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MULTIPLE BIRTHS AND CARDIAC ANOMALIES IN THE BOTTLE-NOSED DOLPHIN[1]

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Abstract: A bottle-nosed dolphin, *Tursiops truncatus*, delivered a stillborn male fetus, and three months later, died in dystocia. The second fetus, a female, had a transposed pulmonary artery and aorta and an interventricular septal defect.

CASE REPORT

An adult female bottle-nosed dolphin had been at Sea-Arama Marineworld since 1964. It was 277 cm in length, estimated to be 15 years old, and had no history of pregnancy. In August, 1972, routine length and girth measurements and weight determinations showed a weight gain of 16 kg (228 kg compared to 212 kg in February, 1972). Despite inconclusive radiographic examination a tentative diagnosis of pregnancy was made based on general appearance, weight gain, and history of being with a mature male. At this time the animal's routine show activities, which included a 4.3 m jump (fluke-first re-entry), were restricted to hand feeding demonstrations four times daily, and the male dolphin was removed from the tank.

On December 13, 1972, a stillborn male fetus 73.6 cm in length and weighing 3.2 kg was found with the animal. Following a 30 day rest period, the dolphin was returned to a four per day hand feeding schedule. On March 11, 1973, examination revealed the genital slit to be separated and the cervix dilated 4 cm. A portion of a fetus was visible but could not be extricated manually. Labor was unproductive, resulting in violent thrashing and opisthotonos. The animal became comatose and died on the morning of March 12, 1973.

Post mortem examination revealed hemorrhage and gas in the abdominal cavity, a gravid uterus with a macerated fetus in the left horn, and gangrenous areas in the body and neck of the uterus. *Escherichia coli* was isolated from the fetus, uterus, and abdominal cavity. The left ovary was larger than the right although both contained corpora albicans. A corpus luteum of pregnancy was present on the left ovary and a similar structure believed to be a degenerating corpus luteum was present on the right ovary. The fetus, a female 122 cm long and weighing 12.7 kg, was in posterior dorsal-sacral presentation. The posture was abnormal, however, in that the flukes were deviated anteriorly and dorsolaterally, resulting in the right lateral aspect of the tailstock being presented at the cervix. In addition, 8.53 m of the last 9.75 m of the animal's intestinal tract were involved in a volvulus.

Dissection of the fetus revealed two congenital anomalies of the heart, transposition of the pulmonary artery and aorta, and an interventricular foramen. Some weights and measurements of the dolphin and its two fetuses are presented (Tables 1 and 2).

[1] Presented at the Fourth Annual Meeting of the I.A.A.A.M., Victoria, British Columbia, Canada, May, 1973.

TABLE 1. Weights and measurements of adult female **Tursiops truncatus.**

Parameter	Feb. 14/72	Aug. 25/72	March 12/73
Length		277.0 cm	277.0 cm
Weight	212.0 kg	228.0 kg	
Girth (anterior dorsal fin)		163.0 cm	155.0 cm
(posterior dorsal fin)			150.0 cm
(ant. genital slit)			124.0 cm
(post. genital slit)			91.0 cm
Fluke width			63.5 cm
Flipper length			40.6 cm
Uterus and ovaries			3.6 kg
Right ovary length			3.2 cm
Left ovary length			6.4 cm

TABLE 2. Fetal weights and measurements **(Tursiops truncatus)**

Parameter	Dec. 13/72 Male	March 12/73 Female
Length	73.6 cm	122.0 cm
Weight	3.2 kg	12.7 kg
Girth (anterior dorsal fin)		68.6 cm
Fluke width	15.2 cm	28.0 cm
Flipper length	10.0 cm	20.3 cm
Dorsal fin height	5.0 cm	10.0 cm
Dorsal fin base	6.3 cm	12.7 cm

DISCUSSION

Most fetal growth in cetaceans is reported to occur in the last 2 months of pregnancy.[2] Also, cetaceans seem to differ from land mammals in that species differences in birth size are achieved mainly by altering the rate of growth rather than the length of intrauterine life.[2] Full-term *T. truncatus* are reported to be 81-122 cm in length and weigh 11.3-15.9 kg.[2]

There are no reports of multiple births or cardiac anomalies in *T. truncatus*. Cetaceans are reported to have only one calf per pregnancy, with the gestation

[2] Goforth, H. W. 1969. Naval Undersea Research and Development Center, Hawaii. Unpublished data.

period in *T. truncatus* lasting 12 months.[4] Twinning is extremely rare in toothed whales, except in the genus *Physeter* in which 0.66% of pregnancies are reported to be twins.[1] In baleen whales, twinning has been reported to occur as frequently as in man.[1] In this case, the presence of a corpus luteum of pregnancy on the left ovary and an apparent degenerating corpus luteum of pregnancy on the right ovary, and the sex difference of the two fetuses leave little doubt as to the fraternal (dizygotic) nature of these twins.

The time required for a normal delivery in cetaceans is reported to be relatively short, 20 minutes to 2 hours, whereas stillbirths are reported to last much longer.[3] In view of the intestinal volvulus found at necropsy, it was difficult to distinguish between signs of labor and acute abdominal pain associated with the volvulus.

The cause of the intestinal volvulus could not be determined. Based on personal experience and communications, the occurrence of intestinal volvulus and/or torsion in captive *T. truncatus* has often been associated with certain trained behavior such as the spinning tailwalk and the high jump (John F. Allen. 1972 and G. W. Klontz. 1970. Personal communications). In the reported case, this did not appear to be the cause. Fetal death and resulting septicemia are considered to have preceded the volvulus, and extreme uterine distention due to the septic fetus resulting in intestinal displacement is suggested as a likely cause of the volvulus.

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