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The importance of post-mortem examinations in cetacean biology: A report of a necropsy on *Stenella coeruleoalba* (Meyen, 1833) (Cetacea: Delphinidae), from the Azores, Northeastern Atlantic

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ABSTRACT

This article reports the necropsy of a specimen of striped dolphin *Stenella coeruleoalba* found stranded in the north coast of Terceira Island, Azores, Portugal. Here, the importance of standard protocols in post-mortem examinations and the need to adequately proceed were discussed. Stranded marine mammals are valuable specimens for several studies of pathology and other veterinary medical aspects. Although the causa mortis was not determined, the full access to stranded specimens was crucial, not only for pathology studies but also for a proper training to veterinary medicine students whenever possible.

1. Introduction

The methodical and detailed examination of all cavities and organs of an animal in order to determine its causa mortis is generally known as necropsy[1,2]. Its execution improves the overall knowledge of pathological processes and also allows the collection of material for histology, microbiology and toxicology being the most often but not the only way to diagnose certain diseases[3]. Some widely protected animals, in which cetaceans are certainly included, are rarely available when dead for these examinations and the only specimens available are those found stranded on the shoreline. The majority of specimens, however, are already in an advanced state of decomposition when found. Hence, recently, stranded specimens are a rare finding, which makes them highly important for necropsy procedures, both for veterinary medicine and biology reasons and also for proper training to veterinary students.

Strandings are relatively common worldwide and reports of several species are constantly varying in numbers from sea birds to reptiles, large fish and marine mammals like cetaceans, pinnipeds and rare sirenians[4-10]. A number of these belong to species known to be apex predators, which makes them to be important bio-indicators of environmental parameters including several aspects directly linked to human health[6,11-13].

Nevertheless, publications reported systematic and protocoled necropsy procedures on these animals as well as detailed descriptions of surgeries and general medicine on wild specimens of marine animals are rare[14].

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In this article, the necropsy of a specimen of a striped dolphin *Stenella coeruleoalba* (Meyen, 1833) (*S. coeruleoalba*) was described and the overall importance of post-mortem examinations of stranded cetaceans for biology and medical purposes as well as its pedagogic value in the training of veterinary medicine students was discussed.

2. External analysis and internal examination

A sub-adult female striped dolphin *S. coeruleoalba* was found stranded in the north coast of Terceira Island on 11th January 2014 (Figure 1). The specimen was under Category II recently dead of the classification of strandings using the Azores Regional Net of Cetacean Strandings (RACA). It was transported to university facilities and kept frozen at –35 ℃ until a full necropsy could be properly prepared and scheduled.

Figure 1. Stranded sub-adult striped dolphin *S. coeruleoalba* found in the north coast of Terceira Island, Azores, Northeastern Atlantic on 11th January 2014 (photo by Hugo Dias).

All biometrics were taken under the same RACA protocol referred above and the specimen was prepared for internal examination.

Albeit technical and logistical details did not allow a total collection of samples, the necropsy was carried out in all detail and achieved its full purpose for students of veterinary medicine. The pathology of anatomy auditorium of Department of Agrarian Sciences, University of the Azores was used.

This work was carried out on a stranded dolphin already dead when found. No experimental procedures were involved.

The specimen was under stranding Class II which was applied to recent dead specimens in good preservation of external and internal anatomical characteristics. Its total length was 153 cm and a total weight of circa 50–55 kg.

As mentioned above, all the biometrics were taken according to the RACA standard protocol.

The internal analysis of the specimen started with one dorso-longitudinal incision and three dorso-ventral ones (Figure 2) in agreement with RACA protocols of standard necropsy procedures. The upper subepidermis fat layer was measured (Figure 3) in order to evaluate the animal's fat condition and an important feature in cetacean physiology. This young and immature female verified by the sexual organs examination was then examined in all its entire thoracic and abdominal cavities (Figures 4 and 5).

Figure 2. Dorso-longitudinal and dorso-ventral incisions, a first step before internal examination procedures (photo by Mário Cesar Sedrez).

Figure 3. Subepidermis fat appearance after cuts for measurements (photo by Mário Cesar Sedrez).

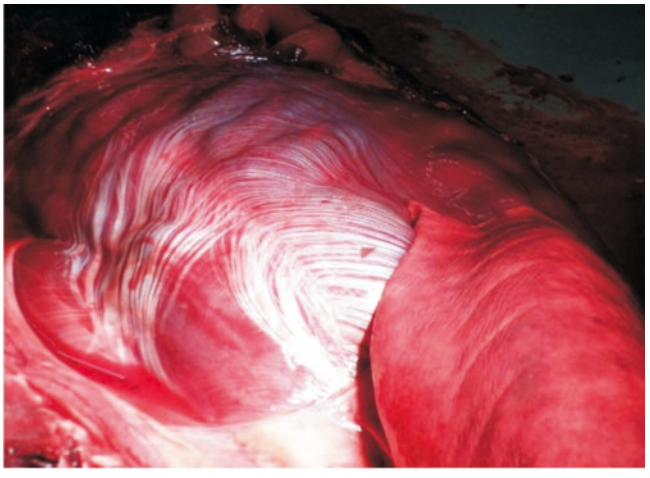

Figure 4. Lung and diaphragm (photo by Mário Cesar Sedrez).

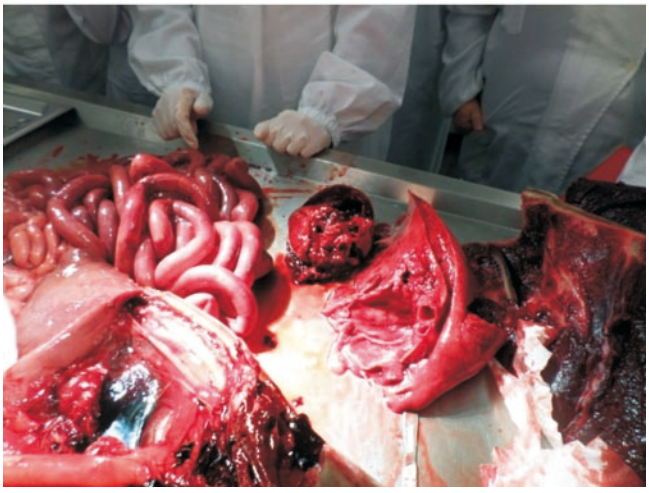

Figure 5. Lungs, heart and small intestines (photo by Mário Cesar Sedrez).

3. Discussion

Necropsies are an essential procedure to obtain macroscopic and microbiological data of organs and tissues for a precise diagnosis of a cause or causes of death[2]. This is an essential training in veterinary medicine and a vital tool in the concrete aspects of cetacean medicine[3].

The necropsy reported here was adequate in its extension, although it did not allow a full identification of a comprehensive diagnosis. No lesions and/or gross pathologies were identified in both external and internal macroscopic examinations, which may discard any type of anthropic influence. The stomach and digestive tracts were empty. But the subepidermis fat did not indicate hunger-stress in the specimen.

It is known that a number of cetacean species are strongly gregarious and isolated individuals, which may get lost and strand especially in winter time and rough weather as the case here[15,16]. However, this is still mere speculation.

Nevertheless, this particular necropsy is part of a full time training process for veterinary medicine students. There is indeed a lack of opportunities to deal with such cases and few veterinary medicine professionals have ever had experience in dealing with cetacean specimens.

Further studies and adequate forensic medical practices are important aspects of graduation and upper degrees training in universities by standard international protocols.

Conflict of interest statement

We declare that we have no conflict of interest.

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