Case Report

Case report of atypical infiltrative lipomatosis of the equine mesojejunum

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Summary

A 25-year-old mare was examined for persistent colic. Over the previous month, the mare had experienced several episodes of mild recurrent colic. The episode of colic persisted for 18 h and the pain became unresponsive to analgesic therapy. Euthanasia was undertaken. Post mortem examination revealed an atypical infiltrative lipoma of the mesojejunum, confirmed histopathologically. To the authors’ knowledge, this is the first case report of a diffuse infiltrative lipoma of the equine mesojejunum.

Introduction

Obesity is well recognised as having a significant effect on human morbidity and mortality and there is increasing awareness of the potential pathological effects of adipose tissue in horses, including horses affected by colic (Packer et al. 2011). Benign lipomas of the mesentery are common findings in the adult horse, with prevalence increasing with age (Blikslager et al. 1992; Edwards and Proudmann 1994; Freeman and Schaeffer 2001). Strangulation of the small intestine or small colon is possible when the stalk of a pedunculated lipoma becomes twisted around a section of the viscus or its mesentery (Garica-Secco et al. 2005; Prange et al. 2010). Alternatively, in cases where the mass arises close to the intestine, the pedicle may act as an extraluminal obstruction, compressing the intestine and causing a simple, often intermittent colic (Mair and Edwards 2003). In contrast to well circumscribed pedunculated lipomas, lipomatosis is a nonencapsulated infiltrative adipose tissue lesion not limited by tissue planes resulting in massive tissue infiltration and expansion (Archer 2007). It is a rare condition that has been reported infrequently in the veterinary literature affecting various species including dogs, llamas, geese, equids and man (Siskind et al. 1984; Dsoust et al. 1991; Bindseil and Madsen 1997; Klopfleisch et al. 2009).

Lipomatosis has been reported in various anatomical locations in numerous species, including subcutaneous/musculoskeletal tissues (Bristol and Fubini 1984; Dsoust et al. 1991; Hammer et al. 2002; Erkert et al. 2007), the epidural space (Chan et al. 2009; Flisberg et al. 2009), salivary glands (Bindseil and Madsen 1997), liver (Klopfleisch et al. 2009), mesentery/gastrointestinal tract (Henry and Yamini 1995; Riley et al. 2007) and the myocardium/mediastinum (Erkert et al. 2007). The pathogenesis of this unencapsulated, infiltrative lesion is unknown. It has been hypothesised to perhaps result from congenital abnormalities in younger animals, while in older animals it may represent a post differentiation genetic aberration of the normal adipocyte karyotype (Erkert et al. 2007).

This report describes the clinical and post mortem findings in a mature horse subjected to euthanasia due to persistent signs of colic. Post mortem examination revealed diffuse infiltrative lipomatosis of the mesojejunum, which to the authors’ knowledge has not been previously reported in the horse.

Case history

A 25-year-old mare presented with a history of acute colic of approximately 10 hours’ duration. Over the previous month, the mare had experienced several episodes of mild recurrent colic. Prior to admission, the mare had been managed medically on the yard for a suspected large colon impaction with enteral fluids and electrolytes (250 g magnesium sulphate in 10 litres of water administered by nasogastric tube) and ketoprofen (Ketofen 10%) (2.2 mg/kg bwt i.v). The mare initially responded well to medical management, but 3–4 h later displayed signs of colic once again, which were refractory to administration of further analgesics (phenylbutazone (Equipalazone Solution for Injection)2, 4.4 mg/kg bwt i.v). Therefore, she was referred to the hospital for further assessment and monitoring.

On presentation, the mare was quiet and depressed, but not showing any signs of pain. Her heart rate was 44 beats/min [reference range {rr} 36–44 beats/min] and respiratory rate 10 breaths/min [rr 8–16 Vf]. Rectal temperature was 37.5°C [rr 37–38°C]. Mucous membrane colour and capillary refill time were both within normal limits. Gastrointestinal sounds were decreased on both sides of the abdomen. Initial rectal examination on admission revealed moderate gas distention of the large colon, Abdominocentesis yielded normal peritoneal fluid (total nucleated cell count 0.5 × 10⁹ cells/l and total protein 26 g/l; rr <2.0 × 10⁹ cells/l and 10–28 g/l, respectively). Transabdominal ultrasonography was unremarkable. Initial haematological evaluation revealed a mild leucocytosis [total white blood cell count 10.3 × 10⁹/l, rr 5–10 × 10⁹/l] characterised by a granulocytosis (granulocytes 9.1 × 10⁹/l, rr 3–8 × 10⁹/l) and a mild lymphopenia [lymphocytes 1.1 × 10⁹/l, rr 1.5–4 × 10⁹/l]. A biochemistry profile revealed hyperfibrinogenaemia (plasma fibrinogen 5.6 g/l; rr 1–4 g/l) and increased serum activity of creatinine kinase [CK 7218 iu/l, rr 150–385 iu/l], lactate dehydrogenase (LDH 2054 iu/l, rr 192–482 iu/l) and aspartate transaminase (AST 580 iu/l, rr 258–554 iu/l).

The mare was admitted to the clinic and placed in a stable for observation. Over the next 4 h, the mare continued to show
escalating signs of discomfort and her heart rate was increased above the normal range (66 beats/min). A nasogastric tube was passed and 15 litres of gastric reflux was obtained. Due to the horse’s history of colic and her failure to respond to medical management, an exploratory laparotomy was recommended. The owner declined surgical intervention due to financial constraints and the mare was humanely subjected to euthanasia.

Post mortem findings
A necropsy was performed immediately after euthanasia. The pelvic flexure of the large colon was found to be displaced into the right cranial abdomen. A large multinodular infiltrative fatty mass was present in a 2 m segment of mid-jejunal mesojejunum (Fig 1); the small intestine proximal to this lesion was moderately distended with fluid. There was a sharp line of demarcation at the oral and aboral borders of the lesion between normal mesentery and the lipomatosis-affected section of bowel. In the affected section of bowel, the abnormal tissue was present from the root of the mesentery to the mesenteric border of the intestine (Fig 2). Diffuse multifocal haemorrhage was noted within the fatty mass (Fig 1). No physical obstruction or strangulation was apparent in the small intestine at the time of necropsy; however, there was moderate fluid distention of the small intestine. Two sections of the jejunum with associated mesentery and one area of mesentery with visible haemorrhage were submitted for histopathological evaluation.

Tissue samples were fixed in 10% neutral buffered formalin, embedded in paraffin wax and sectioned (4 μm). For histopathological examination, sections were stained with haematoxylin and eosin (H&E). In the sections of jejunum there was mild infiltration of the lamina propria by eosinophils and a normal to mildly increased population of lymphocytes and plasma cells. The serosa was slightly oedematous. The associated adipose tissue of the mesentery was composed predominantly of adipocytes of normal appearance; however, areas of necrosis were also present. Occasionally, adipocytes appeared disrupted by infiltration of macrophages and small vessels were frequently congested.

Discussion
To the authors’ knowledge, this case report represents the first reported occurrence of lipomatosis of the equine mesojejunum. Lipomatosis is defined as excessive accumulation of fat in the body or organ that is not encapsulated or limited by tissue planes and pathologically differs from the behaviour of benign lipomas. It occurs uncommonly and has several different presentations (Nielson et al. 2001).

There are currently 2 case reports of lipomatosis of the equine gastrointestinal tract, both of which were associated with the ascending or descending colon (Henry and Yamini 1995; Riley et al. 2007). In the case report by Riley et al. (2007),
a 2-year-old Tennessee Walking Horse developed a refractory small colon impaction secondary to infiltration of fatty tissue into the mesenteric and anti-mesenteric surfaces of the small colon. Henry and Yamini (1995) reported similar findings in a 7-year-old Quarter Horse that had multi-focal to coalescing fatty masses associated with the anti-mesenteric serosal surface of the transverse and small colon. Large lipomatous diverticula were associated with the colonic wall in both cases. Histopathologically, both cases had evidence of infiltration of adipocytes into the muscularis layer of the colon with associated fibrosis, presumed to be responsible for the clinical signs seen in both patients. In our case, there was no identified infiltration of adipocytes into the small intestinal wall, although histopathological examination was limited to 2 small sections from a total of 2 m of affected jejunum so it is possible that affected sites were not sampled.

Lipomatosis in people has been associated with cutaneous, visceral and epidermal pathology, each of which have differing clinical signs (Siskind et al. 1984; Nelson et al. 2001; Cha et al. 2009; Chan et al. 2009; Flisberg et al. 2009). Siskind et al. (1984) published a case report linking prolonged steroid use to mesenteric lipomatosis. It is well documented in many species that corticosteroids can induce alterations of fat distribution, particularly intra-abdominal fat in man (Wajchenberg et al. 1995) and subcutaneous and omental fat in horses (Johnson 2002), as seen in horses affected by Cushing’s disease or equine metabolic syndrome. Our patient had no previous documented history of endocrinopathy, but it is known that a horse’s risk for pituitary pars intermedia dysfunction (PPID) is greatly increased with age. It is possible that this patient had an underlying undiagnosed endocrinopathy that could have contributed to the development of this condition; however, many aged horses have clinical evidence of PPID but the condition of lipomatosis of the gastrointestinal tract appears to be extremely rare.

Another clinical presentation of lipomatosis reported in several species, including horses, is cutaneous lipomatosis (Bristol and Fubini 1984; Erkert et al. 2007), which has also been referred to as infiltrative lipomas. This condition was reported in several young horses, all less than 2 years of age, in which large cutaneous nonencapsulated masses of fatty tissue were identified infiltrating the subcutaneous and underlying muscular tissue. In all horses, no evidence of neoplastic processes was identified histopathologically, which is similar to the benign lipomas seen associated with the gastrointestinal tract. It was hypothesised in these reports that the cutaneous presentation of lipomatosis represents a different pathological process to that of neoplastic infiltrative lesions such as liposarcomas (Bristol and Fubini 1984; Erkert et al. 2007).

Based on the post mortem findings, it is impossible to know if the source of gastrointestinal pain was directly associated with the lipomatous tissue of the mesojejunum. The presence of reflux prior to euthanasia and the absence of evidence of ischaemic bowel make a nonstrangulating extraluminal obstruction the likely cause of the colic signs, which could have been caused by the weight of the mesojejunum compressing the intestine and restricting the passage of ingesta along the small intestine; however, we cannot rule out obstruction of the duodenum by the displaced colon being the source of the gastrointestinal reflux. A report by Ozel et al. (2004) reports a giant nonstrangulating mesenteric lipoma in a 7-year-old girl as a cause of ileus which caused clinical signs of vomiting and abdominal pain since the age of 3 years. Additionally, the visceral lipomatosis seen in the 2 previously discussed case reports in equids had similar signs of pain associated with impactions as a sequel to reduced peristaltic function of the small colon (Erkert et al. 2007). It is possible that the section of bowel affected by lipomatosis experienced some degree of ileus, which could have been the cause for the gastrointestinal reflux. On the other hand, the absence of any previous history of colic in this horse suggests that the lipomatosis probably existed as a sub-clinical condition prior to the development of the persistent colic episode.

In conclusion, lipomatosis is a rare and multifaceted condition that has numerous clinical presentations. This case report highlights the clinical features of lipomatosis associated with the small intestinal mesentery. Although histologically the lipomatous mass appeared to be benign, the locally invasive and infiltrative nature of the lesion likely contributed to the signs of colic. This case report will serve to add more clinical and pathological information regarding lipomatosis as it is the first reported instance of infiltrative lipomatosis in the mesojejunum of an equid.

Authors' declaration of interests
No conflicts of interest have been declared.

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References
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