Retrospective Study on Radiographic Diagnosis of Esophageal Foreign Bodies in Dogs

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SHORT COMMUNICATION

Abstract
Obstruction caused by esophageal foreign bodies is a common condition in dogs, usually due to dietary indiscretion. The aim of the study was the clinical and imaging description of a series of dogs with esophageal foreign bodies. This study included 11 dogs of various breeds, ages and both sexes that showed signs compatible with esophageal obstruction. The imaging examination revealed the presence of foreign bodies (represented by bones and metal objects) in different segments of the esophagus, including both the cervical segment (2 cases) and intrathoracic segment (9 cases). Given the consequences of the presence of foreign bodies in the esophagus, the imaging examination represent the main tool in determining the location of the foreign body for therapeutic management.

Keywords: esophageal foreign bodies, dogs, radiographic exam.

INTRODUCTION
Foreign bodies ingested by dogs and blocked in the esophagus are a medical emergency, because they can have serious consequences to animals, and can be life-threatening (Juvet et al., 2010; Burton et al., 2017). Usually, they can be regurgitated or swallowed, reaching the mechanical obstruction, but also other complications such as esophagitis (moderate or severe), erosions or ulcers, necrosis or esophageal perforations, esophageal stricture, pneumothorax, pneumomediastinum, aspiration pneumonia (Leib and Sartor, 2008; Gianella et al., 2009; reviewed in Thompson et al., 2012; Deroy et al., 2015). In addition, cardio-respiratory arrest and death may occur in severe situations (Gianella et al., 2009) as a direct result of the esophageal foreign body or as a result of treatment-associated complications (Leib and Sartor, 2008). Patients who have ingested foreign bodies usually have a wide range of signs, including suffocation, coughing, retching, hypersalivation, regurgitation, restlessness, repeated attempts to swallow, refusal to eat, and neck pain (Washabau et al., 2013). Foreign bodies can stop anywhere along the esophagus, but usually stop in the narrowest places, such as the distal segment of the esophagus between the heart and diaphragm, as well as at the base of heart or thoracic inlet (Gianella et al., 2009; Thompson et al., 2012). These bodies can have a varied nature, but most commonly bones and bone fragments have been reported (up to 76%) (Deroy et al., 2015), but also toys, wooden sticks, dog chew treats, or large pieces of solid food (Gianella et al., 2009; Aertsens et al., 2016). The aim of this study was the clinical and imaging description of a series of dogs with esophageal foreign bodies.
MATERIALS AND METHODS
The medical records of dogs with clinical signs compatible with mechanical esophageal obstruction, registered in the Link-vet veterinary Clinic Bucharest, in the period 2018-2021 were reviewed. We included in the study patients who had at least one radiographic image of the cervico-thoracic region (using an Examion Laurus-Rad machine, Germany). Patients were not investigated by endoscopy in our clinic. Patient identification date were recorded, including breed, age and sex, as well as clinical signs expressed by patients. Following the radiographic evaluation, they were redirected to the attending veterinarian, in order to establish the removal technique of foreign bodies.

RESULTS AND DISCUSSIONS
A number of 11 dogs were included in this study, represented by Crossbreed (n=5), Dobermann (n=2), Pekingese (n=2), Shih-Tzu (n=1), West Highland white terrier (n=1). The Crossbreed patient were medium-sized (n=3) and small-sized (n=2). Thus, out of the total number of patients evaluated, 6 (54.55%) were small. Of the total, 7 (63.64%) were male and 4 (36.36%) were female. The mean age was 2.45 years, with a range of 6 months to 4 years. The animals had a body weight between 1.5 and 17 kg, with a mean of 5.5 kg. The clinical signs were represented by regurgitation (7/11; 63.64%), refusal of food (6/11; 54.55%), coughing (6/11; 54.55%), hypersalivation (4/11; 36.36%) and retching (4/11; 36.36%). For all cases, the diagnosis of mechanical obstruction due to foreign bodies was established on radiographs, which is considered the gold standard for determining the location of esophageal foreign bodies (Thompson et al., 2012). In 2 cases (2/11; 18.18%) the foreign bodies were identified in the cervical segment (Figure 1a), and in 9 cases (9/11; 81.82%) in the thoracic segment, including 4 cases in the precardiac segment (Figure 1b), 2 cases in supracardiac segment (at the base of the heart – Figure 1c), and 3 cases in the postcardiac segment (between the base heart and the diaphragm – Figure 1d). The foreign bodies were represented by bones (90.91%), including fragments of pig vertebral body – 4 cases, and chicken bones – 6 cases, and metal objects (9.09%), represented by fishing lead – 1 case (Figure 2).

Figure 1. Foreign bodies blocked along the esophagus: (a) cervical (bird’s clavicle); (b) precardiac; (c) above the base of the heart; (d) between the base of the heart and the diaphragm.
The analysis of the obtained results showed that most of the affected patients were small-breed dogs. This aspect is consistent with previous studies (Gianella et al., 2009; Juvet et al., 2010), which suggested that the small body size and thus the smaller diameter of the digestive tract is a predisposition factor for blockage along the esophagus of the foreign bodies accidentally ingested.

![Figure 2. Radiopaque foreign body in the esophagus (fishing lead).](image)

It was also found that males and young animals were more affected. Regarding the age of the patients, the mean age was 2.45 years. As a result, accidental ingestion of foreign bodies can be associated with the active and curious behavior specific for young animals. However, previous studies have shown the presence of this phenomenon in both young and adult animals (Aertsens et al., 2016; Thompson et al., 2012).

The medical records showed that the digestive symptomatology was compatible with esophageal obstruction, including regurgitation, refusal of food and coughing. The topography of foreign bodies trapped in the esophagus varied, but intrathoracic localization was predominant (81.82%), these observations being in accordance with those previously published (Gianella et al., 2009; Deroy et al., 2015).

Regarding the nature of foreign bodies identified radiographically along the esophagus, in the present study bone fragments were by far the most common object ingested, probably due to the eating habits of dogs. These results were comparable to those in the literature (Juvet et al., 2010; Thompson et al., 2012; Aertsens et al., 2016; Burton et al., 2017). Also, our study identified metallic foreign body (fish hook) only in one patient, the result being compatible with those found by Thompson et al. (2012) who identified a similar object in a single case out of 34 patients evaluated. Probably the fishy smell of the object was the cause of its attraction and ingestion.

The best method of treatment for esophageal foreign bodies is the immediate surgical removal (Gianella et al., 2009; Deroy et al., 2015), but this procedure was not performed in our clinic, patients being redirected to referral clinics for adequate treatment.

CONCLUSIONS
Radiographic evaluation allowed identification of esophageal foreign bodies, demonstrating their location. An increased prevalence was associated with young, male’s patients, belonging to Cross-breeds dogs. The location of foreign bodies along the esophagus is essential in subsequent therapeutic management.

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Conflicts of Interest
The authors declare that they do not have any conflict of interest.

REFERENCES