Canine Brucellosis

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Brucellosis is the primary contagious infectious venereal disease of concern in canine reproduction. Infection with the causative organism, Brucella canis, causes reproductive failure in both male and female dogs. Screening for B. canis is an important part of the prebreeding evaluation of any dog and should be included in the initial diagnostics in any case of canine abortion or apparent infertility. Because the incidence of canine brucellosis is low in many parts of the country, breeder compliance with regular testing can wane, making continued veterinary vigilance important.

Diagnostic Criteria

Historical Information

Gender Predisposition
- No gender predisposition.
- A problem of mature, sexually intact dogs and bitches.

Age Predisposition
- Postpuberal dogs and bitches.

Breed Predisposition
- First reports involved beagles because of the increased incidence in breeding colonies.
- Any breed can be affected.
- Mixed breeds can be affected as well.

Owner Observations
- Clinical signs are minimal to mild and generally nonspecific:
  - Lethargy.
  - Poor athletic performance.
  - Change in condition (poor coat, weight loss).
  - Partial anorexia.
  - Lameness.
  - Pelvic pain.
- Bitches:
  - “Infertile” because of early, undetected resorption of fetuses.
  - Late gestational abortion.
- Male dogs:
  - Failure to impregnate bitches.
  - Scrotal excoriation.

Other Historical Considerations/Predispositions
- Exposure to intact dogs or bitches (dog shows; breeding or training kennels).
- Variable geographic incidence (increased in the southern United States, Mexico, Central America).
- Can be associated with interstate or international shipment of semen or dogs for breeding purposes, defying normal geographic tendencies.

Physical Examination Findings
- Subtle lymphadenomegaly (peripheral, inguinal, or pelvic).
- Splenomegaly or hepatomegaly.
- Physical examination may be unremarkable.
- Specific findings can relate to systemic involvement in chronic disease:
  - Neurologic abnormalities.
  - Uveal inflammation.
  - Lameness, spinal pain.
  - Dermatologic signs.
- Bitches: Abnormal vulvar discharge for 6 or more weeks after the abortion.
- Male dogs:
  - Scrotal excoriation or dermatitis, prominent epididymis, testicular heat, and pain. In the acute phase, enlargement of the scrotum occurs secondary to epididymal swelling.
  - Chronic testicular atrophy.

Laboratory Findings
- Semen abnormalities:
  - Decreased motility (asthenospermia).
  - Pyospermia.
  - Sperm head autoagglutination.
  - Sperm morphologic abnormalities (teratospermia).
- Complete blood count, chemistry panel, and urinalysis are usually normal.
- Positive B. canis screening test result (unless <8 weeks from exposure; then a false-negative result is possible).
- Rapid slide agglutination test (RSAT).
- Mercaptoethanol RSAT (meRSAT).
- Positive B. canis confirmation test result.
CHECKPOINT

Indication for euthanasia is primarily a financial one because of an inability to clear the infection in most cases and the expense of ongoing therapy.

- TAT (tube agglutination ≥ 1:200).
- Agar gel immunodiffusion (AGID).
- Positive blood culture result; positive fetal stomach contents culture.
- Polymerase chain reaction (PCR).
- Histopathology (placenta, testes, fetus).

ON THE NEWS FRONT

- PCR can identify persistently infected animals that have become culture negative.
- AGID and culture require special laboratory technical training. The New York State Diagnostic Laboratory (Cornell University), University of Florida, and University of Georgia have such laboratories.

- Kennel hygiene/disinfection: 1% sodium hypochlorite, 70% ethanol, iodine/alcohol solutions, and glutaraldehyde and formaldehyde.

Other Diagnostic Findings

- Ultrasonography in bitches: Postpartum metritis.
- Ultrasonography in male dogs: Epididymitis, orchitis, prostatitis progressing to testicular atrophy.

Summary of Diagnostic Criteria

- History of subfertility or infertility (male dogs) and early or late gestational loss of pregnancy (bitches).
- Positive B. canis screening test (unless <8 weeks from exposure; then a false-negative result is possible).
- Positive conformational B. canis test result.

Diagnostic Differentials

- Other causes of infertility in dogs: Other bacterial prostatitis, other bacterial orchitis or epididymitis, immune-mediated orchitis, husbandry problems.
- Other causes of resorption or abortion in bitches: Premature labor, other bacterial metritis, herpesvirus infection.
- Other causes of diskospondylitis: Other bacterial or fungal causes.

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TREATMENT RECOMMENDATIONS

Initial Treatment

- Isolation.
- Neutering.
- Enrofloxacin 5 mg/kg PO bid for 4 weeks. $$$

Alternative/Optional Treatments/Therapy

- Combination therapy with tetracyclines (doxycycline or minocycline 25 mg/kg bid PO for 4 weeks) and dihydrostreptomycin (10–20 mg/kg bid IM or SC for 2 weeks on weeks 1 and 4) or an aminoglycoside (gentamicin 2.5 mg/kg bid IM or SC for 2 weeks on weeks 1 and 4) has been the traditional, suboptimal treatment regimen. $$
- Euthanasia is advocated by some authors in commercial breeding colonies.
- Abnormal vulvar discharge can persist for 6 to 8 weeks.
- Bitch cycling will continue normally if not neutered; subsequent abortions can occur.
- A surviving litter may be whelped, but neonates can be exposed postpartum.
- Semen can remain infectious for weeks to months.
- Urine can be infectious if it contains semen.
- Chronic immunologic sequelae can be absent or occur months to years after exposure.

**Treatment Contraindications**
- Semen cryopreservation.
- Retention in a breeding facility (potentially contagious even after clinical signs abate).
- Corticosteroids or other immunosuppressive drugs.

**PROGNOSIS**

**Favorable Criteria**
- Brucellosis in dogs and bitches has a low mortality and high morbidity rates.

- Lack of systemic signs of sequelae (immune-mediated or granulomatous disease).

**Unfavorable Criteria**
- Antisperm autoantibodies.
- Testicular atrophy.

**RECOMMENDED READING**