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Case Report

Treatment of Intraoperative Persistent Penile Erection in a Stallion

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ABSTRACT

This case report describes the occurrence of persistent penile erection in a breeding stallion that occurred while the horse was under inhalant anesthesia for a carpal arthroscopy. The horse had no history of breeding problems, and no abnormalities were detected on physical examination, complete blood count, or serum chemistry tests performed prior to surgery. Anesthesia was induced with guaifenesin and ketamine after sedation with xylazine and was maintained with isoflurane in 100% oxygen. Penile erection developed approximately 35 minutes after induction and persisted for over 2 hours despite various physical and pharmacological attempts to alleviate it (massage, cold compresses, intravenous benzotropine administration, and intracavernosal phenylephrine). Successful resolution of the erection was obtained by cannulation and drainage of blood from the corpus cavernosum and subsequent irrigation with heparinized sterile saline and infusion of phenylephrine in the corpus cavernosum. The detumescent penis was placed back into the sheath, and purse string sutures were placed in the sheath to ensure the penis would remain inside the sheath during recovery. The stallion's recovery from anesthesia was uneventful, the sutures were removed, and the horse was fitted with a penile sling to prevent additional edema or trauma. The stallion recovered completely from the persistent penile erection. Semen was collected 6 days after the event, and he returned to normal pasture breeding 6 weeks after surgery.

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1. Introduction

Reports regarding priapism in the horse date back to 1978, when the occurrence of prolonged penile prolapse was described in seven colts sedated with acepromazine, and five of those horses required penile amputation [1]. Over the years, a few more cases have been reported, with most also related to the use of acepromazine and other phenothiazine derivatives [2–6]. Persistent penile erection

was also been reported in two horses in which acepromazine or derivatives were not administered [7], indicating that different pathophysiologic processes may have been involved. In those two horses, priapism quickly resolved following intravenous administration of benzotropine mesylate.

This case report describes a circumstance that occurred in a breeding stallion that had intraoperative persistent penile erection that was not associated with acepromazine administration and that did not respond to initial physical (massage, iced compresses, manual retraction) or pharmacological (intravenous benzotropine, intracavernosal phenylephrine) treatments. The erection was resolved by drainage of blood from the corpus cavernosum, followed by

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heparinized saline lavage and infusion of phenylephrine into the corpus cavernosum.

2. Case Presentation

An 11-year-old 527-kg, Quarter Horse stallion was presented to the Colorado State University Equine Surgery Service for lameness and swelling of the left carpus. Radiographs revealed moderate osteoarthritis with an osteochondral fragment within the left radiocarpal joint. Arthroscopic surgery was recommended and scheduled for the following day. The horse presented for anesthesia in good body condition, with no abnormalities detected on physical examination (apart from the lameness and swelling of the left carpal joint). Complete blood count and serum chemistry values were within normal limits. There was no history of breeding problems, and the stallion had successfully live covered a mare 24 hours prior to surgery.

Xylazine (150 mg, IV) was administered to the horse in the stall in order to minimize excitement from interactions with other horses as he walked to the anesthesia induction area. Once in the anesthesia area, a jugular catheter was aseptically placed, and perioperative medications were administered (phenylbutazone, 2 g; cefazolin, 5.7 g; and gentamicin, 3.5 g, slowly IV). The horse's oral cavity was rinsed, and he was moved into the induction stall. Another 150 mg of xylazine (given 30 minutes after the first dose) was administered intravenously 5 minutes prior to induction of anesthesia. The horse then received 40 g of 5% guaifenesin (administered to effect) and 1.2 g of ketamine, IV, which provided a smooth transition to recumbency. After endotracheal intubation, the horse was moved into the operating room and placed in dorsal recumbency on a well-padded surgical table. Anesthesia was maintained with isoflurane in oxygen, and the horse was mechanically ventilated. Heart rate and rhythm, direct arterial blood pressures (systolic, diastolic, and mean), and arterial blood gases and electrolytes were monitored throughout anesthesia and remained within normal limits. Dobutamine infusion (ranging from 0.5 to 1.0 $\mu\text{g}/\text{kg}/\text{min}$) was used as needed to maintain mean arterial pressure above 70 mmHg.

There was no sign of penile erection during induction of anesthesia, transport, and positioning of the horse on the surgical table or during preparation of the surgical site. Penile erection initially developed approximately 35 minutes after anesthesia induction and just before the beginning of surgery. Isoflurane vaporizer was set at 2.5%, heart rate was 38 bpm, and mean arterial pressure was 78 mmHg with a dobutamine infusion of 1 $\mu\text{g}/\text{kg}/\text{min}$. An arterial blood gas reading had been taken just before the penile erection was noted, and all parameters were within normal limits (pH 7.29; partial pressure of oxygen in the arterial blood [PaO_2], 236 mmHg; Partial pressure of carbon dioxide in the arterial blood [PaCO_2], 55.9 mmHg; and standard base excess [SBE], 0.6 mmol/L). Electrolytes and lactate level were also within normal limits.

Initial treatment of the penile erection consisted of cold compresses and massage in an attempt to reduce the erection and replace the penis into the prepuce. A urinary catheter was also placed, and cold saline was flushed through it without any improvement (Figure 1).



Fig. 1. Penile erection in a breeding stallion during inhalant anesthesia.

Benzotropine mesylate was requested, but as it is not routinely available at our veterinary hospital, there was a time delay of 90 minutes until the drug was acquired from a local human hospital pharmacy and administered. In the interim, continuous attempts were made to alleviate the priapism. During this time, the arthroscopic surgery continued to be performed as planned.

Dobutamine infusion was discontinued for a period of time when mean arterial pressure increased to 90 mmHg, and anesthesia depth was increased by adjusting the isoflurane vaporizer to 3.5%. While mean arterial blood pressure decreased to 75 mmHg, no changes were noticed in the penile erection. Anesthesia maintenance was then switched from isoflurane to sevoflurane in the unlikely case that isoflurane was involved in the development of the persistent erection and in the hope that it would provide a faster and smoother recovery from the anesthetic. Phenylephrine (10 mg) was diluted in 9 ml of sterile saline (to a 10-ml solution at 1 mg/ml) and injected into the corpus cavernosum (Figure 2), which was followed by active massage to help with drug diffusion. This resulted in partial detumescence of only the distal portion of the penis.

Benzotropine mesylate was administered approximately 100 minutes after the penile erection developed, at the same dose and route (8 mg, slowly IV) described previously by Wilson et al [7]. No adverse effects were observed, but the drug did not resolve the priapism. Subsequently, a decision was made to drain the blood from the corpus cavernosum. For that purpose, two 14-gauge needles were aseptically placed in the corpus cavernosum, one dorsally immediately distal to the glans penis, and the second was placed caudal to the testes at the base of the penis. Blood was removed from the corpus cavernosum through the needles by a combination of spontaneous extravasation and manual pressure, which resulted in full detumescence. After initial blood drainage, the corpus cavernosum was irrigated with heparinized sterile saline (0.9%), and another 10 ml of diluted phenylephrine (1 mg/ml) was infused into the corpus cavernosum (Figure 3). The fully detumescent penis was subsequently replaced into the prepuce. A purse string suture was loosely placed around the prepuce to ensure that the penis remained within the sheath during recovery. This procedure was easily performed and took a total of 30 minutes. Total anesthesia time was approximately 180 minutes.

Anesthesia was discontinued, and the horse was moved into a padded recovery stall, and oxygen insufflation was provided during recovery through the endotracheal tube.

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