

Fatal Pneumonia and Pleuritis Caused by an Agujon Beak Penetration in a Bottlenose Dolphin from Puerto Rico

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Abstract.—Although wounds caused by fish spines have been reported to cause disease and mortality in marine mammals, no record of this phenomenon exists for the Caribbean area. We report a case of disease and consequent mortality in a bottlenose dolphin *Tursiops truncatus* caused by ingestion of the beak of an agujon *Tylosurus acus* in Manatí, Puerto Rico. Internal examination of the dolphin revealed that its left lung was necrotic and reduced to one-fourth its normal size and that it had chronic-active pleural inflammation. A 9.1-cm compound bone fragment was found embedded in an abscess in the pleural lining of the left lung. The bone fragment was identified as belonging to the jaws of an agujon, a circumtropical, polytypic species commonly found in the Caribbean Sea. Histopathology revealed chronic inflammation and fibrosis of the lung in addition to granulomatous masses in the pleural space. The cause of death was determined to be chronic lung infection caused by migration of the agujon's beak from the dolphin's esophagus or stomach. No similar cases have been observed in the more than 150 marine mammal strandings documented in Puerto Rico and the Virgin Islands since 1985. This is the first report of disease and death caused by migration of an agujon beak in a marine mammal.

While wounds caused by fish spines have been involved in disease and mortality in marine mam-

mals (Gallo-Reynoso and Hugentobler 1986; Walsh et al. 1988; Gallo-Reynoso and Tovar-Aguilar 1989; McLellan et al. 1996; McFee et al. 1997), especially cetaceans, no record of this exists for the Caribbean area. We report on the disease and consequent mortality in a bottlenose dolphin *Tursiops truncatus* caused by the migration of the beak of an agujon *Tylosurus acus* into its lung and pleural space.

Event

On 29 July 1998, an adult male bottlenose dolphin stranded at Playa Los Tubos in the municipality of Manatí, Puerto Rico (18°28.4'N, 66°27.2'W). The carcass was recovered and a necropsy conducted (including complete morphometrics) following the methodology detailed in Mignucci-Giannoni (1996). The carcass was not decomposed. The dolphin was 251 cm long and severely emaciated, with prominent ribs and scapulae. Blisters in the skin were observed, but these were considered a postmortem change.

Pathology

Internally, all of the dolphin's organs were grossly unremarkable. Although the animal was emaciated, its forestomach contained ingesta remnants consisting of fish bones and squid beaks. A small fishhook was found in the ingesta in the cardiac stomach. The left lung was necrotic, and the pleural cavity was filled with over 1 L of serosanguinous exudate. The lung was reduced to one-fourth its normal size (in comparison with the right lung, which appeared normal) and had chron-

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ic-active pleural inflammation. A 9.1-cm compound bone fragment was found embedded in an abscess in the pleural lining of the left lung. Histopathological examination of the tissues revealed chronic inflammation and fibrosis of the lung in addition to granulomatous infection and fibrosis within the pleural cavity. Multifocal to focally extensive inflammation was observed in the kidneys and interstitium.

The size and shape of the bone fragments and the teeth associated with them conformed to published descriptions (Collette and Berry 1965; Collette 1984; Collette and Parin 1986; Robins and Ray 1986; Cervigón et al. 1992) of the mandible or jaw of the agujon. As their name suggests, needlefishes (family Belontiidae) are long, narrow, and silvery teleost fish. The smaller common species reach a length of about 38 cm; the larger ones can grow to more than 91 cm. Needlefishes have two long rami with sharp teeth that form their mandible or jaw. The mandible and premaxilla together form their "beak." Needlefishes have many specialized features, including prominent elongation of the jaws and premaxilla as well as of the body, the latter being adapted for leaping from the water (Gregory 1933). Agujons are commonly found worldwide in tropical, warm-temperate waters and have been documented in the Caribbean area (Fischer 1978).

Discussion

The bottlenose dolphin has a wide geographic distribution and consumes a large variety of fish (Gunter 1942). Interspecific interactions, such as chasing and capturing redfin needlefish *Strongylura notata*, striped mullet *Mugil cephalus*, hardhead catfish *Arius felis*, gafftopsail catfish *Bagre marinus*, spotted seatrout *Cynoscion nebulosus*, common snook *Centropomus undecimalis*, balao *Hemiramphus balao*, and ladyfish *Elops saurus*, have been observed at Sanibel Island, Florida (Shane 1990). The remains of redfin needlefish, a fish that is anatomically and behaviorally similar to the agujon and that belongs to the same taxonomic family, have been found among the stomach contents of bottlenose dolphins from eastern Florida and Texas (Barros and Wells 1998).

Both external and internal injuries from interactions between dolphins and teleost and cartilaginous fishes are common. Of seven cases reported by Walsh et al. (1988) involving bottlenose dolphins (five wild and two captive) and cartilaginous stingrays (the southern stingray *Dasyatis americana* and the Atlantic stingray *D. sabina*), five en-

tailed injuries to the chest area and lung cavity, as in our case. Mortality from the perforation of the esophagus and/or stomach walls by the sharp spines of hardhead catfish and sheepshead *Archosargus probatocephalus* has also been noted (N. B. Barros, Mote Marine Laboratory, personal communication).

In our case, the cause of death was a chronic lung infection caused by the migration of an agujon's beak from either the dolphin's esophagus or stomach to its left lung and pleural space. We suspect that the fish's beak came from the esophagus or stomach because agujons have been documented as part of the dolphin's natural diet and it is highly unlikely that a collision with the dolphin's chest or flank would have resulted in penetration past the skin and blubber (as is the case with stingrays).

An established stranding network to collect mortality data allowed us to document this fatal incident in a protected marine mammal species. Further, carrying out a thorough necropsy, with both gross and histopathological examination, allowed us to correctly determine the cause of death. No similar cases have been observed in over 150 marine mammal strandings documented in Puerto Rico and the Virgin Islands since 1985 (Mignucci-Giannoni et al. 1999). In fact, this is the first report of disease and death caused by migration of an agujon beak in a marine mammal.

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