

Institute of Veterinary, Animal and Biomedical Sciences
PATHOLOGY REPORT

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TO: Department of Conservation
Marlborough

Species: Cetacean (1)	Sex: Male	Age: Juvenile	Breed: Pygmy Sperm Whal
ID: Juvenile male	At Risk:	Affected: 1	Dead: 1
Owner: Department of Conservation		Prev. Accn.:	Type: Post Mortem

HISTORY

Found washed up at Port Underwood 10th June, 2014 and sent to Massey for necropsy.

GROSS FINDINGS

- Total length: 1730mm
- Upper jaw to origin of dorsal fin: 790mm
- Tip of upper jaw to anus: 1160mm
- Tip of upper jaw to genital slit: 810mm
- Length of genital slit: 75mm
- Tip of upper jaw to insertion of flipper: 400 mm
- Tip of upper jaw to blowhole: 190mm
- Length of gape: 150mm
- Dorsal fin height: 80mm
- Fluke width: 480mm
- Flipper length: 220mm
- Flipper width: 85mm
- Blubber depth (dorsal): 21mm (lateral): 20mm (ventral): 26mm

This was a juvenile male in fairly good body condition, with good blubber thickness and hypaxial/epaxial muscle mass. He was in a good state of preservation within minimal skin sloughing/slippage.

On cut surface the lung parenchyma was deep red and oozed a large amount of white frothy fluid, which was also present throughout the entire trachea.

Both the squamous and glandular portions (compartments 1 and 2) of the stomach contained ~50 nematodes and three squid beaks and a similar number of squid or fish lens. Nematodes measured up to 80-100mm in length and floated free within the stomach lumen. The distal intestine contained multiple segments of well-formed dark brown faeces.

The right testis measured 85 x 20mm while the left measured 80 x 20mm.

Examination of the acoustic structures of the head (acoustic fat, pterygoid sinuses, periotic fat and the melon) revealed no obvious gross abnormalities. The pterygoid sinuses were empty and no parasites were observed. No haemorrhages or blood clots were observed in the brain case or over/in the meninges.

No other abnormalities were noted on gross post mortem.

HISTOPATHOLOGY

- Lung: there is moderate to marked congestion while many alveolar spaces and small numbers bronchi contain fairly dense granular eosinophilic material or lighter, more flocculent pale eosinophilic material (oedema); there are small to moderate numbers of alveolar macrophages.
- Heart: there is patchy congestion of the subendocardial myocardium.
- Liver: there is marked centrilobular congestion. Small numbers of hepatocytes contain small amounts of golden-brown intracytoplasmic pigment (likely iron in the form of haemosiderin) while small numbers of Kupffer cells also contain similar pigment.
- Kidney: there is marked congestion.
- Adrenal gland: there is marked congestion.
- Stomach: within the lamina propria of the non-glandular stomach is a 150 micron-in diameter granuloma composed of a central core of acellular, amorphous to fibrillar material bordered by epithelioid macrophages and multinucleated giant cells. There is congestion of the submucosa in the glandular portion of the stomach.
- Brain: within the cerebellar white matter and overlying leptomeninges there are multiple areas in which erythrocytes and variable amounts of pale eosinophilic granular to globular material is present in the perivascular space; in several of these areas there are also small numbers of neutrophils. Small caliber blood vessels throughout the brain are often surrounded by small amounts of clear space. There is diffuse marked congestion of the neuropil and leptomeninges.
- Sections of skeletal muscle (epaxial and diaphragm), acoustic fat and juvenile testis show no obvious abnormalities.

MICROBIOLOGY

Faecal Swab

(1) No Salmonella isolated

NZVP CASE NO: P14011749

DIAGNOSIS

Unknown cause of stranding

Pulmonary oedema

COMMENTS

This was a juvenile male in good body condition and in a good state of preservation. On gross visual inspection and histological examination of the internal organs including the brain, there was no indication of major trauma or an underlying disease process that help might explain why this animal stranded.

The immediate cause of death is likely pulmonary oedema (fluid in the lung). This is likely due to the stress of stranding and progressive shock as blood starts to pool in the lungs and the cardiovascular system starts to shut down. This results in fluid from the bloodstream (minus the red blood cells) being squeezed/forced out into the small airways of the lung. This fluid then mixes with the small amount of fluid normally present in the lung (this is called surfactant) and the result is the formation of white frothy/foamy fluid and this is termed pulmonary oedema. This will prevent proper oxygen and carbon dioxide exchange in the lung. Pulmonary oedema can be caused by a variety of factors but has been reported in cetaceans that have stranded alive and subsequently died on the beach.

Gross examination of the acoustic structures of the head (including the melon, acoustic fats of the mandible and around the ear, pterygoid sinuses, meninges and brain) did not reveal any haemorrhages of blood clots that have been associated with sonar/seismic injury. Histological examination of multiple internal organs including the brain did not reveal any obvious evidence of gas/air emboli which have also been reported in association with sonar injury.

Histological examination of the brain showed multiple small areas of haemorrhage in the cerebellum and meninges. The haemorrhage is acute (occurred at or around the time of death) and was not associated with any inflammation, spongiosis (fluid accumulation within the brain substance) or injury/death of nearby neurons/neural tissue. In the absence of other evidence of haemorrhage and blood clots within the other acoustic structures of the head and elsewhere in the brain, the most likely explanation would be that the haemorrhage is the result in fluctuations in blood flow/pressure in the brain as a result of stress being stranded and have occurred around the time of death.

Parasites were observed in the stomach but it is common to find parasites in various organs in wild cetaceans. Since this animal was in good body condition it seems unlikely the stomach parasites were doing this animal too much harm. It has been suggested that these nematodes can in fact aid in digestion by invading the soft tissues of prey items. Several squid beaks were found in the stomach of this whale. Squid beaks are very difficult for the whale to completely digest and are often retained in the stomach and then regurgitated after a period of time. There seems to be some debate as to how long squid beaks are retained in the stomach so it is difficult to say how long ago this whale had eaten.

File Nos.:

Students:

Date:

Pathologist:

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