

GA 947

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GA 947 was an infant male *Tursiops truncatus* measuring 109 cm long and weighing 16.4 KG. He was recovered dead, Code 2, from 0.2 miles east of Sea Isle light, Galveston, April 20, 1998.

There was no evidence of decomposition, and there was no sign of injury. There were a few bird beak scratches around the left eye; apart from these there were no skin lesions. Age was estimated to be about 2-3 days old. The teeth were not erupted, the vibrissae were still present, and the tongue was heavily papillated. The lateral fetal folds were present, but almost effaced. The dorsal fin was mostly erect, with slight drooping of the tip. The umbilical cord was gone, and the site healing.

Internal examination: The muscles were pale. All organs were normally formed and arranged. There was no evidence of congenital abnormality. The left lung and pleural space were normal. On opening the right pleural space there was an outward rush of air. The pleural cavity contained about 150 ml of clotted blood, and the lung was collapsed around the hilus (the point where the bronchus and vessels enter the lung). On the superior ventromedial aspect of the lung was a laceration or tear measuring 5 cm long. On initial examination, the laceration was closed by fibrin clot, but on manipulation it opened to reveal that the lung was torn through to the opposite surface with only the pleura (covering membrane) intact. The pleura covering the inside of the chest wall was normal, with no evidence of hematoma. There were no rib fractures, but one upper rib, overlying the position of the laceration, while not displaced, seemed nearly torn from its articulation with the spine.

There were no parasites in either lung. All other organs were completely normal. The stomach contained clotted milk, and the intestine contained digested milk. There were no intestinal parasites. The skull, vertebrae and brain were unremarkable.

Comment: In normal respiration, the lungs expand following movement of the chest wall. The lungs are elastic, and left to their own devices, will collapse around the hila. They are held open by a slight negative pressure or vacuum in the pleural space. Movement of the chest wall on inspiration draws the lungs open, and relaxation of the chest wall allows passive expiration. In this baby, the tear of the lung allowed air from the bronchi to escape to the pleural space in inspiration, producing the condition known as pneumothorax (literally, air in the chest) The particular nature of the lung tear allowed air to be sucked into the pleural space by the movement of the chest wall, but did not allow it to be expelled during expiration. The lung tear acted as a one-way flutter valve. The result was a progressive increase in the volume of air in the chest cavity, with collapse of the lung. At some point, enough air was trapped to cause a rise in pressure in the chest cavity. This interfered with circulation and return of blood to the heart. Pressure rose high enough to push the heart toward the other lung. This condition of air in the chest under pressure is called tension pneumothorax. It is well known in human medicine as a complication of chest injury and emphysema. In the case of our dolphin baby, it was the cause of the rush of air we observed on opening the chest. In addition to the pneumothorax a great deal of blood was lost into the chest from the torn lung. This could have been fatal by itself.

It is easy to explain the cause of death in this animal. The main unanswered question is what tore the lung, and when? External features indicate the dolphin was a couple of days old. The presence of milk in the stomach and in the intestine indicates that the baby was able to nurse at least once, perhaps several

times. Histologic examination of the torn lung showed no healing reaction whatever. The injury was so massive and the results so severe that survival could have not have been more than an hour from the incident, at most. These facts all speak strongly against any sort of birth trauma. It is hard to imagine how there could have been such an injury to the lung without some external evidence of trauma. The most plausible explanation for the tear, since it is linear and was not cause by a puncture, is that it was caused by strong shearing forces. These could have acted on the lung by external compression and deformation of the chest. This would have been possible in this animal without breaking ribs because, as an infant, his ribs were very pliable. The near dislocation of a rib supports this interpretation. I think it is likely that he was struck a strong blow, perhaps by an adult dolphin, rather than being hit by a boat or some other hard object because of the lack of abrasion of the skin. Whatever the cause of the injury, there is no doubt that this dolphin died by trauma and its complications.