Simplified Castration With the Equitwister

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The Equitwister is an ideal instrument for use in Equitarian work. The instrument is inexpensive and easy to use. Thus far there have been no complications to castration using the Equitwister. Students have found this an easier technique to master than either emasculators or the Henderson castration device. Authors' addresses: 16445 70th Street Northeast, Elk River, MN 55330 (Turner); 3281 Luneman Rd., Placerville, CA 95667 (Turoff); and Horse Science Center, Middle Tennessee State University, Murfreesboro, TN 37167 (Haffner); e-mail: turner@anokaequine.com. *Corresponding and presenting author. © 2015 AAEP.

1. Introduction

In delivering health care to working equids, castration is the most common surgical procedure performed. In Equitarian work, castration is typically done on a single day in a community during a yearly visit. Due to the lack of ability to follow up on these patients, it is imperative that reliable techniques with few complications be used. In addition, these techniques are often simultaneously taught to local veterinarians or veterinary students. Ideally, the techniques should be simple, easily repeatable, and use equipment that is affordable.

The most common perioperative complication of castration is hemorrhage. Other post castration complications are swelling, infection, and evisceration. Swelling and infection are directly related to postoperative care, but hemorrhage and evisceration are directly related to the procedure. Interestingly, closed castration techniques have fewer complications than other techniques. However, the size and contents of the vaginal tunics prevent the use of closed castration techniques in some instances. This is usually due to the fact that with large vaginal tunics, emasculators cannot achieve sufficient crush to prevent excess hemorrhage. The Henderson tool castration method is a solution to this problem. The technique uses a clamp that can accommodate the entire cord. The instrument is then attached to a battery-powered drill and the testicle is twisted off. The twisting technique is not new and has been used on swine for years, not only to reduce hemorrhage, but also to reduce the possibility of evisceration (a common problem in swine). The twisting of vessels to stop hemorrhage was the preferred surgical technique for hemostasis until the advent of absorbable suture for ligatures. The Henderson tool has become a popular method to use for equine castrations, particularly in Equitarian work because of its reliability.

Sustainability is an important goal of Equitarian work. In this context, sustainability may be defined as the ability to continue the spectrum of veterinary work after the Equitarians leave. In this case, the local veterinarians or animal health workers should be able to continue to perform excellent quality castrations. This can be difficult for no
other reason than equipment is unaffordable, as good-quality emasculators will cost several hundred dollars. Although cheaper ones can be obtained, it has been the author’s (Turner) experience that cheap surgical tools fail to function properly much more often than expensive instruments made of good materials. In the case of the Henderson technique, the Henderson clamp is expensive, the power drill is expensive, and castrations may be performed in areas without access to recharge batteries, making the tool unusable.

The purpose of this paper is to describe how the Equitarian Initiative and Christian Veterinary Mission developed the Equitwister, the technique for using the instrument, and its successful results.

Instrumentation

The authors developed and tested an instrument that would twist the spermatic cord like the Henderson castration tool but required only manual effort and cost only a few dollars to make. An 18-in., 5/16th stainless steel rod is bent at two right angles so that there is a 9.5-in. shaft, 3.5-in. Crank, and 5-in. handle. A 6-in. piece of the 5/16th-in. steel is bent at an acute angle and welded to the end of the shaft. One-inch PVC is used for the sleeves, which are placed over the shaft and handle that prevent surgical gloves from being entrapped in the instrument as it is turned (Fig. 1). Total cost of materials to make one Equitwister is $4.71 and a couple of hours of time.

2. Materials and Methods

Before performing a castration in the equine patient, a preoperative examination is performed. The scrotum must be palpated (under sedation, if necessary) to confirm the presence of one or both testes as well as to detect any indication of inguinal herniation. The presence or history of inguinal herniation is a vital consideration to help avoid evisceration postoperatively. Evidence of inguinal herniation or the absence of one or both testes requires a different surgical technique. Other preoperative considerations include tetanus prophylaxis, antimicrobial administration, and preoperative administration of nonsteroidal anti-inflammatory drugs.

The authors prefer to use general anesthesia when castrating in the developing countries because surgical exposure is improved. In addition, it carries less risk for the surgeon and patient. Various drugs and combinations of drugs can be used. Drug combination familiarity is essential for proper patient monitoring and safety. In addition, one should use only drugs that are locally obtainable. Most commonly, a combination of xylazine and ketamine hydrochloride is used to induce and maintain anesthesia. After induction, the patient is positioned in lateral recumbency. The upper hindlimb is secured with a rope around the pastern and hock. The limb can be secured in any number of ways to protect the surgeons. After recumbency, an antimicrobial scrub is performed on the scrotum and surrounding area. Local anesthetic (10–20 mL lidocaine hydrochloride) is injected into each spermatic cord, the testicular parenchyma, or both. This reduces the need for additional doses of anesthetics as well as retraction of the cord by the cremaster muscle. Standing over the dorsum of the patient, the surgeon has good access to the surgical site and is in a safe position. The midline of the scrotum is cross clamped with two large hemostats or Carmalt clamps, and a 5-cm diameter section of skin is excised with scissors. Minimal skin bleeders result. Both testes can be exteriorized from this opening.

The scrotal fascia is stripped from one exteriorized testicle using a dry piece of gauze. The fascia is stripped from the spermatic cord as far proximally as possible. The same procedure is performed on the second testicle. After testicular exteriorization and stripping of the spermatic cords, the most ventral testicle’s cord is wrapped between the forks of the sterile Equitwister castrating tool with the testicle preventing the cord from sliding free (Fig. 2).
One hand holds the Equitwister and mild tension is applied to the instrument so that the spermatic cord remains straight. The other hand turns the Equitwister like a crank. As the Equitwister is turning, the spermatic cord will retract into the scrotum as it initially shortens when it begins to twist. Light tension is maintained on the cord to prevent the cord from twisting upon itself. The cord will continue to twist until it fatigues and separates with only minimal tension by the operator, typically in 15–25 turns. The testicle is removed from the castrating instrument, leaving behind a tightly coiled and sealed segment of the closed spermatic cord. The second testicle is removed in the same fashion. The horse is then recovered.

Horses are observed for 1 hour after surgery for potential complications. Further followup is by phone call assessment via local animal health care individuals. Complications were noted that consisted of continued bleeding after recovery, any tissue hanging from the scrotum or excessive swelling during the first 3 days after surgery.

4. Discussion

The authors have successfully castrated more than 100 horses this past year using the described technique without any complications. The average weight of the horses was approximately 300–370 kg and they included a wide range of ages. We have used the technique for standing castration but have not yet tried to use it for removing a retained testicle.

As previously stated, in Equitarian work, followup of horses can be difficult. Therefore, it is imperative to use reliable techniques with as few potential complications as possible. It is also important that the technique be simple so as to teach others, and inexpensive so that the service is sustainable. In addition to the safety of the patient and surgeon, the primary advantage of the Equitwister technique is the perception of significant reduction of intraoperative and postoperative complications. After 100 horses, we have not had a complication. There is minimal, if any, bleeding. Like the Henderson tool, the Equitwister instrument coils and seals the testicular artery and spermatic cord. Clamping the scrotal skin eliminates most scrotal skin bleeder.

The sealing of the spermatic cord seems to reduce the possibility of evisceration.

The large scrotal opening allows for excellent drainage.

Castrated horses are allowed to return to light work the day following surgery, thus reducing postoperative swelling. The Equitwister costs just a few dollars to make compared with hundreds of dollars to purchase a Henderson tool or a good emasculator. More than 50 veterinary students have been trained to use the tool and when asked they have found the tool easier to use than either the emasculator or Henderson tool.

In the authors’ opinion, the slow twist of Equitwister is superior to the power twist of the Henderson tool because the spermatic cord is less likely to double on itself and the slower speed provides a tighter twist. Experience with this instrument in developing countries suggests this may be a superior technique for routine use, and the authors encourage others to try the instrument.

Acknowledgments

Declaration of Ethics

The Authors declare that they have adhered to the Principles of Veterinary Medical Ethics of the AVMA.

Conflict of Interest

The Authors declare no conflicts of interest.

References

