

Removal of lodged esophageal foreign bodies by gastrotomy in two dogs

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Abstract

One of the most serious emergency situations in dogs is esophageal obstruction. Bones are mostly reported as foreign bodies which cause obstruction. This study reports two similar situations where dogs had a bone stuck in their esophagus. The dogs showed symptoms such as regurgitation, respiratory distress, salivation, and retching. The endoscopy had been attempted to migrate the bone orally in the previous veterinary clinics, but it failed and both cases were referred to the Veterinary Teaching Hospital of Shiraz University. Plain radiography was repeated to confirm the presence of the foreign body. Initially, our treatment plan involved moving foreign objects toward the stomach before proceeding with a gastrotomy procedure. Due to the fact that both foreign bodies were lodged in the esophageal mucosa and the esophagus should not be incised as much as possible, a long fine-tips alligator forceps was used to pull out both foreign bodies from the gastrotomy incision. In both patients, the foreign bodies were removed from the esophagus without causing any mucosal damage. After two weeks, the cases showed no complications.

Key words: Esophagus, Foreign body, Surgery

Introduction

One of the most common emergency situations in dogs is the presence of a foreign body in the esophagus. The cases with esophageal foreign body (EFB) often show the clinical signs including regurgitation, vomiting, salivation, retching/gagging, coughing and dysphagia, and halitosis (Luthi and Neiger, 1998). The most commonly reported EFBs in veterinary medicine include bones, wood, sewing needles, toys, fishing hooks, and other food items (Brisson et al, 2018; Dunlap and Risselada, 2019). Reports indicate that EFBs are frequently observed

in small breed dogs, such as poodles, West Highland White Terriers, Yorkshire Terriers (Deroy et al, 2015; Luthi and Neiger, 1998). Although some studies stated that younger dogs are more susceptible, others stated that very young and old dogs can equally be affected (Deroy et al, 2015; Dunlap and Risselada, 2019). In many cases, a plain radiograph or endoscopy can be used to diagnose the presence of foreign body and determining its type and location. The present study describes two similar cases that the foreign bodies pulled out through the gastrotomy.

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Case descriptions

Case I

A 4-year-old, intact, male Pomeranian dog (4 kg), exhibiting respiratory distress, salivation, and retching from previous day, was referred to the Veterinary Teaching Hospital of Shiraz University on 9 July 2022. The history indicates that the dog had been visited by another clinic earlier in order to remove a foreign body from esophagus, but due to unsuccessful endoscopic attempts, it was subsequently referred. Immediately, diagnostic imaging was performed to determine the presence, location, and size of the foreign body. Radiography revealed a foreign body with an osseous tissue nature and dimensions of 3.1 cm × 3.7 cm at the base of heart (Figure 1a). Laboratory findings showed only a mild dehydration without any other abnormality.

Case II

A 4.5-year-old, neutered, male Pomeranian dog (8.5 kg) was referred to the Veterinary Teaching Hospital of Shiraz University on 21 May 2023 with clinical signs of dysphagia, regurgitation, and salivation for 2 days. The owner stated that a foreign body (bone) was diagnosed in the esophagus in another clinic and was not removed by endoscopy performed there. Radiographic examination confirmed the presence of a foreign body with bone density in esophagus at the diaphragmatic hiatus with dimensions of 3.5 cm × 4.0 cm (Figure 2a). The fluid therapy was performed in the previous clinic, and the patient had no symptoms of dehydration when referred. Also CBC examination showed normal findings.

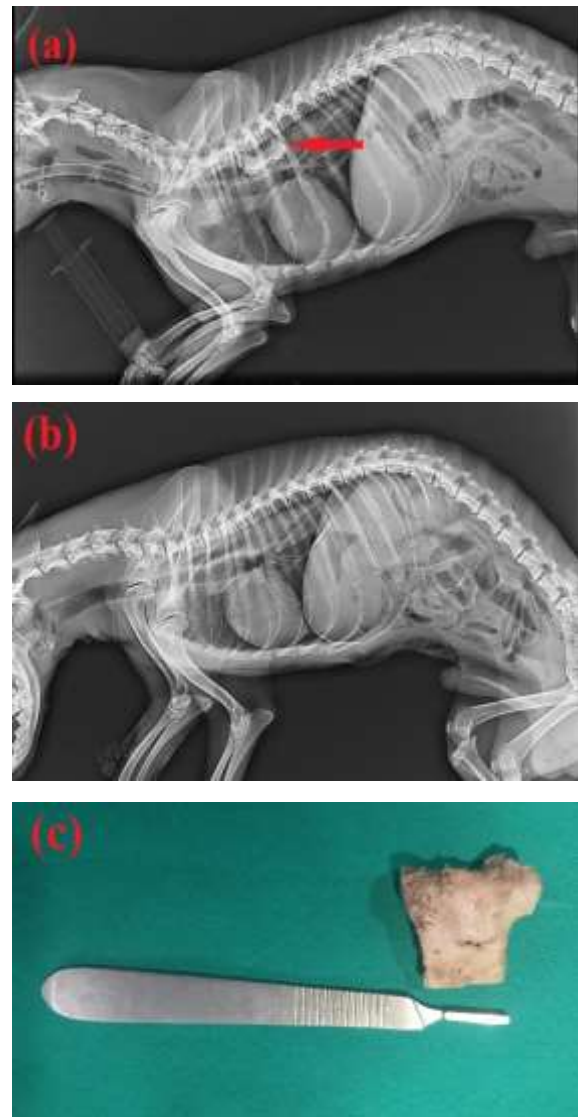


Figure 1: (a) A 4-year-old, intact, male Pomeranian dog with esophageal foreign body (red arrow). (b) Plain radiograph after removal of foreign body. (c) The extracted bone.

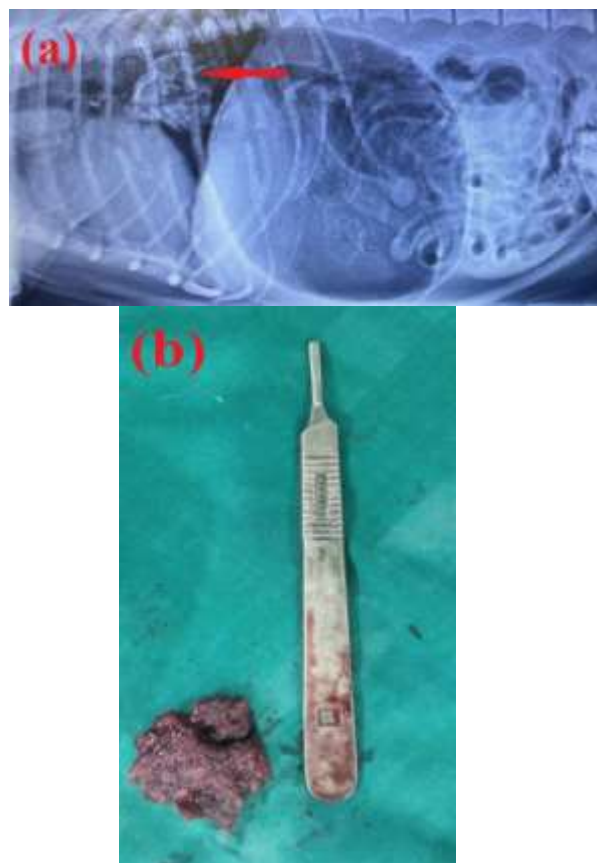


Figure 2: (a) A 4.5-year-old, neutered, male Pomeranian dog with esophageal foreign body (red arrow). (b) The extracted bone.

Surgical procedure

Prior to surgery, fluid therapy was carried out to treat the mild dehydration of the patients. The animals were sedated with a single dose of acepromazine (0.05 mg/kg, IM, Alfasan, The Netherlands). Then, the patients were catheterized and induced by propofol (4 mg/kg, IV, Beheshtan Darou Pharmaceutical Co., Iran). After induction, the patients were intubated in order to prevent the aspiration any material regurgitated from the esophagus. A stomach tube was used to advance the bone toward the stomach, but it failed in both cases; therefore, gastrotomy was selected as the course of treatment. The anesthesia was maintained by 1.5% isoflurane (Minrad International Inc., Orchard Park, USA) and a single dose of cefazolin (22 mg/kg, IV, Dana Pharmaceutical Co., Iran) was administered as prophylactic antibiotic therapy. Next, the patients were restrained

in dorsal recumbency, and the surgical area (midline region) was shaved, scrubbed, and draped. During the surgery, vital signs including oxygen saturation (SpO_2), respiratory rate, and heart rate were constantly monitored and the patients received Ringer's Solution at 10 cc/kg/h (Shahid Ghazi Pharmaceutical Co., Tehran, Iran) and Fentanyl (5 μ g/kg, slow IV, Caspian Tamin Co., Iran). A cranial midline incision (from umbilicus to xiphoid process) was made to access the stomach. After packing stomach with moist sterile gauze sponges, two stay sutures were placed on stomach. Gastrotomy was performed with an incision between the greater and lesser curvature of the stomach. The foreign bodies in both cases were then removed using a long fine-tips alligator forceps. First, stomach was sutured using a simple continuous pattern followed by a Cushing pattern using USP 2/0 Vicryl™ (Supabon, Supa Medical Devices Co., Iran). In this stage, the surgical gloves were changed with new ones, then abdominal wall (*linea alba*) and subcutaneous tissues were sutured in two individual layers using simple continuous pattern by USP 0 Vicryl™. At the end, skin was sutured using intradermal pattern by USP 2/0 Vicryl™.

Postoperative care included tramadol (1 mg/kg, P.O., q8h, Alborz Darou Pharmaceutical Co., Iran) for 3 days and cephalexin (20 mg/kg, P.O., q12h, Farabi Pharmaceutical Co., Iran) for 5 days. The owner was suggested to avoid feeding the dog orally for 24 hours, followed by a gradual introduction of a small amount of soft food. Sucralfate (500 mg per dog, P.O., q8h, Soha Pharma Co., Iran) was also administered to protect the esophageal mucosa. Both cases showed no complications after two weeks and were then fully recovered.

Discussion

Foreign body ingestion is a critical emergency condition that requires immediate medical/surgical intervention.

EFBs can be life-threatening if not treated, with the most common signs being regurgitation or increased vomiting (Davoodi et al, 2021; Luthi and Neiger, 1998). EFBs are commonly found in various species, including horses, cattle, cats, and dogs (Craig et al, 1990; Davoodi et al, 2021; Gomez et al, 2014; Haas, 2010). The most common type of EFB in veterinary medicine is bone (Luthi and Neiger, 1998).

EFBs can be usually trapped in the thoracic inlet, the base of the heart, and diaphragmatic hiatus, with the diaphragmatic hiatus being the most frequent site (62%) (Davoodi et al, 2021; Luthi and Neiger, 1998). Complete esophageal obstruction can cause ptyalorrhea and respiratory distress, while incomplete esophageal obstruction can cause anorexia and dysphasia (Haas, 2010). Small breeds like poodles, West Highland White Terriers, and Yorkshire Terriers are more likely to be affected (Deroy et al, 2015; Luthi and Neiger, 1998).

Diagnosing EFBs is crucial for prompt treatment. Oral examinations, palpation, passing stomach tubes, and endoscopy are the methods for detecting the presence of foreign bodies. Plain radiology is one of the other methods of reliable diagnosis that is useful to diagnose the presence, type, location, and dimensions of foreign body. Radiology can also help diagnose the aspiration, abdominal free air, and subcutaneous emphysema (Pfau, 2014). Double contrast radiology is also effective to diagnose the presence and type of foreign body (Haas, 2010).

Treatments include glucagon prescription (relaxes the smooth muscles of the esophagus), balloon catheter or Foley catheter technique (with or without fluoroscopy or endoscopy guide), flexible endoscopy (minimally invasive technique), laryngoscope or rigid endoscope (FBs located close to the pharynx), and various tools like Thygesens probing extractor, stomach tube, and covault hook etc (with or

without endoscopy guide). However, there is always a risk of esophageal rupture/perforation when using these tools (Cangir et al, 2002; Pfau, 2014; Davoodi et al, 2021; Haas, 2010).

Foreign body treatment involves surgery, including esophagotomy (which can be performed in the cervical area or chest) and gastrostomy. But due to segmental blood supply, continuous peristaltic movements, and lack of serous layer, efforts have been made to avoid esophagotomy surgery as it has prolonged recovery and significant postoperative complications (Fossum, 2018). Instead, the foreign body is often directed into the stomach and extracted through a gastrostomy, which was done in the cases of the current study.

After foreign body extraction, minor lesions should be treated with broad-spectrum antibiotics and dietary restrictions. Esophagitis should be treated immediately with proton pump inhibitors and H₂-receptor antagonists, and sucralfate can provide a protective barrier against gastric acid (Luthi and Neiger, 1998). In general, no foreign body should be allowed to remain for more than 24 hours, and it should be removed within 6 to 12 hours since the time passes, the complications will increase (Pfau, 2014). Complications of this condition can be acute, including ulceration, esophagitis, and pneumothorax, and late, including fistulae and strictures (Davoodi et al, 2021). The prognosis can be good if intervention is done between 2 and 12 hours from the onset of symptoms. Foreign bodies that are not treated within 24 to 48 hours of obstruction have a much worse prognosis (Haas, 2010).

In conclusion, foreign body ingestion is an emergency condition with high priority to medical/surgical intervention. Endoscopy is an effective and non-invasive means of foreign bodies' diagnosis and treatment. If the foreign body cannot be removed via endoscopy, surgical intervention is required.

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Conflict of Interest

The authors declare that they have no conflicts of interest.

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References

- Brisson, B. A., Wainberg, S. H., Malek, S., Reabel, S., Defarges, A., and Sears, W. C. (2018). Risk factors and prognostic indicators for surgical outcome of dogs with esophageal foreign body obstructions. *Journal of the American Veterinary Medical Association*, 252(3), 301-308.
- Cangir, A. K., Tuğ, T., and Ökten, İ. (2002). An unusual foreign body in the esophagus: Report of a case. *Surgery today*, 32, 523-524.
- Craig, D., Shivy, D., Pankowski, R., and Erb, H. (1990). Esophageal disorders in 61 horses: results of nonsurgical and surgical management. *Veterinary surgery*, 18(6), 432-438.
- Davoodi, F., Valizadeh, Y., Raisi, A., Mozaffari, N., and Gohardehi, K. (2021). Esophageal foreign body removal through gastrotomy using a covault hook in a female dog: A case report. *Veterinary research forum*, 12(3), 387-389.
- Deroy, C., Corcuff, J. B., Billen, F., and Hamaide, A. (2015). Removal of oesophageal foreign bodies: comparison between oesophagoscopy and oesophagotomy in 39 dogs. *Journal of small animal practice*, 56(10), 613-617.
- Dunlap, A. E., and Risselada, M. (2019). Caudal mediastinal fish hook foreign body with pulmonary artery penetration in two dogs. *Journal of the American Animal Hospital Association*, 55(1), e551-01.
- Fossum, T. W. (2018). Surgery of the digestive system. In: Radlinsky M, Fossum TW (Eds). *Small animal surgery* (5th ed. pp 376-380). Philadelphia, USA: Elsevier Inc.
- Gomez, D. E., Cribb, N. C., Arroyo, L. G., Desrochers, A., Fecteau, G., and Nichols, S. (2014). Endoscopic removal of esophageal and ruminal foreign bodies in 5 Holstein calves. *The Canadian Veterinary Journal*, 55(10), 965-969.
- Haas, J. (2010). Esophageal foreign body in a 2-day-old calf. *The Canadian Veterinary Journal*, 51(4), 406-408.
- Luthi, C., and Neiger, R. (1998). Esophageal foreign bodies in dogs: 51 cases (1992–1997). *The European Journal of Comparative Gastroenterology*, 3(2), 7-11.
- Pfau, P. R. (2014). Removal and management of esophageal foreign bodies. *Techniques in Gastrointestinal Endoscopy*, 16(1), 32-39.

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برداشتن اجسام خارجی مری با گاستروتومی در دو قلاده سگ

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چکیده

یکی از جدی‌ترین موقعیت‌های اورژانسی در سگ‌ها، انسداد مری است. استخوان‌ها بیش‌ترین اجسام خارجی گزارش شده هستند که باعث انسداد می‌شوند. این مطالعه دو موقعیت مشابه را گزارش می‌کند که در آن‌ها، استخوان در مری گیر کرده بود. سگ‌ها علایمی مانند استفراغ (بدون محتویات)، سختی تنفسی، ترشح بزاق و عوق زدن را داشتند. در کلینیک‌های دامپزشکی قبلی، اندوسکوپی برای درآوردن استخوان از دهان انجام شده بود، اما برای هر دو بیمار ناموفق بود و هر دو به بیمارستان آموزشی دامپزشکی دانشگاه شیراز ارجاع شدند. رادیوگرافی ساده برای تأیید وجود جسم خارجی تکرار شد. در ابتدا تصمیم بر آن شد تا اجسام خارجی را به سمت معده پیش برده و جراحی گاستروتومی انجام شود. با توجه به این که هر دو جسم خارجی در مخاط مری قرار داشتند و مری نباید تا حد امکان برش بخورد، از پنس بلند با نوک ریز برای انتقال هر دو جسم خارجی از برش گاستروتومی استفاده شد. در هر دو بیمار، جسم خارجی بدون ایجاد خراش در مخاط، از مری خارج شدند. هیچ عارضه‌ای در هر دو بیمار طی دو هفته پیگیری نشان داده نشد.

کلمات کلیدی: مری، جسم خارجی، جراحی

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