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Topical Review

Adult-Onset Lymphoplasmacytic Orchitis in a Labrador Retriever Stud Dog

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A formerly fertile 5-year-old 45-kg Labrador retriever was evaluated for azoospermia noted during routine semen collection for an artificial insemination. Over the past 3 years, the dog had sired 4 litters of anticipated size for the breed out of 5 breedings, the most recent a litter of 10 conceived and whelped 2 months previously. Physical examination findings were normal with the exception of bilaterally small and soft testes. An open excisional wedge biopsy of the right testis was performed under general anesthesia. Histopathology findings supported an immunologic, autoimmune pathogenesis that had resulted in infertility over the previous 4 months.

Case Report

A formerly fertile 5-year-old 45-kg Labrador retriever was evaluated for azoospermia noted during routine semen collection for an artificial insemination. The dog was healthy, with no history of trauma, travel, toxin exposure, or illness. He was fed a balanced commercial dry dog food and was on monthly oral flea and tick preventative (NexGard, afoxolaner; Merial 136 mg orally every 30 days) and heartworm preventative (Heartgard Plus, Ivermectin/pyrantel; Merial 272 μg orally every 30 days).

Over the past 3 years, the dog had sired 4 litters of anticipated size for the breed out of 5 breedings, the most recent a litter of 10 conceived and whelped 2 months previously. Each bitch had a negative *Brucella canis* screen finding before breeding. The dog was screened for *B. canis* annually, and the results were negative.

Physical examination findings were normal with the exception of bilaterally small and soft testes. The scrotum was normal with no evidence of dermatitis, lichenification, or hyperpigmentation. As a result of the reduced testicular size, the epididymides were comparatively enlarged. The prostate was normal for an intact male of his age and size with no pain or asymmetry. Ultrasound of the reproductive tract was performed; the prostate had typical size, shape, echogenicity, and parenchymal appearance for an intact male adult dog, and the urinary bladder and urethra were normal and the testicular parenchyma homogenous. Subjectively, the testicular parenchyma was mildly hyperechoic. The epididymides were normal in appearance.

A complete blood count, serum chemistry profile, urinalysis, and comprehensive thyroid panel were performed, and the results were normal (Table). An antinuclear antibody test result was negative. *B. canis* serology by immunofluorescent antibody was repeated, and the finding was found negative.

Repeat semen collection was performed; libido was good. The sample was azoospermic with no evidence of blood or inflammatory cells. Cytologic examination of the prostatic fraction of the ejaculate was acellular. Semen was submitted for an alkaline phosphatase measurement; the level was 5412 IU/L, compatible with a complete ejaculate.[1]

An open excisional wedge biopsy of the right testis was performed under general anesthesia. Premedication with ace promazine 0.01 mg/kg subcutaneously and hydromorphone 0.10 mg/kg subcutaneously was followed by induction with propofol, 6 mg/kg intravenously, and isoflurane-O_2 at maintenance flow. The tissue was placed in 10% formalin fixative and submitted for histopathologic evaluation.

Histopathology of the testicular biopsy was performed. The biopsied tissue included sections of testicle with seminiferous tubules and a section of epididymis; the histologic features of the epididymis appeared generally within normal limits. Spermatozoa were not identified within the lumina of the epididymal ducts (Fig 1). The testicular parenchyma was heavily infiltrated by lymphocytes and plasma cells, and nearly all components of the germinal epithelium, except Sertoli cells, were degenerated (Figs 2-4).

The interstitium around some seminiferous tubules was heavily infiltrated by mixed chronic inflammation consisting of lymphocytes, plasma cells, and lesser numbers of histiocytes. Although difficult to assess, there was also apparent loss of some interstitial (Leydig) cells in the more heavily infiltrated areas (Figs 3 and 4).

Rarely, lymphocytes were found breeching the basement membranes of affected tubules. The seminiferous tubules cuffed and invaded by lymphocytes had variably degenerative germinal

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Table
Clinical Pathology Results

Test	Result	Reference range	
Free T4-ed (ng/dL)	1.4	0.7-3.7 ng/dL	
Free T4-ed (pmol/L)	18.0	9.0-47.4 pmol/L	
T4	2.4	1.0-4.0 μg/dL	
cTSH	0.13	0.05-0.42 ng/mL	
TGAA screen 1.0%	0%-35%		
Antinuclear antibody (ANA) negative			
ALP	66	5-160 U/L	
ALT	38	18-121 U/L	
AST	20	16-55 U/L	
Creatine kinase	54	10-200 U/L	
GGT	3	0-13 U/L	
Albumin	3.3	2.7-3.9 g/dL	
Total protein	5.9	5.5-7.5 g/dL	
Globulin	2.6	2.4-4.0 g/dL	
Total bilirubin	0.1	0.0-0.3 mg/dL	
Bilirubin—conjugated	0.0	0.0-0.1 mg/dL	
BUN	15	9-31 mg/dL	
Creatinine	0.9	0.5-1.5 mg/dL	
Cholesterol	203	131-345 mg/dL	
Glucose	106	63-114 mg/dL	
Calcium	10.0	8.8-11.2 mg/dL	
Phosphorus	5.1	2.5-6.1 mg/dL	
TCO_2 (bicarbonate)	27	13-27 mmol/L	
Chloride	113	108-119 mmol/L	
Potassium	4.9	4.0-5.4 mmol/L	
Sodium	149	142-152 mmol/L	
Alb-glob ratio	1.3	0.7-1.5	
BUN-creatinine ratio	16.7		
Bilirubin—unconjugated	0.1	0.0-0.2 mg/dL	
Na-K ratio	34	28-37	
Hemolysis index	N^1		
Lipemia index	N^2		
Anion gap	13	11-26 mmol/L	
WBC	7.7	4.9-17.6 K/μL	
RBC	6.29	5.39-8.70 M/μL	
HGB	14.3	13.4-20.7 g/dL	
HCT	44.4	38.3%-56.5%	
MCV	65	59-76 fL	
MCH	23.3	21.9-26.1 pg	
MCHC	35.8	32.6-39.2 g/dL	
% Reticulocyte	0.3	%	
Reticulocyte	16	10-110 K/μL	
% Neutrophil	71.5	%	
% Lymphocyte	15.7	%	
% Monocyte	6.5	%	
% Eosinophil	6.3	%	
% Basophil	0.0	%	
Auto platelet	178	143-448 K/μL	
Remarks	Slide reviewed microscopically		
Neutrophil	5506	2940-12670 /μL	
Lymphocyte	1209	1060-4950 /μL	
Monocyte	501	130-1150 /μL	
Eosinophil	485	70-1490 /μL	
Basophil	0	0-100 /μL	
Collection method	Cystocentesis		
Color	Yellow		
Clarity	Hazy		
Specific gravity	1.049		
Glucose	Negative		
Bilirubin	1+		High
Ketones	Negative		
Blood	Negative		
pH	6.5		
Protein	Negative		
WBC	0-2	0-5 HPF	
RBC	10-15	0-5 HPF	High
Bacteria	None seen	HPF	
EPI cell	1+ (1-2)	HPF	
Mucus	None seen		
Casts	None seen	HPF	
Crystals	None seen	HPF	
Other	Amorphous debris		
Urobilinogen	Normal		
Heartworm antigen—ELISA	Negative		

Abbreviations: ALP, alkaline phosphatise; ALT, alanine transaminase; AST, aspartate aminotransferase; cTSH, canine endogenous thyroid stimulating hormone; GGT, Gamma-glutamyl transferase; BUN, blood urea nitrogen; Alb-glob, albumin-globulin; WBC, white blood cell; RBC, red blood cell; HGB, hemoglobin; HCT, hematocrit; MCV, mean cell volume; MCH, mean cell haemoglobin; MCHC, mean cell hemoglobin concentration; EPI, epithelial; ELISA, enzyme-linked immunosorbent assay; HPF, high-pass filter.

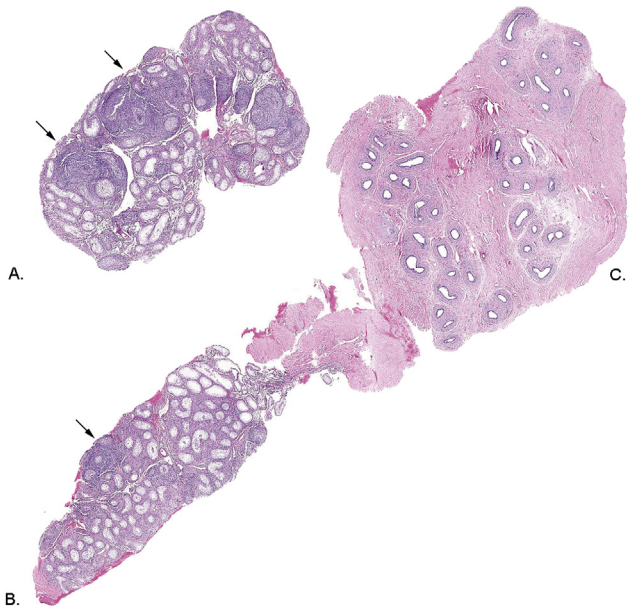

Fig 1. Subgross image of sections of 3 tissues collected by testicular biopsy. The 2 wedge-shaped sections of testis (A and B) contain intense focal inflammatory cell infiltrates that have effaced the testicular parenchyma. Note the absence of sperm in the cross section of epididymis (C).

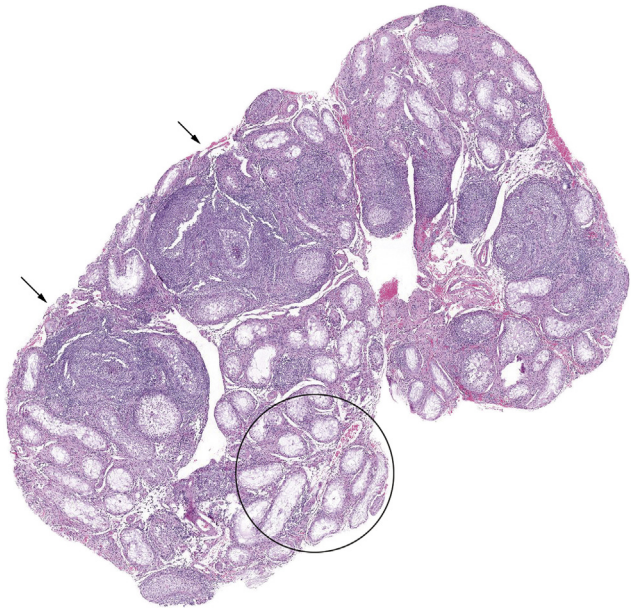

Fig 2. Higher magnification of the piece of testicle labeled "A" in Fig 1. Arrows point to the largest areas of intense lymphoplasmacytic inflammation. Other smaller areas of lymphoplasmacytic inflammation surround individual seminiferous tubules. The seminiferous tubules enclosed in the circle are degenerated. No mature sperm were found in any tubules in the examined samples.