Use of a Sterile Plastic Bag to Facilitate the Removal of Large Ovarian Tumors During Standing Flank Laparotomy in Mares

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The use of the sterile plastic bag in the removal of large ovarian tumors greatly diminishes the traditional disadvantages of the standing flank ovariectomy. The sterile plastic bag technique provides a safe alternative for the removal of large ovarian tumors without general anesthesia. Authors’ address: Veterinary Medical Teaching Hospital, University of California at Davis, Davis, CA 95616. © 1998 AAEP.

1. Introduction
The removal of large ovarian tumors (>10 cm) can be technically difficult because of problems with exposure, pain associated with manipulation and traction, and an increased blood supply.1, 2 For these reasons, traditionally it has been recommended that ovarian tumors greater than 10 cm in diameter be removed under general anesthesia.2–5 The advantages of ovariectomy by means of standing flank laparotomy include the avoidance of the cost and risks associated with general anesthesia and recovery; decreased tension on blood vessels to be ligated; and better assessment for hemostasis and visualization of the pedicle. With the sterile plastic bag technique, traction and manipulation of the ovary and pedicle are minimized and the final incision size can be reduced. With this technique we were able to successfully remove large ovarian tumors up to 18 cm in diameter by means of a standing flank laparotomy.

2. Methods
Procaine penicillin G (22,000 IU/kg IM) and flunixin meglumine (1 mg/kg IV) were administered to each mare 1 h prior to surgery. All mares were sedated with detomidine (0.01–0.02 mg/kg IV) and butorphanol (0.005–0.01 mg/kg IV) and restrained in standing stocks. Sedation was titrated throughout the procedure as necessary. The appropriate paralumbar fossa was clipped and aseptically prepared for surgery. In all mares paravertebral blocks of the ventral branches of spinal nerves T-18, L-1, and L-2 were performed to provide regional anesthesia, with the exception of one mare in which an incisional line block was performed.6 A routine vertical skin incision and a standard modified grid flank approach were performed in all mares. Large self-retaining retractors (Finochietto retractors) were placed within the flank incision, and the ovarian tumor was identified. The pedicle was desensitized by infiltration or direct application of 2% lidocaine to the pedicle.
For the bulk of the tissue in the ligature to be decreased, the mesosalpinx was transected with scissors. The mesovarium and enclosed vessels were ligated by using overlapping ligatures of no. 2 polyglactin 910 or by stapling with thoracoabdominal 90 mm\textsuperscript{a} (TA 90) or a combination of both. After the pedicle was ligated, a sterile plastic bag\textsuperscript{b} was introduced into the abdomen through the flank incision and positioned around the ovary. The top of the sterile plastic bag was secured to the incision with towel clamps or stay sutures so it would not be lost in the abdomen. The ovary was transected from its pedicle and allowed to drop into the sterile bag. The retractors were removed. The securing clamps or stay sutures were released from the incision. The top of the sterile bag was grasped, and the bag and enclosed ovary were removed. The pedicle was then inspected for hemorrhage and additional ligatures were applied if necessary. A routine closure was then performed.

3. Results
Eight ovarian tumors ranging 10–18 cm in diameter were removed from eight mares by means of standing flank laparotomies. The use of the sterile bag facilitated the removal of the large ovarian tumors through the flank incision in all mares. No intraoperative complications occurred. Mild swelling and emphysema were noted at the incision sites. All mares recovered and were discharged within 3 days from the date of surgery.

4. Discussion
The advantages of standing flank ovarietomies include (1) the avoidance of the cost and risk of general anesthesia and recovery; (2) a decreased tension on the vascular pedicle during ligature and examination of hemostasis of the transected pedicle. The described disadvantages of the standing flank ovarietomy are (1) pain with traction and manipulation of the ovary and pedicle in the nonanesthetized mare; and (2) the difficulty in exteriorizing an ovarian tumor greater than 10 cm through the flank incision of the nonanesthetized mare.

Traditionally, it has been recommended that large ovarian tumors be removed under general anesthesia through a flank, ventral midline, or diagonal paramedian incision. This recommendation has been based on difficulties with exposure of the ovary, the discomfort associated with traction of the ovarian pedicle, and the difficulty with removal of the large ovary through the flank of a nonanesthetized mare. For these reasons the size of the ovary may not be the deciding factor as to whether the surgeon performs a standing flank ovarietomy. In this series of cases, the use of a sterile bag enabled us to easily and safely remove ovarian tumors ranging from 10 cm up to 18 cm in diameter through a standing flank incision.

Providing adequate analgesia is of paramount importance in the performance of any form of standing procedure. In the cases described, the combination of neuroleptanalgesia and regional anesthesia provided excellent operating conditions. We prefer the paravertebral block over the line block or inverted L block because it provides better relaxation of the paralumbar fossa muscles. This improved muscle relaxation makes the exposure and extraction of a large ovarian mass easier. The paravertebral block provides the added benefit of improved anesthesia of the peritoneum, which can be very sensitive and is not usually well anesthetized by a line or inverted L block.

The use of the sterile plastic bag greatly diminishes the traditional disadvantages of the standing flank ovarietomy. The plastic bag we used was a sterile x-ray cassette bag.\textsuperscript{b} Other heavier grade plastic bags may be used provided they are sterilized, of adequate size, and durable enough so that they do not tear during manipulation and removal of the tumor. Using the sterile plastic bag, we were able to remove large ovarian tumors, up to 18 cm in diameter. The presence of the sterile plastic bag eliminates the need for exteriorization of the ovary prior to transection. The mare experiences less discomfort and is more amenable to the standing procedure because there is less manipulation of the ovarian pedicle. The removal of a large ovary is greatly facilitated because the bag permits easy extraction through the flank incision without the surgeon's hands obstructing the incisional space. In addition, the use of a large self-retraining retractor allows the procedure to be easily accomplished without a surgical assistant. The sterile plastic bag technique provides a safe, practicable alternative for the removal of large ovarian tumors without general anesthesia.

References and Footnotes

\textsuperscript{a}TA 90, Auto Suture, US Surgical Corp., Norwalk, CT 06856.
\textsuperscript{b}Z-drage x-ray cassette bag, Zimmer Inc., Warsaw, IN 46580.