Standing Surgery in the Equine Patient

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Standing surgery in horses has become a more common approach in modern equine practice, offering safe, economical, and efficient alternative to general anesthesia. With continual advances in sedation, analgesia, and surgical technique and instrumentation a wide variety of procedures can now be performed successfully in the standing horse. This presentation reviews current applications across multiple body systems, with practical considerations for patient selection, surgical setup, and intraoperative management.

Selection and preparation are essential to the success of standing surgery. The patient should ideally be well handled and good-natured. The environment for the surgery should be quiet, and clean. Placement of the horse into a stocks/ crush with a head stand can be helpful with restraint and surgeon safety for most procedures unless this obstructs surgical access. A competent and attentive handler is critical. Aids such as earplugs and blinkers can help minimize sensory stimulation of the patient. Ensure the patient is clean and free of debris and that the tail is contained and secure. Draping and maintenance of sterility can be more challenging in standing procedures and require a well-thought-out plan and careful monitoring throughout the procedure. The use of a good quality head lamp for the surgeon is often critical to adequate illumination of the surgical site. Surgeries in which the surgical site is easily and sterilely accessible and can be adequately locally anesthetized are candidates for standing surgery, see table 1 below for a list of some standing surgeries.

A multimodal approach to patient sedation and analgesia is essential when performing standing surgery. A non-steroidal anti-inflammatory medication such as phenylbutazone is usually helpful to decrease inflammation and pain from surgery. Alpha-2 agonists such as detomidine, xylazine, or romifidine critical to sedation during a standing procedure. Opioids such as methadone, butorphanol or morphine are not only helpful for analgesia but are also synergistic with alpha-2 agonists for superior sedation. The author often uses a pre-operative/ loading dose of 0.01mg/kg detomidine IV and dose of 0.1-0.2mg/kg Methadone iv or IM. Intraoperative sedation is then maintained with a CRI or regular top-ups of alpha-2s. The author prefers a CRI of 15mg detomidine in 1L isotonic fluids dripped to affect. Acepromazine can be a helpful to add to the protocol for more anxious patients, typically at a starting dose of around 0.02mg/kg. Small doses of

ketamine (0.1 mg/kg) and/ or diazepam (0.02mg/kg) can be helpful in more difficult patients. It is also critical that there is complete analgia of the surgical site. This is achieved with a local anesthetic such as lidocaine, prilocaine, mepivacaine, or bupivacaine. These are administered as an injection either via or in combination of perineural, local infiltration, or line block. It is important to understand the nerves innervating the surgical area and block them when possible. Blocking motor nerves can also be helpful in some surgeries to minimize movement of local muscle such as with ophthalmic surgery but are important to avoid for nerves that control limb function. Finally higher volume opioid or low volume local anesthetic epidurals can be helpful with more caudal surgeries

Table 1: Examples of Equine Standing Surgeries by Body System

Body System	Standing Surgical Procedures (not limited to)
Musculoskeletal System	Kissing spine surgery (partial ostectomy, ligament desmotomy) Splint bone removal Sequestrum debridement Tenoscopy (e.g., digital flexor tendon sheath) Bursoscopy (e.g. nuchal bursa) Arthroscopy (e.g., fetlock) Fracture repair Pedal keratoma removal Tenotomy
Head and Respiratory Tract	Tooth extractions Sinus flap surgery Gental procedures or endodontics Laryngeal tie-back Laryngeal tie-forward Gutteral pouch surgery Tracheotomy/ tracheostomy Upper airway laser procedures Subepiglottic cyst removal Epiglottic entrapment surgery Ceratohyoidectomy surgery Simple jaw fracture repair
Gastrointestinal and Abdominal	Nephrosplenic space closure Mesenteric lymph node biopsy Exploratory laparoscopy Grade 1 or 2 rectal tear repair Rectal/ small colon prolapse

Urogenital Tract	Standing ovariectomy (colpotomy/laparoscopy) Cryptorchidectomy Caslick's procedure Perineal body reconstruction Rectovaginal fistula repair Urovagina correction via urethra extension Bladder surgery via perineal urethrotomy or bladder sphincter enlargement Perirectal cystotomy Partial penile amputation Standing urethral process resection Segmental posthetomy
Integumentary System	Wound repair Skin mass removal Reconstructive flaps Skin grafts
Ophthalmic	Superficial keratectomy Conjunctival graft Eyelid repair Enucleation Third eye lid removal

There are limitations to standing surgery. There can be problems with patient compliance despite sedation. Additional people are often required to help restrain the horse, manage the sedation, nurse, and assist with the procedure. There is no doubt that it is more dangerous for the surgeon as the patient is not under general anesthesia. Draping and maintenance of sterility is much more difficult. Ergonomics for the surgeon is often sub-optimal. Although not true for all procedures, some standing procedures can take longer due to patient preparation and movement of the patient throughout the procedure. Hemorrhage can be both decreased or increased with standing surgery depending on the surgical site's height relative to the heart.

In conclusion, standing surgery is an evolving frontier in equine practice. With appropriate patient and surgical selection, sedation and anesthesia, and surgical skill, it enables an often safe, effective alternative to general anesthesia and in some cases referral to a hospital. Expanding its use can reduce risk, cost, and recovery times for equine patients—often without compromising outcomes.

References

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