ULTRASONOGRAPHIC FINDING OF OMPhALITIS IN A FRIESIAN CALF

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Summary

A 4 months old Friesian calf was presented to the University of Nairobi with a pendulous swelling at the umbilicus. Ultrasound was used to diagnose omphalitis as indicated by increased diameter of the external umbilical ring, change in echogenicity of the umbilical tissues and increased diameter of the extra-abdominal umbilicus.

Introduction

Omphalitis refers to the inflammation of the umbilicus that occurs when the navel portion of the calf is infected, by bacteria contamination of umbilicus following parturition. The infection spreads via the umbilical cord which is the connection between the fetus and mother, which provides necessary nutrient for the development of the fetus during intrauterine life (Ganga et al, 2011).

The umbilical cord consists of the umbilical veins, the umbilical arteries and the urachus. The amniotic membrane of the umbilical cord is torn at birth and gradually the umbilical vein and the urachus closes but they remain temporarily outside the umbilicus. The umbilical arteries retract as far back as the top of the bladder and it becomes round ligament of urinary bladder. Normally umbilical cord dries up with in one week after the birth (Barrie, 1992).

The infection of the umbilicus and its associated structures occur commonly in the newborn calf. It may occur soon after the birth and may result in omphalitis, omphalophlebitis, omphaloarteritis or infection of the urachus (Rings, 1995). Umbilical infection usually occurs as a mixed bacterial infection but Arcanobacterium pyogenes and E. Coli are the commonly isolated organisms (Fubini and Ducharme, 2004). Localized infection may occur in joints, bones, meninges, eyes, endocardium and end arteries of the feet, ears and tail (Ganga et al, 2011).
History and Clinical Examination

A 4 months old Friesian female calf belonging to Mr. Joseph Waithaka (case number AD/071/11) was presented to the University of Nairobi large animal veterinary clinic, with the history of a pendulous swelling on the ventral abdominal region that had been getting larger since birth. Upon clinical examination, the swelling was found to be an enlargement of the umbilicus measuring 8 cm in length, soft in consistency with a fibrous structure palpable at the base. Ultrasonography of the swelling was done using a sector probe at a frequency of 6.5 MHZ. Ultrasonographic examination revealed a break in the ventral body wall at the base of the swelling measuring 12 mm in diameter and filled with relatively hyperechoic content (Figure 1). The content of the swelling were hypoechoic with pockets of anechoic contents (Figure 2). The diameter of the swelling was 23 mm and the wall appeared hyperechoic (Figure 3). Based on clinical and ultrasonographic examination, the case was diagnosed as omphalitis. Further confirmation of diagnosis was strengthened by findings during surgery in which fibrous content were noted with pockets of pus at the base of the swelling.

Figure 1: Ultrasonogram of the swelling using 6.5 MHZ sector probe
Figure 2: Ultrasonogram of the swelling using 6.5 MHZ sector probe

Figure 3: Ultrasonogram of the swelling using 6.5 MHZ sector probe

- Hypoechoic content
- Anechoic pockets
- Wall of the swelling
Discussion

Umbilical disorders are of great clinical relevance in calves during the early postnatal period. They may be classified as noninfectious disorders such as hernias and urachal cysts; infectious disorders involving extra- and intra-abdominal umbilical structures, or combinations of the infectious and non-infectious disorders (Steiner and Lejeune, 2009).

Umbilical ultrasonography can be performed easily and is a very reliable and informative aid in the diagnosis of umbilical disease, determining extent of the disease and involvement of other structures as well as determining the choice of therapy (Lischer and Steiner, 1994). This information is important as the owner can be informed in advance about the expense and the prognosis of the planned therapy. Ultrasound has been found to be an accurate diagnostic tool for the diagnosis of umbilical defects in calves with a sensitivity of 0.89 and specificity of 0.83 (O’Brien and Forrest, 1996).

Previous studies have reported several ultrasonographic finding in cases of omphalitis in calves. These findings include: increase in the diameter of the external umbilical ring, hypoechoic umbilical tissue appearing echogenic starting from the external umbilical ring, high number of extra-abdominal umbilical vessels, increase in the mean diameter of the extra-abdominal umbilicus and thickened hyperechoic wall (Heidemann, 1995; O’Brien and Forrest, 1996). These findings are consistent with this case in which the external umbilical ring was 12 mm as reported by (Heidemann, 1995). Normal umbilical tissues appears hypoechoic on ultrasound (Lischer and Steiner, 1993) however in this case, umbilical tissue appeared hypoechoic with some circumscribed area appearing anechoic. These anechoic areas were due to pus which was seen during surgery. The mean diameter of extra-abdominal umbilicus in this case was 23 mm and this was larger than normal diameter of 12-15mm in calves (Watson et al, 1994) and therefore
indicative of omphalitis as has been reported by (Zolotarev et al, 2001). The wall of the umbilicus in this case appeared thicked and hyperechoic.

**Conclusion**

The use of ultrasonography as a tool for the diagnosis of omphalitis provides additional information to the clinical examination and may improve the prognostication of surgical therapy. Early diagnosis and management of omphalitis is important as umbilical infections have been show to predispose calves to umbilical hernia (Steenholdt and Jorge, 2004).

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**Reference**


