

SEX HORMONE-RESPONSIVE SKIN DISORDERS (DERMATOSES)

BASICS

OVERVIEW

- “Dermatosis” (plural, dermatoses) is the medical term for any skin disorder
- Sex hormone-responsive skin disorders (dermatoses) are uncommon conditions characterized by hair loss (known as “alopecia”), suspected to result from an imbalance of sex hormones; often defined on the basis of response to sex hormone therapy
- “Estrogen,” “progesterone,” and “estradiol” are female hormones; “testosterone” and “androgen” are male hormones
- An “intact” animal is one that has its reproductive organs; an “intact female” has her ovaries and uterus and an “intact male” has his testicles
- A “neutered” animal has had its reproductive organs surgically removed; females commonly are identified as “spayed,” but may be identified as “neutered;” males may be identified as “castrated” or “neutered”

SIGNALMENT/DESCRIPTION of ANIMAL

Species

- Dogs and cats

Breed Predispositions

- Estrogen-responsive skin disorders—dachshunds, boxers
- Condition characterized by the presence of fluid-filled sacs or cysts in the ovaries (known as “cystic ovaries”)—English bulldogs may be more susceptible than other breeds
- Increased levels of estrogen (known as “hyperestrogenism”) in male dogs due to testicular cancer—boxers, Shetland sheepdogs, Weimaraners, German shepherd dogs, Cairn terriers, Pekingese, and collies
- Testosterone-responsive skin disorders—Afghan hounds
- Castration-responsive skin disorders—chow chows, Samoyeds, keeshonden, Pomeranians, Siberian huskies, Alaskan malamutes, and miniature poodles
- Adrenal sex-hormone imbalance—Pomeranians

Mean Age and Range

- Estrogen-responsive skin disorders—primarily young adults
- Increased levels of estrogen (hyperestrogenism) in females—generally, middle-aged and old, intact female dogs
- Feminizing signs in a male dog of unknown cause (so called “idiopathic male feminizing syndrome”)—intact, middle-aged male dogs
- Testosterone-responsive skin disorders—old, castrated male dogs
- Castration-responsive skin disorders—onset of signs, 1 to 4 years of age or older
- Adrenal sex-hormone imbalance—onset of signs, 1 to 5 years of age

Predominant Sex

- Estrogen-responsive skin disorders—females
- Increased levels of estrogen (hyperestrogenism)—intact female dogs; male dogs due to testicular cancer producing excessive levels of estrogen
- Feminizing signs in a male dog of unknown cause (idiopathic male feminizing syndrome)—intact male dogs
- Testosterone-responsive skin disorders—castrated male dogs
- Castration-responsive skin disorders—intact male dogs with normal testicles
- Adrenal sex-hormone imbalance—males and females, intact or neutered

SIGNS/OBSERVED CHANGES in the ANIMAL

- Hair loss (alopecia)—localized hair loss (alopecia) more common than generalized; initially involves the skin between the anus and the external genitalia (known as the “perineum”), the under side of the chest and abdomen (known as the “ventrum”), thighs, and neck; later involves the back and flank; flank alopecia may be the first or only sign in some patients with increased levels of estrogen (hyperestrogenism) and may be seasonal in some spayed females
- Fur or hair coat—may be soft or dry and brittle
- Nipples, mammary glands, vulva (external genitalia of the female), prepuce, testicles, ovaries, and prostate—often abnormal
- Secondary excessively oily or dry scaling of the skin (known as “seborrhea”); itchiness (known as “pruritus”); skin infection characterized by the presence of pus (known as “pyoderma”); hair follicles filled with oil and skin cells (known as “comedones”); inflammation of the outer ear, characterized by an oily discharge (known as “ceruminous otitis externa”); and darkened skin (known as “hyperpigmentation”)—variable
- Increase in the number of cells in the tail glands (known as “tail gland hyperplasia”) and increase in the number of cells in the perianal gland (known as “perianal gland hyperplasia”) with localized change in color of the skin due to deposits of melanin (known as “macular melanosis”)—dogs with testicular tumors

- Urinary incontinence—estrogen- and testosterone-responsive conditions

CAUSES

Estrogen-Responsive Skin Disorders—Females

- Possible deficiency or imbalance of the female hormone, estrogen; serum estradiol concentrations may be normal
- Inadequate production of adrenal sex hormones
- Skin defect in the sex hormone-receptor/metabolism system
- Rare in dogs
- Extremely rare in cats
- Susceptible breeds—dachshunds and boxers
- Primarily seen in young adults
- May occur after surgical removal of the ovaries and uterus (known as a “spay” or “ovariohysterectomy”) in non-cycling, intact females
- Occasionally seen during false pregnancy or pseudopregnancy
- Variant—cyclical flank hair loss (alopecia) and darkened skin (hyperpigmentation); noted in Airedale terriers, boxers, and English bulldogs; may worsen in winter

Skin Disorders due to Increased Levels of Estrogen (Hyperestrogenism)—Females

- Estrogen excess or imbalance owing to a condition characterized by the presence of fluid-filled sacs or cysts in the ovaries (cystic ovaries), ovarian tumors (rare), or excess/overdose of estrogen-containing medications
- Abnormal peripheral conversion of sex hormones
- Production of sex hormones in an unexpected location in the body
- Animals with normal serum estrogen concentrations may have a increased number of estrogen receptors in the skin
- Rare in dogs
- Extremely rare in cats
- English bulldogs may be more susceptible to a condition characterized by the presence of fluid-filled sacs or cysts in the ovaries (cystic ovaries) than other breeds
- Generally, middle-aged and old, intact female dogs

Skin Disorders due to Increased Levels of Estrogen (Hyperestrogenism)—Male Dogs with Testicular Tumors

- Estrogen excess (or rarely increased levels of the female hormone, progesterone [known as “hyperprogesteronism”]) due to a tumor in the testicles, such as Sertoli cell tumor (most common), seminoma, or interstitial cell tumor (rarely)
- Lack of normal descent of one or both testicles into the scrotum, resulting in the testicle(s) being located in the abdomen or inguinal canal (known as “cryptorchidism”) increases the likelihood that affected animals will develop testicular tumors
- Intact males; usually middle-aged or older
- Susceptible breeds—boxers, Shetland sheepdogs, Weimaraners, German shepherd dogs, Cairn terriers, Pekingese, and collies
- Associated with male pseudohermaphroditism in miniature schnauzers; “pseudohermaphroditism” is a condition where the animal has either ovaries or testicles, but has uncertain (ambiguous) external genitalia

Skin Disorder due to Increased Levels of Androgen (known as “Hyperandrogenism”) Associated with Testicular Tumors

- Androgen-producing testicular tumors (especially interstitial cell tumors) in intact male dogs

Skin Disorder and Feminizing Signs in a Male Dog for Unknown Cause (Idiopathic Male Feminizing Syndrome)

- Undetermined cause
- Serum sex hormone concentrations normal
- Blockage of androgen receptors in the skin may prevent attachment of testosterone
- Intact, middle-aged male dogs

Testosterone-Responsive Skin Disorders—Males

- Rare
- Old, castrated male dogs
- Afghan hounds may be more susceptible than other breeds
- Extremely rare in cats
- Suspected low levels of androgen (known as “hypoandrogenism”) or a possible defect in the skin sex hormone-receptor system

Castration-Responsive Skin Disorders

- Intact males with normal testicles
- Hormone levels (estradiol, testosterone, and progesterone)—variably high, low, or normal
- Onset of signs, 1 to 4 years of age or older
- Susceptible breeds—chow chows, Samoyeds, keeshonden, Pomeranians, Siberian huskies, Alaskan malamutes, and miniature poodles

Adrenal Sex-Hormone Imbalance

- Adrenal enzyme (21-hydroxylase) deficiency, resulting in excessive adrenal gland secretion of androgen or progesterone
- Males and females, intact or neutered
- Onset of signs, 1 to 5 years of age
- Pomeranians may be more susceptible than other breeds

TREATMENT

HEALTH CARE

- Depends on type of sex hormone-responsive skin disorder (dermatosis)
- Discontinue administration of estrogen-containing medications, as directed by your veterinarian, if excessive estrogen is the likely cause of the skin disorder

SURGERY

- Skin biopsy
- Surgical removal of testicles (neuter or castration) of animals with lack of normal descent of one or both testicles into the scrotum, resulting in the testicle(s) being located in the abdomen or inguinal canal (cryptorchidism); neuter when young
- Surgical removal of testicles (neuter or castration)—castration-responsive skin disorder (dermatosis) and testicular tumors
- Exploratory surgery (known as a “laparotomy”)—diagnosis and treatment (such as surgical removal of the ovaries and uterus [spay or ovariectomy] and surgical removal of testicles located in the abdomen [castration]) for ovarian cysts and tumors and abdominal testicular tumors

MEDICATIONS

Medications presented in this section are intended to provide general information about possible treatment. The treatment for a particular condition may evolve as medical advances are made; therefore, the medications should not be considered as all inclusive.

General Treatment

- Topical (applied to the skin directly) medication to treat seborrhea (known as “antiseborrheic therapy”)—conditions with associated keratinization defects and comedones (in which the hair follicles are filled with oils and skin cells)
- Antibiotics—to treat associated skin infections, characterized by the presence of pus (pyoderma)
- Prednisone—for itchiness (pruritus), if infections and bone-marrow suppression have been ruled out

Estrogen-Responsive Skin Disorder (Dermatosis)

- Spayed females—diethylstilbestrol (DES); if no response, try methyltestosterone or mibolerone until hair regrowth and then taper to maintenance
- Intact females—diethylstilbestrol (DES) until bloody vaginal discharge; then administer luteinizing hormone and finally follicle-stimulating hormone (treatment is designed for administration of hormones on specific days of the induced “heat” or “estrous” cycle, as administered or directed by your pet’s veterinarian; “luteinizing hormone” is a female hormone that stimulates the ovarian follicle to complete development and rupture to allow release of the egg and to produce progesterone; “follicle-stimulating hormone” is a hormone from the pituitary gland that stimulates development of eggs in the ovaries and production of estrogen)
- Alternative treatment—follicle-stimulating hormone until signs of “heat” or “estrus” appear

Testosterone-Responsive Skin Disorder (Males)/Some Estrogen-Responsive Skin Disorders (Female Dogs)

- Methyltestosterone—until response; may take 1 to 3 months; after hair regrowth is complete, administer 2 to 3 times/week for maintenance
- Repositol testosterone as needed to maintain normal hair coat

Skin Disorders due to Increased Levels of Estrogen (Hyperestrogenism)—Female Dogs

- Consider o,p'-DDD (Lysodren®) or l-deprenyl
- Alternative treatments—gonadotropin-releasing hormone (hormone that causes release of luteinizing hormone and follicle-stimulating hormone from the pituitary gland) or human chorionic gonadotropin (hormone produced early in pregnancy by the human embryo to maintain progesterone production by the “corpus luteum” or “yellow body” in the ovary; progesterone supports and maintains the pregnancy)
- Tamoxifen (drug that competes with estrogen for receptor sites)—may be useful

Other Conditions

- Castration-responsive hair loss (alopecia)—may respond to human chorionic gonadotropin (hormone produced early in pregnancy by the human embryo to maintain progesterone production by the “corpus luteum” or “yellow body” in the ovary; progesterone supports and maintains the pregnancy) or testosterone, if castration is not possible
- Adrenal 21-hydroxylase enzyme deficiency—o,p'-DDD (Lysodren®), if adrenal sex hormones are high

FOLLOW-UP CARE

PATIENT MONITORING

- Diethylstilbestrol (**DES**) treatment—complete blood count (CBC) to monitor for decreased production of blood cells by the bone marrow (known as “bone-marrow hypoplasia”) or lack of production of blood cells (known as “bone-marrow aplasia”) every 2 weeks for the first month; then every 3 to 6 months
- Testosterone treatment—blood work (serum biochemistry) with an emphasis on liver enzymes every 3 to 4 weeks for the first 3 months; then every 4 to 6 months
- Treatment with o,p’-DDD (**Lysodren®**)—blood work (electrolytes) and adrenocorticotropic hormone (**ACTH**)-stimulation testing every 3 months

PREVENTIONS AND AVOIDANCE

- Animals with lack of normal descent of one or both testicles into the scrotum, resulting in the testicle(s) being located in the abdomen or inguinal canal (cryptorchidism)—do not breed

POSSIBLE COMPLICATIONS

- Estrogen treatment or excessive estrogen—decreased production of blood cells by the bone marrow (bone-marrow hypoplasia) or lack of production of blood cells (bone-marrow aplasia), which are uncommon; signs of “heat” or “estrus,” which is rare
- Methyltestosterone treatment—inflammation of the bile ducts and liver (known as “cholangiohepatitis”), which is rare; behavior changes (uncommon); excessive oily scaling of the skin (known as “seborrhea oleosa”)
- Treatment with o,p’-DDD (**Lysodren®**)—potential side effects (such as vomiting, diarrhea, collapse, and inadequate production of steroids by the adrenal glands secondary to medical treatment [known as “iatrogenic hypoadrenocorticism”])
- Tamoxifen—swelling of the vulva (female genitalia); discontinue until signs of “heat” or “estrus” are gone

EXPECTED COURSE AND PROGNOSIS

- Estrogen-responsive skin disorder (dermatosis)—regrowth of hair may take about 3 months and may be transient
- Female increased levels of estrogen (hyperestrogenism)—improvement should occur within 3 to 6 months after surgical removal of the ovaries and uterus (spay or ovariectomy)
- Estrogen- and androgen-secreting tumors—resolution of signs noted within 3 to 6 months after surgical removal of the ovaries and uterus (spay or ovariectomy) or the testicles (castration), respectively; lack of production of blood cells (bone-marrow aplasia) associated with hyperestrogenism usually does not respond to neutering, and the prognosis for recovery is grave; relapse after a positive response to castration may indicate spread of cancer (known as “metastasis”), and if confirmed, the prognosis is poor
- Castration-responsive skin disorder (dermatosis)—response noted 2 to 4 months after castration
- Testosterone therapy—may result in hair regrowth in 4 to 12 weeks
- Adrenal sex-hormone imbalance—response seen 4 to 12 weeks after treatment with o,p’-DDD (**Lysodren®**) to decrease the production of hormones by the adrenal glands

KEY POINTS

- Sex hormone-responsive skin disorders (dermatoses) are uncommon conditions characterized by hair loss (alopecia), suspected to result from an imbalance of sex hormones; often defined on the basis of response to sex hormone therapy

