



CASE REPORT

Modified Endoscopic Removal of Foreign Objects from the Forestomach of a Common Bottlenose Dolphin (*Tursiops truncatus*)

Kyung-Yeon Eo, Yong-Gu Yeo and Oh-Deog Kwon*

Seoul Zoo, Gwacheon 427-702, Korea; *College of Veterinary Medicine, Kyungpook National University, Daegu 702-701, Korea

*Corresponding author: odkwon@knu.ac.kr

ARTICLE HISTORY

Received: April 22, 2012
Revised: May 03, 2012
Accepted: May 11, 2012

Key words:

Common bottlenose dolphin
Modified endoscopy
Tursiops truncatus

ABSTRACT

We report on the removal of foreign objects from the forestomach of a 200 kg adult male common bottlenose dolphin (*Tursiops truncatus*) in the Seoul zoo using a modified stainless steel hook and flexible wire snare attached to a gastrointestinal fiberoptic endoscope. The foreign bodies included a 10 × 3.5 cm plastic tube, 4 × 2.0 cm stainless steel pipe, brush, and concrete debris. Our technique using a stainless steel wire hook and snare attached to a gastroscope can be used to remove foreign objects from the forestomach of common bottlenose dolphins.

©2012 PVJ. All rights reserved

To Cite This Article: Eo KY, YG Yeo and OD Kwon, 2013. Modified endoscopic removal of foreign objects from the forestomach of a common bottlenose dolphin (*Tursiops truncatus*). Pak Vet J, 33(2): 251-253.

INTRODUCTION

Members of the order Cetacea are commonly kept in aquariums, oceanariums, and marine research institutions and are a familiar sight to the public (Sweeney and Ridgway, 1975b; Eo and Kwon, 2011). The consumption of foreign objects is a major problem for anyone dealing with cetaceans (Sweeney and Ridgway, 1975a; Burdett and Osborne, 2010). Some porpoises and small whales will swallow virtually anything that falls or is thrown into their tank, including flashbulbs, cups, plastic toys, net floats, and rubber balls (Derraik, 2002). Small foreign bodies, such as stones or coins, can occasionally be removed by induced emesis or they may be vomited spontaneously by the animal (Greenwood *et al.*, 1978). Since the opening between the first and second stomachs is small, few foreign bodies pass into the intestines. Foreign bodies remaining in the forestomach might eventually cause gastric irritation or obstruction (Beroza *et al.*, 1981). Since the number of facilities keeping cetaceans is increasing, more veterinarians are treating cetaceans. We report our experience with the endoscopic removal of foreign objects from a common bottlenose dolphin (*Tursiops truncatus*). This report should help other clinicians to perform fiberoptic gastroscopy in cetaceans.

CASE PRESENTATION

History and clinical examination: An adult male bottlenose dolphin weighing 200 kg in the dolphinarium

of Seoul zoo snatched the 10 × 4 cm plastic cap of a Multiparameter probe (@YSI556MPS), which is used for testing water quality, when a dolphin trainer put the probe into the pool. This male was one of five dolphins suspected of swallowing missing 6.5 × 3.5 cm stainless steel pipes that had detached from a gate to the pool. However, none of the animals showed obvious abnormal activity (e.g., eating, swimming, jumping, or behaving) for 2 weeks, other than one case of vomiting.

Diagnosis: To detect the swallowed metallic material in the dolphins, each of the five dolphins was first examined with a metal detector (DMF® 10 Zoom, Bosch) (Fig. 1). When the examination with the metal detector was positive, an x-ray was obtained to make the definitive diagnosis (Fig. 2). When gastroscopy was performed to remove these objects, a brush and concrete debris were also found. Since we had no medical device that could tightly grasp the objects in the forestomach, we attached a 1 mm ø stainless steel wire hook to the tip of the endoscope (Fiberscopex Model 60512 VG; Karl Storz Veterinary Endoscopy, Tuttlingen, Germany). The point of the hook was adjusted so that it could be seen through the endoscope. We then welded a tiny stainless steel hook to the end of a thin cable that we passed through the gastroscope channel. This was useful for removing the plastic probe cap and stainless steel pipes because the endoscopist could visualize the objects directly on a monitor. In addition, a snare was made from a thin flexible wire cable passed through the accessory channel and fixed in a loop at the tip of the endoscope (Fig. 3). This was used to remove the brush and concrete debris.



Fig. 1: The use of an industrial metal detector to detect metal objects in the stomach.



Fig. 2: In the lateral view, two stainless steel pipes are seen in the forestomach (arrows).



Fig. 3: A snare assembled using a thin flexible wire cable passed through the accessory channel and fixed at the tip of the endoscope to make a loop.

Gastroscopy technique: The dolphin was fasted for 6 hours before the procedure. Sedation was achieved with 0.2 mg/kg diazepam (Pharmacia and Upjohn, NJ, USA). The dolphin was restrained and placed on a foam pad to ensure its safety. It was positioned in sternal recumbency and six dolphin trainers were placed around the animal to minimize movement. The rostrum was stabilized using clean bath towels wrapped around both the mandible and maxilla. A round wood gag with a 2-cm-diameter hole in

the middle was placed inside the rostrum to protect the gastroscope (Fig. 4). The gastroscope and flexible wire snare were well lubricated with Surgilube sterile lubricant (Surgilube Sterile Surgical Lubricant, U.S. Family, Inc.). The distal scope tip was passed through the oropharynx and advanced about 100 cm into the forestomach with gentle, consistent pressure under direct vision. The image was obtained using standard gastrosopy methods, such as air insufflation, withdrawal, rotation, deflection, and advancement. The plastic probe cap and stainless steel pipes were removed using stainless steel hooks that were attached to the tip of the gastroscope and welded to the thin cable. The brush and concrete debris were removed using the modified snare, which was passed through the accessory channel of the gastroscope (Fig. 5).



Fig. 4: Endoscopy was performed with the dolphin placed on an air mattress.



Fig. 5: The multiparameter probe ©YSI556MPS (A) and the foreign objects removed from the forestomach, including the probe cap (B).

DISCUSSION

Gastrointestinal foreign bodies are a serious problem in cetaceans. Beroza *et al.* (1981) described the manual retrieval of a gastric foreign body in an Atlantic bottlenose dolphin. However, manually removing items from a dolphin's forestomach using bare arms is an antiquated technique and is no longer recommended (Dover and Bonn, 2001). Ultrasonography, radiography, and endoscopy (gastroscopy, bronchoscopy, cystoscopy, and colonoscopy) are common diagnostic modalities in cetaceans (Reidarson, 2003). Levy *et al.* (2009) reported using a laryngeal snare to remove a fishing net ingested by a common bottlenose dolphin. Greenwood and Taylor (1978) removed foreign bodies from dolphins using various grasping forceps passed through the fibroscope channel. Such forceps are chiefly designed for removing small objects; therefore, the size of the object that can be grasped is limited. The distance to the forestomach is too great and gastroscopic visualization has been limited to the first stomach (Sweeney and Ridgway, 1975b). Foreign material retrieval, especially in cetaceans, requires the construction of custom tools designed around a specific material and species (Dover and Bonn, 2001). In most bottlenose dolphins, it is necessary to pass 100–140 cm of the fibroscope to obtain a clear view of the forestomach (Greenwood and Taylor, 1978). However, limited data have been published on the gastroscopic removal of foreign bodies in bottlenose dolphins. We devised stainless steel hooks and a flexible wire cable snare attached to a gastroscope to remove foreign objects from the forestomach. When the gastroscope was advanced into the forestomach, the plastic probe cap, stainless steel pipe, and other objects were identified in the forestomach. All

of the foreign objects were removed using our modified stainless steel wire hooks or snare. The endoscopic removal of forestomach foreign objects appears to be a satisfactory alternative in the common bottlenose dolphin.

Acknowledgements: This research was supported by Kyungpook National University Research Fund, 2012.

REFERENCES

- Beroza GA, WP Barclay, SE McDonald and JE Ott, 1981. Manual retrieval of a gastric foreign body in an Atlantic bottlenose dolphin. *J Am Vet Med Assoc*, 179: 1286-1288.
- Burdett LG and CA Osborne, 2010. Enterolith with a stingray spine nidus in an Atlantic bottlenose dolphin (*Tursiops truncatus*). *J Wildlife Dis*, 46: 311-315.
- Derraik JG, 2002. The pollution of the marine environment by plastic debris: a review. *Mar Pollut Bull*, 44: 842-852.
- Dover SR and WV Bonn, 2001. Flexible and rigid endoscopy in marine mammals. In: *CRC Handbook of Marine Mammal Medicine* (Dierauf LA and FMD Gulland, eds). 2nd Ed, CRC Press, New York, USA, pp: 621-635.
- Eo KY and OD Kwon, 2011. Two cases of bacterial pneumonia in Bottle-nosed Dolphins (*Tursiops Gillii*) at the Seoul Zoo, Korea. *Pak Vet J*, 31: 260-262.
- Greenwood AG, DC Taylor and D Wild, 1978. Fibreoptic gastroscopy in dolphins. *Vet Rec*, 102: 495-497.
- Levy AM, O Brenner, A Scheinin, D Morick, E Ratner, O Goffman and D Kerem, 2009. Laryngeal snaring by ingested fishing net in a common bottlenose dolphin (*Tursiops truncatus*) off the Israeli shoreline. *J Wildlife Dis*, 45: 834-838.
- Reidarson TH, 2003. Cetacea (whales, dolphins, porpoises). In: *Zoo and wild animal medicine* (Fowler ME and Miller RE, ed). 5th Ed, WB Saunders Company, New York, USA, pp: 442-459.
- Sweeney JC and SH Ridgway, 1975a. Common diseases of small cetaceans. *J Am Vet Med Assoc*, 167: 533-540.
- Sweeney JC and SH Ridgway, 1975b. Procedures for the clinical management of small cetaceans. *J Am Vet Med Assoc*, 167: 540-545.