SEVERE INFECTION OF A RIB IN A HARBOUR PORPOISE PHOCOENA PHOCOENA: A RARE COMPLICATION AFTER OPEN CHEST TRAUMA

by

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1. Introduction

Several pathological conditions of the skeleton are known to occur in Cetacea. Congenital, degenerative and infective bone diseases have been described. In some species degenerative disc disease (spondylosis deformans) is common in aged animals (Kompanje, in press). Parasitic destruction of bone due to infection bij Crassicauda sp. is found in the tympanoperiotic bones and skull base (Cowan et al., 1986). Bacterial infection (periostitis, osteomyelitis) is found in vertebrae, jawbones and the bones of the pectoral fins. This may occur after a penetrating (pyogenic osteomyelitis by direct infection) or blunt (haematogenous osteomyelitis) trauma. Osteomyelitis of the ribs is little known. In this article a case is described of this rare condition in a harbour porpoise Phocoena phocoena (L., 1758).

2. Material

In August 1994, the decomposed carcass of a relatively young harbour porpoise of unknown sex was found on the beach at Old Head of Kinsale, Courtmacsherry Bay, Cork, southern Ireland. The skull was missing and the right side of the corpse had been severely damaged by scavenging gulls and dogs. After turning the carcass onto the other side it became evident that the fourth left rib showed a severe abnormality in the form of a large swelling. This rib and the two adjoining (3-5) ribs were collected, as were the pectoral fins and cervical vertebrae. After macerating the bones, a severe osteomyelitis with several large sequestera and grotesque new bone formation of the fourth left rib was diagnosed (fig. 1). This is most probably the result of direct infection of the fractured rib through an open, penetrating wound in the chest. Due to the presence of fragments of dead bone, the infection had developed into a chronic pyogenic osteomyelitis, and the involucrum (callus) surrounding these portions had become riddled with cloacae for pus drainage. This can clearly be seen in fig. 1. The two adjoining ribs also show the effects of the infection. This infection could have been the indirect cause of death in this porpoise, septicaemia the direct cause. The ribs are now in the private collection of G.Th. de Vries, Geldrop, the Netherlands.

3. Discussion

Osteomyelitis of the ribs is rare in odontocetes. No cases of osteomyelitis of the ribs have been found in 107 skeletons of stranded harbour porpoises, 35 of bottle-nosed dolphins Tursiops truncatus, 51 of white-beaked dolphins Lagenorhynchus albirostris and 12
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Fig. 1. Third, fourth and fifth rib of the described harbour porpoise Phocoena phocoena. Severe infection of the fourth rib with enormous enlargement of the bone with several sequestra. Photograph: Rob 't Hart.

of white-sided dolphins Lagenorhynchus acutus (National Museum of Natural History, Leiden, the Netherlands; Zoological Museum, Amsterdam, the Netherlands and Meeresmuseum, Stralsund, Germany). In addition, no cases of osteomyelitis of the ribs are mentioned by Slijper (1931, 1936) or De Smet (1977). The only described case of osteomyelitis of a rib in an odontocete is that of an old male killer whale Orcinus Orca (see Kompanje, 1991). Five cases of osteomyelitis of the mandible in harbour porpoises are described (Kompanje, 1993) and four unpublished cases were found in the collection of the Meeresmuseum in Stralsund. Osteomyelitis of the ribs occurs more frequently in terrestrial mammals.
Large penetrating chest wounds with fractured ribs will usually be fatal in aquatic mammals. Collapse of the underlying lung due to penetration of the pleura by the direct source of the trauma, or by the fractured rib(s) could result in the invasion of seawater into the thoracic cavity. This will be the direct cause of death in such cases. In a normal situation, the lung more or less completely collapses on opening the thoracic cavity (Cowan et al., 1986). Due to the fatality of such wounds, a secondary osteomyelitis will rarely have a chance to develop. However, it did occur in the present case. The described porpoise must have had a large open wound with a fractured fourth rib, but without the fatal penetration of seawater into the thorax. The porpoise must still have been able to dive and breathe normally, according to the chronicity of the infection.

Healed rib fractures and fractures with pseudo-arthrosis without open chest wounds are more often found in small odontocetes (Slijper, 1931, 1936; De Smet, 1977). This kind of fracture occurs after a blunt trauma of the chest. The physical principle of blunt trauma differs from that of a penetrating trauma. In the former case the object striking the chest is usually larger and not able to penetrate the skin; all energy is dissipated without an obvious point of internal damage. An example of a possible blunt trauma of the chest in a harbour porpoise could be a confrontation with the beak of a larger dolphin, e.g. a bottle-nosed dolphin. Aggressive behaviour between different species has been shown to be the cause of frequent rib fractures in harbour porpoises in Scottish waters (pers. comm. Harry Ross). Examples of penetrating trauma are collision with a propeller, or gunshot.

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SUMMARY

This article describes a case of severe osteomyelitis of a rib in a harbour porpoise. This is a rare complication after a penetrating chest injury. Such injury will usually be fatal in cetaceans, being the result of collapse of the lung after direct penetration by the source of the trauma or a puncture of the pleura by the broken rib(s). This porpoise must have had an open chest wound and a fractured and infected rib, but without seawater penetrating into the thoracic cavity.

SAMENVATTING

Een ernstige infectie van een rib bij een bruinvis Phocoena phocoena, een zeldzame complicatie na een thoraxletsel

In dit artikel wordt een geval van ernstige osteomyelitis van een rib bij een bruinvis beschreven. Dit is een zeldzame complicatie na een penetrerend thoraxletsel. Een dergelijk letsel zal meestal dodelijk verlopen bij Cetacea, wegens collaps van de onderliggende long na penetratie van de pleura door de directe oorzaak van het trauma of de gebroken rib, met blootstelling aan zeewater. De beschreven bruinvis heeft een aanzienlijke open wond van de thorax gehad, met een gefractureerde en geïnfecteerde rib, maar met intacte pleura.
REFERENCES


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