



INTUSSUSCEPTION SECONDARY TO GASTROINTESTINAL FOREIGN BODY IN AN ELEVEN MONTH OLD JUVENILE AFRICAN LION (*PANTHERA LEO*) CASE REPORT

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ABSTRACT

An eleven month old male, juvenile lion brought for rehabilitation at the Olusegun Obasanjo Presidential Library (OOPL) Wildlife Park was diagnosed with gastrointestinal foreign body and intussusception based on the history of persistent vomiting following ingestion of a cotton towel, and radiographic findings of a radiopaque gastric foreign body extending from the fundus to the pylorus and a cylindrical soft tissue mid-abdominal mass. The lion was premedicated with an intramuscular injections of ketamine (5 mg.kg⁻¹) and midazolam (0.25 mg.kg⁻¹), while anaesthesia was induced with an intravenous injection of propofol (2 mg.kg⁻¹). A celiotomy followed by gastrotomy and subsequent intestinal resection and anastomosis was performed to remove the gastrointestinal foreign bodies and correct the intussus-

ception. The lion recovered well without any complication and was gradually introduced back into the group housing three weeks later following successful alimentionation process. This report is probably the first case of intussusception in a lion that was associated with a gastrointestinal foreign body.

Key words: foreign-body; intestine; lion; intussusception; stomach

INTRODUCTION

An intussusception is an invagination of one segment of the intestine into another and is due to changes in peristalsis in the intestinal segments [12]. It results in either partial or complete intestinal obstruction with associated clinical

signs depending on the chronicity, size or location of the intussusception [9]. The majority of intussusceptions are idiopathic [16], however, causes such as: gastrointestinal foreign body, intestinal parasitism, neoplasms and enteritis have been documented [2, 9, 12, 16]. Intussusceptions have been reported in various animal species such as: dogs and domestic cats [6, 9], cattle [8], Maine coons [16], and a Red corn snake [2]. However, there is no record of an intestinal intussusception in a lion in the literature.

A gastrointestinal foreign body is not common in lions. There is only one report of a gastrointestinal foreign body in a lion and that was associated with the ingestion of a blanket used to provide warmth for the cubs, resulting in gastric outflow obstruction, perforation and subsequent toxemia [15]. There has been no report of a gastrointestinal foreign body resulting in an intussusception in lions either. This report presents the diagnosis and successful management of a gastrointestinal foreign body with an intussusception in a lion.

CASE PRESENTATION

An eleven month old juvenile male lion weighing 22 kg was referred to the Veterinary Teaching Hospital, Federal University of Agriculture, Abeokuta, Ogun State, from the Olusegun Obasanjo Presidential Library (OOPL) Wildlife Park, Abeokuta, Ogun State, where the lion was undergoing rehabilitation. The Zoo keeper complained that the lion developed a sudden onset of vomiting two days after being suspected to have eaten the cotton towel kept in the house. The lion was weak and lethargic, and appeared severely dehydrated. The examination following anaesthesia with an intramuscular injections of 5 mg.kg⁻¹ ketamine (Ketamine®, Kepro, Holland) and 0.25 mg.kg⁻¹ of midazolam (Dormicum®, Claris life, India) revealed that ocular and oral mucous membranes were dry and moderately congested, while the rectal temperature was normal (37.2 °C). Also, the heart rate was rapid (165 beats.min⁻¹), while the femoral pulse was weak and rapid (172 beats.min⁻¹). A survey abdominal radiograph obtained with a mobile digital X-ray machine (Siemen, Germany) revealed a radio-opaque gastric foreign body (Fig. 1) with a cylindrical soft tissue opaque mid-abdominal mass. In addition, blood obtained from the cephalic vein for a complete blood cell count and determination of plasma concentrations of urea, creatinine



Fig. 1. Ventro-dorsal abdominal radiograph of an eleven month old lion showing the gastric foreign body

and electrolytes revealed normal packed cell volume (38.0%) with neutrophilia (neutrophils: $18.4 \times 10^3.l^{-1}$) and leukocytosis (WBC: $24.9 \times 10^3.l^{-1}$). There was mild hypernatremia (sodium: 158 mmol.l⁻¹), hyperchloremia (chloride: 125 mmol.l⁻¹) and metabolic acidosis (HCO₃: 35 mmol.l⁻¹). The values for the level of creatinine (1.7 mg.dl⁻¹), urea (18 mg.dl⁻¹) and potassium (4.0 mmol.l⁻¹) were normal. Based on the findings, a tentative diagnosis of a gastrointestinal foreign body was made. The lion was therefore scheduled for celiotomy and gastrotomy.

Management and Outcome

The lion was premedicated with intramuscular injections of 5 mg.kg⁻¹ ketamine and 0.25 mg.kg⁻¹ of midazolam and the ventral abdomen was prepared aseptically for surgery. Thereafter, venous access was secured using



Fig. 2. Intraoperative picture of an eleven months old lion showing removal of the ingested cotton towel (Red arrow)

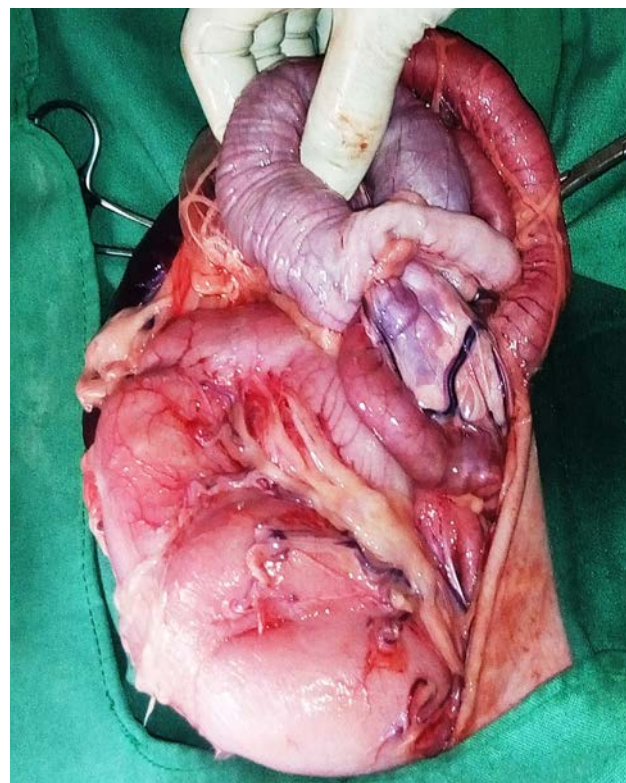


Fig. 3. Intraoperative picture of an eleven months old lion showing the intestinal intussusception

23 gauge intravenous cannula and a lactated ringers solution was administered at the rate of $5 \text{ ml.kg}^{-1}.\text{hr}^{-1}$. Anaesthesia was induced with 2 mg.kg^{-1} of 1 % Propofol (Diprivan, ICI—Zeneca Pharmaceuticals) and maintained with continuous propofol infusion at the rate of $0.2 \text{ mg.kg}^{-1}.\text{hr}^{-1}$. The lion was then placed on dorsal recumbency and the limbs secured to the table. A standard celiotomy incision was made extending from the xyphoid cartilage to the prepubic tendon. The stomach was exteriorized and an incision was made at the less vascularized area to access the gastric foreign body (Fig. 2). A partially digested cotton towel measuring about 30 centimetre long was removed from the fundus of the stomach. Following the removal of the gastric foreign body, the gastric incision was closed with a double row of a Lembert suture pattern using size 2-0 Polyglactin 910 (Vicryl, Anhui Kangning Ltd, China). Thereafter, the intestine was explored and a portion of the jejunum-ileum with the intussusception (Fig. 3) was exteriorized and freed. The devitalized portion was removed, and an end to end anastomosis was done with a Lembert suture pattern using size 2-0 braided Polyglactin 910 (Vicryl, Anhui Kangning Ltd, China). Before closure of the laparotomy

incision, the intestinal anastomosis was tested for leakage and obstruction by injecting saline into the anastomosed site. The laparotomy incision was then closed in three layers. The linea alba was closed with simple continuous suture pattern using size 0 braided Polyglactin 910 (Vicryl, Anhui Kangning Ltd, China). The subcutaneous layer was closed with a subcuticular pattern using size 0 Polyglactin 910 (Vicryl, Anhui Kangning Ltd, China), while the skin was closed with a horizontal mattress suture pattern using size 1 nylon monofilament (Agary Ltd, China). Following recovery, 2 mg.kg^{-1} of tramadol injection (TramadolR, Gland Pharma, India) was administered intramuscularly. The lion was then returned to the transport cage until full recovery. Postoperatively, the lion was treated twice daily with 500 mg of ciprofloxacin (R. K. Laboratories, India) dissolved in drinking water for seven days. Thereafter, meat was gradually introduced to the lion until full alimentation was restored. The lion was introduced back into its housing three weeks after surgery

DISCUSSION

Although gastrointestinal foreign bodies are commonly encountered in domestic cats, they are not common in wild felidae. They may present with a variety of clinical signs depending upon the location, the degree and the duration of the obstruction resulting from them [1, 11]. This is probably the first report of an intussusception in a lion resulting from foreign body ingestion. Intestinal obstructions have been reported to result in disturbances of fluid balance, acid-base status and serum electrolyte concentrations due to hypersecretion and sequestration within the gastrointestinal tract [4]. In this report, the lion was presented with vomiting, dehydration and metabolic alkalosis resulting either from gastric outflow obstruction or the intussusception.

Chemical immobilization and anaesthesia is an integral component in conservation, diagnostic and surgical procedures in wild animal species. The risks involved in chemical immobilization and anaesthesia in lions are: loss of thermoregulation, rigidity, depressed respiration, shock, unpredictable recovery, delayed recovery and convulsions [3]. Although inhalational anaesthesia appears to be the safest technique for anaesthesia of the lion, this might not be feasible in field settings, coupled with the difficulty of endotracheal intubation when compared with domestic cats. Ketamine and propofol have been reported to be suitable for the induction of anaesthesia in lions [3]. In this report, anaesthesia was successfully induced with propofol and maintained also with propofol using a constant rate infusion technique. Many patients with gastrointestinal disorders are dehydrated. The hypotension associated with anaesthesia as well as the distension of the gut occasioned by redistribution of fluid will compound the fluid deficit. This explains why the lactated Ringers solution was administered at $5 \text{ ml.kg}^{-1}.\text{hr}^{-1}$ throughout the intra-operative period.

Majority of obstructive non-linear intestinal foreign bodies compromise the blood supply to the intestinal segment leading to intestinal wall oedema and progressive necrosis. These factors contribute to ileus and to an increase in the number of pathogenic intraluminal bacteria resulting in the breakdown of the mucosal barrier and systemic endotoxemia [5]. This may be responsible for the neutrophilic leukocytosis observed in the lion. The packed cell volume of the lion was normal probably due to the early

detection of the intussusception or may be as a result of the haemo-concentration resulting from the dehydration.

The major challenges with the management of intestinal foreign bodies are early diagnosis of the condition, and risk associated with anaesthesia of patient with compromised electrolyte and acid base status [14]. Early presentation and recognition of the condition in this lion might have been responsible for the favorable outcome recorded compared to the previous record of gastrointestinal foreign body in lion cubs in which the animals were dead prior to intervention. Surgical management and wound healing are compromised by intestinal wall viability, intraluminal bacterial overgrowth, ileus and hypoproteinaemia [13]. There were no complications resulting from wound dehiscence or anaesthesia in this lion. Enteric wound breakdown and leakage are the most serious and catastrophic complications of surgery on the gastrointestinal tract [7].

A technique of single enterotomy removal of linear foreign bodies has been reported and used with good success [7, 16]. However, many chronic foreign objects may not be safely manipulated due to the severe compromise of the local gastrointestinal segment. This explains the choice of resection and anastomosis technique over enterotomy. The choice of resection and anastomosis also allows for the removal of devitalized intestinal segments occasioned by the intussusception. However, the technique is more time consuming and with higher risk of leakage. In addition, several techniques have been reported for the anastomosis of the intestinal segments following resection. These include end to end, end to side and side to side [10]. The technique of choice depends on the length of the intestine that is resected and the diameter of the two ends. An end to end anastomosis was performed using a Lembert suture pattern because the resected ends were of the same diameter

In conclusion, captive lions are prone to consume indigestible materials such as blankets out of curiosity, playfulness, or even nutritional deficiencies resulting in gastrointestinal complications; thus the use of such materials to provide warmth for young or sick lions should be discouraged. Prompt diagnosis of gastro-intestinal foreign body in lions followed by appropriate selection of anaesthetic and surgical technique with adequate intensive post-operative follow-up is essential for successful management.

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