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Gastrocutaneous fistula secondary to umbilical hernia in a dog: A surgical case report

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Abstract

A two-and-a-half-year-old male shih tzu dog was presented to the Department of Veterinary Surgery and Radiology, Veterinary College Hospital, Bengaluru with the complaint of mass in the ventral abdominal region along with signs of inappetence and dullness for 2 days. The animal had a history of a small, uncorrected congenital umbilical hernia which had significantly increased in size over the past week. On clinical examination the mass was firm and irreducible. Radiological examination of lateral abdomen revealed soft tissue swelling with no much appreciable structures within the mass. Haematological and biochemical profiles showed marked leucocytosis and elevated liver enzymes. Following initial presentation and diagnosis of a complicated irreducible umbilical hernia, the animal developed a cutaneous opening at the hernia site within a few days. This opening exhibited external leakage of ingested food and water, indicating a gastrocutaneous fistula - a rare but serious sequela of hernia. Dissection of the fistula and surgical closure of the stomach, abdominal wall and skin along with antibiotic therapy and nutritional support led to complete recovery.

Keywords: Umbilical hernia, gastrocutaneous fistula, Shih Tzu

Introduction

Any abnormal outpouching or protrusion of contents (mainly visceral organs) or part (s) of contents of a body cavity via a normal or abnormal aperture in the cavity wall is referred to as a hernia (Conze *et al.*, 2001; Stubbs and Hyder, 2009) [5, 18]. An umbilical hernia is a common anomaly in neonatal animals (especially ruminants) (Doijode, 2019) [6]. Congenital umbilical hernias result from failure of fusion or delayed fusion of the lateral folds (principally, the rectus abdominis muscle and fascia) at the umbilicus after normal return of the midgut from the umbilical cord in the canine foetus, which normally occurs at the sixth week of gestation (Harvey, 1992) [8]. According to Amare and Haben (2020) [2], abdominal hernias are common in all species and include umbilical hernias, which account for 44.8% of all hernias, diaphragmatic hernias (31%), scrotal hernias (13.8%), and inguinal hernias (10.4%). There is no sex predilection for umbilical hernia in the general population; however, females of predisposed dog breeds have a greater incidence of umbilical hernia for unknown reasons (Hayes, 1976; Robinson, 1977) [9, 17].

The terms fistula, sinus tract and draining tract are used to describe an abnormal passage between or within body organs or cavities, or leading from an organ or cavity to the subcutaneous space or skin (Blood and Studdert, 1993; Lamb *et al.*, 1994) [4, 11]. Gastrocutaneous fistulae have been documented in humans after removal of percutaneously inserted endoscopic gastrostomy (PGE) tubes (Bender and Levison, 1991; Yaseen *et al.*, 1996; Makris and Sheiman, 2002) [3, 21, 12], as a complication of splenectomy (Martinez *et al.*, 2000) [13] and as a sequela to fulminant pancreas and abscessation of the pancreas (Warshaw *et al.*, 1989) [19]. This case describes the presenting signs, clinical examination, diagnosis and successful management of gastrocutaneous fistula secondary to umbilical hernia in a shih tzu dog.

Materials and Methods

A two-and-a-half-year-old male shih tzu dog weighing 6 kg was presented to the Department of Veterinary Surgery and Radiology, Veterinary College Hospital, Bengaluru with the complaint of mass in the ventral abdominal region along with signs of inappetence and dullness for two days. The animal had a history of a small, uncorrected congenital umbilical hernia which had significantly increased in size over the past week. On clinical examination, the mass in the ventral abdominal region was firm and irreducible. The physical examination revealed rectal temperature of 103.2 °F whereas all other vital parameters *i.e.* Heart rate, Respiratory rate and Capillary refill time were within normal range. The plain radiography of right lateral abdomen revealed soft tissue swelling near the umbilicus with no much appreciable structure within the mass (Fig. 1). Contrast radiography was conducted using barium sulphate suspension (1 g/ml), which demonstrated normal transit of the contrast medium through the gastrointestinal tract with no radiographic signs of presence of any intestinal loop within the mass (Fig. 2). Routine haematological and biochemical profiles revealed leucocytosis (TLC-35, 600 cells/ μ L of blood) and high liver values (SGPT-103.7 U/L) suggestive of systemic inflammation and possible hepatocellular compromise. Based on the history, clinical signs and radiological examination it was diagnosed as a complicated irreducible umbilical hernia. The animal was treated with fluid therapy and antibiotics *i.e.* Inj. Ceftriaxone @ 25 mg/kg body weight for 5 days, prescribed oral syrup Hepamust (5 ml, b.i. d). The animal on the 5th day of presentation had developed a cutaneous opening at the hernia site. This opening exhibited external leakage of undigested ingested food and water, indicating a gastrocutaneous fistula (Fig. 3). The haematological and biochemical profiles were repeated which showed all parameters being within the normal range.

The animal was subjected for the surgical correction of the gastrocutaneous fistula. As preanesthetic Inj. Xylazine (1 mg/kg body weight), Inj. Atropine sulphate (0.04 mg/kg body weight) were given intramuscularly. Preoperative antibiotic (Inj. Ceftriaxone- 25 mg/kg body weight intravenously) and analgesic (Inj. Meloxicam - 0.2 mg/kg bodyweight SQ) were administered. The animal was anaesthetised and maintained using Inj. Thiopental sodium @ 12.5 mg/kg body weight and was given to effect intravenously. The surgical site was prepared aseptically (Fig. 4). The animal was placed in dorsal recumbency, the ventral midline opening was extended. On abdominal exploration the stomach had adhered to the abdominal wall. The adhesion was detached where the gastrocutaneous fistula was dissected completely (Fig. 5). The edges of the hernial ring were freshened and the gastric opening was sutured with Cushing followed by Lembert suture pattern using Polyglactin 910 No. 2-0 (Fig. 6). The abdominal muscles were apposed using Polyglactin 910 No.0 with simple interrupted suture pattern. The subcutaneous tissue was sutured in a simple continuous manner using Polyglactin 910 No-0. Skin was closed with Polyamide No.0 in a horizontal mattress pattern. Post operatively the owner was advised to keep animal off-food and off-water for 5 days, where the animal was administered with intravenous fluids twice daily for 5 days. Other postoperative care included Inj. Ceftriaxone (25 mg/kg) bid, IV, Inj. Metronidazole (10 mg/kg) bid, IV and Inj. Beplex forte (0.3 mL, IV) for 3 days. Owner was advised to provide liquid diet after 5 days.



Fig 1: Plain Radiograph of right lateral abdomen showing soft tissue swelling near the umbilicus.



Fig 2: Contrast Radiograph showing normal transit of barium through the gastrointestinal tract.



Fig 3: Gastrocutaneous Fistula near the abdominal swelling.



Fig 4: Surgical site was prepared aseptically.



Fig 5: Gastrocutaneous Fistula was dissected out.



Fig 6: Suturing of the gastric opening.

Results and Discussion

The animal recovered uneventfully and the sutures were removed on the 10th postoperative day. Dogs of all ages are predisposed to different types of hernias; of which, inguinal, perineal, and diaphragmatic hernias have been reported frequently (Waters *et al.*, 1993; Gill and Barstad 2018; Pereira *et al.*, 2023) [20, 7, 15]. An umbilical hernia is likely to be a less common case in dogs, as few published reports are available (Robinson, 1977; Jahromi *et al.*, 2009; Park, 2015; Alkattan *et al.*, 2018) [17, 10, 14, 1]. It has been found that umbilical hernia in some young puppies below six months of age often undergoes spontaneous remission (auto-reduction followed by self-closure of the hernial ring) as the animals mature (Park, 2015; Alkattan *et al.*, 2018) [14, 1]. Hence, invasive treatments including surgical corrections were not usually recommended for newborn and immature puppies. However, persistent cases in mature puppies above six months warrant appropriate management. This case on presentation revealed a history of a small, uncorrected congenital umbilical hernia which had significantly increased in size over the past week. Incidence of penetrating foreign body and formation of fistula or adhesion between fore stomach and body wall is common in the ruminants, whereas there were very few reports about gastro-subcutaneous fistula due to the penetrating foreign body in dogs (Radostits *et al.*, 2000) [16]. In humans, most gastrocutaneous fistulae occur after iatrogenic gastric injuries; for example, after splenectomy, breakdown of gastroenteric anastomosis or non-healing of gastrostomy tube tract (Warshaw *et al.*, 1989) [19]. The dog in this case report developed a cutaneous opening at the hernia site on the 5th day of medical management, the cause of opening was unnoticed by the owner; hence, the exact cause of this opening remained elusive. However, the firm and irreducible nature of hernia on the day of presentation suggests the chances of incarceration of stomach, which might have led to rapid organ necrosis due to the insufficient collateral blood supply, resulting in organ rupture. Surgical treatment of gastrocutaneous fistula in human is reserved for cases refractory to conservative management which has limited success (Makris and Sheiman, 2002) [12]. In one report, only two of six gastrocutaneous fistulae were successfully managed medically (Warshaw *et al.*, 1989) [19]. Conservative medical management aims to encourage gastric emptying and reduce intragastric pressure to promote healing of fistula (Makris and Sheiman, 2002) [12]. In this case, the gastrocutaneous fistula of dog was successfully managed by surgical dissection of fistula, closure of the stomach, abdominal wall and skin, followed by post-operative fluid therapy and antibiotic treatment.

Conclusion

This case report highlights the clinical presentation of signs, diagnosis and successful surgical management of gastrocutaneous fistula in a shih tzu dog which was secondary to umbilical hernia. The postoperative care which included fluid therapy along with antibiotic treatment also aided in an uneventful recovery of the animal.

Conflict of Interest

Not available

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Not available

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