ATATÜRK ÜNİVERSİTESİ YAYINLARI
ATATURK UNIVERSITY PUBLICATIONS

Case Report *Olgu Sunumu* DOI: 10.5281/zenodo.14638126

Esophageal Perforation and Pericarditis Case Caused by Chicken Scapula Bone in a Puppy

Yavru Bir Köpekte Tavuk Scapula Kemiğinin Neden Olduğu Özefagus Perforasyonu ve Perikarditis Olgusu

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ABSTRACT

Because of their eating habits, dogs often experience foreign bodies in their esophagus. A common diagnostic imaging technique for identifying and excising foreign objects from the stomach, esophagus, and anterior duodenum is endoscopy. Bones and other hard, stinging foreign objects can clog and puncture the esophagus. Serious side effects including pericarditis and pleuritis can arise from a delayed detection of an esophageal perforation. In this case, there was anamnesis of dysphagia shortly after eating chicken meat with bones and subsequent regurgitation of the food. A case of pericarditis with perforation in the esophagus, inflammation in the pleura and thoracic cavity and pericarditis with perforation in the esophagus, perforation in the esophagus and inflammation in the pleura and thoracic cavity in a 45-day-old, 5 kg live weight, male, kangal cross-breed puppy who was admitted to our clinic with clinical symptoms such as cough, lethargy, decreased movement, moaning, anorexia, difficulty in eating and drinking and constant desire to lie down was evaluated.

Keywords: Chicken bone, Dog, Esophageal perforation, Foreign body, Pericarditis

ÖZ

Yemek yeme alışkanlıkları nedeniyle köpeklerde yemek borusunda yabancı cisimlere sıklıkla rastlanılmaktadır. Endoskopi, özefagus, mide ve duedonumun ön kısmındaki yabancı cisimlerin teşhisinde ve uzaklaştırılmasında yaygın olarak kullanılan bir diagnostik görüntüleme yöntemidir. Kemik gibi sert ve batıcı özellikteki yabancı cisimler özefagusta tıkanıklığa ve perforasyona neden olabilmektedir. Özefagus perforasyonunun gecikmiş tanısı pleuritis, perikarditis gibi ciddi komplikasyonlarla sonuçlanabilmektedir. Bu olguda, kemikli tavuk eti yedikten kısa bir süre sonra yutma güçlüğü ve müteakiben verilen gıdayı tekrar geri çıkarmaya çalıştığı anamnez bilgisi mevcuttu. Öksürük, durgunluk, hareketlerde azalma, inleme, iştahsızlık, yemede içmede zorluk ve sürekli yatma isteği gibi klinik belirtilerle kliniğimize başvuran 45 günlük, 5 kg canlı ağırlığında, erkek, kangal melezi yavru bir köpekte özefagusta perforasyon, pleurada ve göğüs boşluğunda yangı ile birlikte perikarditis şekillenmiş bir olgu değerlendirilmiştir.

Anahtar Kelimeler: Köpek, Özefagus perforasyonu, Perikarditis, Tavuk kemiği, Yabancı cisim

Geliş Tarihi/Received 07.12.2024
Kabul Tarihi/Accepted 31.12.2024
Yayın Tarihi/Publication Date 02.01.2025

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Cite this article: Ekinci G, Tüfekçi E, Perk G, Erol H, Güneş V, Keleş İ. Esophageal Perforation and Pericarditis Case Caused by Chicken Scapula Bone in a Puppy. *J Vet Case Rep*. 2024;4(2):34-38.

INTRODUCTION

Due to their eating habits, foreign bodies in the esophagus are more common in dogs than in cats.[1] The most common foreign bodies reported in the literature are bone, cartilage, and plastic objects.[1,2] Other foreign bodies frequently swallowed by dogs and cats include many penetrating and non-penetrating objects such as toys, shoe strings, pine cones, fishing rods, needles, thread, balls, pieces of wood, coins, and plastic buckles.[3,4] Hypersalivation, retching, vomiting, regurgitation, anorexia, repeated swallowing attempts, pain, and respiratory distress are common clinical findings after foreign body ingestion. The severity of clinical signs may vary depending on various factors such as the location of the swallowed foreign body (esophagus, stomach or duodenum), its size and the size of the animal, its species (whether it is traumatic for the gastrointestinal mucosa) and the duration of the obstruction.[1,5] In one study, it was reported that 11.7% of foreign bodies in dogs were localized in the esophagus, 83.8% in the stomach and 2.4% in both.[1] Of the foreign bodies in the esophagus, 1.2% were reported to be in the cervical esophagus, 10.5% in the thoracic esophagus and 2.4% in both the thoracic esophagus and stomach. In contrast, another case series reported that 41% of foreign bodies in the esophagus had a cervical localization.[6] Esophageal obstructions can cause necrosis, ulceration and perforation in the esophageal mucosa, which can lead to pneumothorax, pneumomediastinum or pyothorax as a result of prolonged retention of foreign bodies.[1,7]In this case, a case of esophageal rupture and subsequent pericarditis resulting from the ingestion of a foreign body (Os scapula) in a puppy is presented. This case report is expected to contribute to veterinarians' diagnosis of cases complicated by pericarditis that may occur due to foreign body ingestion.

CASE PRESENTATION

A 45-day-old male Kangal crossbred puppy, weighing 5 kg, was presented to the Internal Medicine Clinic of the Faculty of Veterinary Medicine at Erciyes University, exhibiting symptoms of dysphagia, vocalization, and emesis following the ingestion of chicken meat with bones. During the anamnesis, information was gathered from the animal's owner, revealing that the owner procured boned chicken meat, referred to as 'chicken bone for soup,' from a market specializing in offal goods, which he subsequently cooked and fed to his dogs. It was also discovered that one of the puppies experienced trouble swallowing quickly after ingesting the food and subsequently attempted to regurgitate it. Subsequently, he exhibited symptoms like coughing, lethargy, reduced mobility, groaning, anorexia, difficulties in eating and drinking, and a persistent inclination to recline. About 36 hours' post-consumption, the owner sought diagnosis and treatment at our clinic due to the dog's deteriorating condition and lack of improvement.

The patient's general clinical examination revealed a body temperature of 38.8°C, a respiratory rate of 28 breaths per minute, and a pulse rate of 160 beats per minute. Symptoms observed included regurgitation, weakness, groaning, loss of appetite, reluctance to move, excessive salivation, odynophagia, halitosis, and gagging. The oral mucosa appeared normal, with hypersalivation attributed to swallowing difficulties. The conjunctival mucosa was also normal. Dehydration was assessed as moderate (6-8%), and the prescapular lymph nodes were slightly enlarged. A latero-lateral (L/L) radiograph encompassing the neck, thorax, and abdomen was obtained, in addition to the anamnesis and physical examination findings (Figure 1).

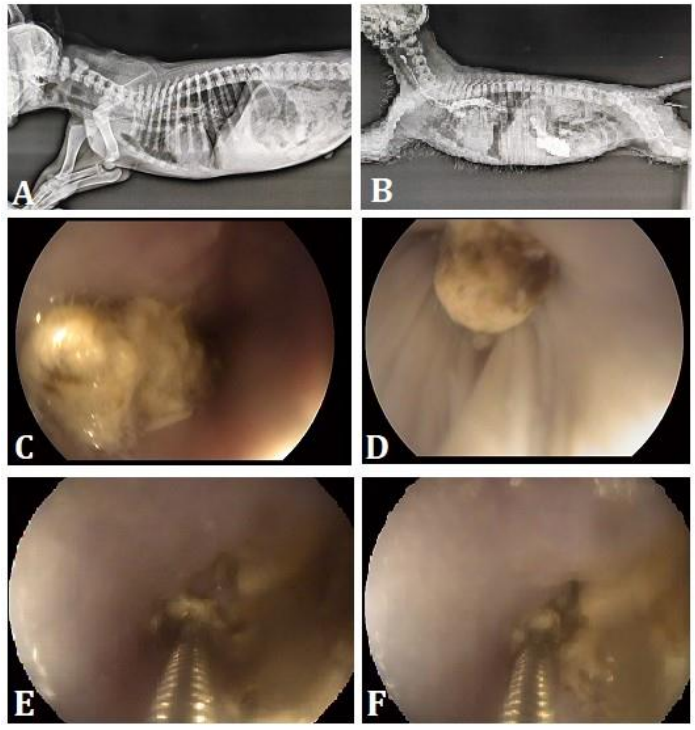

Figure 1. (A) Latero-lateral direct and **(B)** indirect Neck and Thorax radiographs of the dog. **(C)** Endoscopy showing food debris and **(D)** foreign body (chicken meat with bones) in the esophageal lumen, attempt to remove the foreign body with the help of alligator forceps **(E, F).**

The radiograph evaluation revealed a radio-opaque foreign body located in the thoracic esophagus, positioned dorso-caudal to the heart and at the level of the main bronchi, along with fluid accumulation in the lungs. The widest portion of the foreign body was believed to be pressed against the esophageal wall, leading to perforation from penetration and subsequent aspiration of saliva due to hypersalivation. The puppy underwent general anesthesia using a combination of medetomidine (100 µg/kg, IM, Domitor®, Pfizer®, Finland) and ketamine (10 mg/kg, IM, Ketasol 10%, Richter Pharma Ag, Wels, Austria) for endoscopy and foreign body removal. Endoscopic examinations were conducted by an experienced operator and observer. The observer aided the operator in the attempts to grasp and remove the foreign body using forceps. Esophagoscopy commenced following the administration of anesthesia to the patient. The endoscope (EickView HD Video Endoscope 150, Eickemeyer, Germany) was inserted from the oral cavity into the esophagus using a padan. Endoscopy was utilized to assess the esophageal lumen and mucosa. Food residues and fibrous plant materials, including grass, were observed in the cervical esophagus, specifically in its proximal third. The cervical esophageal mucosa was assessed and found to be normal. The thoracic esophagus, comprising the middle two-thirds of the esophagus, was subsequently accessed. The chicken bone was observed lodged and embedded within the esophageal lumen. The chicken bone was subsequently removed using alligator forceps. The removal of the chicken bone was impeded due to its considerable size, compression within the esophagus, and penetration into the esophageal mucosa. The case was referred to the Department of Surgery for surgical intervention. Indirect radiography (BLD-150AJ, AJEX Meditech. Ltd., Korea and Fujifilm Computed Radiography, CR-IR 392, Chine) was conducted using diatrizoate (10 ml, Oral, Urografin® 76% Solution for injection and infusion, Schering AG, Berlin, Germany) to enhance the overall condition and verify the complication of esophageal perforation prior to the surgical procedure. Indirect radiography revealed the aspiration of contrast material from the esophagus into the chest cavity. The surgical intervention was postponed due to pleural effusion in the chest cavity, a prominent and hyperechoic cardiac silhouette, and a deterioration in the general condition. To enhance the patient's overall condition, treatment with penicillin and streptomycin (Reptopen®, Ceva, Türkiye), meloxicam (Maxicam, Ceva, Türkiye), isotonic 0.9% NaCl® (Polifleks, Polifarma, Istanbul), Lactated Ringer (Polifleks, Polifarma, İstanbul, Türkiye), 5% Dextrose (Polifleks, Polifarma, İstanbul, Türkiye), and a vitamin-mineral-amino acid solution (Duphalyte®, Zoetis, Spain) was initiated, and the dog was transferred to the intensive care unit. An emergency operation was deemed necessary approximately 16 hours after the initiation of treatment due to respiratory and cardiac failure. Despite all emergency interventions conducted prior to the operation, the dog succumbed. A thoracostomy was performed for diagnostic and macroscopic examination following the dog's death. Following the thoracostomy, a chicken bone (Os scapula) measuring 3.7 cm in length, 2.5 cm at its widest point, and 0.85 cm at its highest point was identified in the thoracic esophagus at the level of the heart, resulting in partial obstruction. Furthermore, it was established that the esophageal mucosa exhibited perforation, accompanied by the presence of a cloudy fluid within the chest cavity. Pleural effusion, pleuritis, and diffuse pericarditis of the heart were also documented. This case report presents a fluid aspiration and pericarditis resulting from esophageal rupture caused by the ingestion of a foreign body (Os scapula) (Figure 2).

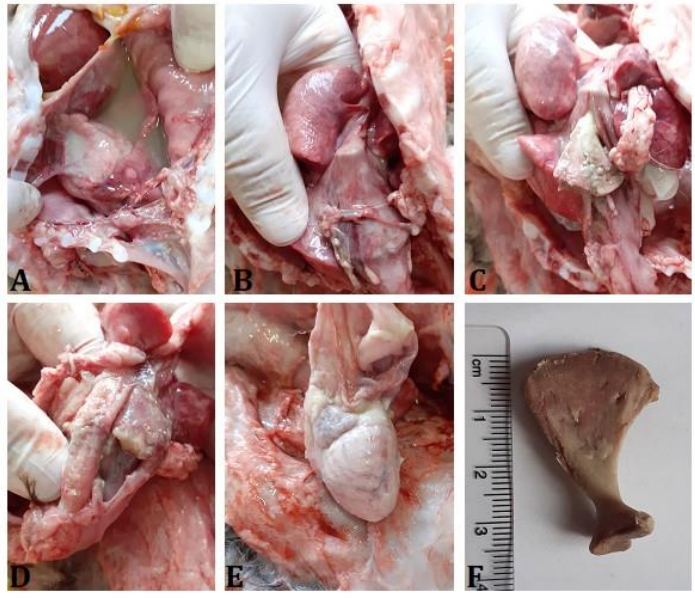

Figure 2. (A) Macroscopic image of fluid accumulation in the chest cavity, **(B)** chicken bone stuck in the esophagus, **(C)** removal of the chicken bone by incision and **(D)** perforation in the esophageal mucosa due to a foreign body (chicken meat with bones), **(E)** Exudate accumulation in the pericardium, **(F)** chicken bone (Os. Scapula, 3.7 cm long, 2.5 cm at its widest point and 0.85 cm at its highest point).

DISCUSSION

Foreign body ingestion is a common condition in pets, both for play purposes and due to improper feeding, and dogs are more likely to apply to clinics with complaints of foreign bodies in the esophagus and stomach than cats.[5] Foreign body ingestion is a condition that affects young dogs more due to their habits of playing with toys and

eating them haphazardly.[8] Foreign bodies detected in the esophagus are most commonly seen in puppies and small breed dogs due to the size of this organ, and obstruction is often detected in areas where the organ is anatomically narrowed (thoracic inlet, heart base and hiatal esophageal region).[7] Digestible esophageal foreign bodies can be pushed into the stomach instead of being removed orally, and possible damage can be minimized. Digestible food materials, such as bone and cartilage, can be processed in the stomach, whereas the expulsion of other foreign bodies is contingent upon their characteristics and dimensions. Due to the complexities associated with direct surgical intervention on the esophagus, it is advisable to utilize direct grasping forceps to retrieve foreign bodies or to push them into the stomach for removal via gastrotomy. This approach aims to minimize the risk of complications and enhance the prognosis.[7,9] Nonetheless, the insertion of foreign bodies into the stomach may not be feasible in all instances. A study indicated that 10.5% of foreign bodies in the esophagus were found in the thoracic esophagus, while 1.2% were located in the cervical esophagus.[1] The present case report identifies the localization of a foreign body, specifically a chicken scapula bone, within the thoracic esophagus. In dogs, the most frequently reported foreign bodies in the esophagus include socks (12.8%), plastic pieces (12.8%), rags (11.6%), bones (8.1%), pine cones (7%), wooden toothpicks (5.8%), needles (2.2%), and fishing rods (2.2%).[1] The success rate for endoscopic removal of gastric foreign bodies ranges from 78% to 94%, whereas for esophageal foreign bodies, it ranges from 68% to 88%.[10] The attempt to endoscopically remove the esophageal foreign body in the present case was unsuccessful. The substantial size of the foreign body (chicken scapula bone) precluded attempts to either extract it or push it into the stomach. The failure of the attempt can be attributed to the narrow esophageal lumen characteristic of a 45-day-old dog. In cases where endoscopic removal or gastric pushing is unsuccessful, surgical intervention is necessary for the extraction of foreign bodies.[9,10] The challenges and risks associated with surgical manipulation, particularly in the thoracic region of the esophagus, diminish the likelihood of intervention in these instances. The prognosis of patients who ingest foreign bodies is significantly worsened by complications that arise as a result of the foreign body.[1,7] One study indicated that complications occurred in 43.4% of cases following foreign body ingestion.[1] Minor complications, including esophageal or gastric mucosal inflammation, occurred in 92.5% of cases, whereas major complications such as bleeding, perforation, and pneumothorax were observed in 7.5% of cases.[1] Maggi et al.[1] documented erosion and ulceration of the esophageal mucosa in 2 out of 3 cases of significant complications following foreign body ingestion, as well as esophageal perforation resulting in pneumothorax and mortality in 1 case. In this case report, significant complications including esophageal perforation, pleuritis, and pericarditis were identified as a result of a chicken bone, leading to the puppy's death shortly thereafter. A comparable instance of esophageal perforation and pericarditis resulting from a chicken sternum bone (right trabecula lateralis and trabecula intermedia) was documented in an 8-month-old, female, 3-kg dog.[11] A case of pericarditis resulting from esophageal rupture due to the ingestion of a chicken bone was reported in a 59-year-old individual.[12] A human case report describes an instance of esophageal perforation that developed 48 hours after onset, resulting in multifactorial shock (septic and cardiogenic) attributed to pericarditis and pericardial and pleural effusion.[13] Prior research indicates that small dogs with extended esophageal obstruction and foreign bodies, including bones and fishing lines, experience poor prognosis and significant complications.[14,15] The esophageal perforation in this case likely resulted from the sharp edge of the bone penetrating or tearing the mucosa during its movement toward the stomach, coinciding with the peristaltic actions of the esophagus. Significant complications associated with penetrating esophageal foreign bodies, specifically bone, have been documented in small dogs, particularly those localized in the thoracic esophagus.[1] In the present case report, efforts to extract the bone using forceps and to advance it into the stomach during endoscopic removal may have worsened the esophageal perforation. Literature indicates that complications may arise from irregular surfaces of foreign bodies, compression, or entrapment in the esophagus.[1,7,14,15] The presence of chicken scapula bone in the thoracic esophagus of dogs is an uncommon phenomenon when assessed from all these perspectives. The occurrence of esophageal perforation due to chicken scapula bone, accompanied by significant comorbidities such as pericarditis, enhances the case's importance. Major complex esophageal foreign masses are hardly encountered in small animal clinics.

In conclusion, current information suggests that a potential solution involves the extraction of massive, rigid, inflexible foreign substances, such as bones, by fragmenting them into smaller pieces within the esophagus lumen. Consequently, augmenting the assortment of endoscopic forceps in Veterinary Hospitals will facilitate intervention in challenging circumstances.

Peer-review: Externally peer-reviewed.
Author Contributions: Concept-GE, İK, VG; Design-GE, ET; Supervision-HE, VG, İK; Resources-GE, ET, GP; Data Collection and/or Processing- GE, ET, GP; Analysis and/or Interpretation-VG, İK, HE; Literature Search-GE, ET; Writing Manuscript-GE, ET, GP; Critical Review-VG, İK, HE.
Conflict of Interest: The authors have no conflicts of interest to declare.
Financial Disclosure: The authors declared that this study has received no financial support.

Hakem Değerlendirmesi: Dış bağımsız.
Yazar Katkıları: Fikir-GE, İK; Tasarım-GE, ET; Denetleme-HE, VG, İK; Kaynaklar-GE, ET, GP; Veri Toplanması ve/veya İşlemesi-GE, ET, GP; Analiz ve/ veya Yorum-VG, İK, HE; Literatür Taraması-GE, ET; Yazıyı Yazan-GE, ET, GP; Eleştirel İnceleme-VG, İK, HE.
Çıkar Çatışması: Yazarlar, çıkar çatışması olmadığını beyan etmiştir.
Finansal Destek: Yazarlar, bu çalışma için finansal destek almadığını beyan etmiştir.

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