

# Chronic fibrinous and necrotic orchitis in a cat

Robert A. Foster, Jeffrey L. Caswell, Nancy Rinkardt

An adult domestic short hair was referred to the Veterinary Teaching Hospital of the Ontario Veterinary College for bilateral scrotal enlargement and failure to gain weight. The animal was a stray that had been adopted and fed regularly. The cat had a mild pyrexia (39.9°C) and a slightly distended abdomen. The testes were enlarged, but no pain could be elicited on palpation. Hematology and clinical biochemical determinations were within normal reference limits, but feline leukemia virus (FeLV) antigen and antibody against feline immunodeficiency virus (FIV) were detected in serum (Snap Combo FeLV Ag/FIV Ab test, IDEXX Laboratories, Westbrook, Maine, USA). No examination for antibody to feline infectious peritonitis (FIP) virus was performed. The testes were enlarged but the epididymides were palpable and considered to be normal. Ultrasonic examination of the testes was performed. The left and right testes measured 38 × 23 × 18 mm and 32 × 17 × 18 mm, respectively. There was greater echogenicity and occasional irregularly shaped hypochoic areas within the testicular substance. An inflammatory process was suspected and the cat was treated with an antibiotic (Clavamox, SmithKline Beecham, Mississauga, Ontario), 62.5 mg/kg body weight, q12h, for 14 d. The testes continued to increase in size, and castration was performed. Adhesion between the visceral and parietal tunica vaginalis was noted. Routine hematoxylin and eosin (H&E) stained sections of formalin-fixed, paraffin-embedded tissues were examined histologically.

Both testes showed similar changes; however, they were particularly severe in the larger, left testis (Figure 1). In the most severely affected areas, there were large areas of coagulative necrosis. In viable areas, the seminiferous tubules were widely separated with a mixture of fibrin, lymphocytes, plasma cells, and macrophages. The dominant cell or exudate varied from location to location within the testis. The seminiferous tubules were lined by Sertoli's cells; no germinal cells were identified. In places, there were bands of fibrous tissue coursing irregularly throughout the interstitium. Rarely, blood vessels had karyorrhectic debris, fibrin, and neutrophils within their walls. A thin layer of fibrin with lymphocytes and macrophages admixed was on the tunica albuginea. We diagnosed a chronic necrotic and fibrinous orchitis and fibrinous periorchitis with vasculitis, consistent with FIP.

Over the next 3 wk, uveitis of the right eye, a swelling of the forehead (2 cm diameter), and an ulcer (7 mm) of the right lower lip developed. Euthanasia and necropsy were performed. There were firm, white, raised plaques (0.5 to 1 cm) adherent to the pleura and pericardium. Two white, firm, poorly demarcated nodules were in the

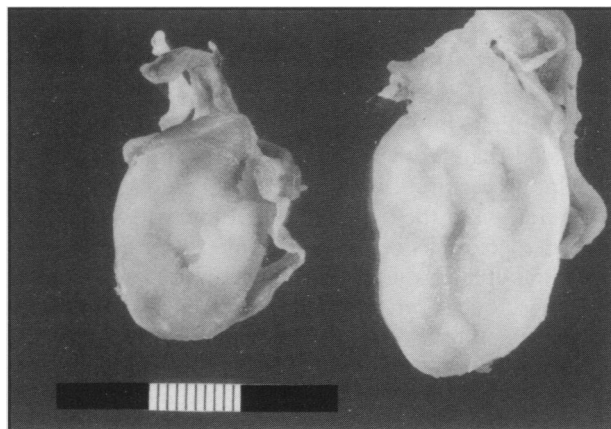


Figure 1. Internal appearance of enlarged left and right testis of a cat with feline infectious peritonitis. (Scale: mm)

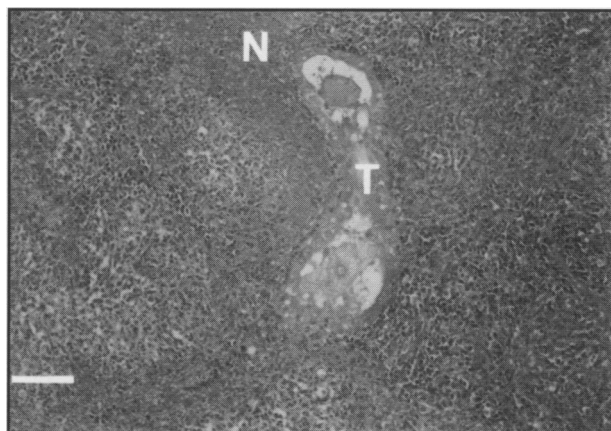


Figure 2. Histological changes of marked infiltration of inflammatory cells within the interstitium and around atrophic tubules (T), with regions of fibrin deposition and necrosis (N). Other areas had regions of coagulation necrosis. (H&E. Bar = 50 µm)

medulla of one kidney. The right frontal sinus contained brown catarrhal fluid and the mucosa was granular. There was a raised, ulcerated, firm mass (7 mm) on the right lower lip involving both the skin and mucosal surfaces. The mass on the forehead was formed by clear fluid and thick fibrous tissue.

On histological examination, lesions were interpreted as being consistent with FIP. There was a multifocal, fibrinous, necrotic, pyogranulomatous inflammation of the pleura and lung parenchyma. The eye had an extensive uveitis with edema and fibrin exudation, fibrinoid and necrotic vasculitis, and aggregates of neutrophils and macrophages. Similar, but less severe, changes were in the posterior uvea and periorbital tissues. The lip mass was ulcerated and composed of poorly demarcated, multifocal, coalescing regions of central coagulative necrosis, surrounded by necrotic cells and peripheral neutrophils and epithelioid macrophages. The mass on the forehead had a deep dermal and subcutaneous nodular pattern. The nodules in the subcutis contained aggregates of neutrophils, macrophages, and lymphocytes

and plasma cells near blood vessels, and fibrin was present in the surrounding tissue. The dermal nodules often had a central core of coagulative necrosis, surrounded by inflammatory cells.

Orchitis in domesticated mammals, with the exception of brucellosis in bulls in endemic areas, is a relatively rare lesion (1,2). We found no confirmed reports of orchitis in cats. The only reference to inflammatory cells in cat testes was to the presence of lymphocytic foci in the testicular interstitium of 8 of 42 cats in a study of age associated changes (3). Previous reports of FIP describe a fibrinous periorchitis (4,5), but make no mention of inflammation of the parenchyma of the testis. Orchitis in other species has been divided into major categories; interstitial orchitis, intratubular or granulomatous orchitis, and necrotising orchitis (1). This case has the features of necrotic orchitis, as is seen with brucellosis in bulls.

Only a small number of diseases have been reported in the reproductive tract of male cats (excluding urethral obstruction due to urolithiasis). These include testicular degeneration (3), cryptorchidism and monorchidism (6), cystic rete testis (7), and prostatic adenocarcinoma (8). One of us (RAF) has also seen suppurative periorchitis, secondary to a bite wound.

The pathogenesis of FIP involves infection with a feline coronavirus. This virus has a tropism for macrophages and replicates in them. Viremia develops and widespread infection of macrophages of the body occurs. Depending on several factors, including the type and extent of the cell mediated immune response, disease may occur. Concurrent infection with FeLV or FIV may allow full expression of the disease. The formation of antigen-antibody complexes and their

subsequent deposition in the wall of small blood vessels leads to complement fixation, chemotaxis of neutrophils, vasculitis, and local tissue damage (9). The histological changes seen in this cat, especially in the testis and skin, are consistent with vasculitis, fibrinogen exudation, and infarction. We confirmed that this cat was viremic with FeLV and this presumably contributed to the development of FIP.

We hope to alert practitioners and pathologists to consider FIP when a cat is presented with scrotal enlargement and, especially, testicular enlargement.

CVI

## References

1. Ladds PW. The male genital system. In: Jubb KVF, Kennedy PC, Palmer N, eds. Pathology of Domestic Animals, 3rd ed. vol 3. Toronto: Academic Pr, 1993: 500-504.
2. McEntee K. Reproductive Pathology of Domesticated Mammals, 1st ed. Toronto: Academic Pr, 1990: 252-278.
3. Elcock LH, Schoning PS. Age related changes in the cat testis and epididymis. Am J Vet Res 1994; 45: 2380-2384.
4. Wolfe LG, Griesemer RA. Feline infectious peritonitis: Review of gross and histopathological lesions. J Am Vet Med Assoc 1971; 158: 987-993.
5. Weiss RC. Feline infectious peritonitis and other coronaviruses. In: Sherding RG, ed. The Cat: Diseases and Clinical Management, 2nd ed. vol 1. New York: Churchill Livingstone, 1994: 449-471.
6. Millis DL, Haupman JG, Johnson CA. Cryptorchidism and monorchidism in cats: 25 cases (1980-1989). J Am Vet Med Assoc 1992; 200: 1128-1130.
7. Gelberg HB, McEntee K. Cystic rete testis in a cat and fox. Vet Pathol 1983; 20: 634-636.
8. Hubbard BS, Vulgamott JC, Liska WD. Prostatic adenocarcinoma in a cat. J Am Vet Med Assoc 1990; 197: 1493-1494.
9. Barker IK. The peritoneum and retroperitoneum. In: Jubb KVF, Kennedy PC, Palmer N, eds. Pathology of Domestic Animals, 3rd ed. vol 2. Toronto: Academic Pr, 1993: 438-441.



## BOOK REVIEW

## COMPTE RENDU DE LIVRE

Ozcel MA, Alkan MZ, eds. *Parasitology for the 21st Century*. CAB International, Wallingford, United Kingdom, 1996. 304 pp. ISBN 0-85198-777-2. \$99.00 US.

This book is a compilation of papers presented at the Eighth International Congress of Parasitology (ICOPA VIII), held in Ismir, Turkey, in October 1994. The book attempts to present the latest information on a number of important parasitic diseases, highlighting the use of the most recent research techniques. The editors state in the preface a hope that the book will serve as an "excellent source for research proposals in the future." Subjects covered include such important human

diseases as leishmaniasis, malaria, schistosomiasis, and giardiasis. The immunology, epidemiology, and pathophysiology of infection with these parasites are covered in the various papers. As a parasitologist, I read the book with great interest and would recommend it for purchase by a university or college library. However, as a veterinarian, the strong focus of the book on parasitic diseases of humans and the price (\$99.00 US) prevents me from recommending it to a general veterinary readership.

*Reviewed by Gary Conboy, DVM, Assistant Professor, Atlantic Veterinary College, University of Prince Edward Island, 550 University Avenue, Charlottetown, Prince Edward Island C1A 4P3.*