils are present in subcapsular sinuses.

Brain including cerebral cortex, hippocampus, internal capsule, cerebellum and brainstem (slides 1F-H): Neuronal cell bodies within the superficial cortical lamina are rarely flanked by increased numbers of glial cells (satellitosis). Blood vessels in the meninges and cerebral cortex are mildly congested and occasionally lined by plump endothelial cells.

No significant lesions are present in the following tissues: Spleen (slide 1A, 1C), liver (slide 1A), adrenal gland (slide 1B), stomach (slide 1C, 1E), ovary and uterus (slide 1D), urinary bladder (slide 1D), small intestine (moderate autolysis, slide 1E), colon (moderate autolysis, slide 1E)

DIAGNOSIS

Kidney: Moderate, multifocal, acute tubular necrosis

Lung: Diffuse pulmonary oedema and congestion with acute, multifocal haemorrhage

Heart: Mild, acute, multifocal subendocardial haemorrhage

Brain: Rare satellitosis

COMMENTS

Histologic changes are most significant within sections of kidney which are characterised by scattered areas of acute tubular necrosis. Small clusters of tubular epithelial cells are acutely degenerate and occasionally necrotic, rarely accompanied by small numbers of infiltrating lymphocytes and rare multinucleate giant cells. The distribution of

the lesion is limited and the extent to which this change may have resulted in clinically detectable renal disease is uncertain.

Acute tubular injury is an aetiologically non-specific change that may be associated with a variety of ischaemic and toxic insults. The presence of rare fibrinoid vasculitis raises the possibility of a microangiopathy (eg. vasculitis, hypercoagulability, sepsis). No viral inclusions or bacterial colonies are detected; however, an infectious aetiology cannot be excluded.

Consistent with necropsy findings, sections of lung are characterised by congestion and oedema with scattered areas of haemorrhage. Occasionally, fibrin tags form hyaline membranes, suggestive of diffuse alveolar damage and again consistent with a variety of insults including sepsis, DIC, infectious disease, some toxins (eg. 100% oxygen, paraquat), adverse drug and hypersensitivity reactions. The presence of rare fibrinoid vasculitis is again suggestive of a vascular insult.

No significant lesions are present in sections of brain to account for the reported behavioural change and tremors. Sections of heart are characterised by acute subendocardial haemorrhage, consistent with necropsy findings and interpreted as a non-specific agonal change.

The presence of acute tubular injury warrants consideration of a toxic aetiology (eg. toxic plants, drugs). Given the concern surrounding an emerging syndrome, additional testing (RNA sequencing) of frozen tissues (minimally brain, kidney, spleen, liver) is additionally warranted in this case.

Pathologist:

Date Finalised: 22-Jan-2020 00:00:00

Copy To: Renata.phelps7@me.com; Andrew Hill; Tiggy Grillo, Ofir, Claire