

CC 162

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CC 162 was a female bottlenose dolphin, *Tursiops truncatus*, measuring 195.8 cm long and weighing 162 KG, recovered alive from 9 miles south of Bob Hall Pier, Kleberg County, Texas, on March 4, 1999. She was taken to the Texas State Aquarium for rehabilitation. She was judged to be a young animal, based on length. There was no evidence of significant injury. For a while she appeared to be doing well, but late in her clinical course she developed wart-like and ultimately ulcerating skin lesions. Upon swabbing the blow-hole, a fragment of tissue wiped away. Treatment was of no avail, she died on March 18 (6:00 PM), and was brought to Galveston for necropsy. Serological studies for morbillivirus, reported after death, were positive.

External examination revealed a large ulcerated lesion on lower beak, and many elevated and/or ulcerated lesions on body. Many of these looked like raised abrasions.

Internal examination disclosed many necrotic (dead) appearing small foci (1-2 cm) within the blubber, and on the right side, just dorsal to the scapula, a linear zone of necrotic muscle under the blubber. Much of the muscle was serous; that is, appeared watery or gelatinous. Abscesses were found in the muscle on the left side lateral to the anus, and a large inflamed lymph node was found next to the mammary gland.

The lymph nodes of the neck were very large. The dorsal group alone weighed 54 g, the largest we have seen. Nodes were enlarged throughout the body. The joints were all normal.

The heart was yellowish and soft, suggesting degeneration or necrosis. There were no scars. Both lungs contain many nematodes in the airways and patches of inflammation.

The liver was soft, but otherwise not abnormal. All the other abdominal organs were normal, except for parasites (*Braunina sp*) in the second and third chambers of the stomach. The brain seemed to have too much spinal fluid associated with it.

At the end of the gross examination, before any microscopy was done, the impression was marked diffuse lymphadenopathy (enlargement of the lymph nodes throughout the body), and many lesions suggesting abscesses. Cultures were made of fluid from the body cavities and the blood. *Aeromonas hydrophila*, *Stenotrophomonas (xanthomonas) maltophilia* were recovered from the blood, and *Aeromonas caviae*, *Pseudomonas aeruginosa*, *Stenotrophomonas maltophilia*, and an *enterococcus* were recovered from fluid in the chest.

Microscopic examination was very revealing. First, it confirmed the general impression of sepsis. There was abundant evidence of infection in the lymph nodes and elsewhere. There was a prominent inflammation of the brain and its coverings (meningoencephalitis) and of the spinal cord. This was not a surprise, as meningoencephalitis has been common this season. Unexpectedly however, was the finding of a very large protozoan in large numbers deep in tissues and in lymph nodes. They were also present in the lesion in the blow-hole, and in the grossly necrotic muscle. Even though this animal tested positive for morbillivirus antibodies, no evidence of morbillivirus infection was identified.

Comment: Very enlarged lymph nodes always suggest either a reaction to infection, or lymphoma, a malignancy of the lymphocytes. The lymph node

system is integral to the defense against infection, either viral or bacterial, and the nodes enlarge as their cells are activated to make antibodies and to clear bacteria from the tissue fluids. Whenever we see them, we look for bacteria in the blood and body fluids. In this case, lesions that looked like dead tissue and abscesses raised a strong suspicion of diffuse infection (sepsis), and cultures justified the suspicion. In humans and other land animals, infections are usually caused by one organism at a time. There are exceptions, but one organism at a time is most often the case. In dolphins, however, we commonly find a mixed organism or polymicrobial infection, probably related to the source of the bacteria. I have come to believe that most infections not directly related to an overt injury arise from the intestine. This is the usual home of many bacteria, and we have frequently cultured the same organisms from the intestine and the blood. What may be happening is that the intestine is a target organ for stress, and when the animal becomes heavily stressed, the integrity of the mucosa (lining of the intestine) breaks down, allowing bacteria access to the blood. This allows infection to seed out in any organ. In this case, there was also an infection with protozoa, which we believe came from the water directly, since the lesions are usually associated with the skin and not the internal organs, primarily.

The other impressive feature of this case is how well a wild animal may appear clinically, even though it is dangerously ill. In the absence of clinical signs or symptoms, it is difficult to know what, if anything, to treat, and by the time the problem declares itself, it may be too late to do anything about it. Finally, this animal is the first live animal we have seen with a positive morbillivirus test. This is an important observation, since it confirms that the test may be positive, indicating past exposure, while the animal may have no active disease. With viruses, this usually (not always) means that it would not be infective. Measles, the morbillivirus disease of man, is contagious only during a limited period of the course of the disease.