Case Report

Congenital Liver Cyst in a Neonatal Calf

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Congenital serous cysts attached to the liver capsule are usually small and multiple, but can be solitary, grow extremely large, and become symptomatic. They are considered rare incidental findings during laparotomies or necropsies and their occurrence is well described in the human literature, with limited reports from the veterinary literature. This report describes the ante-mortem diagnosis and successful surgical removal of a large congenital liver cyst in a neonatal calf.

1. Introduction

Congenital serous cysts are attached to the capsule of the liver and have been reported in many different species and are considered rare incidental findings during laparotomies or necropsies [1]. These cysts are usually small and multiple, but can be isolated and grow extremely large and become symptomatic [2]. Their occurrence is well described in the human literature, with limited reports from the veterinary literature [3, 4]. This report describes the ante-mortem diagnosis and successful surgical removal of a congenital liver cyst in a neonatal calf.

2. Case Presentation

A 2-week-old Angus bull calf presented to the University of California Davis Veterinary Medical Teaching Hospital for weakness. On physical examination the calf had a fever (103.3 F), tachycardia (156 bpm), tachypnea (84 bpm), and an enlarged, pendulous abdomen. Abnormalities on blood work included neutropenia (1478/ μ L; ref. 2300–6800/ μ L), monocytosis (1,003/ μ L; ref. 0–900/ μ L), thrombocytosis (981,000/ μ L; ref. 233,000–690,000/ μ L), and mild

hypoalbuminemia (3 g/dL; ref. 3.1–4.3 g/dL). Ultrasound exam of the abdomen was performed and revealed a large, fluid filled structure occupying the entire ventral abdomen, measuring 23 cm $\times$ 25 cm (Figure 1). It contained slightly echogenic fluid and was in direct contact with the liver in the cranioventral abdomen. The liver demonstrated normal size, margins, echogenicity, and vascularity. The left and right kidneys, the spleen, and the gastrointestinal structures were all within normal limits.

A cyst originating from the liver or peritonitis with adhesions to the liver were considered most likely. Aspiration of the fluid filled structure was performed and yielded serosanguinous fluid with low cellularity (50 cell/ μ L). Cytological evaluation revealed nucleated cells consisting predominantly of foamy macrophages, along with a few reactive lymphocytes, nondegenerate neutrophils, and eosinophils. An exploratory laparotomy was performed and a multiloculated cyst originating from the caudal edge of the right liver lobe was found (Figure 2). An approximately 2 cm wide region of the cyst wall was adhered to the peritoneum at the ventral body wall. The umbilical structures were visualized, with no communication to the cyst. A total of 2500 mL of serosanguinous fluid was recovered from the cyst by suction

FIGURE 1: Ultrasound image obtained from the right cranioventral abdomen using a 3–9 MHz “microconvex” curvilinear transducer at a depth of 13.6 cm. The large cyst (arrows) can be seen originating from the right liver lobe.

FIGURE 2: Fluid filled, multiloculated cyst originating from the right liver lobe.

that allowed exteriorization of the cyst capsule (Figure 3). The connection between the liver and the cyst was cauterized by a commercially available device (LigaSure, Covidien AG, Boulder, CO). Further exploration of the abdomen revealed no other abnormalities and the abdomen was closed in a standard pattern.

Histopathology of the excised cyst capsule was unable to determine the origin of the cyst due to the extensive fibrosis, necrosis, congestion, and hemorrhage within the wall. The calf was maintained on broad-spectrum antimicrobials (florfenicol, 20 mg/kg intramuscularly every other day for 5 days) and anti-inflammatory medications (flunixin-meglumine, 1 mg/kg IV 1x daily for 3 days) postoperatively and discharged from the hospital 5 days after surgery. The calf was doing well 10 days later at recheck evaluation. His physical exam was within normal limits; blood work and abdominal ultrasound exam were unremarkable. Antimicrobials were discontinued and it was recommended to limit his exercise for a month until the abdominal incision was healed. The calf was reported to be doing well at 1 year of age.

FIGURE 3: Exteriorization of the cyst capsule after removal of the cystic fluid. Cyst originated from the caudal border of the right liver lobe.

3. Discussion

To the authors' knowledge, this is the first report describing antemortem diagnosis and successful management of a congenital liver cyst in a neonatal calf. In human medicine, congenital liver cysts are usually diagnosed during the antenatal ultrasound exam of the pregnant women and depending on the size of the cyst postnatal surgical and laparoscopic techniques have been described [5, 6]. The calf in this report presented with weakness and nonspecific clinical signs of systemic inflammation. The abdominal ultrasound exam helped to rule out common causes of abdominal distension associated with the gastrointestinal or urinary tracts, while the ultrasound-guided aspiration of the cystic fluid directly supported the diagnosis. Congenital liver cysts arise from aberrant bile ducts which are obstructed from the main biliary system [7] and contain fluid with water and electrolyte content similar to serum [8]. While the abdominal enlargement is a characteristic clinical sign of symptomatic liver cysts, the presence of fever and weakness are nonspecific, and neither is typical of this congenital abnormality. In this case, the continuous accumulation of cystic fluid leads to the widespread necrosis of the cyst capsule, which likely induced systemic inflammation resulting in fever, tachycardia, tachypnea, and weakness. Various surgical and minimally invasive techniques have been described for the management of symptomatic cysts in human medicine, while there is only a few reports describing successful management of congenital liver cysts in companion animals [3, 4]. Intraoperative suction of the cystic fluid allowed exteriorization and better visualization of the cystic capsule in this case, while the cauterization of the stalk close to the margin of the liver resulted in successful removal of the cyst capsule. The calf in this case report had an uneventful recovery after surgery, no complications associated with the procedure, and no recurrence was noted during follow-up examination.

In conclusion we can say that congenital liver cysts do occur in calves, and their presence should be suspected when a neonatal bovine presents with nonspecific signs of systemic inflammation coupled with an abnormally enlarged abdomen. Ultrasonography and cytological evaluation of the cystic fluid can directly support the diagnosis. Surgical removal of the cyst is feasible and can result in a full recovery.

Conflict of Interests

The authors of this paper do not have a direct financial relation with any commercial entity mentioned in the paper that might lead to a conflict of interests for any of the authors.

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