Lidocaine-xylazine Lumbosacral Epidural Anesthesia for Surgical Resection of Umbilical Structures in Calves

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Surgical resection of umbilical structures in calves is most frequently done using intravenous or intramuscular administration of xylazine/ketamine with or without inhalation anesthetic agents. We were interested in examining the efficacy of a practical and inexpensive alternative anesthetic protocol for umbilical surgery, specifically intramuscular xylazine sedation combined with lumbosacral epidural administration of lidocaine and xylazine.

Six healthy male dairy calves were instrumented by placing a catheter in the auricular artery (to obtain arterial blood samples and measure mean arterial pressure) and by placing a Swan-Ganz catheter into the pulmonary artery via the jugular vein, right atrium, and right ventricle (to measure cardiac output and mean pulmonary artery pressure). At least 36 hours after recovering from instrumentation, each calf was placed in sternal recumbency and baseline hemodynamic measurements were obtained. Each calf was then sedated with xylazine (0.1 mg/kg, IM) and the dorsal lumbosacral area clipped and aseptically scrubbed. A solution of 2% lidocaine (0.15-0.20 ml/kg) containing xylazine (0.05 mg/kg) was administered into the lumbosacral epidural space, the calf placed in dorsal recumbency, and the umbilical region clipped and aseptically scrubbed for surgery. Lidocaine (20 ml) was also injected 5 cm cranial to the umbilicus in an inverted "V" pattern. The umbilical structures were then surgically removed and the abdomen closed in a routine fashion. Hemodynamic values were obtained every 15 minutes during anesthesia. At the end of the surgical procedure, the calf was placed in sternal recumbency and tolazoline administered IV (1 mg/kg) to reverse xylazine-induced sedation and systemic arterial hypotension.

Lumbosacral epidural anesthesia did not alter cardiac output, stroke volume, arterial oxygen tension, and oxygen delivery. Analgesia and sedation were excellent and surgery proceeded uneventfully. Mean arterial pressure was significantly decreased during anesthesia, but tolazoline administration returned mean arterial pressure to baseline values within 2 minutes. All calves had a suckle reflex within 10 minutes and were able to stand within 90 minutes of surgical completion.

We conclude that lumbosacral epidural administration of lidocaine/xylazine combined with intramuscular xylazine sedation and infiltration of lidocaine cranial to the umbilicus is a practical, inexpensive, effective, and safe anesthetic method for surgical resection of umbilical structures in calves. The anesthetic technique provided adequate sedation, regional umbilical anesthesia, immobility of the pelvic limbs and caudal abdomen, and maintained cardiac output and oxygen delivery. The anesthetic regimen is recommended for umbilical surgical procedures of less than 1 hour duration in calves with respiratory disease or where economic constraints preclude use of inhalation anesthetic agents.