School of Veterinary Science

Pathology Report

Submitter Ref.: H315	Date Sent: 23/03/2023	Accession No.: **61824**

To: [redacted]
Department of Conservation
Hamilton

Email:

Report Sent: 17/04/2023

Copy To: [redacted]

Species: Cetacean		Breed: Maui dolphin	
Age: Adult		Sex: Male	
Owner:			Type: Post Mortem
ID: H315			Prev. Accn.:
Submitted:	At Risk:	Affected:	Dead:

History

Transcribed from DOC submission form:
"Reported by [member of the public] on morning of 22nd March, discovered on beach on 21/3/23 at Walton's Gap on Awhitu Peninsula."

Gross Findings

This adult male Māui dolphin was presented chilled for necropsy.
The body was in a moderate state of preservation (code 3), with extensive loss of skin over the majority of the body, distension of the body cavities by decomposition gases and minor scavenging damage particularly around body orifices. The left eye was missing, presumed scavenged, and the tip of the tongue had been scavenged. Body condition was assessed as good based on the rounded body profile, although this was slightly artefactual due to distension of tissues by decomposition gas. Blubber depths were less than expected for a healthy animal (dorsal 14mm; lateral 9mm; ventral 9mm). The blubber was not grossly liquefied, but was tinged green due to decomposition; it is possible that the decreased blubber thickness was partly due to autolysis. The body weighed 43.5kg and measured 1.405m (standard length).
The maxillary teeth were mostly worn or missing. The mandibular teeth were moderately worn. The blowhole tissue was palpably distended by gas and the penis partially prolapsed (decomposition changes).
Sloughing of the majority of the skin meant that it was not possible to assess this dolphin for skin impressions or lacerations. The remaining skin was covered in numerous narrow (3-5mm width) gouge marks typical of bird scavenging, with areas of skin fissures (cracking due to decomposition changes). Skin of the fins and flippers peeled off easily.
There was no evidence of external damage involving the underlying, exposed subdermal tissues, i.e. no deep cuts or bruises were present. The intermandibular soft tissues were dark red and gelatinous, with the appearance of bruising, however this is an extremely common change associated with autolysis, known as pseudobruising. A similar dark red glistening band of discolouration was present overlying the occipital area of the skull, also often associated with decomposition. Two similar marks were present in areas not usually associated with autolysis; one just dorsal to the right eye socket and one on the dorsal midline at the level of the pectoral flippers. The eye socket lesion could represent a true bruise associated with damage inflicted by birds as they attacked the eye.
The junction of the first rib and the sternum (sternocostal joint) on the right was enlarged and firm. Dissection revealed that the articulating ends of the sternum and rib were expanded and distorted by large, proliferative boney masses, with hypermobility of the junction.
The heart was flabby, and the lungs were hyperinflated and mottled red/white (post mortem gas production plus congestion). There were large numbers of lungworms within the airways, with scant fluid and no froth. The thoracic cavity contained abundant watery red fluid, as did the peritoneal cavity. The stomach contained a few sticks, small pebbles, gritty sand and a small amount of sea grass, along with two 3-4mm diameter spherical white firm structures (likely fish eye lenses). The bladder was full of cloudy yellow urine.

Histopathology

Histology summary.
Significant lesions are present in the heart, liver, lung, adrenal, spleen and brain. These lesions are characterised by necrosis and inflammatory infiltrate, with intralesional basophilic structures consistent with Toxoplasma tachyzoites, singly and in clusters, visible on routine H&E sections. Immunohistochemistry staining for T. gondii on sections of

liver, spleen, lung and brain confirms the presence of very large numbers of Toxoplasma tachyzoites.
Sternal lesion. Sections of tissue examined represent proliferative collagen and cartilage consistent with a chronic, healed fracture. Inflammation is present but is more consistent with a traumatic origin rather than an infection.

Microbiology

Toxoplasma (B1) PCR:
DNA was extracted from subsamples of brain, spleen, adrenal, heart, tongue, liver, kidney, testis, and lymph node. All tissues were PCR positive.
Bands from the spleen and brain were submitted for sequencing: both sequenced as Toxoplasma gondii.

Diagnosis

1. Fatal disseminated toxoplasmosis
2. Historic rib/sternum fracture with callus formation

Comments

This dolphin had pronounced tissue damage in the lung, liver, spleen, adrenal, heart and brain, which was severe enough to cause death. Immunohistochemistry, a special staining technique targeted at Toxoplasma gondii, showed that the areas of tissue damage contained large numbers of Toxoplasma tachyzoites, which are the rapidly-producing, destructive life stage of this parasite. The presence of these organisms within lesions in the affected organs confirms that this dolphin died of toxoplasmosis.

Further confirmation was sought using molecular tests. PCR assays on lung, liver, spleen, brain, kidney, testis, heart, tongue and lymph node were all positive, and the causal agent was confirmed as T. gondii by genetic sequencing.

The proliferative lesion at the junction of the first rib and the sternum was a bone callus, which has formed as a normal part of the healing process after a fracture. This indicates that this dolphin had sustained an injury to this region in the past, although it isn't possible to work out the cause of that injury.

Date: 27/03/2023	Pathologists: [redacted]
Students:	