Intestinal epidermoid cyst in a cat

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Summary

A 3-year-old cat was presented with anorexia and vomiting. Palpation revealed a caudal abdominal mass. Ultrasound and explorative abdominal surgery revealed a cystic mass in the jejunum. Histopathologic findings were consistent with an epidermoid cyst. The cyst was likely of congenital origin, since the cat had not undergone previous abdominal surgery, and gradually grew to reach a size that caused intestinal obstruction. Extrapolating from findings in people, intestinal epidermoid cysts are considered benign with a good long-term prognosis when completely excised.

Keywords: intestinal mass, ileus, epidermoid cyst, teratoma, abdominal surgery

Intestinale Epidermoidzyste bei einer Katze

Bei einer 3 Jahre alten Katze mit Erbrechen und Anorexie wurde eine Umfangsvermehrung im caudalen Abdomen palpiert. Die weiterführende Ultraschalluntersuchung stellte eine Verbindung der Veränderung mit dem Dünndarm dar und die darauffolgende Laparotomie ergab den Befund einer zystischen Umfangsvermehrung im Jejunum. Histologisch wurde diese Struktur als Epidermoidzyste diagnostiziert. Die Vermutung liegt nahe, dass diese Epidermoidzyste einen kongenitalen Ursprung hatte, da die Katze zuvor nie einer abdominalen Chirurgie unterzogen worden war. Anscheinend war die Umfangsvermehrung über die Jahre hinweg langsam gewachsen, bis es zu Schwierigkeiten in der Darmpassage kam. In Anlehnung an die Humanmedizin gelten Epidermoidzysten bei kompletter Exzision grundsätzlich als benigne Umfangsvermehrungen mit einer guten Langzeitprognose.

Schlüsselwörter: intestinale Umfangsvermehrung, Ileus, Epidermoidzyste, Teratom, Abdominalchirurgie

DOI 10.17236/sat00037

Received: 25.03.2015
Accepted: 06.05.2015

Introduction

Epidermoid cysts are cystic lesions originating from inclusion of non-neuronal ectoderm during embryogenesis, in the course of an injury, foreign body reaction or iatrogenically induced during surgical procedures (Featherstone and Llabres, 2003) and they are found in multiple locations (Nogales and Silverberg, 1976; MacKillop et al., 2006; Sahoo et al., 2013; Ząbkowski and Wajszczuk, 2014).

Depending on their location and size, epidermoid cysts may be incidental findings or cause a variety of symptoms, including pain, gastrointestinal disorders or neurological abnormalities. Epidermoid cysts are commonly described lesions of the skin, both in people and dogs (Handa et al., 2002; Vail and Withrow, 2006), but unusually described in organs outside of the skin (Macoomb and Penner, 1962; Davidson and Blanchard, 1991; Featherstone and Llabres, 2003; MacKillop et al., 2006; Steinberg et al., 2007). To our knowledge, epidermoid cyst of the gastrointestinal tract has only been described in a single case report in the dog (Shimamura et al., 2014). In cats, we are only aware of a single case of epidermoid cyst, occurring in the lung (Milli and Haziroglu, 1990). The present report is to our knowledge the first case describing a feline intestinal epidermoid cyst.

Case History

A 3-year-old, 6 kg, neutered male European shorthair cat was presented with a one-week history of anorexia and intermittent vomiting. Physical examination revealed a firm rounded mass in the caudal abdomen. Routine hematologic and biochemical analyses and urinalysis were unremarkable.

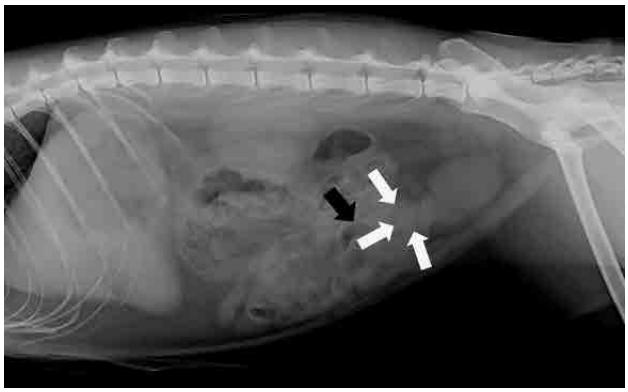

Figure 1: Lateral abdominal radiograph showing a well-defined round soft tissue mass cranial to the bladder and ventral to the colon (white arrows) with a moderately gas filled small intestinal loop adjacent to the mass (black arrow).

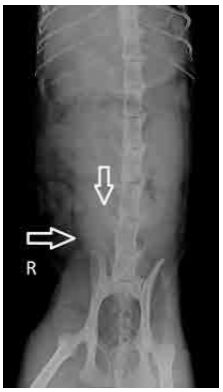

Figure 2: Ventrodorsal abdominal radiograph showing the soft tissue mass slightly on the right side of the abdomen (open arrows).

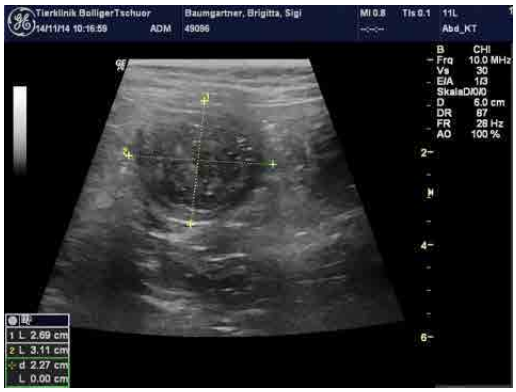

Figure 3: Ultrasound image showing a cystic structure filled with hypoechoic material and floating corpuscular material. Cross-section of the mass in this view was 2.69 × 3.11 cm.

Diagnostic Imaging

On abdominal radiographs (Figs. 1, 2), a well-defined round soft tissue mass was visible in the caudal abdomen, ventral to the descending colon and cranial to the bladder. One small intestinal loop adjacent to the mass was moderately filled with gas and other small intestinal loops were fluid filled. This segmental small intestinal dilation was suggestive of partial ileus. Abdominal ultrasound revealed a 3-cm diameter cystic structure cranial to the urinary bladder that appeared associated with the jejunum (Fig. 3). The content of the cystic mass was hypoechoic with floating hyperechoic material. The jejunum in this region was slightly dilated, suggesting partial ileus. In view of the clinical and ultrasonographic findings, suggesting partial ileus, an immediate explorative laparotomy was recommended.

Surgery

The cat was premedicated with buprenorphine (0.02 mg/kg i.v.) and medetomidine (2.5 µg/kg i.v.). General anesthesia was induced using propofol (4 mg/kg i.v.) and maintained with 1.5–2% isoflurane in 100% oxygen following endotracheal intubation. Amoxicillin-clavulanic acid (20 mg/kg i.v.) was administered following induction. The patient underwent laparotomy via a midline incision, which revealed an approximately 3-cm round intestinal lesion in the distal jejunum. The involved bowel segment was excised with approximately 2.5 cm margins, and an end-to-end anastomosis was performed. No other abnormalities were detected. The cat had an uneventful recovery from surgery and was discharged from the clinic 2 days later. At follow-up examinations, 2 weeks and 3 months after surgery, the cat was considered clinically unremarkable.

Histopathology

The resected tissue was fixed in 10% neutral buffered formalin and submitted for histopathology. Grossly, the cyst was a thin-walled cavity filled with granular to pasty, tan-colored material. The lesion was located intramurally within the smooth muscle layers of the intestinal wall. Tissue was embedded in paraffin, cut at a thickness of 4 µm and stained with hematoxylin and eosin (Fig. 4). The wall of the cyst was lined by few layers of polygonal squamous epithelial cells sitting on a basement membrane. The appearance of this epithelium was that of epidermis, with a well recognizable stratum basale, stratum spinosum, stratum granulosum and stratum corneum (Fig. 5). The lumen of the cyst was filled with lamellar keratin and few cholesterol clefts. There were no adnexal structures associated with the wall of the cyst, nor other tissue, excluding a dermoid cyst or teratoma. No significant tissue inflammation was present around the cyst. Based on these findings, a diagnosis of epidermoid cyst was made.

Discussion

Epidermoid cysts are histologically characterized by cystic spaces lined by stratified squamous epithelium with the cavity containing a mixture of keratinocytes, keratinaceous debris and cholesterol. This is differentiated from dermoid cysts, in which adnexal structures, such as hair follicles, sebaceous glands, and sweat glands, are also present in the cyst wall (Russel and Rubinstein, 1977) or from tissues of all three germ layers, like bone, teeth, muscle etc., as in teratoid cysts (Meyer, 1955; De Ponte et al., 2002). The general term dermoid cyst has been used to describe any of three histologically distinct epithelium-lined structures (Pear, 1969; Wilkinson et al., 1996; Dutta et al., 2013).

Figure 4: Photograph of a histologic preparation through the intestinal segment showing a cross section through the jejunum in the lower part and a cross section of the epidermoid cyst on the serosal side in the upper part. The cyst is filled with keratinized material.

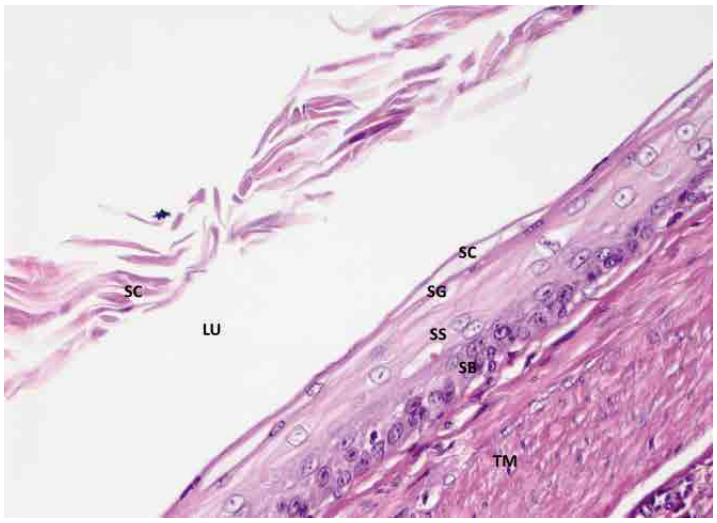

Figure 5: Photomicrograph showing from bottom to top, the thick muscular tunic (TM), the stratum basale (SB), the stratum spinosum (SS), the stratum granulosum (SG), the stratum corneum (SC), and the cyst lumen (LU) containing squamous epithelium (SC). Hematoxylin & Eosin, 400×.

Epidermoid cysts may either arise from the inclusion of ectodermal elements during embryological development (congenital origin) or be caused by implantation of epidermal fragments in locations favorable to growth during injury or surgery (acquired origin) (Gardner et al.; 1989, Pear, 1969; Frank et al., 1995).

In people, epidermoid cysts occur most commonly in the subcutis of the face, scalp, neck and trunk (Handa et al., 2002). Other more common locations are the central nervous system, the lumbar spine (Dhebri and Afify, 2004) and the bone – especially the phalanges (Macoomb and Penner, 1962; Simone et al., 2011) – similar to findings in dogs (Kornegay and Gorgacz, 1982; Davidson and Blanchard, 1991; Frank et al., 1995; Featherstone and Llabres Diaz, 2003; MacKillop et al., 2006; Vail and Withrow, 2006; Steinberg et al., 2007).

Intestinal epidermoid cysts are very rare in people (Andiran et al., 1999; Mady and Melhem, 2002; Sahoo et al., 2013). In dogs, a single case report describes an epidermoid cyst in the ileum of a 13-year-old miniature Dachshund (Shimamura, 2014) and a further case describes a dermoid cyst in a 2-year-old German shepherd (Saberi et al., 2013). Clinical signs associated with intestinal epidermoid cysts in people vary from slow growing intraabdominal masses (Al-Arfaj et al., 2003) and vague gastrointestinal symptoms, to acute abdominal pain due to cyst rupture or volvulus (Torreggiani et al., 2001; Verswijvel et al., 2004).

The cat described herein was presented because of acute gastrointestinal signs with clinical and radiographic findings suggestive of subileus. The epidermoid cyst appeared to have behaved as a slow growing intraabdominal mass, which finally led to mechanical ileus. As the cat had not undergone previous abdominal surgery, a congenital origin due to embryological sequestration was suspected. The process of abnormal migration of primordial germ cells is poorly understood. It has been postulated in the human literature that, in the case of an intestinal epidermoid cyst, these cells may migrate from the dorsal mesogastrium and subsequently cross the mesentery to the intestinal region (Upadhyaya et al., 2010).

A diagnosis of epidermoid cyst based exclusively on imaging is unreliable and histological examination is implicitly recommended (Mady and Melhem, 2002; Morgan et al., 2013; Sahoo et al., 2013; Zavras et al., 2014). Differential diagnoses of abdominal masses such as foreign bodies, polyps and neoplasms must be considered. Complete surgical excision is considered curative although recurrence after incomplete excision is possible (Davidson and Blanchard, 1991; Saberi et al., 2013, Sahoo et al., 2013). Epidermoid cysts are benign lesions, but very rare cases of malignancy arising from these lesions are described (Caratozzolo et al., 2001). In conclusion, this is the first report of intestinal epidermoid cyst in a cat. Although rare, epidermoid cysts should be considered as a curable differential diagnosis in small animals presenting with intestinal masses.

Acknowledgements

The authors thank Dr. Judith Howard for proofreading and for her helpful comments on the manuscript.

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