Esophageal foreign bodies in dogs: 51 cases (1992 – 1997)

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Introduction

Esophageal foreign bodies can be one of the many causes of regurgitation and dysphagia. Animals with esophageal foreign bodies are often presented to the emergency services, because many owners notice the swallowing of a potential foreign body by their dogs.

Mild symptoms such as restlessness, distress, drooling, odynophagia, retching/gagging and regurgitation are frequent. However, serious complications, such as perforation with subsequent mediastinitis, pleuritis or even pneumothorax are possible (Spielman and others, 1992). To avoid pressure necrosis, prompt removal should be initiated. The degree of mucosal damage is usually proportional to the duration of the foreign body entrapment (Guilford and Strombeck, 1996).

There are several possibilities how to remove an esophageal foreign body. According to previous studies removal under fiberoptic endoscopic guidance or by esophagotomy have been successful in approximately 80% of affected dogs (Pearson, 1966; Ryan and Greene, 1975; Spielman and others, 1992).

Advancement of foreign objects into the stomach with or without subsequent gastrotomy is another possible option (Zimmer, 1984). According to one recent report, prognosis for dogs with esophageal foreign bodies is guarded to good, however, one third of the animals develop complications (Guilford and Strombeck, 1996). Possible sequels are esophageal strictures, diverticula or local deficits in motility occurring weeks after foreign body removal. The purpose of this study is to analyze retrospectively signalment, symptoms, diagnosis, management and follow-up of 51 dogs with esophageal foreign bodies.

Materials and Methods

All medical records of dogs with an esophageal foreign body treated at the Small Animal Hospital, University of Bern between January 1992 and December 1997 were reviewed. The retrospective data obtained included signalment (sex, age, breed), history, clinical findings, thoracic radiographic diagnosis, localization and type of foreign body, treatment, esophageal reevaluation and outcome. Macroscopic appearance of the esophagus was graded into normal, mild, moderate and severe lesions, or perforation. Telephone follow-ups of dogs that were not reevaluated in-house were obtained from referring veterinarians or owners.

Results

Fifty-one dogs with an esophageal foreign body were identified; 49 were referred. Eighteen (33%) were male (5 castrated) and 33 (66%) were female (23 spayed). The mean age was 6.2 years with a range of 2.5 months to 14 years. The majority of animals were either less than three years old (28 dogs) or older than eight years (20 dogs). Half of the dogs were small to toy breeds, and the other half-weighted more than 25 kg. Twenty-six breeds were represented, including West Highland White Terriers, 19.6% (10 dogs); Bernese Mountain Dogs, 15.7% (8); Cairn Terriers, 9.8% (5); German shepherd dogs, 7.8% (4); Labrador Retrievers, 5.9% (3); and Yorkshire Terriers, 5.9% (3).

Forty-eight (94%) dogs were referred with the suspicion of an esophageal foreign body. Only three dogs were presented for other reasons (vomiting, anorexia, epilepsy). The most common clinical signs related to the esophageal foreign bodies were vomit-
ing and regurgitation (31 dogs) followed by anorexia (22), retching (17), restlessness (12), salivation (11), lethargy (7), dyspnea and coughing (7) and fever (1). In 14 dogs additional problems were identified: weight loss (2), generalized skin problems (2), and one each with chronic diarrhoea, obesity, polyphagia, pyoderma, atopie, mitral insufficiency, polyuria and polydipsia, hypothyroidism, arthrosis, hip dysplasia, and a osteosarcoma. Median duration of clinical signs prior to presentation was two days (range, one day to 6 weeks).

Thoracic radiographs performed by the referring veterinarian or at the teaching hospital were available in 47 (92%) cases (Fig. 1). Results diagnostic or highly suggestive for an esophageal foreign body were seen on all but one (97.8%) radiographs, while on the radiographs of one dog a megaesophagus and aspiration pneumonia were found.

In 29 cases the foreign body was located in the distal esophagus between the heart and the diaphragm. Fifteen foreign bodies were located over the base of the heart, two at the thoracic inlet and one was found in the cervical esophagus. The location was not reported in four dogs.

After premedication and induction of anaesthesia with a short acting barbiturate or propofol, all dogs were intubated to prevent aspiration. Anaesthesia was maintained with halothane or isofluorane in oxygen. Where appropriate, fiberoptic endoscopy was performed with the dog in left lateral recumbency using an instrument with four way distal tip deflection, air, water and suction capabilities and a working channel (Olympus GIF X20).

Thirty-nine foreign bodies were bones and seven consisted of various materials; plastic objects (3 dogs) dried chewing skin (2) and a piece of meat (2). In five dogs the type of foreign body was not described.

Depending on type and location of the foreign body, different retrieval methods were used and often more than one method was tried in the same dog. Tripode forceps and wire baskets were used trough the working channel of the endoscope, while large foreign body forceps were advanced either beside the endoscope or under fluoroscopic guidance. In 25 dogs successful retrieval of the esophageal foreign body was achieved under fluoroscopic and in 15 under endoscopic control. Five dogs required esophageal surgery and in three dogs the foreign body advanced into the stomach without manipulation during anaesthesia. In three cases the method of retrieval was not mentioned. Two dogs with suspected perforation underwent gastroscopy for foreign body retrieval and subsequent visualization of the esophagus through a transdiaphragmatic aperture. No further surgery was found to be necessary and after closure, the air in the thoracic cavity was aspirated through the diaphragm. Another dog also underwent gastroscopy but the bony foreign body was firmly embedded in the mucosa and could not be pulled into the stomach. A transdiaphragmatic esophagotomy was subsequently successful. In one dog a tension pneumothorax occurred during esophagoscopy of a perforating esophageal foreign body. This led to respiratory and cardiac arrest, which could be successfully managed with positive pressure ventilation and open heart massage. The foreign body was subsequently removed through an esophagotomy (Fig. 2).

Endoscopic esophageal reevaluation after foreign body removal was performed in 25 dogs. The mucosa appeared normal in three dogs and mild, moderate and severe mucosal lesions were seen in five, six and seven dogs, respectively. In four dogs
Discussion

Breed predisposition seen in this study confirms previous results (Pearson, 1966; Houlton and others, 1985; Spielman and others, 1992), where terriers, and especially West Highland White Terriers and Yorkshire Terriers were found to be predisposed for esophageal foreign bodies. Out of 235 dogs reported in these four publications, 122 (51.9%) were terriers. The findings of more than 50% terriers with this problem favour the assumption of a breed specific anatomical abnormality. Whether conformation (large head compared to body size) or histological configuration of the esophagus are responsible is unknown. In contrast to human patients, where mostly children are presented with esophageal foreign bodies (Harned and others, 1997), very young and old dogs can equally be affected.

Either regurgitation or vomiting were the most frequent symptoms seen in dogs with esophageal foreign bodies. This is not surprising, since most foreign bodies in dogs occlude the esophagus and only liquid can pass. Other frequently reported signs like retching, gagging, salivation and halitosis (Houlton and others, 1985; Spielman and others, 1992) were also commonly seen in this case series. Anorexia and lethargy are likely the result of pain from esophageal spasms (Guilford and Strombeck, 1996). These signs are not diagnostic per se but should prompt thoracic radiographs including the cervical area. Radioopaque objects, such bones are readily visualized. Radiolucent objects can sometimes be assumed based on accumulation of gas or fluid cranial to the obstruction (Guilford and Strombeck, 1996). Positive contrast studies can be used to outline radiolucent foreign bodies or detect perforations, however, all but one of the plain radiographs were diagnostic in the dogs of this series.

Foreign bodies can lodge for a prolonged period in the esophagus, since fluid passing around prevents dehydration or electrolyte abnormalities. While 28 dogs were presented within two days after the symptoms started, six dogs presumably had the foreign body stuck in the esophagus for more than one week. This is in agreement with previous studies in dogs (Pearson 1966; Houlton and others, 1985) but also in children (Macpherson and others, 1996; Harned and others, 1997), where duration of clinical signs have been reported to last as long as seven and four weeks, respectively. In few cases in children, the foreign body has migrated outside the esophagus into the mediastinum. In this scenario, also called "the buried treasure syndrome", a foreign body has prolonged impaction on the esophageal wall and migrates extraluminally (Macpherson and others, 1996).

Foreign bodies usually lodge in the esophagus at three physiological areas of narrowing, the thoracic inlet, the base of the heart, or the diaphragmatic hiatus. This is where surrounding anatomical structures like aorta; trachea, main bronchi and the diaphragmatic crura limit the distension of the esophageal musculature. In accordance with other authors (Pearson, 1966; Houlton and others, 1985; Spielman and others, 1992), the distal esophagus was found to be the most frequent site of entrapment (62%) followed by the heart base area (32%). One study found most esophageal foreign bodies in dogs located in the proximal esophagus (Ryan and Greene, 1975), which is the most common entrapment site found in children (Macpherson and others, 1996; Harned and others, 1997).

Bones are by far the most common foreign objects found in the esophagus in dogs in this study and also in all previous reviews (Person, 1966; Ryan and Greene, 1975; Houlton and others, 1985; Spielman and others, 1992). A likely reason for this is the indiscriminate eating habit of canidea. In children, coins are the most common foreign objects found in the esophagus (Macpherson and others, 1996).
All esophageal foreign bodies should be rapidly removed because they cause pain and dysphagia, and they may result in perforation or stricture (Guilford and Strombeck, 1996). The methods of foreign body removal in veterinary medicine have changed over the past decades. Historically, transthoracic esophagotomy was preferred (Knight, 1963; Pearson, 1966), however, high morbidity and availability of fiberoptic equipment has shown a trend towards endoscopic removal of foreign bodies in the gastrointestinal tract (Tams, 1990). Surprisingly, the removal of esophageal foreign bodies under fluoroscopic guidance, the technique used most frequent in this case series (52%), has not been reported in the veterinary literature. Since most foreign bodies in dogs are bones, they can be easily seen with fluoroscopy and removed with long foreign body forceps. With this technique bony foreign bodies can also be pushed into the stomach for dissolution. Withdrawal under endoscopic guidance, second most frequently performed in this case series (31%), is favoured by recent publications for foreign body retrieval (Houlton and others, 1985; Spielman and others, 1992). Advantages of the fluoroscopic technique in our hands are decreased anaesthesia time and cost, disadvantages, however, are no direct visualization and exposure to radiation beam. Whenever perforation is suspected, surgery, not endoscopy is preferred (Guilford and Strombeck, 1996). Surgical exploration can be accomplished either transthoracically, or less invasively through the diaphragm as shown in three dogs in this case series.

In human medicine, blunt objects, such as coins are frequently removed by the Foley catheter method. A Foley catheter is advanced beyond the impacted coin, inflated with water-soluble contrast medium, a lateral radiograph is taken to verify the position and the catheter is then withdrawn. Overinflation expands the esophageal lumen and releases the impaction. The success rate is >95%, only few complications are reported and the cost is about one fourth of endoscopic removal (Harned and others, 1997). Only one Foley catheter removal of an esophageal foreign body has been reported in the veterinary literature (Hawe, 1979). This technique was not utilized in this case series. It is imperative to stress, that only blunt foreign objects are removable with the Foley catheter method.

Although dogs can tolerate simple experimental perforations of the esophageal wall up to 12 mm in diameter without surgical repair (Killen and Pridgen, 1961), perforation by a foreign body can lead to tissue necrosis, bacterial contamination and subsequent mediastinitis and pleuritis (Parker and others, 1989). Even though esophageal perforation was seen by endoscopy or radiography in four dogs, only one required surgical exploration and repair. Minor lesions can be handled conservatively with broad-spectrum antibiotics and dietary restriction (Spielman and others, 1992). Withholding food might decrease local mechanical trauma to the damaged esophagus and may reduce the fibroplastic reaction which normally occurs (Zimmer, 1984). In dogs with a severely injured esophagus a percutaneous gastrostomy tube should be placed surgically or endoscopically to facilitate feeding. Pharyngostomy or nasogastric tubes are not ideal, since they pass the damaged area and may delay epithelial healing.

Therapy of the esophagitis should be initiated as soon as the foreign body has been removed. It has been postulated, that once esophageal inflammation is established, a vicious cycle of decreased esophageal sphincter pressure, recurrent reflux and further inflammation may ensue (Zimmer, 1984). As shown previously (Spielman and others, 1992) almost all dogs in this study had some esophageal inflammation. Histamine (H2)-receptor antagonists (cimetidine or ranitidine) or a proton pump inhibitor (omeprazole) were given to almost half of the dogs. However, most of these antisecretory drugs increase the gastric pH and the dissolution of bones pushed into the stomach may be prevented during treatment. Sucralfate, which was administered to two thirds of the dogs in this study, forms a complex with proteinaceous exudates that adhere to ulcers and provides a protective barrier for gastric acid. The role of corticosteroids to prevent stricture formation is controversial. While some advocate their use in dogs especially after severe mucosal lesions (Tams, 1990), no apparent benefit has been seen in children with corrosive injury of the esophagus (Anderson and others, 1990). Steroids have been associated with an increased frequency of perforation (Knox and others, 1967).

Complications after foreign body removal can occur almost immediately or after several days to weeks. Immediate problems are perforation during attempted foreign body removal with pneumomediastinum, pneumothorax, mediastinitis, pleuritis and pneumonia as possible consequences (Parker and others, 1989). Furthermore, severe esophagitis might ensue after lodgement of a foreign body. In one dog in this study efforts to remove a vertebral body by endoscopy resulted in pneumothorax with cardiac arrest. This dog survived only due to immediate resuscitation, and the foreign body was subsequently remove surgically. In four other dogs perforation was identified either by control endoscopy or radiography. In unclear cases, water-soluble contrast media can be given orally to visualize leakage into the mediastinum (Guilford and Strombeck, 1996). Late complications are esophageal stricture forma-
tion (Melendez and others, 1998), esophageal fistulas (Spielman and others, 1992) or esophageal diverticula (Houlton and others, 1985). Strictures, which are uncommon in dogs, result from fibrous scarring of an ulcerative inflammatory process of the mucosa and submucosa. Diagnosis and therapy have recently been described (Melendez and other, 1998). Communications between the esophagus and either the trachea, a main bronchus or the aorta are rare problems seen after an esophageal foreign body in humans (Macpherson and others, 1996). Diagnosis must be confirmed with contrast radiography. In three dogs of this study, late complications were suspected based on clinical signs, however, neither endoscopy nor radiography was undertaken to confirm esophageal-related problems.

Acknowledgements

The authors acknowledge the help of Drs. J. Lang, B. Gerber and G. Neiger-Aeschbacher.

Summary

This study was performed to identify signalment, symptoms, diagnosis, treatment and complications of esophageal foreign bodies in dogs. We retrospectively reviewed the medical records of 51 dogs with esophageal foreign bodies seen at the Small Animal Clinic, University of Bern, from 1992 through 1997. Most foreign bodies were bones (76%) in the lower esophagus (57%) in terriers (39%) for fewer than 48 hours (57%). The presenting symptoms varied, with 61% showing vomiting or regurgitation. In 25 dogs (49%) foreign body extraction was performed with long foreign body forceps under fluoroscopic guidance, in 15 cases (29%) with esophagoscopy and in 5 cases (10%) surgically. In four dogs a perforation was found on control endoscopy or radiography. Late complications were suspected in three dogs based on clinical symptoms.

References


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