



Diagnosis and management of sand impaction of the large intestine in an Alsatian puppy

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Abstract

A four-month-old, male German Shepherd puppy previously (six weeks ago) managed for babesiosis and toxocariasis was re-presented with complaints of weakness and poor growth. Physical examination revealed body weakness, emaciation, rough hair coat and dried muzzle. Empty rectum and caudal abdominal pain with crepitating hard masses were felt on palpation. Plane lateral thoraco-abdominal radiograph revealed gas-trapped (impacted) radio-opaque masses in the transverse and descending colon. Oral administration of vegetable oil (total of 300ml) given to effect was employed to soften and evacuate bowel content (within 3 hours of treatment). Radiographic examination 14 hours post management revealed a completely empty bowel. Compounded cereal paste-like diet was given for 5 days and the puppy was discharged 6 days after presentation.

Keywords: Colon, Sand impaction, Diagnosis, Management, Puppy

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Introduction

Sand impaction may be regarded as a focal accumulation of sand in the intestinal tract resulting in the dilatation and mechanical obstruction of the impacted intestinal segment, and it is an uncommon condition in dogs (Moles *et al.*, 2010). Ingestion of materials other than normal food (called allotriophagia or pica) varies from licking to actual eating and drinking, and it is due in most cases to dietary deficiency, either of bulk or of individual nutrients such as cobalt, phosphorus, etc (Radostits *et al.*, 1994). Allotriophagia is considered to be a normal behavior in rabbits and foals (Radostits *et al.*, 1994). Chronic abdominal pain or gastritis and central nervous system disturbances are often accompanied by pica in animals (Radostits *et al.*, 1994). Pica may have serious consequences: poisoning, foreign body lodgement in the alimentary tract, accumulations of sand which may cause obstruction, perforation of the oesophagus, stomach or intestine may result from ingestion of sharp

and/or coarse foreign bodies and feeding time is often reduced (Radostits *et al.*, 1994). The possible or common causes of intestinal blockage due to foreign objects swallowed by dogs are bones, stones, marbles and buttons (Sherding & Johnson, 1994; Anon., 2012a), while medical conditions causing intestinal obstruction include tumor, hernias, intussusceptions and mesenteric torsion (Anon., 2012b). Diagnosis of allotriophagia involves general history, physical examination (with emphasis on abdominal palpation) and laboratory (ultrasonography, radiography, complete blood cell count and serum biochemistry) evaluations of the patient (Sherding & Johnson, 1994). Both medical and surgical managements of intestinal sand impaction in dogs can be effective and often have a good prognosis with the medical approach being the primary treatment but, surgical intervention can be employed when necessary (Moles *et al.*, 2010).

Case report

Case history of the puppy

A four-month-old male German Shepherd puppy weighing 4.5 Kg was re-presented to the Small Animal Unit of the Veterinary Teaching Hospital, Ahmadu Bello University, Zaria with complaints of weakness and poor growth. The puppy had been presented six weeks earlier, with complaints of inappetence and weakness. It was then managed for babesiosis, where blood was transfused and intramuscular injection of diminazene aceturate (Diminazene^(R) - Vetinda Pharmaceuticals Ltd, India) was administered at 4mg/Kg; and dewormed with pyrantel pamoate (Pyranthrin^(R) - Niemath International Pharmaceuticals plc, Oregon, Lagos, Nigeria) at 10mg/kg for toxocarosis. The puppy had been vaccinated against canine distemper, hepatitis, leptospirosis, parvo virus and para-influenza (DHLPP: Biocan^(R) - Bioveta, a. s. Czech Republic). The vaccine was administered on second presentation (2 weeks prior to this presentation).

Physical examination

The body temperature was 38.9⁰ C, pulse and respiratory rates were 140 beats/min. and 40 cycles/min. respectively. Weakness, rough hair coat,

dried muzzle and emaciation were observed. Ventral retroperitoneal to pelvic abdominal palpation elicited pain in the colon which contained a hard crepitating mass and the rectum was empty.

Laboratory Investigation

A number of investigations involving: ultrasonographic and radiographic examinations; whole blood and serum for complete blood count and serum chemistry respectively, were conducted to ascertain what went wrong (diagnosis) with the puppy. The results of the investigations were:

Ultrasonographic and radiographic examinations: - Transabdominal ultrasonographic scan revealed normal abdominal organs, except for multilayered hyperechoic structure at the caudal abdominal region. Lateral thoraco-abdominal radiograph revealed gas-trapped radio-opaque substances impacted in the transverse and descending colons with empty rectum (Plate I).

Clinical pathology result - Complete blood count revealed severe anaemia (Table 1); and the blood chemistry showed azotaemia, hypophosphataemia and decrease in the serum bicarbonate (Table 2).

Table 1: Haematology results

Parameter	Patient's values	Reference values *
Packed cell volume (%)	20	37-55
White blood cells count (10 ⁹ /L)	8.0	6-17
Neutrophils (10 ⁹ /L)	4.2	3-12
Lymphocytes (10 ⁹ /L)	3.36	1-5
Monocytes (10 ⁹ /L)	0.24	0.2-1.5
Eosinophils (10 ⁹ /L)	0.16	0.1-0.8
Basophils (10 ⁹ /L)	0.0	Rare

*Source: Sastry, 1983

Table 2: Results of Serum chemistry and enzymes

Parameters	Patient's Values	Reference Values
Urea (mmol/L)	10.00	*6-25
Creatinine (mmol/L)	153.00	*44-138
Sodium (mmol/L)	141.00	#140-155
Potassium (mmol/L)	4.80	#3.6-5.8
Chloride (mmol/l)	101.00	#100-120
Bicarbonate (mmol/L)	12.00	#17-24
Calcium (mmol/L)	2.21	#2.0-3.0
Phosphorus (mmol/L)	0.80	*1.0-2.0
Glucose (mmol/L)	5.80	*3.9-7.8
Uric acid (mmol/L)	0.2	*0.2-0.9
Aspartate aminotransferase (mmol/L)	13	*5-55
Alanine aminotransferase (mmol/L)	4	*5-107
Alkaline phosphatase (mmol/L)	57	*10-150

Source: * Anon, 2014

Awasum, 2010



Plate I: Plane lateral radiography of thorax and abdomen showing radio-opaque substance impacted in the colon (red arrow) with gas wrapped in an empty rectum (green arrows)



Plate II: Drenching the puppy with vegetable (groundnut) oil



Plate III: The impacted sand particles voided

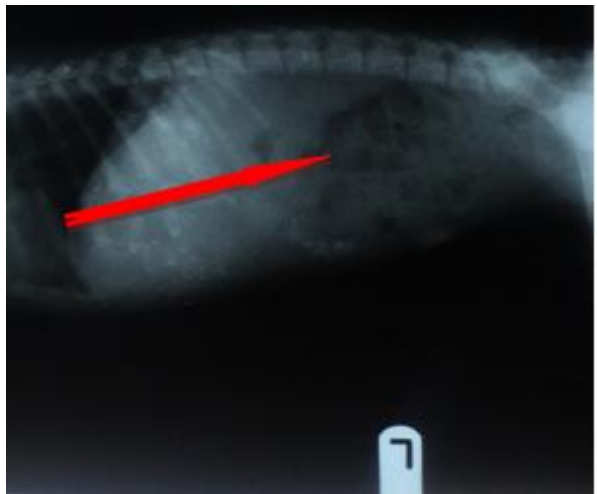


Plate IV: Lateral thoraco-abdominal plane radiograph showing clear intestinal passage to the rectum (arrowed) 14 hours after expulsion of sand particles

Case management

Three hundred milliliters of vegetable (groundnut) oil were administered orally to effect, over a period of 10 minutes (Plate II). The puppy was then walked a distance of 100 meters within 10 minutes after which it was allowed to rest and observed closely in the intensive care unit of the outpatient department of the Veterinary Teaching Hospital. Three hours later, the drenched vegetable oil began to be voided through the anus, followed by the impacted sand particles (50 g) in a projectile form (Plate III). Lateral

thoraco-abdominal radiograph was then taken 14 hours after expulsion of the impacting sand particles (Plate IV). The puppy was placed on compounded paste-like diet (a paste composed of water, grounded millet and guinea corn, sugar and fried fish) for 5 days with 2.5% ciprofloxacin (CIPCON^(R) – Concept Pharmaceuticals Limited, Mumbai India) oral suspension at 7mg/kg x ⁵/₇ and multivitamins (Vetzyme^(R) – Bob martin (UK) Ltd, Wemberham Lane Yatton, North Somereset, UK) at 1400mg x ¹/₁₂ p.o.

Discussion

The occurrence of large intestinal sand impaction in dogs generally is very rare worldwide (Moles *et al.*, 2010). The condition is the first encounter in our practice and from the literature search there is no available information of such report, except that on eight (experimental) dogs with small intestinal sand impaction (Moles *et al.*, 2010) managed surgically. The suggestive predisposing factor in this case that led to the puppy consuming sand particles is attributable to the previous medical conditions (babesiosis and toxocarosis) that caused anemia (that could have led to azotaemia) and metabolic acidosis because of anaerobic glycolysis following haemolysis, thereby increasing cellular production of hydrogen ion- H^+ ; this results in loss of bicarbonate leading to reduction in the buffering capacity of the body and thus allowed H^+ to accumulate; and mineral deficiency (hypophosphataemia due to prolonged inappetence) (Steven & Michael, 2008). Complete evaluation (diagnostic techniques) was employed to ascertain the cause of the condition. Depending on the patient's condition, medical management generally involves the use of

intravenous fluid therapy, gastrointestinal protectants, analgesics and a combination of laxatives and cathartics with frequent radiographic monitoring (Anon., 2012c). The vegetable (groundnut) oil administered was to act as gastrointestinal protectant, laxative and cathartic; the exercise (walking) was to aid relaxing the gastrointestinal tract for the oil to mix and flow together with the sand; the diet was a source of nutrient with little disturbance to the alimentary tract; ciprofloxacin was to take care of possible bacterial infection in the colon; and multivitamins was to supplement some minerals and vitamins.

In conclusion, the case reported here happens to be unique in puppies because, the available literatures attributed the occurrence of sand impaction is in adult dogs (if it does) and surgical intervention had been advocated (Sherding & Johnson, 1994).

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