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## CASE OF CEPHALIC PRESENTATION OF FOETUS IN A HARBOUR PORPOISE *PHOCOENA PHOCOENA* (CETACEA, PHOCOENIDAE), WITH NOTES ON OTHER AQUATIC MAMMALS

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**Case of Cephalic Presentation of a Foetus in a Harbour Porpoise *Phocoena phocoena* (Cetacea, Phocoenidae), with Notes on Other Aquatic Mammals. Gol'din P. E.** — A stranded harbour porpoise pregnant with a near-term foetus in cephalic (head) presentation was found. It is the first time when cephalic presentation, now recorded in three odontocete families, is reported for phocoenids. It proved to occur rarely, yet to be more widespread for aquatic mammals than could be expected.

**Key words:** porpoise, cetacean, prenatal development, parturition, evolution

**Случай головного предлежания плода у морской свиньи *Phocoena phocoena* (Cetacea, Phocoenidae), с заметками о других водных млекопитающих. Гольдин П. Е.** — Обнаружена выброшенная на берег морская свинья, беременная предродовым плодом в головном предлежании. Головное предлежание впервые отмечено у морских свиней и теперь известно у представителей трех семейств зубатых китов. Это явление редко встречается у водных млекопитающих, однако распространено шире, чем предполагалось.

**Ключевые слова:** морская свинья, китообразные, пренатальное развитие, роды, эволюция

### Introduction

Cetaceans (at least, odontocetes) are generally characterized by tail presentation of a foetus by the moment of birth and tail-first delivery: it is supposed to be an adaptation to the pregnancy and delivery in the aquatic environment (Slijper, 1962; Kleinenberg et al., 1964; Reidenberg and Laitman, 2009). This seems to be a general rule for aquatic mammals: fluke presentation at birth in water is reported for manatees (Walsh, Gearhart, 2001; Reidenberg, Laitman, 2009), and tail presentation is common (if not predominating) in various pinnipeds (e. g., Acevedo et al., 2008; Karamanlidis et al., 2010), although the latter usually give birth on land or ice. It is known that a cetacean foetus can change its position in the uterus during pregnancy but it usually moves into a tail-first position by the last months (Slijper, 1966; Reidenberg, Laitman, 2009). The harbour porpoise is not an exception; its parturition in captivity was recently described in details by Blanchet et al. (2009): the expulsion of the newborn (stage 2 of the parturition) lasted 1 hour 42 minutes, tail first. This study provides an evidence for the opposite case, the cephalic presentation in porpoises.

### Material and methods

On June 7, 2009, a carcass of a female harbour porpoise *Phocoena phocoena* (Linnaeus, 1758) was found at the western coast of the Crimean peninsula, at the sandy bar dividing Kyzyl-Yar salt lake and the Black Sea. The carcass was measured and dissected according to standard protocols (Norris, 1961; Kuiken, Garcia Hartmann, 1993).

### Results and discussion

The carcass was partly decomposed (stage 3 to 4 according to classification by Kuiken and Garcia Hartmann, 1993); still, the internal organs were in their natural

position. The adult animal was 138 cm long, the size normal for sexually mature porpoises from the northern Black Sea, whose length varies in the range of 127–150 cm (Gol'din, 2004). The female was pregnant with a foetus lying in cephalic (head) presentation (fig. 1). The foetus was a male, 62 cm long, though smaller than average, was considered to be near-term from its body size and proportions (Gol'din, 2004). Details of morphometry are provided in the Table 1 (all measurements were taken from the left side and according to the protocol by Norris, 1961). Also, the season of the finding corresponded to the birth season of porpoises in the Black Sea.

The foetus was preserved in a remarkably better condition than the mother's carcass (stage 2 to 3) (fig. 2). It lay in the left part of the uterus with the folded tail. The head of the foetus was located near the cervix. The dorsal fin was unfolded; however, this could be a result of decomposition of the mother's carcass.

The uterine wall, as well as the umbilical cord, seemed to be intact. No hemorrhages were found in the uterine wall, except for a hemorrhagic field near the umbilical cord. No other macroscopic signs of pathology were found in either of the two carcasses. However, the advanced state of decomposition of the female carcass prevented its detailed examination. It was impossible to conclude if there were any marks of incidental by-catch. Thus, the cause of death was not identified.

The described case is probably the first report on a head presentation observed in porpoises (Phocoenidae family). The only other documented case of a deviation from tail presentation was an apparent pathology in a harbour porpoise described by Baker and Martin (1992): lateral presentation of a foetus caused peritonitis and mother's death. Pregnant stranded and by-caught porpoises were reported in numerous studies, while no cases of head presentation were mentioned.



Fig. 1. Harbour porpoise with the foetus in cephalic presentation. Photo by I. Nurpeisov.

Рис. 1. Морская свинья с плодом в головном предлежании. Фото И. Нурпеисова.



Fig. 2. The external appearance of the foetus. Photo by I. Nurpeisov.

Рис. 2. Внешний вид плода. Фото И. Нурпеисова.

However, head presentation of a foetus was reported for several delphinid species. It was repeatedly observed in captivity: according to the summary by Robeck et al. (2001, p. 213), the rate of head-first deliveries was 7% in killer whales *Orcinus orca* (Linnaeus, 1758) and 1.2% in bottlenose dolphins *Tursiops truncatus* (Montagu, 1821). Successful head-first delivery in a captive bottlenose dolphin was described in detail by Essapian (1963): stage 2 of the parturition lasted 22 minutes. Head-first delivery in captivity is indicated as a complicating factor; still such cases are not referred to as pathologies (Walsh and Gearhart, 2001, p. 697).

In the wild, head presentation of a foetus was observed in a stranded dead white-beaked dolphin *Lagenorhynchus albirostris* Gray, 1846 ('t Hart and van der Kemp, 1999); it had ruptured uterine wall, so the head presentation could be a cause of the mother's death.

Numerous cases of head-first delivery were consistently reported for belugas *Delphinapterus leucas* (Pallas, 1776) (Monodontidae family), both in nature (Vladykov, 1944; Doan and Douglas, 1953; Kleinenberg et al., 1964) and in captivity (Robeck et

**Table 1. Body measurements of the foetus of harbour porpoise in cephalic presentation**

**Таблица 1. Промеры тела плода морской свиньи в головном предлежании**

Measurement	Length, cm
Body length, tip of rostrum to fluke notch	62
Tip of the rostrum to centre of eye	10
Tip of the rostrum to centre of external auditory meatus	13.5
Tip of the rostrum to centre of blowhole	11
Tip of the rostrum to anterior margin of dorsal fin	30
Tip of the rostrum to posterior margin of dorsal fin	36
Height of the dorsal fin	5
Tip of the rostrum to centre of navel	27
Tip of the rostrum to centre of genital slit	33.5
Tip of the rostrum to centre of anus	42
Tip of the rostrum to flipper	17
Maximum length of flipper	11
Maximum width of flipper	5
Fluke span	18

al., 2001). Vladykov (1944) even thought head-first delivery to be more frequent than tail-first. Robeck et al. (2001, p. 213) reported the 14% rate of head-first delivery in captive belugas. Head presentation seems to be more widespread in belugas than in any cetacean species.

Thus, after the finding of head presentation of a foetus in Phocoenidae, this phenomenon has now been recorded for all three Delphinoidea families. Among delphinids, it was found in representatives of different phyletic lineages. Thus, head presentation of a foetus appears to be spread across a broad variety of cetacean taxa; it can occur in other groups, although undiscovered yet.

The reported case is in favour of the idea that the cephalic presentation of a foetus in cetaceans is not a pathology but a natural variation. This idea is also supported by the documented cases of successful head-first deliveries and by occurrence of head presentations both in the wild and in captivity. Still, head presentation of a foetus in a small cetacean can increase the risk for trauma or dystocia. Also, a change of presentation at an advanced stage can be a pathology, like the one described by Baker and Martin (1992).

Suggested cephalic presentation in a member of Protocetidae, an Eocene family of Archeoceti, became the point for a recent discussion (Gingerich et al., 2009; Thewissen and McLellan, 2009): female remnants of *Maiacetus inuus* (the species described by Gingerich et al., 2009) contained the remnants of a foetus or newborn of the same species. If it was a near-term foetus, the authors concluded, it was an evidence for giving birth on land rather than in water. However, given all the above-mentioned facts, a case of cephalic presentation cannot be a base for conclusions about terrestrial vs. aquatic lifestyle. On the contrary, the finding of a tail-first foetus could indicate the adaptation to the parturition in water.

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