



# Disease Caused by *Brucella*, a Type of Bacteria (Brucellosis)

## Basics

### OVERVIEW

- Contagious disease of dogs caused by *Brucella canis*, a small, intracellular, gram-negative bacteria
- Characterized by abortion and infertility in females and inflammation of the epididymis (where sperm are stored prior to ejaculation; condition known as “epididymitis”) and wasting or decrease in size of the testicles (known as “testicular atrophy”) in males
- Dogs may become infected during breeding or through contact with aborted materials or vaginal discharge following abortion
- A female dog is a “bitch”

### GENETICS

- No known genetic susceptibility to developing brucellosis
- Occurs most commonly in beagles

### SIGNALMENT/DESCRIPTION OF PET

#### Species

- Dogs and, infrequently, people

#### Breed Predilections

- No evidence of breed susceptibility, but exceptionally high number of cases in beagles
- Infected Labrador retrievers and several other breeds found in commercial kennels (“puppy mills”)

#### Mean Age and Range

- No age preference
- Most common in sexually mature dogs



## **Predominant Sex**

- Both sexes are affected
- More common in females

## **SIGNS/OBSERVED CHANGES IN THE PET**

- Suspect whenever a female dog (bitch) experiences abortions or reproductive failures or a male has genital disease
- Affected dogs, especially females, may appear healthy or have vague signs of illness
- Sluggishness (lethargy)
- Loss of libido
- Back pain
- Abortion—commonly at 6–8 weeks after conception, although pregnancy may terminate at any stage
- Males—swollen scrotal sacs, often with inflammation of the skin covering the scrotum (known as “scrotal dermatitis”); enlarged and firm epididymides (plural of epididymis; where sperm are stored prior to ejaculation)
- Long-term (chronic) infection—wasting or decrease in size of one or both testicles (known as “testicular atrophy”); spinal pain; weakness in the hindquarters; wobbly, incoordinated or “drunken” appearing gait or movement (known as “ataxia”)
- Long-term (chronic) and recurrent cloudy eye (inflammation of the front part of the eye, including the iris [known as “anterior uveitis”]) involving one eye, without other generalized signs of disease; darkening of the iris (the iris is the colored part of the eye; darkening is known as “hyperpigmentation”); inflammation of the choroid and retina (known as “chorioretinitis”); choroid is located immediately under the retina and is part of the middle-layer of the eyeball that contains the blood vessels
- Fever (rare)
- Enlarged lymph nodes (common)
- Vaginal discharge, may last for several weeks after an abortion

## **CAUSES**

- *Brucella canis*—gram-negative bacteria

## **RISK FACTORS**

- Breeding kennels and pack hounds
- Risk increases when popular breeding dogs become infected
- Contact with strays in a particular region (known as “endemic area”) where *Brucella* is present

## **Treatment**

### **HEALTH CARE**

- Outpatient

### **ACTIVITY**

- Restrict working dogs

### **SURGERY**

- Neutering/spaying plus medical treatment—when euthanasia is unacceptable to an owner

## **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

- Several therapeutic regimens have been evaluated, but results have been equivocal
- Most successful treatment—combination of a tetracycline (tetracycline hydrochloride, chlortetracycline, or minocycline) or doxycycline and dihydrostreptomycin
- Enrofloxacin
- Gentamicin—limited success; insufficient data on effectiveness when combined with tetracycline

# Follow-Up Care

## PATIENT MONITORING

- Serologic tests (blood tests that detect the presence of antibodies to a certain disease-causing agent or antigen; an “antibody” is a protein that is produced by the immune system in response to a specific antigen)—monthly for at least 3 months after completion of treatment; continuous, persistent decline in antibodies to negative status (known as a “seronegative status”) indicates successful treatment
- Infection becoming active again (indicated by a rise in antibody levels on serologic tests and recurrence of bacteria in the blood [known as “bacteremia”] after treatment)—retreat; spay or neuter and retreat; or euthanize
- Bacterial blood cultures—negative for at least 3 months after completion of treatment

## PREVENTIONS AND AVOIDANCE

- Vaccine—none; would complicate serologic testing (blood tests that detect the presence of antibodies to a certain disease-causing agent or antigen; an “antibody” is a protein that is produced by the immune system in response to a specific antigen)
- Testing—all brood bitches, before they come into “heat” or “estrus,” if a breeding is planned; males used for breeding, at frequent intervals
- Quarantine and test all new dogs twice at monthly intervals before allowing them to enter a breeding kennel

## POSSIBLE COMPLICATIONS

- Owners may be reluctant to spay or neuter or euthanize valuable dogs, regardless of treatment failure
- Infertility
- Human exposure/infection

## EXPECTED COURSE AND PROGNOSIS

- Prognosis is guarded
- If infected for less than 3–4 months—likely to respond to treatment
- Long-term (chronic) infections—males may fail to respond to treatment
- Dogs with diskospondylitis (infection of the intervertebral disks and adjacent bone of the spine [vertebral bodies])—may need repeated drug treatment; surgical treatment rarely needed
- Multiple-drug combination therapy with gentamicin or streptomycin, doxycycline, enrofloxacin, and rifampin has been successful in treating *Brucella* eye disease in dogs
- Successfully treated (decline in antibodies to negative status [seronegative status]) dogs—fully susceptible to reinfection

## Key Points

- Goal of treatment is the eradication of *Brucella canis* from the pet (as indicated by a decline in antibodies to negative status [seronegative status] and no bacteria in the blood [bacteremia] for at least 3 months), but sometimes the result of treatment is persistent low antibody titers, with no generalized (systemic) infection
- Antibiotic treatment, especially minocycline and doxycycline, is expensive, time-consuming, and controversial (because outcomes are uncertain)
- Treatment is not recommended for breeding or commercial kennels; it is recommended only for non-breeding dogs or those that have been spayed or neutered
- Before treatment is attempted for an intact household pet or breeding dog, the client must clearly agree that the dog must be neutered or euthanized if treatment fails
- Owners must understand the ethical considerations and obligations not to sell or distribute infected dogs
- Zoonotic potential of brucellosis should be considered; a “zoonosis” is a disease that can be passed from animals to people.

## TinyBear Pomeranians

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