Canine Brucellosis

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What is Canine Brucellosis?

• It is a **relatively new disease** in dogs: *B. canis* was first discovered in 1966.
• It is caused by a **bacteria**.
• The major symptoms of infection in dogs are **abortion and infertility**.
• In dogs infection is usually through **contact with**: Urine, placental fluids and aborted tissues, and by **mating** (venereal infections).
Which dog is infected with *Brucella canis*?
What happens when dogs get infected?
Placenta

- Normal
- Brucella infected

Amnion

CEOC 2019

Dr. Brower

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How does Brucellosis spread between dogs?
What will make me suspicious that I have Brucellosis in my kennel?

Abortions or fertility problems, particularly if you have:

- acquired new dogs or
- have had Brucella in your kennel in the past.

Abortions are usually in the last trimester of pregnancy.

Other signs in females:
- prolonged vaginal discharge, failure to conceive, stillbirths

Other signs in males:
- pain with urination, blood in the urine, or swollen or painful testes.
How do I find out if a dog is infected? What are the different tests?

- Blood tests: Serum vs. Blood Culture
- Tissue culture
Small dogs: 3.3 cc blood minimum.

Large dogs: 8.3 cc blood minimum.
Brucella blood culture
The “card test” for serum
Two rapid slide agglutination testing methods for a presumptive diagnosis of canine brucellosis.

Procedure for Rapid Slide Agglutination Test (RSAT)
1. Bring reagents to room temperature (21°C/70°F) and shake well before use.
2. Place one drop of antiserum (white label) positive control on one side of card. Use one disposable plastic pipette and a rubber bulb to place one drop of test serum on the other side of the card. Each test kit contains disposable pipettes to prevent serum cross-contamination. Do not dispose of pipette until 2ME-RSAT is completed.
3. Add one drop of the B. canis agglutination antigen close to each serum drop, being careful not to touch serum with dropper.
4. Mix each antigen-serum with a separate end of an applicator stick, spreading to a circular area 2cm in diameter.
Do not allow the positive control test to touch the suspect serum test.
5. Rock card very slowly and gently, and observe for agglutination for no longer than 2 minutes. If the serum is NEGATIVE (absence of agglutination), NO FURTHER TESTING IS REQUIRED; the animal is considered not to be infected with B. canis. If the card test is positive, perform the 2ME-RSAT.

procedure for 2-Mercaptoethanol-Rapid Slide Agglutination Test (2ME-RSAT)
1. Add 2 drops of 2-mercaptoethanol, 0.2M solution, to a tube containing 2 drops of the serum to be tested and mix well.
2. Place 1 drop of mixture on a clean card.
3. Add 1 drop of B. canis agglutination antigen next to the serum solution and mix well.
4. Gently rock the card and observe for agglutination. When the RSAT-positive sample also tests positive by 2ME-RSAT, the animal is presumptively diagnosed as being infected with B. canis. Blood should then be submitted to cultural examination for B. canis and/or tube titers.
When the RSAT-positive sample tests negative by 2ME-RSAT, the animal may be in the early stage of B. canis infection, or alternatively its serum may contain non-specific agglutination to B. canis. To distinguish between these two conditions, a second serum sample should be collected in approximately thirty days and retested by the 2ME-RSAT procedure. Only if this sample tests positive should the animal be presumptively diagnosed as having B. canis infection. Results should be confirmed with additional seriological testing such as tube titer and/or blood culture.
What is good or bad about each test?

- Serum: Fast test, get results in 1-2 days. Takes 3-4 weeks for dogs to become positive. Positive and negative tests are not always right. Why?

- Whole blood and tissues for culture: Positive is always positive. Earliest possible test, dogs can be positive by 2 weeks after infection. Results can be as fast as a few days, more often positives found in 7 days, positives may show up as late as 2-3 weeks. Negatives and positives can still be missed. Why?
If my kennel has Brucellosis, what kind of losses can I expect?

Abortions and premature whelping are reported to occur in 50% of dogs that are positive on serum tests.

Infection rates of 30-40% are common in uncontrolled outbreaks.

Let’s look at a hypothetical situation...
10 breeding females

new purchase: infected stud - $500

2007 1 abortion – litter of 5 - @$100/puppy - $500

Test kennel: Serology - $17.00/dog
Blood Culture – $12.00/dog x 11: $132.00
Cull Stud - $500; $500 lost puppies
Find 3 more positive females – $250/dog: $750
$1,882.00 + additional follow up testing

Ignore and continue breeding

2008 3 abortions – litters of 5 – @$100/puppy - $1500

Cull Stud - $500
$500 2007 lost puppies
$1500 2008 lost puppies
Test kennel: Blood Culture $132.00
Find 6 more positive females: $1500
$3,132.00 + additional follow up testing

Get rid of stud dog and continue breeding

2008 1 abortion – litter of 5 - @$100/puppy - $500

Cull Stud - $500
$500 2007 lost puppies
$500 2008 lost puppies
Test kennel: Blood Culture $132.00
Find 2 more positive females: $500
$2,132.00 + additional follow up testing

$500 2007 lost puppies
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Let’s look at one more scenario:

You require that the new dog be tested up front….It’s positive and you don’t buy it.

Even if you offered to pay for the testing and did 2 tests just to be sure:

Total cost = $24.00
How common is this disease in the US?

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<th>Number RSAT</th>
<th>Number Positive RSAT</th>
<th>% Positive RSAT</th>
<th>Number IFAT*</th>
<th>Number Positive IFAT</th>
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Oklahoma diagnostic laboratory data

B. canis surveys have found infections in dogs in the U.S. from 1-19% and in Mexico up to 28%.
How can I prevent B. canis outbreaks in my kennel?

Yearly testing of all breeding stock and testing of all dogs to be introduced into the kennel.

Two negative tests done 4-6 weeks apart should be required for all dogs before they are introduced into a breeding colony.

Females that abort should be assumed positive and should be isolated until proven otherwise.
Control: How do I get rid of B. canis once it is in my kennel?

Euthanasia of all CULTURE positive dogs is recommended.
Test all dogs in the kennel monthly for 3 months until the entire kennel is negative on 2 successive tests.
Separate females at birthing to reduce transmission in the kennel.
Why shouldn’t I just treat infected dogs?

- Expensive: Multiple antibiotics are used for an extended period of time – 3 months!
- Usually ineffective, particularly in chronically infected males – the bacteria frequently re-appear once antibiotics are stopped.
- Uncertainty.
What animals can get brucellosis?
Human Disease

- The first human case of canine brucellosis was diagnosed in 1968, 2 years after the disease was discovered in dogs.

- Symptoms in people are usually vague: fevers and lymph node enlargement, and other flu-like symptoms: sweats, fatigue, loss of appetite, headache, muscle aches, and back pain.
How can contact with infected tissues, blood, urine, vaginal discharge, aborted fetuses, and placentas cause infection in people?
1. Through eating or drinking something that was contaminated with *Brucella*

2. Through skin wounds or splashing into the eyes.

3. By breathing in the organism (inhalation), while cleaning out infected pens and cages.
What can make diagnosis in humans difficult?

- It may take a long time to show signs of illness: 7 to 21 days up to several months.

- Human infections are usually mild and many likely go unnoticed. Severe disease is rare.

- The medical profession is largely unaware of potential infection in people.

  Unlike dogs, infected humans usually respond quickly to antibiotics.
How should I protect myself from getting infected with *B. canis*?

- Test and remove infected dogs from your kennel.
- Wear proper attire if dealing with infected animals/tissues: Gloves, mask, goggles.
- Disinfect all exposed surfaces.

Thank you!!!!!
Questions?