Diagnosis and therapy

Anorexia and an abdominal mass in a cat

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A 6-year-old, desexed, female, domestic short-haired cat with a history of weight loss, intermittent vomiting and inappetence over a 2 to 3 month period was presented with anorexia. Physical examination revealed the cat to be cachexic and about 5% dehydrated. An intra-abdominal mass, which elicited slight discomfort upon palpation, was also detected. No other abnormalities were found. The mass was about 9 cm in diameter, firm, lobulated and mobile. It was situated in the mid-

abdominal region caudal to the liver and cranial to the bladder but unattached to either of these organs. Both kidneys were palpably normal in size and location.

Economic constraints precluded detailed investigation of this cat. With the cat physically restrained, an unguided transabdominal fine-needle aspirate was obtained from the intra-abdominal mass using a 3.75 cm 25-gauge needle, after the abdominal wall overlying the mass had been clipped and

appropriately prepared. Smears were air-dried and stained with a rapid Romanowsky stain (Figure 1). This was followed by a laparotomy to determine the extent of abdominal lesions (Figure 2).

- What is your diagnosis and what other tests might you perform to confirm your diagnosis?

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Figure 1. Cytological image of the fine-needle aspirate from an intra-abdominal mass in a cat. A. High-power photomicrograph (Diff Quik x 1200). B - D. High-power photomicrographs. Diff Quik, x 3000.

Figure 2. Gross findings at laparotomy in the cat. Bar = 5 cm.

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Interpretation

Among the red blood cells in the aspirate were numerous macrophages which often contained variable numbers of small organisms within their cytoplasm. These oval to slightly elongated intracytoplasmic organisms were about 2 µm to 4 µm in diameter and had a round 1.5 µm diameter basophilic nucleus (Figure 1A, B, C). Many of the organisms were also located extracellularly throughout the smear where they assumed a larger (about 3 µm to 6 µm diameter) appearance with a shape like a banana or a comma. They contained an eccentrically placed round to oval basophilic nucleus. In some instances the extracellular organisms were arranged in rosettes (Figure 1D). The morphological features of these organisms resembled those described for tachyzoites of *Toxoplasma gondii*.¹ Neutrophils and mature and immature lymphocytes were also evident in the smears. The diagnosis made was of active chronic inflammation caused by a protozoal organism (probably *T gondii*) and possibly associated with lymphoid tissue.

Laparotomy revealed a large, focal, multilobulated, 12 x 7 cm, pinkish-white, granulomatous, mesenteric mass (Figure 2), which contained multiple necrotic and haemorrhagic foci and which abutted the pancreas.

Histopathological examination of the mesenteric mass revealed locally extensive central areas of necrosis. Occasional protozoal cysts and macrophages containing tachyzoites were found in and around necrotic foci. These central necrotic foci were surrounded by markedly depleted and peripherally displaced zones of lymphoid tissue which in turn were enveloped by connective tissue. More protozoal cysts and free tachyzoites could be found at the periphery of this mass (Figure 3). Adjacent lymph node parenchymal architecture was more obvious. Giant cells and large numbers of macrophages, some of which contained intracytoplasmic debris, were evident in subcapsular sinuses of the lymph node as was the presence of erythrophagocytosis and

increased numbers of neutrophils. In some areas pyogranulomatous inflammation had extended to the surface of the pancreas. No organisms could be found within sections of pancreas examined, but small groups of tachyzoites were scattered in inflammatory foci within interstitial tissue on the surface of the pancreas in some areas. Immunoperoxidase staining was positive for *T gondii*, but negative for *Neospora caninum*, and supported a definitive diagnosis of granulomatous lymphadenitis due to *T gondii* infection with associated mild to moderate, focal, chronic interstitial pancreatitis.

Discussion

Toxoplasmosis has rarely been diagnosed cytologically from granulomatous or pyogranulomatous masses in the abdomen.² Tachyzoites are sometimes found in cytological preparations obtained from cerebrospinal fluid, transtracheal aspirates or bronchoalveolar lavages, and pleural or peritoneal effusions during acute infection.²⁻⁵

As *Toxoplasma* organisms are rarely detected, serologic examination becomes the primary means of diagnosing recent or active infection antemortem. Various enzyme-linked immunosorbent assays have been developed for the detection of *T gondii* specific IgG, IgM, antigen, and antigen-containing immune complexes. Currently, no single serological assay exists that can definitively confirm toxoplasmosis in the cat.⁶ Criteria for a tentative antemortem diagnosis of clinical toxoplasmosis have been proposed and include the demonstration of an IgM titre > 256, an increasing IgG titre following paired serum sampling 3 to 4 weeks apart, circulating antigens without antibodies, clinical signs of disease referable to toxoplasmosis, exclusion of other common aetiologies and response to appropriate treatment.⁷

Gross findings at laparotomy or necropsy include necrotic foci most often in liver, pancreas, mesenteric lymph nodes and lungs, whereas intraocular disease (anterior uveitis) and small focal areas of discolouration in the brain may be present in some affected cats.⁵

Figure 3. Histopathological image of mesenteric mass from a cat with toxoplasmosis. High-power photomicrograph depicts *Toxoplasma gondii* tachyzoites (arrows) scattered throughout an area of inflammation and necrosis. Haematoxylin and eosin, x 1100.

The differential diagnosis of enlargement of mesenteric lymph node in cats should also include alimentary lymphosarcoma, disseminated mycobacterial infection and focal feline infectious peritonitis.⁸ This cat was euthanased at the time of the laparotomy due to the locally extensive nature of the mass which was not surgically resectable.

Clindamycin is the drug of choice for treating clinical toxoplasmosis in cats with neurological or ocular lesions.⁷ The dose is 25 mg/kg per day divided into two doses, given orally or intramuscularly. Treatment is continued for at least 2 weeks after clinical signs clear. Side-effects of clindamycin can include anorexia, vomiting and diarrhoea. An alternative is a combination of sulphonamide and pyrimethamine, but side-effects are common and include depression, anaemia, leukopaenia and thrombocytopenia, which make this combination less suitable than clindamycin.⁷

Conditions causing immunosuppression, such as infection with feline immunodeficiency virus, feline leukaemia virus or feline coronavirus, may predispose cats to infection with *T gondii* or reactivate chronic *T gondii* infection.⁴ This cat's immune status was not investigated.

References

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BOOK REVIEW

Veterinary Ophthalmology, 3rd edn, KN Gelatt, Lippincott Williams & Wilkins, New South Wales, 1999, 1544 pages, ISBN 0 683 30076 8

This is a big book, both in terms of its size, some 1544 pages, weighing nearly 4.5 kilograms, but also in its importance to veterinary science. The previous 2 editions have been considered as the most important textbooks for veterinary ophthalmologists. Having spent almost as much time reading this book as I did reading 'War & Peace', I am pleased to say that the third edition is now the most important reference for veterinary ophthalmology.

This book is divided into four main sections. The first, 'Basic Visual Sciences' deals with embryology, anatomy, physiology and optics. The next section, 'Foundations of Clinical Ophthalmology' deals with genetics, immunology, microbiology, pharmacology, pathology, eye examination, ocular imaging and electrodiagnostic evaluation of vision. Practitioners will find the last 2 sections of this textbook very helpful in their management of eye cases. Section three deals with canine ophthalmology. The material is presented by anatomical systems, from the orbit right back to the optic nerve. Each of these chapters starts with the developmental conditions that affect that part of the eye being described. Then the clinical conditions, their aetiologies, clinical manifestations, diagnosis and therapy are well described. The last section of the book is called 'Special Ophthalmology'. In this section chapters are devoted to feline, equine, food animal, poultry, laboratory animal, and exotic ophthalmology. This section also contains information on animal models for ophthalmic disease, comparative neuro-ophthalmology and ocular manifestations of systemic disease.

'Veterinary Ophthalmology' is a well-written book. It contains a large number of diagrams and photographs, some of which are in color. The book is well set out, making it easy to find the information you are looking for. At the end of each chapter there is an extensive reference list. This book contains all the information you could ever need to manage eye cases in practice. I could not find any omissions.

All veterinarians that have more than a passing interest in ophthalmology must have this book. In fact in my 3-Veterinarian practice we have 2 copies of this book, as we are always referring to it. Even those who occasionally see eye cases could benefit greatly by having this book as a reference.

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