Improve Veterinary Education

Gastric and Intestinal Foreign Bodies

Introduction

This lecture addresses gastric and intestinal foreign bodies in dogs and cats, focusing on diagnostic approach and therapeutic options. Management strategies include induction of emesis, medical management, endoscopic retrieval, and surgical intervention, with emphasis on selecting the appropriate pathway based on clinical presentation, patient stability, and foreign body characteristics.

History and Clinical Presentation as Diagnostic Clues

Diagnosis begins with careful attention to history. Many patients have known access to potential foreign material, including toys, bones, clothing, and linear objects. Owners may have directly witnessed ingestion, which is particularly common in dogs that swallow items while playing, such as balls, or during scavenging episodes involving objects such as corncobs or mango pits. Similarly, owners of cats may report ingestion of ribbon-like material during play, or accidental swallowing of objects such as needles during household activities. A thorough history is essential, particularly because many of these animals have ingested foreign material previously.

Households with children may present increased risk due to the availability of small toys. Notably, some of the most striking endoscopic findings occur in dogs that ingest children's toys. Young cats are also more predisposed than older cats because of increased play behaviour.

Vomiting patterns can provide important diagnostic guidance. Obstruction at the pylorus or within the proximal duodenum often results in projectile vomiting, and owners may report that the animal cannot retain even water. In such cases, diarrhoea is uncommon because intestinal transit is mechanically blocked. Clinical concern should increase substantially in patients that are febrile, exhibit marked abdominal pain, are profoundly lethargic, or present in hypovolaemic shock. These findings raise suspicion of gastrointestinal perforation, particularly in severely affected animals.

Laboratory Assessment and Interpretation

A complete blood count and serum biochemistry profile, including electrolytes, are recommended in suspected foreign body cases. Patients with non-obstructive gastric foreign bodies, such as a tennis ball or a cat toy remaining in the stomach without clinical signs, frequently have normal laboratory findings. In contrast, animals with true obstruction may develop significant dehydration and electrolyte derangements that must be corrected before surgical intervention.

On haematology, a mildly increased haematocrit is common due to dehydration. Anaemia is rarely a primary feature of foreign body disease. White blood cell changes vary: mild neutrophilia may be seen with uncomplicated obstruction, whereas marked leukocytosis raises concern for perforation and septic peritonitis, particularly in patients with systemic deterioration.

A clinical example illustrates the importance of careful interpretation of in-house analyser data. A three-year-old cat presenting primarily for vomiting showed a markedly increased white blood cell count with high neutrophils, alongside apparent lymphocytosis and monocytosis. In-house analysers may classify band neutrophils or other immature neutrophils as lymphocytes and monocytes; therefore, blood smear review is recommended in such cases. Ultrasonography in this patient revealed a mass containing a foreign body that had perforated, with a hyperechoic mesentery and free abdominal effusion consistent with inflammatory change.

Electrolyte abnormalities are particularly informative. Hypochloraemia is a key marker of upper gastrointestinal obstruction, including pyloric and proximal small intestinal obstruction, and is attributed to loss of chloride through persistent vomiting. This disturbance contributes to metabolic alkalosis as the body attempts compensation. Hyperlactataemia may be present, and is typically more severe in patients with significant obstruction or perforation. Potassium may be decreased, while hyponatraemia is less common but can occur. Hypochloraemia in a refractory vomiting patient is a particularly important indicator of proximal obstruction. An example is provided of a patient with a proximal intestinal foreign body immediately distal to the duodenal flexure, demonstrating low chloride (98) and sodium (138), with otherwise normal protein values. In this case, ultrasonography identified a 7.29 cm foreign body immediately after the duodenal flexure, illustrating the classical hypochloraemic pattern seen with persistent vomiting in proximal obstruction.

Imaging Modalities: Radiography and Ultrasonography

Imaging is central to diagnosis. Some foreign bodies are immediately apparent on radiographs, such as radiopaque objects including rocks. Other cases are more subtle, with non-radiopaque foreign material resulting in indirect radiographic signs such as two populations of bowel diameter. In such patients, if clinical suspicion remains high, the options include proceeding to surgery or obtaining abdominal ultrasonography. Evidence of bowel plication is a surgical indication.

A radiographic example is described in a cat with linear foreign body obstruction, in which the intestines appear bunched together with an “accordion” configuration. Published metrics have attempted to quantify obstruction by comparing intestinal dilation to vertebral landmarks, using the height of L5 at the narrowest aspect in dogs and the cranial endplate of L2 in cats. In dogs, a ratio below 1.4 is considered unlikely to represent obstruction, while a ratio above 2.4 is considered likely, although a substantial proportion of cases fall within a grey zone between 1.4

and 2.4. These ratios may therefore support, but not replace, clinical judgement and integration of clinical signs.

Ultrasonography is presented as a highly valuable tool, often superior to radiography for intestinal foreign bodies, although it depends strongly on operator skill. Its advantages include localisation of the foreign body and assessment of the risk of perforation. The clinical relevance of ultrasonographic localisation is emphasised: a large, proximal, seven-centimetre foreign body immediately after the duodenal flexure in a dog with severe hypochloraemia is unlikely to pass, whereas a distal jejunal or ileal foreign body in a cat may be more amenable to medical management. For gastric foreign bodies, particularly non-obstructive ones, radiographs are strongly valued because gastric gas can obscure ultrasonographic visualisation and create artefact. Radiographs also allow measurement of foreign body size and assessment of whether food is present in the stomach prior to endoscopy. Accordingly, a practical principle is that ultrasonography is generally superior for intestinal foreign bodies, whereas radiographs are particularly beneficial and may be superior for gastric foreign bodies.

Ultrasonographic assessment can identify additional high-risk findings, including free abdominal fluid or free gas, which increase concern for perforation. Foreign bodies are described as among the most challenging lesions to evaluate ultrasonographically, as their appearance can resemble gas and requires careful scanning from multiple angles. Misinterpretation is possible, including overestimating obstruction when shadowing material is present but not causing complete obstruction.

Therapeutic Pathways: Emesis, Medical Management, Endoscopy, and Surgery

Management options include induction of emesis, medical management, endoscopic retrieval, and surgery. Each option requires deliberate patient selection based on obstruction status, clinical stability, foreign body type, and location.

Induction of Emesis

Induction of emesis should be considered for non-obstructive gastric foreign bodies, such as a dog that has recently ingested an object at the park. In a substantial proportion of cases, the foreign body can be recovered successfully. Emesis induction is also indicated in selected toxin ingestions within an appropriate time window, such as chocolate ingestion, with the understanding that cats are less frequently presented for this scenario.

Emesis is not recommended in patients with gastric outlet obstruction or intestinal obstruction, as the foreign body is unlikely to be recovered and the procedure may exacerbate clinical deterioration. Caution is required in severely lethargic patients, particularly those affected by sedating medications, because diminished airway reflexes increase the risk of aspiration and the ingested material may already have been absorbed. Additional caution is warranted in

brachycephalic breeds and when sharp objects such as glass have been ingested, in which case emesis is contraindicated.

In dogs, apomorphine is highly effective, with reported success exceeding 94%. Administration may be via conjunctival placement of a dissolved tablet or injection. Apomorphine can cause ocular irritation, and the eye should be flushed after use. Antiemetic therapy is commonly provided after emesis induction, with maropitant administered subcutaneously. In some settings, an ocular emetic formulation is available, and apomorphine may be followed by this agent if vomiting is not achieved.

In cats, emesis induction is more challenging. At higher doses, dexmedetomidine can induce vomiting, and some clinicians use hydromorphone, although vomiting in cats is often unpredictable. When dexmedetomidine is used, reversal is recommended afterwards. A dose of 10 micrograms per kilogram is described as producing marked sedation, prompting concern regarding airway safety. Overall, inducing vomiting in cats is considered difficult when desired, and easily encountered when not desired.

Medical Management

Medical management is indicated for patients with partially obstructive foreign bodies that are dehydrated but clinically stable. In such cases, rehydration may facilitate passage of the foreign body, and a recent publication is referenced reporting that approximately 40% of cases pass with medical management. Medical management should not be prolonged in patients with linear foreign bodies, as these carry a higher risk of perforation and should proceed to surgery as soon as possible.

Medical management consists of fluid therapy, antiemetics, and analgesia. Rehydration should be calculated based on estimated dehydration percentage and corrected over six to eight hours, often over six hours in practice, then combined with maintenance requirements. Pain control should be selected with the possibility of surgery in mind; methadone or other strong opioids are preferred in case operative intervention becomes necessary. In severely compromised patients, fluid boluses may be required, typically 10 ml/kg, with a range up to 20 ml/kg depending on clinical status. For a 20 kg dog assessed as 7% dehydrated, rehydration requirements plus daily maintenance are used to derive an hourly fluid rate. A 10 ml/kg bolus in this patient would correspond to 200 ml.

Monitoring depends on the diagnostic modality. When a foreign body is visible on radiographs, serial radiographs after hospitalisation and fluid therapy for approximately 12 hours can objectively demonstrate migration towards the colon and normalisation of gastric appearance. When ultrasonography is used, accurate localisation is essential for meaningful comparison. The clinician is advised to identify and report the foreign body location in anatomical terms such as proximal duodenum, at or after the duodenal flexure, proximal, mid, or distal jejunum, or

ileum. Recording the abdominal quadrant is also recommended, for example describing a jejunal foreign body localised to the right ventral quadrant in a cat. This facilitates reassessment at 12 hours and supports continuity if a different clinician performs repeat imaging.

Endoscopic Retrieval

Endoscopy is presented as first-line therapy for gastric foreign bodies, with the expectation that approximately 99% should be approached endoscopically in the first instance, including those that are large. Endoscopic retrieval may also be attempted for proximal duodenal foreign bodies, especially those composed of cloth or other graspable material. Removal of hard objects such as seeds from the duodenum may be more difficult, although successful removal of a mango pit from the mid duodenum is described.

Certain objects are particularly challenging endoscopically. Corncobs are difficult due to size and shape, and successful extraction may require careful positioning during grasping. Intact tennis balls are described as especially problematic because they can be difficult to secure and may not pass easily through the lower oesophageal sphincter. Large toys present similar difficulties. A practical technique is described in which a small dose of dexmedetomidine, at 2 micrograms per kilogram, is used to reduce the tone of the lower oesophageal sphincter, facilitating removal of large foreign bodies. This approach is favoured because dexmedetomidine does not prevent conversion to surgery if required, unlike butorphanol which may compromise postoperative analgesic planning.

Pre-procedural preparation is emphasised. Endoscopy should not be performed in patients with a stomach full of food, as it makes visualisation and retrieval extremely difficult. When radiographs demonstrate significant gastric food content and the foreign body is not caustic and not at high risk of immediate obstruction, fasting for six to eight hours followed by repeat radiography is recommended prior to gastroscopy. It is noted that some clinicians feed dogs before inducing vomiting, but this is discouraged because if emesis fails and endoscopy becomes necessary, gastric food burden complicates the procedure. Induction of vomiting with apomorphine or an ocular emetic agent is therefore recommended without feeding, so that if vomiting is unsuccessful, endoscopy can proceed without delay. Illustrative examples of successful endoscopic retrieval include removal of the head of a toothbrush ingested by a cat during dental care and removal of a large corncob from a Golden Retriever that accessed food during a barbecue.

Surgical Intervention and Perioperative Priorities

Surgery is required when endoscopy is inappropriate or unsuccessful, when obstruction is severe, or when there is concern for perforation or clinical deterioration. Certain risk factors are associated with poorer outcomes, including delayed surgical intervention and prolonged duration of clinical signs, typically three to five days, which increases the likelihood of

perforation and systemic compromise. Elevated lactate is also associated with worse outcomes. Linear foreign bodies are particularly high risk and are not considered appropriate for prolonged medical management due to increased perforation risk.

In patients selected for a trial of medical management, a period of 12 to 24 hours is typically sufficient to determine whether passage is likely, with duration adjusted according to foreign body size and nature. Stabilisation before surgery is critical and includes fluid resuscitation, correction of dehydration, and electrolyte normalisation. Potassium supplementation may be required, commonly at 20 or 40 mEq per litre, but potassium chloride must not be added to fluids intended for bolus administration. Boluses should be delivered using potassium-free fluids. If a patient proceeds to surgery while receiving potassium-supplemented fluids, this must be communicated clearly to the anaesthetist to prevent inadvertent potassium-containing fluid boluses during intraoperative hypotension.

Postoperatively, early enteral nutrition is strongly encouraged, as it improves outcomes. Feeding should begin as soon as the patient is awake and stable, and if voluntary intake does not resume, feeding tube placement within 12 hours is considered. Ongoing postoperative care includes maintenance of hydration and electrolyte balance, with potassium highlighted as particularly important because hypokalaemia can contribute to gastrointestinal hypomotility. Adequate pain control is required, and the critical postoperative period is identified as the first three to five days, during which complications may develop.

Clinical Workflow Example: Rapid Triage to Surgery

A clinical case is presented to illustrate an effective workflow. A 27 kg dog was triaged by a technician at 10:00, with vital signs recorded and early initiation of a streamlined estimate to expedite minimal diagnostics. An intravenous catheter was placed immediately and blood work and radiographs were obtained. Within one hour the patient was diagnosed with a severe intestinal foreign body. Ultrasound and endoscopy were pursued because the foreign body appeared large, and surgery was ultimately required. The dog was administered a 555 ml bolus, consistent with approximately 20 ml/kg, followed by a structured fluid therapy plan. The timeline from diagnosis at approximately 11:00 to surgery at 16:00 is approximately five hours, described as a typical institutional goal, with surgery ideally occurring as soon as the patient is hydrated and surgical resources are available, often within four to six hours depending on staffing and operating room availability.

Analgesia and antiemetic therapy included methadone and maropitant prior to surgery, fentanyl during surgery, and rapid tapering thereafter. Overnight analgesic escalation included a ketamine constant rate infusion when pain was judged inadequately controlled. Postoperative feeding was first offered at 23:00, with voluntary intake occurring at 02:00. If the patient had not eaten by morning, appetite stimulants would have been attempted, followed by nasogastric tube placement if oral intake remained absent. Fluid therapy began with lactated Ringer's

solution, and after postoperative electrolyte reassessment, potassium chloride was added at 20 mEq per litre. Additional doses of methadone and maropitant were administered postoperatively as needed.

Closing Remarks

This lecture emphasises that medical management is valuable both as a therapeutic trial in selected stable patients and as part of stabilisation prior to surgery, but should not be used to justify prolonged delay in definitive treatment. A carefully monitored 12 to 24 hour trial is appropriate in selected patients that are not severely compromised, while urgent intervention is required in high-risk presentations, particularly linear foreign bodies and clinically deteriorating animals. Questions are welcomed via email and will be addressed at the end of the course.