

Typical cases of gastro-intestinal foreign bodies and their successful surgical management in dogs

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Abstract

Different cases of foreign body ingestion in dogs and their lodgment in different parts of the gastrointestinal tract mostly the stomach and transverse colon, causing partial or complete obstruction, were reported to the Department of Veterinary Surgery and Radiology, Veterinary Clinical Complex, Belgachia, Kolkata, WBUAfS, with a common history of vomiting, anorexia, dullness, and depression. Due to non-responsiveness to conventional therapy against the symptoms, the patients were suspected of any foreign body ingestion due to their habit of pica. The presence of different-sized radio-opaque foreign bodies in digital radiographs confirmed the cases. The lodgment sites were found to be different in the case of different animals due to the size of the foreign body as well as the time of reporting. Laparotomy was performed to remove the foreign body after assessment of lodgment sites from the radiographs. All the animals were kept under proper post-operative care and management and showed uneventful recovery after two weeks.

Keywords: Foreign body, Gastrotomy, Laparotomy, Obstruction, Pica

Highlights

- Obstruction of different parts of the gastrointestinal tract by ingestion of foreign bodies
- Diagnosis of gastrointestinal foreign bodies by digital radiography
- Surgical removal of foreign bodies by Laparo-gastrotomy and Laparo-enterotomy with successful recovery

Gastrointestinal obstruction by foreign bodies are very common in dogs which may be presented with a variety of clinical symptoms depending upon the nature and site of obstruction (Cornell and Koenig, 2016). It may be a partial obstruction or a complete one. Complete intestinal obstruction is associated with more pronounced symptoms like anorexia, vomiting, dehydration, dullness and depression. The dogs having vices like pica show more tendency to develop gastrointestinal obstruction due to licking or ingestion of inanimate objects like rubber ball, plastic wares, metal objects etc. (Eyarefe, 2016). There may be linear and non-linear foreign body obstruction of the intestine. Non-linear foreign body obstruction is most common in dogs and it causes increased pressure over the obstructed area that may precipitate edema and subsequent necrosis. In a retrospective study of gastrointestinal obstruction, it has been documented that 68% of the obstructions were due to the non-linear

foreign body (Hobday *et al.*, 2014). Most of the time intestinal obstructions seek emergency critical care (Clark, 1968; Fages *et al.*, 2021; Corrick, 2023).

Most of the time, gastro-intestinal obstructions are presented later until and unless not seen by the owner to engulf foreign materials. In such situations wound healing and the outcome of the surgical interventions became compromised due to partial or remarkable loss of intestinal motility and occurrence of toxemia along with the development of hypoproteinaemia (Mullen *et al.*, 2020; James *et al.*, 2024). Previous studies have documented many cases of foreign body obstructions with variable outcomes (Brisson *et al.*, 2018; Barash *et al.*, 2022). The present paper will focus on a few specific cases of gastro-intestinal obstructions.

Case 1: A two years old golden retriever dog (28 kg) was presented with the history of engulfment of a rubber ball as seen by the owner. The case was sent for

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a digital radiography (Fig. 1) which revealed that the said foreign material was within the stomach. The case was considered as a surgical emergency because the size of the foreign body was bigger enough to pass through the rest part of the gastro-intestinal tract which might lead to complete gastro-intestinal obstruction. A routine laparo-gastrotomy was performed and the rubber ball was retrieved. The dog was recovered uneventfully.

Case 2: A 5 years old spitz dog (11 kg) was presented with anorexia, frequent vomition and melena. After anamnesis, it was evident that the animal had pica. It was then decided to take one radiograph (Fig. 2) which depicted some foreign materials within the stomach. The case was diagnosed as gastric foreign bodies lodged in the pyloric end of the stomach. As the animal was quite stable, different haematological parameters were evaluated, which showed increased WBC count suggestive of associated inflammation and infection. Serum lactate was also estimated which showed an elevated level (468 U/L) indicative of under-tissue perfusion. It was quite expected that partial gastrectomy may be required due to gastric necrosis. Routine gastrotomy was performed and the devitalized portion

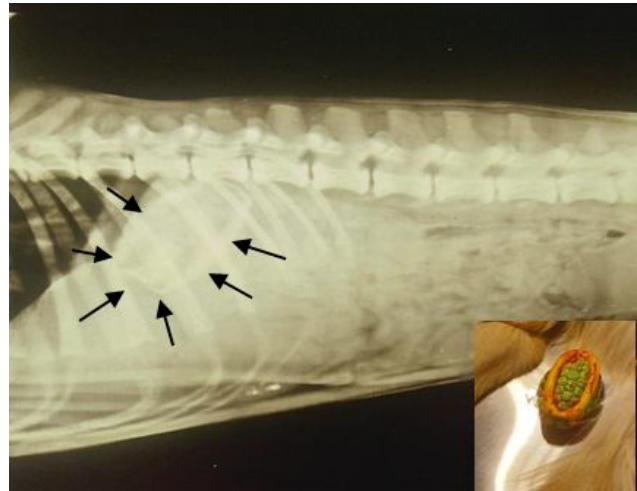


Fig. 1. Radiographs of the whole abdomen (lateral view) showed a foreign body covering most of the stomach area with a radio-opaque outer border (arrow marked). No radiolucent patches in and around the foreign material were visible which indicated minimal inflammatory reaction and damage to the gastric mucosa. Other structures seemed to be normal. The patency of the rectum and the colonic area is appreciable

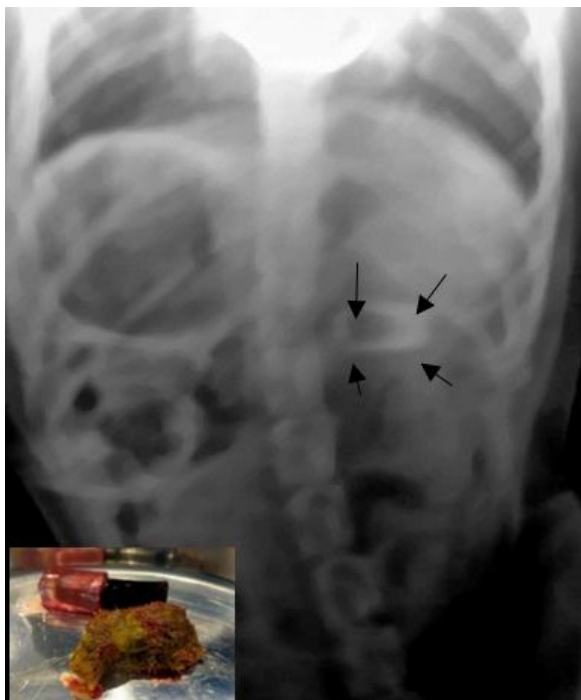


Fig. 3. The radiograph of abdomen (ventro-dorsal view) showed presence of radio-opaque foreign body at pyloric end of syomach. No marked gaseous distension in and around the foreign material was observed



Fig. 2. The radiograph showed presence of multiple radio-opaque foreign bodies, lodged at body and pylorus part of the stomach. Others structures were found to be normal

of gastric areas resected out and closed by standard methods.

Case 3: A 1.5 years old golden retriever dog (23 kg) was presented with complain of recurrent vomition with the habit of pica (chewing of unusual objects). The radiograph of abdomen (Fig. 3) showed presence of radio-opaque foreign materials at the pyloric end of stomach. The haemogram did not show any significant variation except increased PCV (66%). As the size of

the gastric foreign body was quite larger to pass through the intestine, laparo-gastrotomy was performed to remove it. No such necrosed or devitalized tissues were found within the stomach, so only gastrotomy was performed without resection. The animal had a favourable outcome after post-operative care and management.

Case 4: A 1.5 year old male Labrador dog weighing 15.8 kg was presented with occasional frothy vomition and hyporexia. History of depraved appetite (pica) was also reported by the owner during clinical investigation. The radiographic examination revealed a bunch of radio-opaque materials (foreign body) located within the stomach (Fig. 4). The haemogram showed elevated neutrophils and increased ESR may be due to infection and inflammatory changes within stomach. The patient was prepared for emergency gastrotomy and the removed foreign body was found to be pieces of wired earphone. The animal showed successful recovery after a follow up period of two weeks.



Fig. 4. The radiograph depicted presence of bunch of radio-opaque foreign bodies in the body and pyloric part of stomach. Other structures showed no such radiological abnormality

Case 5: A 2 years 10 months old female Labrador bitch weighing 27 kg body weight was presented with the history of accidental ingestion of sewing needle with cotton thread around 36 hours ago. Apparently the animal didn't show any clinical abnormalities. Immediate radiographic examination revealed presence of sharp ended linear radio-opaque foreign body located within large intestine (parts of transverse colon) (Fig. 5). To avoid any chance of piercing and further complications, it was decided to remove the needle by emergency laparo-enterotomy. Therefore, the animal was prepared for surgery as per routine manner. After opening of abdominal cavity, different parts of colon were palpated and the needle was found in transverse colon. Without giving any incision the needle was removed simply by piercing the intestinal wall with its sharp end. One protective simple interrupted suture was given through submucosal layer at the site of piercing. The abdomen was closed by routine manner. The animal was kept under post-operative care and management for ten days and met uneventful recovery.

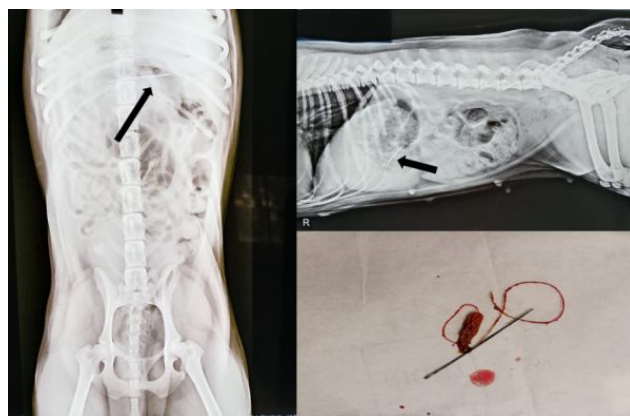


Fig. 5. The radiograph revealed presence of linear, sharp ended metallic foreign body lodged at a part of transeverse colon. The stomach showed presence of gases, without any foreign materials



Fig. 6. The radiograph showed presence of irregular shaped radio-opaque foreign materials present at pyloric end of stomach

Case 6: One 8 months old male Labrador dog (16 kg) was reported at the clinic with a history of ingestion of

bunch of keys 48 hours ago. The animal was clinically normal except seldom vomition. The radiograph (Fig. 6) showed presence of irregular shaped metallic foreign bodies within the pyloric end of stomach. The

haemogram depicted increased ESR and WBC count may be due to inflammatory response of gastric mucosa. Laparo-gastrotomy was performed to remove the keys by standard procedures. After post-operative care and management of two weeks, it showed successful recovery.

In case of laparo-gastrotomy the abdominal area was prepared aseptically and the incision was given from the xyphoid to the caudal abdomen. After approaching towards abdominal cavity, the gastrotomy incision was made in a comparatively less vascular area, almost at the mid-way between and parallel to the greater and lesser curvature and equidistant between pylorus and cardia. The foreign bodies were removed manually and the incised part of the stomach was sutured using 2-0 catgut by double layered lembert pattern (Monnet, 2020). In case of gastrectomy the devitalized portion of the stomach was removed up to the fresh tissue margin. After that, rest of the part was sutured using 2-0 catgut by continuous suture followed by lembert pattern (Fages *et al.*, 2021).

In case of laparo-enterotomy the incision was given mid-ventrally along the linea-alba. After opening of abdominal cavity, the parts of transverse colon were palpated for presence of sharp ended foreign body which was removed by piercing, without giving any incision. One protective simple interrupted suture was given at the point of piercing (Hobday *et al.*, 2014). The abdominal cavity was closed following routine procedures. The standard anaesthetic protocols were followed using Atropine sulphate (0.04 mg/kg SC) as pre-anaesthetic, Xylazine (1 mg/kg IM) as sedative, Ketamine hydrochloride (5 mg/kg IM) along with diazepam (0.5 mg/kg IM) for induction and maintenance. Patients with foreign bodies in the stomach are always associated with severe gastritis and vomition. Preoperative fluid therapy was considered a must to correct the fluid and electrolyte balance.

All the animals were followed up for two weeks post-operatively. 5% dextrose infusion (@ 20 mL/kg b.wt. twice daily), Ringers lactate solution (@ 20 mL/kg b.wt. twice daily), Cefotaxime sodium (@ 35 mg/kg b.wt. twice daily), Ondansetron injection (0.5 mg/kg b.wt. twice daily), Vit-B complex injection (1 mL/20 kg b.wt. once daily) were given intravenously and injection ranitidine (2 mg/kg b.wt. twice daily) was given intramuscularly for seven days without any oral intake. After seven days, liquid diet followed by semi-solid and normal diet were advised with pre-biotic

and pro-biotic preparations (capsule syn-fo-sium) for one week. Regular dressing of wounds were monitored as per routine practice and the suture was removed at 10th post-operative days.

In these studies, the radiographs were adequate to attain information on the presence of foreign bodies in the stomach. Most of the time local dilatation, and accumulation of gas and fluid may be evident. But this is not true for all the time. (Clark, 1968; Gibbs and Pearson, 1973; Graham *et al.*, 1998; Ciasca *et al.*, 2013; Kaur *et al.*, 2015; Miles *et al.*, 2021; Corrick, 2023). However, plain radiography may not be sufficient alone to provide information regarding foreign bodies in the stomach for which either digital radiographs or barium meal X-ray is suggestive. Fortunately, in all the present cases radiographs provided information about the presence of foreign materials in the stomach as well as transverse colon. The existing clinico-pathological variations along with sero-biochemical alterations were corrected preoperatively which resulted in better outcomes of the surgeries with greater survival rates. These observations simulate the observations of Swinbourne *et al.*, 2017; Monnet (2020), and Fages *et al.*, 2021. The better outcome of the gastric surgeries may also be due to the fact that gastric wound healing occurs with minimal collagenase activity at the wound site resulting in more and more collagen deposition (Gokulakrishnan *et al.*, 2023). The present paper describes the accurate diagnosis, proper preparation, and correct surgical management of gastro-enteric foreign bodies.

Conflict of interest: Authors have no conflict of interest.

Author's contributions: SM, MM: Surgical interventions; CBR, DP: Recording and diagnostic formulations; DG, PM: Organization and writing of paper; SSH: Biochemical estimation; SR: Conceptualization, writing and editing of paper.

Data availability statement: All the cases were presented at VCC, Belgachia, WBUAfSc, Kolkata. The corresponding author is willing to provide the raw data upon reasonable request.

Ethical statement: All the cases were clinical patients. Hence, not applicable.

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