

Endoscopic Retrieval of a Large and Circular Foreign Body Lodged in Gastric Pylorus in a Dog

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Abstract : A 7-year-old Shih Tzu cross dog was presented for severe abdominal pain, persistent vomiting and anorexia. Laboratory tests revealed mild anemia and hypoproteinemia. Abdominal survey radiography revealed marked gastric distension and large circular foreign body in the gastric pylorus. The foreign body was removed using a videoendoscope, fishing line and retrieval forceps. The dog's clinical signs resolved following foreign body removal.

Key words : Foreign body, GDV, gastric dilation, endoscopy, dog.

Introduction

Gastric obstruction from a foreign body is fairly common in dogs. Dogs seem to like to chew on and even consume odd things at times. Obstruction of the intestines in dogs and cats is always treated as emergency.

Endoscopic foreign body retrieval refers that ingested objects from the esophagus, stomach and duodenum are removed by endoscopic maneuvers. These maneuvers do not involve surgery, but rather encompass a variety of techniques employed through the gastroscope for grasping foreign bodies, manipulating them, and removing them while protecting the esophagus and trachea (1-3).

Endoscopic maneuvers can not be indicated in situations i) where small blunt objects (less than 2.5 cm) have already passed into the stomach, ii) when there is perforation of the esophagus or mediastinitis, iii) when toxic materials-containing bags are ingested, because of the risk of intoxication if they are ruptured (1). Foreign bodies should be removed from the esophagus within 24 hours of ingestion because of a high risk of complication (2).

In this case study, we presented an unusual case of large circular foreign body incidentally ingested in dogs and practical retrieval method using endoscopic maneuvers.

Case

A 7-year-old castrated male Shih Tzu cross dog was referred at Veterinary Teaching Hospital of Kangwon National University with the primary complaint of persistent anorexia, protracted vomiting and severe abdominal pain. The referring veterinarian suspected acute gastric dilation and volvulus. In physical examination, the dog was lethargic and was nearly in shock

state. No particular abnormalities were observed in laboratory tests, except anemia (red blood cell count: $2.24 \times 10^6/uL$; reference range $5.5-7.5 \times 10^6/uL$) and hypoalbuminemia (2.0 g/dL, reference range: 2.5-3.7 g/dL).

Abdominal radiography revealed marked gastric dilation and large circular foreign body ($r = 29$ mm) lodged in gastric pylorus (Fig 1). Since the dilation of stomach was severe, rapid 0.9% saline solution infusion (90 mL/kg/hr) with methylprednisolone sodium succinate (20 mg/kg) via jugular vein were done for restoring circulatory volume and preventing hypovolemic shock. After the dog's condition was stabilized, the endoscopic examination and retrieval was decided. For endoscopic examination, the dog was heavily sedated with propofol (5 mg/kg), atropine (0.02 mg/kg) and diazepam (0.1 mg/kg, IV). An elec-



Fig 1. Abdominal survey radiography of this dog. The radiography revealed marked gastric dilation and large circular foreign body ($r = 29$ mm; arrow) lodged in gastric pylorus.

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tronic scope (EB-1570 K video bronchoscope, Pentax, Japan) was inserted into the stomach. A plastic toy car wheel (r = 29 mm) covered with bloody mucus was tightly lodged at the pylorus of the stomach (Fig 2). There was a piece of plastic sausage

casing with lead wiring inside the toy car wheel (the main foreign body). The piece of plastic sausage casing was removed from the stomach using endoscopic alligator forceps (FG-53SX-1, Olympus, Japan; Fig 4B). However, the plastic toy car wheel

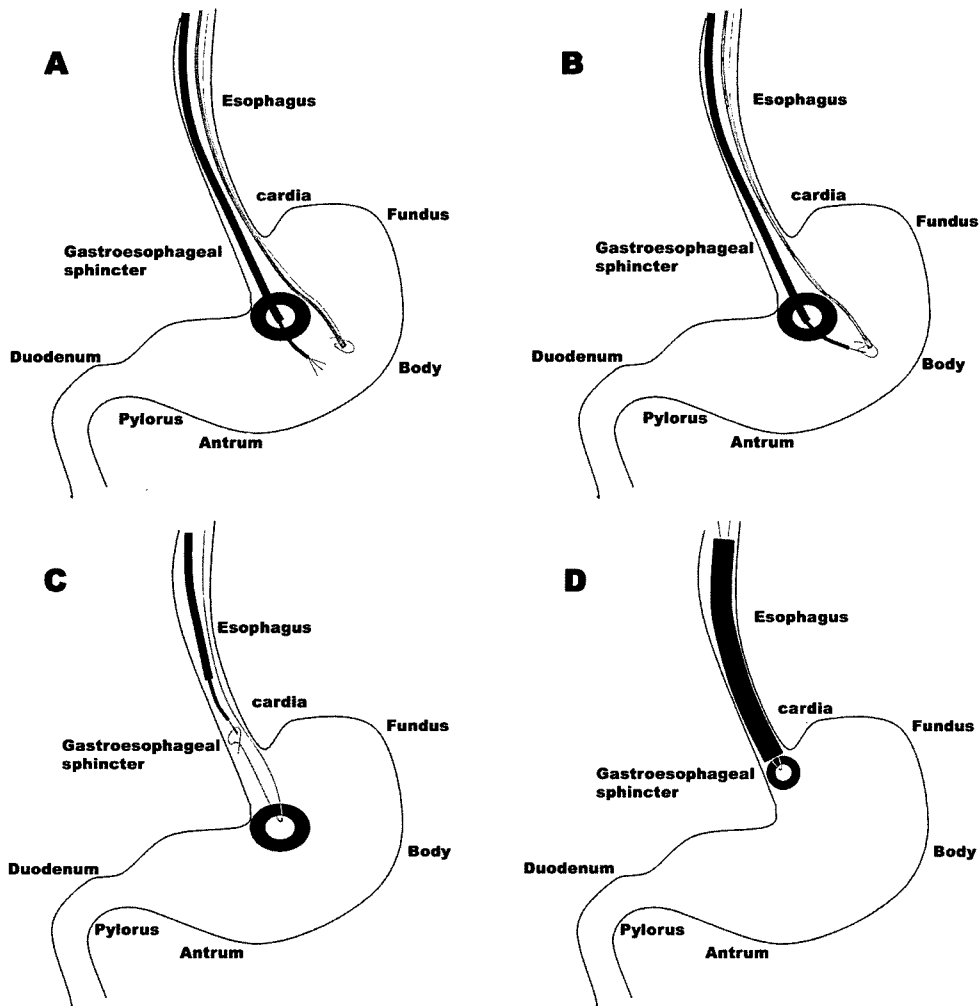


Fig 2. The procedure of the foreign body removal. A: A fishing line hooked on the second endoscopic alligator forceps was inserted along the endoscope. B: By manipulating the first forceps, the fishing line was hooked on the first forceps. C: The fishing line was removed with the first forceps and the endoscope. D: The foreign body was removed by pulling the rubber tube back out with the fishing line.

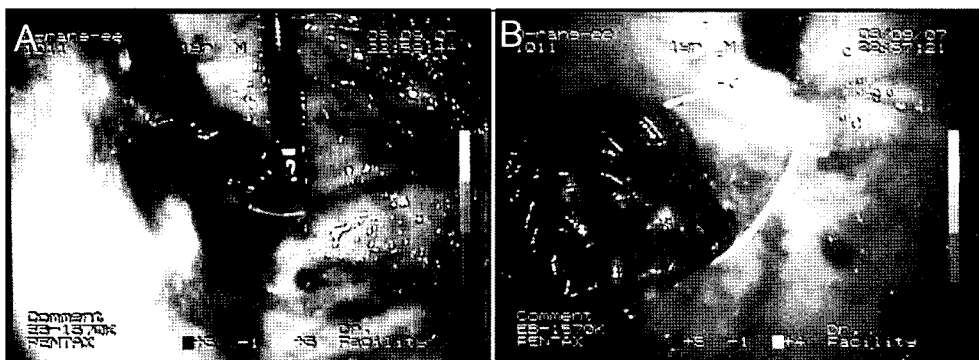


Fig 3. Endoscopic photo of foreign body hooked on the endoscope (A) and close view of the hooked foreign body (B).

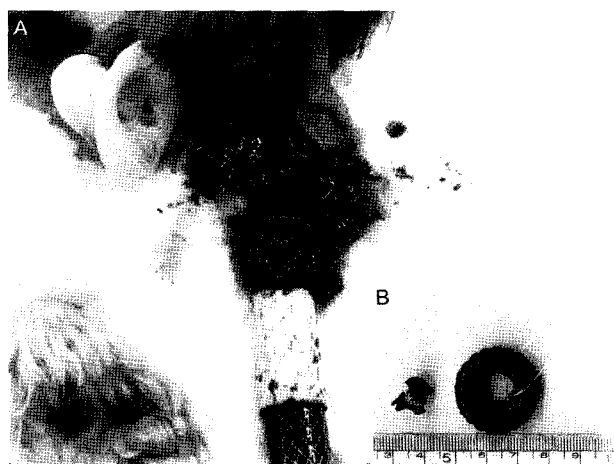


Fig 4. After the retrieval of foreign bodies. A: A large circular foreign body covered with bloody mucus. B: A plastic toy car wheel and sausage casing with lead wiring removed from the stomach of this case.

was hard to remove, since it was too large and too tightly lodged in the gastric pylorus. At first, we inserted endoscopic alligator forceps and pulled out the plastic toy car wheel stuck in the pylorus for easy manipulation. Because the foreign body had a central hollow space, we decided to hook it out using a fishing line. To insert the fishing line into the foreign body, we inserted foreign body forceps (Three Wires Nail Tip; Rosot, USA) into the small channel of the endoscope. The fishing line hooked on the second endoscopic alligator forceps was then inserted along the endoscope (Fig 2A). The first forceps was then pushed into the central hollow space of the foreign body and then the second forceps with the fishing line was pushed in to meet the tip of the first forceps. By manipulating the first forceps, the fishing line was hooked on the first forceps (Fig 2B). The fishing line was removed with the first forceps and the endoscope (Fig 2C). Finally, the foreign body was hooked with the fishing line. We pulled the line back to retrieve the foreign body. However, we could not remove it from the stomach, because it was tightly stuck in the gastric cardia. The fishing line holding the foreign body was inserted into a large diameter rubber tube ($r = 15 \text{ mm}$) to help widening of cardia since gastroesophageal sphincter pressure was reduced by sedative drugs (diazepam and propofol). After then, the rubber tube was pushed into stomach with surgical lubricant containing 2% lidocaine (Sung-Kwang Pharmaceuticals, Korea; Fig 2D). Finally, the foreign body was removed, when we pulled the rubber tube back out with the fishing line.

After retrieval of foreign bodies, the dog was treated with sucralfate (250 mg/kg, SID, PO) and ranitidine (2 mg/kg, BID, IV) for alleviating gastric signs, and 0.45% saline and 2.5% dextrose solution to maintaining fluid balance. After one day of foreign body retrieval, small frequent meals (Hill's i/d) were offered to the dog. Because further deterioration of gastric signs was not observed and the dog started to voluntarily eat, the dog was released.

Discussion

Endoscopic foreign body retrieval by endoscopic maneuvers is widely applied in veterinary clinics. Endoscopic retrieval involves the use of an electronic scope or an optic fiber scope. This instrument is inserted through the mouth into the esophagus and stomach to identify the foreign body or bodies. This procedure is usually performed under deep sedation. Many techniques have been described to remove foreign bodies from the stomach and esophagus using forceps, which come in varying shapes, sizes and grips (5), snares, and oval loops that can be retracted from outside the gastroscope to lasso objects (6), as well as Roth baskets (mesh nets that can be closed to trap small objects) (7) and magnets placed at the end of the scope or at the end of orogastric tubes (5,8). Usually the esophagus is protected with an overtube (a plastic tube of varying length), through which the gastroscope and retrieved objects are passed (4). Although various endoscopic retrieval methods have been described in literature, those methods could not be applied in this case, because the foreign body stuck in the gastric pylorus was too large to pull it out using retrieval forceps. Although surgical removal was indicated for this case, we decided to remove foreign body using endoscopic retrieval devices with fishing line to reduce anesthetic risks and to fasten recovery after removal.

Main problems encountering to remove large objects from the stomach are that gastroesophageal sphincter tone may hinder the migration of foreign body to esophagus and may induce mechanical damage to sphincter muscle. To minimize these risks, the patient was sedated with diazepam and propofol. According to literature, gastroesophageal sphincter tone can be lowered by certain sedative drugs such as morphine, meperidine, diazepam, xylazine, propofol and acepromazine (9-11). Furthermore we used large diameter rubber tube with surgical lubricant to widen gastric pylorus and to ease migration of foreign body from the stomach to the esophagus.

This case showed similar clinical signs of gastric dilation and volvulus (GDV) especially marked gastric dilation in abdominal radiography, hypovolemia and repeated vomiting. Most cases with gastric foreign bodies may not show severe gastric dilation, unless the foreign bodies were stuck in gastric outflow tract (pylorus). Our case was unique since a large circular object obstructed gastric outflow tract so that the patient showed mimic clinical signs of GDV. Aggressive fluid therapy to prevent circulatory failure was beneficial for this case. Although an emergency decompression using a large bore needle is usually indicated for severe GDV cases, it was not necessary in this case, since the gastric decompression can be achieved by endoscopic suctioning.

Conclusion

This case study described successful retrieval of large circular foreign body choked in the pylorus using an endoscope, retrieval forceps, fishing line, a long large diameter of rubber tube. Although foreign body in gastrointestinal tract is the common

problem in dogs, this case study provides useful information and clinical tips for removing large circular foreign bodies, which can not be easily removed by endoscopic retrieval forceps.

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내시경을 이용한 유문폐색을 유발한 개의 이물제거

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요 약 : 7년령의 수컷 시츄 잡종개가 심한 복통, 지속적인 구토와 식욕부진 등의 증상으로 내원하였다. 실험실 검사상 빈혈과 저단백혈증의 특별한 소견은 관찰되지 않았다. 복부 방사선 상에서 심한 위확장소견과 유문부를 막고 있는 대형의 원형 이물질이 관찰되었다. 내시경, 이물제거용 포셉과 낙시줄을 이용하여 이물을 위장관으로 부터 제거하였다. 환자는 이물 제거 후 빠르게 회복하였다.

주요어 : 이물질, GDV, 위확장, 내시경, 개