

OMENTAL TORSION IN A RABBIT (*ORYCTOLAGUS CUNICULUS*)

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Abstract

A 2-year-old male rabbit (*Oryctolagus cuniculus*) presented for loss of appetite, abdominal distension, and absence of fecal production. The patient had previously been treated with a prokinetic agent for gastrointestinal stasis based on history and presenting clinical signs. A few days after treatment no improvement was observed and the patient was referred for a second opinion. A firm mass just caudal to the stomach was noted upon palpation of the abdomen, but neither radiography nor ultrasound provided a diagnosis of the mass. An exploratory laparotomy was performed and omental torsion of the lesser omentum was diagnosed. The torsed lesser omentum was resected and histopathological examination supported the intraoperative diagnosis. Torsion of the omentum, although rare, should be added to the list of differential diagnoses in rabbits presenting with clinical signs related to gastrointestinal stasis. Copyright 2016 Elsevier Inc. All rights reserved.

Key words: omentum; rabbit; omental torsion; lagomorphs; gastrointestinal stasis

A 2-year-old male rabbit (*Oryctolagus cuniculus*) was presented for loss of appetite, progressive abdominal distension, and absence of fecal production. The patient was treated with metoclopramide (Plasil, Sanofi-aventis, Italy), 0.5 mg/kg orally, every 6 hours by another veterinarian who suspected gastrointestinal (GI) stasis based upon history and presenting clinical signs. No diagnostic testing was performed. There was no treatment response observed by the owner following a few days of medical therapy; therefore, the patient was referred for a second opinion.

A hard irregular mass located caudal to the stomach was noted upon abdominal palpation. Serum chemistry panel (Table 1) showed a moderate hypoalbuminemia (2.16 g/dL, reference range: 2.5 to 5 g/dL), low total protein concentration (4.2 g/dL, reference range: 5.4 to 7.5 g/dL); elevated creatinine (3.6 mg/dL, reference range: 0.5 to 2.6 mg/dL), and slightly increased alanine transaminase values (88 U/L, reference range: 14 to 80 U/L); all other values were within normal limits.¹ The complete blood count (Table 2) showed leukopenia ($2.3 \times 10^3/\mu\text{L}$, reference range: 5 to $12 \times 10^3/\mu\text{L}$) and a mild thrombocytopenia ($119 \times 10^3/\mu\text{L}$, reference range: 290 to $650 \times 10^3/\mu\text{L}$), with all other values within normal limits.¹

Total body standard laterolateral and ventrodorsal radiographs demonstrated moderate amounts of gas within the intestines mixed with normal rabbit ingesta (Fig. 1). Abdominal ultrasound showed an extraluminal lesion with poorly defined rounded margins, which was nonhomogenous and echogenic/hypoechoic (Fig. 2). This lesion was located in the cranial abdominal region, caudal to the stomach, and appeared related to the palpable mass describe above.

Based on these findings, exploratory surgery was elected. The patient was premedicated with ketamine hydrochloride (Ketavet100, Intervet Production, Italy) 10 mg/kg intramuscularly,

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dexmedetomidine hydrochloride (Dexdomitor, Orion Pharma, Italy) 60 µg/kg intramuscularly, and butorphanol (Dolorex, Intervet, Italy) 0.2 mg/kg intramuscularly. General anesthesia was induced with isoflurane (Isoflo 250 mL, Esteve, Spain), gradually reaching 5%, and oxygen 100% 1 L/min, delivered through a facemask. Once intubated (2.5-mm endotracheal tube; Teleflex Medical S.r.l., Italy) anesthesia was maintained with isoflurane 3% and 100% oxygen at 1 L/minute.

Surgical exploration of the abdomen revealed an irregular, brown, firm, and avascular mass (Figs. 3 and 4). The mass of tissue and the lesser omentum were removed by applying an encircling loop suture with 3-0 Polyglactin (Vetsuture, Noévia SAS, France). During surgery, a single dose of verapamil (Isoptin, Knoll, Germany) 2.5 µg/kg was administered intraperitoneally to prevent adhesion formation, and no other abnormalities were identified. Abdominal closure was routine and followed by an intradermal suture layer using 4-0 Poliglecaprone 25 (Monocryl, Ethicon, Somerville, NJ USA). Recovery of the rabbit from anesthesia was uneventful.

The rabbit was given buprenorphine hydrochloride (Budale, Dechra Ltd, UK) 0.03 mg/kg subcutaneously, every 12 hours for 2 days and meloxicam (Metacam, Boehringer Ingelheim, Germany) 0.5 mg/kg subcutaneously every 12 hours for 7 days. Verapamil was continued at 2.5 µg/kg subcutaneously every 8 hours until the patient was discharged 72 hours later. In addition, enrofloxacin (Baytril, Bayer, Germany) 10 mg/kg diluted with saline was administered subcutaneously every 12 hours for 7 days.

TABLE 1. Serum biochemistry panel for a rabbit with omental torsion

	Values	Reference Range ¹
ALP	31 U/L	4 to 70
ALT	88 U/L	14 to 80
Total bilirubin	0.4 mg/dL	0 to 0.75
Blood urea nitrogen	28 mg/dL	15 to 50
Calcium	12.1 mg/dL	8 to 14.8
Phosphorus	2.7 mg/dL	2.3 to 6.9
Creatinine	3.6 mg/dL	0.5 to 2.6
Glucose	96 mg/dL	75 to 150
Sodium	133 mmol/L	138 to 155
Potassium	4.7 mmol/L	3.5 to 7
Total Protein	4.2 g/dL	5.4 to 7.5
Albumin	2.16 g/dL	2.5 to 5
Globulin	2.04 g/dL	1.5 to 3.5

Bold values are lower, bold and italics are elevated.
ALP, alkaline phosphatase; ALT, alanine aminotransferase.

TABLE 2. Hematologic values obtained from a complete blood count of a rabbit with omental torsion

	Values	Reference Range ¹
Red blood cells	$5.75 \times 10^6/\mu\text{L}$	4 to 8
Hematocrit	33.6%	30 to 50
Hemoglobin	11.3 g/dL	8 to 17.5
Mean corpuscular volume	58.5 µm ³	58 to 75
Mean corpuscular hemoglobin	19.6 pg	17.5 to 23.5
Mean corpuscular hemoglobin concentration	33.6 g/dL	29 to 37
White blood cells	$2.3 \times 10^3/\mu\text{L}$	5 to 12
Lymphocytes	59.1%	25 to 60
Monocytes	1.6%	2 to 10
Neutrophils	39.3%	17.2 to 59.3
Platelets	$119 \times 10^3/\mu\text{L}$	290 to 650

Bold values are lower.

Subcutaneous administration of the antibiotic (enrofloxacin) was selected over oral dosing to reduce the incidence of dysbiosis.

Histopathological evaluation of the resected material showed the presence of necrotic adipose tissue associated with vascular necrosis (Fig. 5). After 30 days of the surgical procedure, physical examination was unremarkable and the incision was healed.

DISCUSSION

The omentum is a layer of peritoneum that surrounds several abdominal organs; it is anatomically divided into the greater and the lesser omentum (gastrohepatoduodenal ligament). The greater omentum, also referred to as epiploon, develops from a dorsal mesentery fold and connects to the stomach; it extends from the gastric greater curvature, passing behind the small intestines, and reaching the dorsal wall of abdomen. The lesser omentum is a double layer of peritoneum and attaches from the inferior curvature of the stomach and the duodenum to the liver; this structure forms the omental bursa. Contained within the omentum are several hematic and lymphatic vessels.¹

Omental torsion is a rare pathology, first described in a human by Eitel² in 1899. There are currently only 250 cases of omental torsion reported in the human medical literature.^{3,4} When coiled, the omentum twists on its long axis until

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