A Clinical Case of Navel and Joint Ill in a Calf - Medical Management

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Abstract
An intensively managed five days old female Friesian cross breed calf weighing approximately 30kg was presented to the University Veterinary Hospital, Universiti Putra Malaysia (UPM). The complaint was that the calf had swollen navel and joints and had not been able to stand up properly and frequently fell down. But the calf was alert and the appetite was normal at the time of presentation. On physical examination, body condition score was 2.5 out of 5 and temperature was 39.3 °C (slight pyrexia), pulse and respiratory rates were within the normal range. The navel was swollen with dark necrotic tissues within the navel opening with presence of foul smelling odour. Both the carpal joints of the forelimbs and the hock joints of the hind limbs were swollen. Arthrocentesis and Jugular venepuncture were performed to collect samples for synovial fluid cytology, haematology and blood chemistry. Based on the history, physical examination and laboratory findings, the calf was diagnosed to have navel ill with associated joint ill. Treatment was performed by umbilical debridement and cleaning of necrotic tissues and debris with subsequent application of povidone of iodine. Flunixin meglumine, 1.1 mg/kg, 0.7 mL, was given intramuscularly, twice daily for 3 days as analgesic, anti-inflammatory and antipyretic agent. A combination of penicillin and dihydrostreptomycin (1.2mL) at a dosage of 1 mL/25 kg body weight was administered intramuscularly, once daily for 5 days. Remarkable progressive improvement was observed 3 days after commencement of treatment. The umbilical care by debridement of necrotic tissues and debris and topical antisepsis, coupled with systemic antibiotic therapy using combination of penicillin and dihydrostreptomycin was effective in the treatment of navel ill and/or joint ill.

Key words: Navel Ill, Joint Ill, Friesian Calf, Debridement
Introduction

Navel ill or joint ill is a condition characterized by inflammation, as a result of infection, in the umbilicus and its associated structures. It occurs commonly in neonatal farm animals and appears to be particularly common in calves delivered in dirty environments (Radostits et al., 2007; Naik et al., 2011). Anatomically the umbilicus and its associated structures comprised of the amniotic membrane, umbilical vein (paired externally), paired umbilical arteries and the urachus. At birth the amniotic membrane of the umbilical cord breaks followed by gradual closure of the umbilical vein and the urachus (Anderson, 2004). The smooth muscles of the umbilical arteries contracts thereby forcing the umbilical arteries retract as far back as the top of the bladder (Radostits et al., 2007). The umbilical cord normally dries up within a week, usually 1 to 8 days, after parturition (Hides and Hannah, 2005). The infection may manifest in any of the clinical entities or combination of omphalitis, omphalophlebitis, omphaloarteritis or infection of the urachus. It usually occurs as a mixed bacterial infection usually with possible localization of infection occurring in the joints (joint ill), bones, meninges, eyes, endocardium and end arteries of the feet, ears and tail (Naik et al., 2011). The clinical findings in navel ill are usually the enlargement of the umbilicus with purulent material, chronic toxaemia, and unthriftiness (Radostits et al., 2007).

The prevalence of navel ill or omphalitis is 5 to 15% of new-born calves (Mee, 2008a). If this condition is left untreated can lead to reduced growth, joint ill, and other sequelae (Mee, 2008b). The occurrence of this condition is mostly associated with poor hygienic maintenance of maternity pen, prolonged residency of new born calf in unhygienic maternity pen, lack of adequate and early intake of good quality colostrum and immediate navel antisepsis after parturition (Mee, 2008b; Waltner-Toews et al., 1986). It has been observed that in new-born calves that previously had failure of transfer of maternal immunity during foetal life, navel infection may act as source of infection leading to septicaemia (Naik et al., 2011). Therefore this case report describes the successful medical management of clinical navel and joint ill in a calf.

Case history

An intensively managed 5 days old female Friesian cross breed calf weighing approximately 30kg was presented to the Large Animal Clinic of the University Veterinary Hospital, Universiti Putra Malaysia (UPM). The owner complained that the calf had swollen navel and joints and had not been able to stand up properly leads to frequently fell down. Tincture of iodine was previously applied to the umbilicus following parturition and the animal was fed with colostrum.
Physical Examination

On physical examination, the calf was alert and the appetite was normal, the body condition score was 2.5 out of 5 and and temperature was 39.3 °C (slight pyrexia), pulse and respiratory rates were within the normal range. The mucous membrane colour was pink with capillary refill time (CRT) of less than 2 seconds. The navel was swollen with dark necrotized tissue within the navel opening and noticeable presence of foul smelling (Fig. 1). All the carpal joints of the forelimbs and the hock joints of the hind limbs were swollen; particularly the right carpal joint and the hock joints being more prominent. In both cases there are multiple areas of abrasions with hair loss or alopecia on the affected joints (Fig. 2a and b).

![Swollen navel with dark necrotized tissue within the navel opening](image1)

Fig. 1: Swollen navel with dark necrotized tissue within the navel opening

![Swollen carpal joints with alopecia](image2a)  ![Swollen hock joints with alopecia](image2b)

Fig. 2: (a) Swollen carpal joints with alopecia  (b) swollen hock joints with alopecia

Laboratory examination

Arthrocentesis was performed and the joint fluid collected was sent to histopathology laboratory for synovial fluid cytology, which result revealed no significant findings. Jugular venepuncture was done and
whole blood collected sample was collected and sent to haematology and clinical pathology for full blood count and blood biochemistry. The haematology result revealed thrombocytosis and neutrophilia with regenerative left shift suggestive of infection and/or inflammation. There are no significant changes in the blood chemistry except for the low value of creatinine 20µkat/L and slight hyperkalemia.

**Diagnosis**

Based on the history, physical and laboratory examination findings, the calf was diagnosed to have navel ill with associated joint ill.

**Treatment**

Antibiotic therapy was given using combination of penicillin and dihydrostreptomycin (penstrep), at a dosage of 1 mL/25 kg, 1.2 mL was administered intramuscularly, once daily for 5 days. Non-steroidal analgesic, anti-inflammatory and antipyretic agent, flunixin meglumine, 1.1 mg/kg, 0.7 mL, was given intramuscularly, twice daily for 3 days. A dietary supplement, Biodyl®, 3 ml was administered intramuscularly for alternate 1 day to increase the metabolism and enhance the appetite. The umbilical care was performed by debridement and cleaning of necrotic tissues and debris followed by application of hydrogen peroxide and subsequent application of povidone iodine. This was followed by daily dressing and tincture of povidone iodine application for the next 5 days. Three days after commencement of treatment there was remarkable progressive improvement. The improvement in the condition of the calf was monitored throughout the course of the treatment. The animal was able to walk and when offered milk the appetite was good. The debridement followed by the application of diluted povidone iodine after cleaning and flushing with diluted chlorhexidine was continued. The multiple areas of abrasions showed signs of improvement by drying up, but the swelling of the right carpal joint persisted even after 5th day of hospitalization. There was necrosis of the skin at the cranial aspect of the carpal joint with opening of about 2 cm in diameter with pocket containing caseous material and pus at the subcutaneous level. There was no evidence of involvement of intra-articular region of the carpal joint. The caseous material and the pus in this cavity were removed and the cavity flushed with diluted chlorhexidine then followed with the application of diluted povidone iodine. Ilium Dermapred®, a combination of anti-inflammatory, anti-bacterial, healing and deodorizing compounds was applied and bandage was applied to protect the wound. A tremendous improvement was noticed five days after the commencement of wound dressing with the swelling subsiding and the wound showing granulation.
Discussion

Navel or joint ill usually occurs in calves less than one week of age, as a result of inflammation, due to infection of the tissues of the umbilicus after parturition in dirty environment (Blowey and Weaver, 2011). The tissue of umbilicus gets infected by bacterial contamination soon after parturition in contaminated environment (Anderson, 2004). Although in this case bacteriological examination of the wound swab was not done, Anderson and Rings (2008) reported that most umbilical infections are caused by *Actinomyces pyogenes* and *Escherichia coli* being the second most commonly isolated bacteria and is believed to be the most likely to cause systemic infection and septic polyarthritis. Urachus is the most common umbilical structure infected resulting in urachal sepsis and urachitis. Omphalophlebitis, inflammation of the umbilical vein is the second most commonly infected, while umbilical arteries are the least commonly infected resulting in omphaloarteritis (Anderson and Rings, 2008). It has been observed that the practice of dipping navels in strong iodine solutions (7%) may cause marked inflammation and necrosis, that organisms may more easily penetrate the stalk or the umbilical vessels may be sealed completely that may hinder the drainage of minor infections (Anderson and Rings, 2008). Clinically, Navel ill manifest as the swellings of the umbilical stalk with associated septicaemia and possibly haematogenous septic polyarthritis (“Joint Ill”) (Anderson and Rings, 2008). Affected animals usually show pyrexia, swollen, painful navel exuding foul smelling creamy-white pus (Blowey and Weaver, 2011). This was in consonance with the clinical presentation in this case report presented with foul smelling swollen navel with dark necrotized tissue within the navel opening. Treatment of navel ill often involves surgical drainage of abscess and or debridement of necrotic tissues with antibiotic therapy (Naik et al., 2011) which was in line with the treatment instituted in the present case report. Navel ill can be prevented by maintenance of maternity pen hygiene, navel antisepsis with repeated cord dipping with chlorhexidine and adequate early intake of good quality colostrum (Lorenz et al., 2011). Mee (2009) suggested that producers should avoid possibly harmful cord application procedures with strong antiseptics and concentrate on maternity pen hygiene and calf immunity.

Conclusion

The umbilical care by debridement of necrotic tissues and debris with topical antisepsis, coupled with systemic antibiotic therapy using combination of penicillin and dihydrostreptomycin was effective in the treatment of navel ill. Producers were advised to improve maternity pen hygiene, navel antisepsis with repeated cord dipping with chlorhexidine and ensure calves have adequate early intake of good quality colostrum.
Reference