History

A nulliparous 6-year-old 106-kg (233.2-lb) Nubian-Boer–crossbred doe was examined at the University of Florida Food Animal Hospital because of hemorrhagic discharge from the vulva of approximately 1 week’s duration. The doe was housed with 3 wethers and fed a commercial diet formulated for goats. There was no history of breeding or exposure to a buck, and the owners did not intend to breed the doe in the future. Sporadic episodes of hemorrhagic discharge from the vulva of this doe had been detected by the owner during the preceding year; however, they resolved quickly without medical treatment.

A female sibling of the doe had been examined at the university hospital 3 months previously because of discharge from the vulva and pollakiuria. Transabdominal and transrectal ultrasonographic examination of that sibling doe revealed a large mass involving the uterus. Ovariohysterectomy was performed, and a large invasive mass was found that extended through the uterine body, cervix, and pelvic canal of the sibling doe. Because the mass extended into the pelvic inlet and there was excessive blood loss during surgery, that doe was euthanized. Necropsy revealed the mass was a uterine leiomyosarcoma.

A few days before the doe of the present report was examined at the university hospital, a primary care veterinarian performed a vaginal speculum examination, which confirmed the presence of discharge through the cervix. Transabdominal ultrasonography was also performed, but results were not definitive. Thus, the doe was referred to the university hospital for further evaluation.

At the time of admission, the doe was bright and alert. Results of physical examination were within anticipated limits. No abnormalities were palpable within the abdominal cavity; however, the doe was overweight, which made it difficult to perform abdominal palpation. There was mammary gland development, and thin watery secretions could readily be expressed from both glands. A CBC revealed no abnormalities.

Dried brown discharge and fecal staining were present on the ventral aspect of the tail and perineum. Vaginal speculum examination revealed thick, brown, nonfetid, tenacious exudate in the cranial aspect of the vagina and at the external cervical os. No fetal structures or foreign materials were observed within the vagina or cervix. Cytologic examination of the discharge revealed moderate neutrophilic inflammation, numerous gram-positive cocccobacilli, and RBCs.

Question

What are the most likely causes of hemorrhagic vulvar discharge in a nonmated doe? Please turn the page.
Answer
Vulvovaginitis or uterine, cervical, or vaginal neoplasia.

Results
Transrectal ultrasonography of the reproductive tract was performed, which revealed an abnormally thick endometrium (4.5 cm in width) that contained cystic structures and hyperchoic foci. Large (1.0-cm-diameter) blood vessels were identified in the uterine wall. Because of the abnormal ultrasonographic appearance of the uterine tissue, ovariohysterectomy was recommended. The doe was administered 2 doses of dinoprost tromethamine (0.1 mg/kg [0.045 mg/lb], IM, q 12 h) to help evacuate the uterus of potential contents and decrease uterine size. Cefiofur sodium (2 mg/kg [0.91 mg/lb], IM, q 12 h) was administered, and the doe also received flunixin meglumine (1 mg/kg [0.45 mg/lb], IM, q 12 h) for perioperative analgesia. The next day, the doe was anesthetized and ovariohysterectomy performed. A ventral midline incision was made, and the uterine horns and ovaries were exteriorized. A large soft tissue mass was identified on the ventral aspect of the uterus. The uterine body and cervix were grossly thick and could not be differentiated from the surrounding mass. The uterus was exteriorized but could not be completely excised because of its location in the pelvic canal. Thus, it was transected through the uterine body (cranial to the cervix), which resulted in removal of as much abnormal tissue as possible.

A large biliated mass comprised most of the uterine body. The mass (8.1 cm in height, 7.1 cm in width, and 5.8 cm in length) was fluctuant and light brown (Figure 1). Presumptive gross diagnosis of the mass was leiomyosarcoma. Histologic examination of the excised tissue revealed smooth muscle fibers, and evaluation of trichome-stained tissue sections confirmed a diagnosis of leiomyosarcoma (Figure 2). Neoplastic cells infiltrated and expanded the myometrium in all examined samples.

Discussion
Primary neoplastic conditions of the reproductive tract of female ruminants are rare; when they occur, they generally are smooth muscle in origin. Types of uterine neoplasia involving the tubular reproductive tract of does include leiomyoma, leiomyosarcoma, leiomyofibroma, fibroma, adenoma, adenocarcinoma, sarcoma, and (rarely) lymphosarcoma. Leiomyosarcoma, as in the doe of the present report, represents the most commonly observed tumor of the reproductive tract in female goats. Tumors of smooth muscle of the reproductive tract are more common in females, especially sexually intact females, than in males of all species, and a hormonal influence may be implicated. Ovarian follicular cysts and endometrial hyperplasia have been associated with other neoplasms reported in goats. Metastasis is rare; however, when it occurs, it typically involves the iliac and abdominal lymph nodes. In cattle and goats, uterine leiomyosarcomas are often locally invasive, but metastasis to distant sites including the lungs and liver has been reported. Typically, there are no clinical signs, and tumors are often quite large by the time of diagnosis because of their slow-growing nature. Hydrometra has also been reported in association with neoplasia in does. Hemorrhagic discharge from the vulva is a common sign in ruminants with reproductive tract neoplasia. Both leiomyoma and leiomyosarcoma have been associated with vulvar hemorrhage in does. In some cases, hemorrhage may be extensive, which may result in anemia and, in severe cases, exsanguination. Although trauma can cause acute onset of vulvar bleeding, the chronic (duration of > 1 year) hemorrhagic discharge for the doe of the present report made it extremely unlikely that trauma was the cause of the hemorrhage. Continued trauma from fetal bones as a result of uterine distortion and hyperplasia would be required for prolonged hemorrhage.
of abortion with maceration should be considered, but it can quickly be ruled out by vaginal speculum and ultrasonographic examinations of the reproductive tract. Chronic hemorrhagic vulvar discharge, in the absence of trauma, should lead practitioners to suspect reproductive tract neoplasia, especially in older animals.

Leiomyosarcomas are highly invasive tumors that typically display multifocal tumor necrosis and cellular atypia in most domestic species. In ruminants, leiomyosarcomas typically have a growth pattern of low-grade malignancy, with slow invasion and infrequent metastasis. Older goats appear to have an increased propensity for development of smooth muscle neoplasms, compared with the likelihood of such tumors in cows. A retrospective analysis of 1,344 caprine submissions to the New York State College of Veterinary Medicine from 1977 to 1997 revealed 7 cases of leiomyosarcoma involving the reproductive tract (relative incidence, 0.52%). This compares with a relative incidence of 0.006% in cattle. The Saanen breed appeared to be overrepresented, with a breed-specific incidence of 4.6%. Furthermore, a hereditary component may be involved because 2 of the Saanen does were twins. The doe reported here also provided support for a possible heritable component because leiomyosarcoma was diagnosed in a sibling doe 3 months previously.

A paucity of information exists regarding treatment options and prognosis for ruminants with leiomyosarcoma because of the extremely low incidence. In 1 case report involving a sheep with uterine leiomyosarcoma, the ewe was still alive and in apparently good health 6 months after initial diagnosis and ovariohysterectomy. Regional lymph nodes, and it remains controversial whether lymphadenectomy is beneficial in affected women. Regional lymph nodes were not evaluated in the doe of the present report, and no areas of intra-abdominal metastasis were noted during the surgery. Adjuvant treatment with radiotherapy or doxorubicin has been attempted in humans, but to the authors’ knowledge, such treatments have not been attempted in ruminant species.

Vulvovaginitis and estrus are also differential diagnoses for a doe with discharge from the vulva. Vulvovaginitis commonly is caused by infection with caprine herpesvirus, Trueperella pyogenes, or Staphylococcus spp and can result in gray or yellow discharge from the vulva, which typically is concomitant with lesions of the vulvar mucosa. Occasionally, vulvovaginitis may result in blood-tinged discharge, so vulvovaginitis should be considered when no other cause for hemorrhagic discharge can be identified. Does in estrus may have a mucoid vulvar discharge, which changes to a tenacious milky white discharge during late estrus. Owners can mistake this estral discharge as abnormal purulent exudate. Cytologic examination of estral discharge often reveals numerous neutrophils. In contrast to the situation in cows, female goats do not have postestral hemorrhage, and estrus-associated discharge of does should not appear hemorrhagic. Care should be taken to ensure that physiologic events are not confused with pathological conditions. A thorough history can often help clinicians differentiate among causes of vulvar discharge in does.

Outcome

The doe recovered uneventfully from anesthesia and surgery and was discharged to the owner 2 days after surgery. Approximately 2 years later, the doe was euthanized because of complications attributed to assumed congestive heart failure, which presumably was unrelated to the uterine leiomyosarcoma.

References