

PO 355

Daniel F. Cowan, M.D.

Professor of Pathology

University of Texas Medical Branch

PO 355 was a 289 cm long male false killer whale, *Pseudorca crassidens*, who was recovered live from the beach 15.6 nautical miles east of Matagorda town, Matagorda County on November 16. He was put in the recovery truck, which became bogged down on the beach with the tide change. He could not be evacuated until the next day when he was airlifted by Coast Guard helicopter to Galveston. He survived from the 17th to the 20th in the rehabilitation tank at the National Marine Fisheries Service compound. During its time in the tank he had to be supported continuously or else he would roll over and sink. He showed some spontaneous activity, but was not able to swim on his own. He resisted intubation. On the first day in the tank it passed what looked like tissue (mucosa) per rectum. On the day before death it passed large amounts of material resembling fingers from a leather glove, which is still being studied but may be the remains of plants or tunicates, neither of which is natural food for *Pseudorca*. He was a young male, estimated by Dr. Worthy to be less than 2 years old. Teeth were intact and fully erupted. The tongue retained small papillations. Considering the fact he was still alive after his adventures, the volunteers named him "Miracle".

A blood culture drawn on the 17th grew three organisms, *Vibrio*, *Pseudomonas* and *Staphylococcus*. Serum chemistries showed several abnormalities; in particular serum LDH and creatine kinase of about 25 times normal, suggesting substantial tissue injury. He was treated with antibiotics, steroids and supportive care.

Because of failure to feed and because of the passage of odd material, it was

thought that he might have a foreign object in the stomach. Two veterinarians from Texas A&M University in College Station passed an enteroscope into the stomach but had to remove it due to Miracle's uncomfortable behavior. A short time later, Miracle died. His necropsy was begun within 3 hours of death.

On external examination he appeared very thin, with a prominent neck. The limits of the skull were easily seen. The ribs were not yet prominent, however. There were several recent cookie-cutter shark bites, but no other marks or scars, and no evidence of intraspecific aggression. There was some skin loss from the leading edges of the fin, flippers and flukes. Apart from these findings, he was in good condition. This species, while bigger, has more slender proportions than our familiar Tursiops, so it is not entirely clear how much weight had been lost, although it appears to have been a considerable amount.

Internal examination, with a few exceptions, was not particularly revealing. All serosal surfaces and spaces were normal. There was no evidence of pleural or peritoneal inflammation. The stomach contained a large mass of the leathery objects, plus what appears to be the skeleton of a sea-sponge. All these together formed a dense mass. The striking feature otherwise, was the great prominence of all the lymph nodes, including several in the thorax (anterior mediastinum), and even in the eye sockets. They were all benign on histological study, and showed only reactive changes. There were a few other anatomic variations, but nothing to consider disease. The liver was a bit small and yellowish, consistent with the feeding problem and weight loss.

The main finding was striking contraction band necrosis of the skeletal muscle, which is well known to occur in a wide variety of sensitive wild animals, when severely stressed. It results from spastic contraction of individual muscle cells of such force that the inner structure of the cell is disrupted. It is thought to be a major stress reaction, mediated by massive adrenalin discharge. Because of the

circumstances in which it was first recognized, this muscle injury goes by the name of "capture myopathy".

This reaction is enough to account for the massive changes in the serum LDH and CK, and the inability to maintain his position in the water. Once it is established, capture myopathy is commonly fatal.

Although we are not completely finished with our study, I think we can put Miracle's story together as follows. For reasons unknown, Miracle, who for all his size and teeth was little more than a baby, became separated from his mother. He was very far off his normal range. Perhaps disoriented and not knowing any better, he ate what he could find, which included things he could not digest. These accumulated in his stomach and prevented proper emptying. The opening from the second to the third chamber of the stomach is very small, about 3 mm, and it would take a great deal of pressure to force the foreign material through it. Some would go and some would not. Somewhere along the line, he developed a blood infection with several bad organisms. Weakened, Miracle ended up on the beach at Matagorda.

This is the first time I have had the opportunity to examine a false killer whale. I am confident of the pathology, but as this is my first *Pseudorca*, I have no basis of comparison to help interpret things such as the great size of the lymph nodes. I would appreciate it if anyone with experience with the anatomy of *Pseudorca* would advise me.