
VAS DEFERENS SURGERY IN PEAFOWL (*Pavo cristatus*)

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Abstract

Peafowl (*Pavo cristatus*) are often kept as loosely managed species in zoological collections, fully flighted and roaming freely on zoo grounds. A single peacock may have a harem of 2-5 peahens and each peahen may produce 8-12 chicks per year, rapidly exceeding the carrying capacity of a zoo and affecting surrounding neighborhoods. Contraception of the peacock (rather than peahen) was chosen as the most efficient means of achieving nonlethal population control. Castration is associated with significant risk of mortality during surgery or soon afterward, due to the large bilateral incisions required and risk of severe hemorrhage from the vena cava and other structures, therefore we elected to perform bilateral vas deferens surgery using minimally invasive techniques.

The vas deferens of peafowl runs along the femoral artery, along the surface of the kidney. Therefore, adequate visualization and controlled dissection technique are critical and bilateral vas surgery cannot be performed safely through just one approach. For each vas, an intracoelomic approach via the caudal thoracic air sac was found to be optimal for visualization of anatomy and placement of instruments. A 1-cm incision was made through skin and body wall in the last rib space at approximately mid-thigh. A rigid 2.7-mm endoscope with Taylor sheath was inserted through this incision to visualize the testis and vas deferens. Endoscopic iris scissors were used through the instrument channel of the Taylor sheath to bluntly dissect the vas from the femoral artery in two locations, near the testis/epididymis and approximately 1 cm distal. Hemorrhage during vas dissection varied from negligible (from fascia) to free flowing (from the femoral artery), but was usually minimal. If hemorrhage was more severe, pressure was applied to the artery using the shaft of an instrument passed through the Taylor sheath channel; clot formation was adequate within a few minutes and dissection could continue at another site nearby. Once the vas was sufficiently dissected away from the femoral artery, the endoscope and Taylor sheath were held in place and another skin and body wall incision was made into the last rib space, approximately 2-3 cm dorsal to the first incision. A 5-mm cannula was introduced through this second incision, and its tip could be visualized in the caudal thoracic air sac using the endoscope. A monopolar cautery hook was introduced through the 5-mm cannula and current was applied to each dissected portion of vas using a radiosurgical unit (5.5 setting, filtered current, Surgitron FFPF, Ellman International, Hewlett, NY), taking care to deliver current in short pulses to protect adjacent tissues. Histopathologic exam of removed vas suggested 50-90% of the lumen had been obliterated by cautery. The vas was transected in two sites, either during current application or with endoscopic iris scissors. The region of vas between the two transection sites was grasped with endoscopic forceps and removed through the Taylor sheath. Both incisions were closed with 4-0 monofilament polyglyconate suture (Maxon®, Davis & Geck, Wayne, NJ) in body wall and skin layers. The peacock was then repositioned for the same procedure to be performed on the other vas.

During the development of this surgical technique, several methods were attempted with less adequate results than the technique described above. Hemoclip application was attempted for vas ligation along with vasectomy, but hemoclip introduction through the body wall proved problematic despite the use of various retractors. Other incision sites were attempted (caudal to the last rib, or more ventral) with more soft tissue trauma than we considered acceptable. Typically, we found surgery on the right vas deferens to be more quickly accomplished than for the left vas deferens. Future variations of the procedure may include suture ligation or hemoclip ligation of each vas using a 5-mm laparoscopic hemoclip applier (with the goal of eliminating the possibility of sperm granuloma formation), or use of a 5-mm laparoscopic bipolar cautery instrument.

Devising a technique for peacock contraception was challenging and at times frustrating. Although we do not yet know the long-term contraceptive benefits and surgical consequences of the various techniques tried, we are hopeful that this is a reproducible and useful procedure.