Ligation of the common vaginal tunic is a safe method of reducing the incidence of omental and visceral herniation in post-castration draft horses. Although this will not completely prevent herniation, it should be considered in those males deemed at increased risk of significant post-castration herniation. The presence of suture within the surgical incision, despite healing by second intention, does not potentiate infection. Authors' addresses: Department of Large Animal Clinical Sciences, Western College of Veterinary Medicine, 52 Campus Drive, University of Saskatchewan, Saskatoon, SK S7N 5B4, Canada (Carmalt, Wilson); and Edmonton Equine Veterinary Services (1998) Inc., 12215 William Short Road NW, Edmonton, AB T5B 2B7, Canada (Shoemaker); e-mail: carmalt_vet@hotmail.com. © 2008 AAEP.

1. Introduction
Castration is the most commonly performed surgical procedure in the horse. Most horses are castrated in the field using either a closed or open castration technique that leaves the scrotal incision(s) open to heal by second intention. Irrespective of the chosen technique, the incidence of castration-related complications is generally regarded as low. Complications include hemorrhage, incisional swelling, incisional sepsis, and less commonly, eventration.

We previously published a case series in which 7.6% of 568 draft colts herniated either omentum or intestine (eventration) acutely or within 1 wk after routine field castration. We postulated that if the common vaginal tunic could be secured, this complication could be prevented. Although indirect herniation into the remnant of the common vaginal tunic was a theoretical concern, the condition had not been reported.

A ligation procedure was developed to secure the common vaginal tunic. The purpose of this report is to describe the ligation technique and to evaluate the safety (and complication rate) of ligation under field conditions and within the hospital environment.

2. Materials and Methods
One hundred and thirty-one draft horse colts (Belgian and Percherons) between 6 and 9 mo of age were castrated. All castrations were performed under general anesthesia in field conditions. After anesthetic induction, horses were placed in dorsal recumbency. Then, the scrotum was scrubbed with povidone iodine and rinsed with isopropyl alcohol.

A routine surgical approach using 7–10 cm skin incisions on either side of the median raphe was used. Closed castration was performed by bluntly...
dissecting the testis enclosed in the common vaginal tunic free of the surrounding tissues. A Serra emasculator was applied, and the testis were removed. A pre-tied loop (4S-modified Roeder knot) of #1 polyglyconate was placed over the emasculator, tightened around the common vaginal tunic, and attached cremaster muscle using a knot pusher. The second testis was removed in similar fashion. Horses were allowed to recover from anesthesia without assistance. Follow-up visual examinations were conducted at 24 h and 1 wk postoperatively and 7 mo after castration.

3. Results

Complications were noted in 9 of 131 colts within 24 h of castration. Five horses had pre-putial swelling, three had post-operative bleeding (3/131, 2.3%), and one herniated both omentum and viscera during an uneventful recovery from anesthesia (1/131, 0.76%). The last horse was immediately re-anesthetized, and the bowel was returned to the abdomen with no apparent post-operative complications. Careful examination determined that evisceration had occurred by tunic rupture. Seven months post-castration, one horse (0.76%) was reported to have had drainage from the surgical site for 2 mo that subsequently responded to repeated antibiotic therapy. This animal had not had complications noted at the time of surgery or at the 7-day post-operative inspection.

4. Discussion

Previously, we reported a post-surgical omental herniation and eventration rate of 2.8% and 4.8%, respectively (total = 7.6%) in draft colts, which warranted concern. The omental herniation rate did not differ markedly from that reported by other researchers; however, the incidence of eventration was substantially higher.

The entrance to the inguinal canal (the vaginal ring) is postulated to be the most important determinant of whether or not a horse will eviscerate post-surgery, and it need not be larger than normal to allow herniation to occur. Shoemaker et al. postulated that changes in intra-abdominal pressure (caused by the ingress of air into the abdomen during surgery) may result in herniation post-castration.

Ligation of the common vaginal tunic during closed surgical castration of the horse will prevent ingress or egress of air during the procedure. Additionally, it will support the tenuous “seal” of the tunic created during the crush phase of emascula-tion. Although these measures will not prevent herniation of abdominal contents into the inguinal canal (through the vaginal ring) and possibly the development of a ruptured inguinal hernia, they will likely prevent the pressure differential associated with trans-abdominal air movement and therefore, the incidence of significant surgical problems. The fact that the incidence of post-castration herniation (omentral and visceral) in the current study population was 0.76%, as opposed to the 7.6% previously reported, supports this premise and confirms other reports.

A 4S-modified Roeder knot was chosen, because it was simple to apply in field conditions, could be pre-tied, and has been previously reported as having the highest mean peak force to failure compared with modified Roeder, Weston, and Brooks laparoscopic slip-knots. In a more recent publication, the 4S-modified Roeder knot outperformed the commercially available Endoloop, Brooks, modified Roeder, and Weston knots and was not significantly weaker than a square knot.

The presence of foreign material within open castration incisions has been reported to result in an increased incidence of post-operative infection. The reported infection rate of horses undergoing castration is 3.44%; however, the rate in the draft colts castrated in the current study was only 0.76%. These results do not support the reported increase in incidence of infection after ligation. Combined with the much reduced rate of omental herniation and eventration, these findings support the ligation of the common vaginal tunic in field castrations (where the incisions are to remain open), especially in those breeds that are prone to post-surgical herniation.

References and Footnotes


aSerra emasculator, Jorgensen Laboratories, Loveland, CO 80538.
bMaxon, Davis, and Geck, Danbury, CT 06810.