

Peer Reviewed

Cristine L. Hayes, DVM
ASPCA Animal Poison Control Center



Estrus in a Spayed Bitch

A 7-year-old, 10-kg, spayed mixed-breed dog was presented for evaluation of vulvar discharge and swollen nipples.

HISTORY

The dog had undergone routine ovariectomy at 6 months of age. One month before presentation, the owner noted that the dog's nipples had become swollen (Figure 1). Vulvar discharge was also observed, but the owner did not note other abnormalities or behavioral changes. The dog was on a heartworm preventive only (no other medications).

CLINICAL PRESENTATION

The dog was alert, responsive, hydrated, and normothermic on examination. Her skin coat appeared normal. All nipples were swollen. The vulva was enlarged and vulvar discharge was noted. The remainder of the physical examination was unremarkable.

LABORATORY DIAGNOSTICS

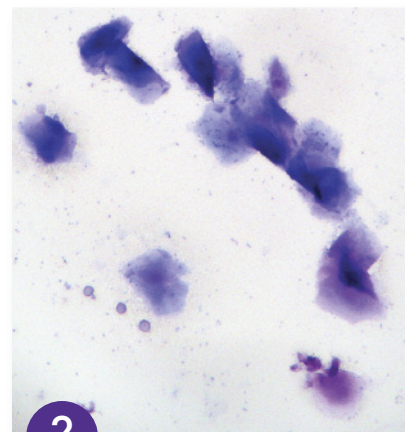
Vaginal cytology revealed 70% cornified epithelial cells, with occasional red blood cells and no neutrophils (Figure 2). The complete blood count (CBC) and serum biochemical profile were unremarkable. Serum estradiol was elevated at 390.5 pg/mL (range: <15 pg/mL for spayed bitch; 15–50 pg/mL for bitch with normal follicular activity). A test for serum luteinizing hormone was negative.

CBC = complete blood count



1

Patient's clinical signs included swollen nipples, an enlarged vulva, and vulvar discharge.



2

Vaginal cytology revealed 70% cornified epithelial cells with occasional red blood cells and no neutrophils.



ASK YOURSELF...

- What other questions should you ask the owner?
- What rule-outs would you consider?
- What long-term effects should you discuss with the owner?

CONTINUES

**DIAGNOSIS:
Human Hormone (Estrogen)
Cream Toxicosis**

Clinical signs and laboratory diagnostics were consistent with estrus. While hormone assays alone are not definitive, in the presence of clinical signs consistent with estrus they suggest being under the influence of estrogen.¹ In the adult bitch, estrogen is responsible for the development of secondary sexual characteristics, such as nipple and vulvar development, behavioral changes associated with estrus, and preparation of the female reproductive tract for breeding.

Sources of estrogen in a spayed dog can include an ovarian remnant, an estrogen-secreting adrenal tumor, or exogenous exposure such as oral exposure to estrogen-containing pills or inadvertent oral or dermal contact with estrogen-containing cream.²⁻⁴

There are no definitive tests to distinguish between endogenous and exogenous sources of estrogen. Diagnostic imaging, such as ultrasound, or invasive procedures, such as endoscopy or surgery, can definitively diagnose ovarian remnant or tumor.² Often thorough questioning of the owner will reveal a source of exogenous estrogen.

DEFINITIVE DIAGNOSIS

Topical hormone replacement therapies (HRTs) are used to treat menopause symptoms in women. Topical HRTs contain estradiol and are available as a spray or cream formulation. They are usually applied to either the forearm or upper thigh.⁵

When pets have inadvertent oral or dermal contact with the owner's treated skin, absorption of estradiol can occur, leading to clinical signs of estrus in female pets and development of feminine

sex characteristics, such as nipple enlargement, in males.⁶ In this case, the owner used a topical estrogen cream on her arm and frequently allowed the dog to sleep next to her in bed.

Estrus due to presumptive exogenous estrogen exposure was diagnosed.

MANAGING ESTROGEN EXPOSURE

If the patient's history reveals possible exogenous estrogen exposure, further exposure must be prevented. Serial CBCs may be necessary to monitor evidence of estrogen-induced myelotoxicity.^{7,8} Evidence of pancytopenia could be apparent by 3 to 4 weeks after exposure. If clinical signs of estrogen influence continue to persist beyond several months despite no further exposure to a topical HRT, then further diagnostics to rule out other causes of hyperestrogenism should be conducted.



ASK YOURSELF...

- The owner should be questioned to determine whether any persons using HRTs have routine contact with the dog. There may be occasions when a pet is showing signs of hyperestrogenism and the owner has failed to recognize that skin-to-skin contact or other seemingly minimal exposures can result in significant estradiol absorption. The owner may need to be questioned multiple times.
- Diagnostic differentials to consider in spayed females include ovarian remnant, exogenous exposure to estrogen-containing products, or estrogen-secreting adrenal tumor (rare).²⁻⁴ In intact females, an estrogen-secreting granulosa cell tumor should also be considered.⁹ In male dogs, Sertoli-cell tumors, interstitial cell tumors, or seminomas should also be considered.¹⁰
- Long-term effects of exposure to estrogen can include myelotoxicity, increased risk for mammary carcinoma, and sex hormone-induced alopecia in both sexes.^{7,8} Females are also at risk for developing pyometra (or stump pyometra in spayed females).^{7,8}

CORRECTIVE ACTIONS

In this case, the owner was instructed to wear gloves when applying the HRT cream and to keep the treated area covered with clothing at all times to prevent further exposure. Because the CBC results at presentation were unremarkable and no other abnormalities were noted on physical examination, intervention measures were unnecessary and the dog was monitored at home without treatment.

OUTCOME

The dog presented for reevaluation 3 weeks after initial presentation. The vulvar discharge had resolved, although nipple and vulvar enlargement were still present. The owner confirmed that she had discontinued using the topical HRT. The results of a second CBC to monitor

Tx at a glance

- Prevent further exposure to exogenous estrogen.
- Monitor CBCs as needed to determine whether myelotoxicity is developing.
- Conduct further diagnostics to rule out other causes of hyperestrogenism if clinical signs fail to resolve within 3 to 4 months.

for myelotoxicity were again unremarkable. At 3 months after the initial presentation, the dog had fully recovered. Additional diagnostics were not conducted.

See Aids & Resources, back page, for references & suggested reading.

CBC = complete blood count, HRT = hormone replacement therapy



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