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Surgical retrieval of linear intestinal foreign body in a cat

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Abstract
Foreign body ingestion is a common cause of gastrointestinal obstruction in small animals, and cats are particularly predisposed to linear foreign bodies such as sewing thread, yarn, and fishing line. These materials anchor proximally, typically at the tongue base or pylorus, while the distal portion advances with peristalsis, leading to intestinal plication, obstruction, and potentially fatal complications. This case report describes the diagnosis and surgical management of a 2.5-year-old female domestic short-haired cat with chronic vomiting, anorexia, and irregular defecation for one month's duration. Survey and contrast radiographic studies confirmed intestinal plication and obstruction, and exploratory laparotomy revealed nylon threads traversing multiple jejunal loops. Intensive postoperative care, including fluid therapy, antibiotics, analgesics, antacids, and antiemetics, resulted in an uneventful recovery.

Keywords: Cat, Enterotomy, Foreign Body, Intestine, Intestinal plication

1. Introduction
Gastrointestinal foreign bodies are among the most frequently encountered surgical emergencies in feline practice. Linear foreign bodies represent a particularly dangerous subset, as their anchoring and advancing mechanism causes the small intestine to fold into tight pleats. This plication not only impairs intestinal transit but also exerts continuous tension on the intestinal wall, leading to ischemia, necrosis, and perforation if untreated (Papazoglou *et al*., 2003; Fossum, 2019) [9, 5]. Cats are predisposed to ingestion of foreign body due to their grooming habits and playful attraction to string-like objects, which explains the relatively high proportion of cases involving thread, yarn, or fishing line ingestion (Hayes, 2009) [6]. Clinical signs can initially be vague, consisting of intermittent vomiting, reduced appetite, constipation, or diarrhoea, which often delays owner presentation and complicate the case leading to its management either by enterotomy or, in cases of necrosis, by resection and anastomosis (Burrows & Bjorling, 1987; Aronson *et al*., 2000) [2, 1]. The present report details the clinical presentation, diagnosis, surgical management, and outcome of a cat with a chronic linear nylon foreign body in intestine, with emphasis on the diagnostic approach and perioperative considerations that contributed to a successful recovery.

2. Case history and clinical observation
A 2.5-year-old intact female domestic short-haired cat weighing 3.3 kg was presented to the Veterinary Clinical Complex, Navsari with a history of progressive anorexia, frequent vomiting, and irregular defecation persisting for approximately one month. The owner reported that the cat had initially vomited intermittently but progressed to multiple episodes daily, often regardless of feeding. Stools were described as scant, and the animal occasionally strained while defecating. A gradual loss of body condition was noted. The cat had been treated with antacids and antiemetics by a local practitioner, but the condition persisted. On clinical examination, the cat appeared dull, depressed, and reluctant to move. The mucous membranes were pale with a capillary refill time of approximately 3 seconds, suggestive of reduced perfusion. Hydration status was assessed as approximately 6% dehydrated, with skin tenting and tacky oral mucosa. Rectal temperature was 102.0 °F, which is at the upper range of normal but consistent with systemic stress. Abdominal palpation elicited a marked pain response, and taut, accordion-like intestinal loops were palpated, raising a strong suspicion of linear foreign body obstruction. A complete blood count revealed a mild normocytic, normochromic anaemia and a leucocytosis characterized by neutrophilia. Right lateral survey radiograph revealed gas-distended intestinal loops arranged in a characteristic pleated or "accordion-like" fashion, although no distinct radiopaque object could be identified as shown

in Fig. 1. Contrast radiography using barium sulphate revealed delayed intestinal transit of contrast agent together with beaded appearance and intestinal plication at 8 hours strongly suggestive of possible linear foreign body ingestion (Fig. 2).

3. Surgical Management

The cat was stabilized with intravenous Ringer's lactate solution (40 ml/kg/day) to correct dehydration and electrolyte imbalance. Prophylactic antibiotic coverage was initiated using ampicillin–cloxacillin @ 10 mg/kg intramuscularly. The animal was fasted for 12 hours prior to surgery and prepared aseptically for laparotomy. Anaesthesia was induced and maintained using a diazepam @ 0.5 mg/kg and ketamine @ 10 mg/kg IV combination. A ventral midline celiotomy extending from the umbilicus to the pubis was performed. On entering the abdominal cavity, the small intestines were gathered into multiple tight pleats around a nylon thread (Fig. 3). The mesentery was stretched, but there was no evidence of vascular compromise, necrosis, or perforation. Three enterotomies were required at different sites along the jejunum where the thread was firmly lodged. The thread was carefully teased out avoid tearing the intestinal mucosa (Fig. 4). The enterotomy sites were closed on the antimesenteric border in two layers: cushing followed by lambert pattern, both using 2-0 chromic catgut. The abdominal cavity was lavaged with warm sterile saline to dilute any contamination and reduce the risk of peritonitis. The abdominal wall was closed routinely in three layers. Postoperatively, fluid therapy with Ringer's lactate was continued to maintain hydration and electrolyte balance. Antibiotic therapy with ampicillin–cloxacillin @ 10 mg/kg intramuscularly twice daily was maintained for one week. Analgesia was provided with meloxicam @ 0.2 mg/kg intramuscularly once daily for three days. Pantoprazole was administered @ 1 mg/kg intramuscularly twice daily for five days as an antacid, while ondansetron was given @ 0.2 mg/kg intramuscularly once daily for five days to control postoperative nausea and vomiting. Wound care was performed daily with 5% povidone-iodine until suture removal. Feeding was withheld for the first five postoperative days to allow intestinal healing, after which a gradual reintroduction of soft, easily digestible food was initiated. By the tenth postoperative day, the cat had resumed normal feeding. Recovery was uneventful, with the cat regaining appetite and passing normal faeces by day 7. Sutures were removed on 10th post-operative day. Follow-up at 4 weeks revealed normal feeding behaviour and activity levels, with no recurrence of gastrointestinal signs.

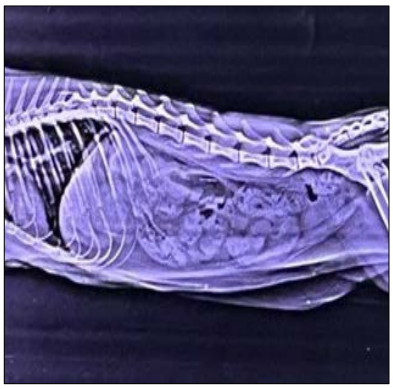

Fig 1: Survey radiograph of cat depicting pleated intestinal loops

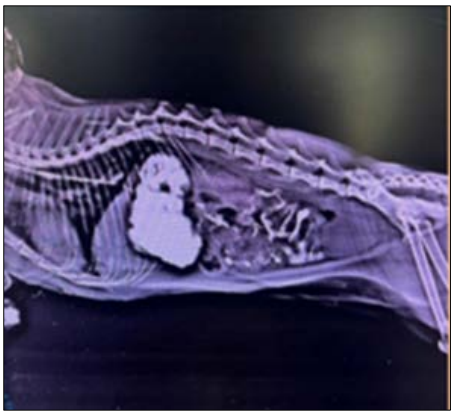

Fig 2: Contrast radiograph of cat at 8 hours with delayed intestinal transit and plicated intestines

Fig 3: Plicated intestines around nylon thread

Fig 4: Retrieved nylon thread

4. Discussion

Linear foreign bodies represent a significant surgical challenge in feline practice. Unlike discrete foreign bodies, which usually cause simple obstruction, linear objects such as nylon threads exert continuous traction on the intestine, causing pleating and mucosal lacerations. If untreated, this process can lead to vascular compromise, ischemia, necrosis, and eventual perforation (Lantz, 1981; Papazoglou *et al*., 2003) [8, 9]. The presence of a linear foreign body should always be suspected in cats presenting with persistent vomiting, abdominal pain, and palpable pleated intestines, particularly if there is a history of exposure to string-like

materials. Similarly, in the present case the cat had history of persisting vomiting and abdominal pain. Radiography remains the first-line imaging modality in suspected foreign body cases. In linear foreign body cases, the "plication" of intestines and the "string of pearls" appearance are characteristic, although not always present (Elser *et al*., 2020) [4]. Contrast studies may increase diagnostic accuracy, especially when the foreign body is radiolucent. Ultrasonography has also been reported to provide high sensitivity, demonstrating hyperechoic linear interfaces with associated acoustic shadows (Krausz *et al*., 2012) [7]. Similarly, intestinal plication on contrast radiography is suggestive of linear foreign body. Surgical removal remains the treatment of choice in most feline linear foreign body cases. Enterotomy is indicated when the intestine remains viable, while resection and anastomosis are necessary in cases of ischemia or perforation (Burrows & Bjorling, 1987) [2]. Although multiple enterotomies may be required, as in the present case, they increase the risk of dehiscence and peritonitis (Ellison, 2015) [3]. The choice of suture material is also important, with monofilament absorbable sutures such as polydioxanone (PDS) or poliglecaprone preferred due to their lower tissue reactivity compared to chromic catgut (Fossum, 2019) [5]. In this case, chromic catgut was used successfully, but newer materials may further reduce postoperative complications. The prognosis for cats with linear foreign body obstruction depends on the duration of obstruction, number of enterotomies or resections required, and presence of complications such as peritonitis. Studies report survival rates ranging from 80–95% when prompt surgical intervention is performed (Aronson *et al*., 2000; Hayes, 2009) [1, 6]. However, delayed presentations exceeding 14 days are associated with poorer outcomes, largely due to increased risk of perforation and septic peritonitis. Despite the chronic one-month history in this case, the absence of perforation, combined with effective surgical clearance and aggressive supportive therapy, contributed to a favourable prognosis.

5. Conclusion

Linear foreign body ingestion is a common and potentially life-threatening emergency in cats. This case demonstrates that even with delayed presentation, favourable outcomes can be achieved through careful diagnosis, timely surgical intervention, and comprehensive postoperative care.

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