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Male Infertility—Dogs

Basics

OVERVIEW

- Diminished or absent fertility in the male dog; does not imply sterility
- Results from a wide range of problems that prevent delivery of sufficient number of sperm to fertilize eggs in the bitch or the sperm are abnormal
- The male dog is the “stud dog”; the female dog is a “bitch”
- The male reproductive tract consists of two testicles (normally located in the scrotum), the epididymides (where sperm are stored prior to ejaculation), the deferent ducts (also known as the “vas deferens,” which are continuations of the ducts of the epididymides, through which semen moves; the deferent ducts enter the prostate and open into the urethra), the spermatic cord, the prostate, the penis, and the urethra (the tube that runs from the bladder and through the penis; urine or semen pass through the urethra)

GENETICS

- Inherited causes of infertility in the stud dog have been substantiated
- 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”) in dogs—inherited, sex-limited, autosomal recessive trait involving many genes
- Alpha-L-fucosidase deficiency—causes impaired sperm maturation in male dogs; a lysosomal storage disorder has been reported—”storage disorders or diseases” are inherited metabolic diseases in which harmful levels of materials accumulate in the body's cells and tissues
- Lack or abnormal motility of sperm (known as “primary ciliary dyskinesia”)—congenital (present at birth) abnormality; absent, irregular, or asynchronous motility patterns of sperm (reported in several breeds; likely inherited as an autosomal recessive trait)
- Inadequate levels of thyroid hormone (known as “hypothyroidism”)—some thyroid disorders appear to be inherited in female dogs and have specific effects on the “heat” or “estrous” cycles; the effect of hypothyroidism on male fertility is less clearly defined and probably is minimal

SIGNALMENT/DESCRIPTION OF PET

Species

- Dogs

Breed Predilections

- Relatively higher number of specific problems involving male infertility seen in breeds with more inbreeding as compared to other breeds

Mean Age and Range

- Male infertility in dogs increases with age

Predominant Sex

- Males

SIGNS/OBSERVED CHANGES IN THE PET

- General complaint—no puppies produced; whelping (birth) rate less than 75% when bred with correct timing to fertile bitches; owner suspects male-dog infertility
- Lack of libido and abnormal breeding behavior
- Abnormalities of the male reproductive tract (such as masses or scarring of the sheath and penis, abnormal testicles, painful testicles, abnormal prostate)

CAUSES

- Incorrect timing of breeding—most common cause of male infertility

Congenital (Present at Birth) Causes

- Chromosomal abnormalities (XXY syndrome) and XX sex reversal (XX male syndrome)—males with underdeveloped testicles and no sperm production
- Defective development or absence of the cells that produce sperm (known as "germinal cell aplasia")—biopsy reveals "Sertoli cell only" syndrome
- Defective development or absence of the epididymis or deferent ducts (vas deferens; condition known as "segmental aplasia of the epididymis or vas deferens")—may involve one side (known as "unilateral") or both sides (known as "bilateral"); causes either a low number of sperm in the ejaculate (known as "oligospermia") or absence of sperm in the ejaculate (known as "azoospermia")

Acquired (Condition That Develops Sometime Later in Life/After Birth) Causes

- Incomplete ejaculation—unfamiliar surroundings; slippery flooring; no bitch in "heat" or "estrus"; dominant owner or bitch present
- Obstruction or blockage of the epididymides or deferent ducts (vas deferens)—leads to absence of sperm (azoospermia) if both sides (bilateral) are involved; sperm granuloma; spermatocele; sudden (acute) inflammation of the epididymis (known as "epididymitis" and/or the testicles (known as "orchitis"); long-term (chronic) inflammation leading to narrowing of the passageways for the sperm (narrowing known as "stenosis"); defective development or absence of the epididymis or deferent ducts (vas deferens; condition is segmental aplasia); tumor or cancer; previous surgical removal of a section of the deferent ducts or vas deferens (known as "vasectomy")
- Inflammation or infection of the testes (orchitis)—especially cases caused by *Brucella canis* and *Escherichia coli*; requires prompt and aggressive treatment to prevent infertility
- Inadequate levels of thyroid hormone (hypothyroidism)—role unclear; evaluate thyroid function in dogs with poor semen quality—hypothyroidism in these dogs is extremely rare; may be associated with decreased libido
- Increased levels of prolactin in the blood (known as "hyperprolactinemia")—role unclear; evaluate prolactin levels in cases with absence of sperm (azoospermia); "prolactin" is a hormone from the pituitary gland that stimulates milk production
- Excessive levels of steroids produced by the adrenal glands (known as "hyperadrenocorticism" or "Cushing's syndrome")—causes decrease in the size of the testicles (known as "testicular atrophy") or a low number of sperm in the ejaculate (oligospermia); probably reversible
- Drugs—examples include medications to kill parasites (known as "parasiticides"); steroids; anabolic steroids; estrogens (female hormones); androgens (male hormones); progestogens (substances capable of producing the effects of the female hormone, progesterone); amphotericin B and antifungal medications (used to treat fungal infections)—may interfere with or interrupt sperm production
- Environmental toxins—hormone-disrupting contaminants can affect the pituitary gland and the reproductive tract; effects in the dog are unknown
- Trauma, environmental damage, tumors or cancer of the testicles, generalized (systemic) disease, blockage of blood flow to the testicles, and heat stress—may cause transient infertility or sterility
- Prostatic disease—appears to reduce semen quality and libido
- Inbreeding—reduces fertility

- Inflammation of the testicles, characterized by the presence of lymphocytes (known as “lymphocytic orchitis”)—familial (runs in certain families or lines of dogs) in some breeds (such as the beagle and borzoi); affected pets may be fertile when young; fertility declines at an accelerated rate with age; “lymphocytes” are a type of white blood cell that are formed in lymphatic tissues throughout the body; lymphocytes are involved in the immune process
- Retrograde ejaculation—some retrograde or backward flow of the ejaculate into the bladder is normal; however, complete retrograde ejaculation will lead to infertility (rare)

RISK FACTORS

- Congenital (present at birth) disorders affecting reproductive function—not uncommon; tend to occur in selected breeds
- Stud dogs and bitches not tested for infectious disease (such as testing for *Brucella canis* and bacterial culture of the genital tract) before breeding; *Brucella canis* is a bacteria that causes reproductive problems in male and female dogs

Treatment

HEALTH CARE

- Supportive regimens—reducing environmental heat or other stress

ACTIVITY

- Restrict, if activity or use is thought to be producing increased body temperature (known as “hyperthermia”)
- No restriction for other causes of infertility

DIET

- Ensure adequate diet and mineral supplementation, as directed by your pet's veterinarian
- Avoid supplementation of products that contain excessive or undefined amounts of steroid hormones (such as extracts of testicles, ovaries and adrenal glands)

SURGERY

- Surgical reattachment of blocked ducts has been successful in several cases

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

- Specific medications must be administered long enough and at a dosage that will ensure tissue penetration
- Antibiotics—chloramphenicol, trimethoprim-sulfa, erythromycin, and enrofloxacin; usually recommended for a minimum of 3–4 weeks to allow adequate and sustained antibiotic levels within the reproductive tract
- Pseudoephedrine—used with limited success in people with retrograde ejaculation (backward flow of the ejaculate into the bladder)

Follow-Up Care

PATIENT MONITORING

- Recheck at intervals that take into account the length of the sperm production cycle (70 days), but are frequent enough to allow detection of deteriorating condition

PREVENTIONS AND AVOIDANCE

- Avoid exposure to environmental temperature extremes (heat or cold)

EXPECTED COURSE AND PROGNOSIS

- Fair-to-good prognosis—cases of mistimed breeding; appropriately breed to fertile bitch
- Guarded prognosis—cases of confirmed infertility; less than 10% of infertile male dogs return to fertility after diagnosis and appropriate treatment

Key Points

- Incorrect timing of breeding—most common cause of male infertility
- The testicles will require at least 70 days from correction of identified reversible causes to return to function
- Regularly have dog checked by your pet's veterinarian to ensure no worsening of the condition
- Not all causes of infertility in stud dogs may be reversible
- Less than 10% of confirmed infertile male dogs return to fertility after diagnosis and appropriate treatment

Notes

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