Cases of Feline Central Retinal Degeneration Decline

Ronald C. Riis, D.V.M., M.S., DACVO

Feline central retinal degeneration (FCRD) is a diagnosis which is satisfying to give because of its known cause and potential treatment. Clinical FCRD has been linked to experimental nutritional retinopathy in kittens and cats by feeding them a semipurified diet containing casein as the only source of dietary protein.5,8 The experimental casein diet contained no taurine. The diet produced a marked fall in the plasma and retinal taurine concentrations within 10 weeks. This results in an increased cone electroretinogram (ERG) implicit time and reduced ERG amplitude. Retinal DNA concentrations decrease as the retinopathy progresses, indicating the loss of cells in the retina.9 These nutritional retinopathies were unresponsive to vitamin A therapy. The progression of FCRD can be stopped by dietary change or taurine supplements3 (daily taurine can be given in capsule [250 mg SID] or powder form), but the existing degeneration of the retina is permanent.

Even though taurine is present in meat, seafood and dairy products, food processing destroys its availability to the cat. Furthermore, studies in the late 1970s demonstrated that the cat's liver has extremely low levels of cysteine-sulfinic acid decarboxylase, limiting endogenous taurine biosynthesis.9 During the 1980s pet food industries began to supplement their cat foods because of concern over retinopathy and cardiomyopathy due to taurine-deficient diets.

Signs of FCRD

Cats with FCRD appear and act normal in the early stages of retinopathy. However, ERG evaluations demonstrate cone dysfunction in the early stages. The cone disease is present over the entire retina even though the lesions may be relatively small, round or elliptical.2

The ophthalmoscopic features of FCRD are characterized in the early cases by tapetal granularity especially in the area centralis, temporal to the optic disc. Interestingly, ERGs at this stage show small or nondetectable waveforms. With progression of the disease, there is a marked increase in tapetal reflectivity and the size of hyperreflectivity. The zone of degeneration extends horizontally on either side of the optic disc. The lesions are bilaterally symmetrical ranging from round to elliptical (see figs. 1-6). Regardless of the size or shape of the lesion, the center is always hyperreflective.
Fig. 1: FCRD Stage I in the earliest stage affecting the area centralis, outlined by the solid block arrows.

Fig. 2: FCRD Stage II, characterized by a horizontal hyperreflective band on both sides of the optic disc. (Starred dark circle with vessels entering.)

Fig. 3: FCRD Stage III with a broader horizontal hyperreflective band outlined by solid black and white arrows. Optic disc is highlighted by a white dot.

Feline Health Topics

A publication for veterinary professionals

The ultimate purpose of the Cornell Feline Health Center is to improve the health of cats everywhere, by developing methods to prevent or cure feline diseases, and by providing continuing education to veterinarians and cat owners. All contributions are tax-deductible.

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While the edges are darker than adjacent tapetum. The appearance of the lesion changes in reflectivity depending on the angle of incident light entering the eye. Supplementation with taurine at Stages I, II, and III have preserved the ERG amplitudes if rhodospin levels remain as determined by early receptor potential.4,6

Veterinary Data Base Shows FCRD Declining

A recent search of reported cases of FCRD in the Purdue University Veterinary Medical Data Base (VMDB) has shown a marked decreasing trend of this nutritional retinopathy (see table 1 and figs. 7 and 8). This decline relates to the supplementation of cat foods with taurine by the pet food industry in the late 1980s. The data base can be questioned because codes do not allow for types of retinal degenerations or stages of FCRD. Usually only those diagnoses entered on the client discharge form are coded for the data base. Many times FCRD is noted by the veterinarian and entered only on a problem list and not dealt with if more serious medical problems overshadow this incidental finding.

![Fig. 5: FCRD Stage IV, outlined by arrows, indicates the extent of involvement of hyperreflectivity, i.e., retinal degeneration. Note the small vessel diameters. The cat has severe visual impairment.](image)

![Fig. 4: FCRD Stage III fluorescent dye study outlines the retinal vessels white. The darkly scalloped area (white arrow) illustrates the lack of viable retinal tissue in the hyperreflective zone. The cat still has vision.](image)

Summary

FCRD should be diagnosed in the future, but less frequently than in the last 15 years.7 A pos-
Fig. 7: Total number of FCRD cases reported through 1990; see table 1 for number key.

Fig. 8: Total FCRD cases from all reporting VMDB institutions through 1990, showing a sharp decline in last year reported.

Possible clinical situation might exist in cats fed solely dog food which is lower in protein content, or if the taurine has been destroyed and the food unsupplemented. Fewer young house cats will be diagnosed with FCRD, but whether the VMDB is predictably accurate depends on the accuracy of our records and coding.

Table 1. Number Key to Institutions

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<tr>
<th>Institution</th>
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<tr>
<td>1—Michigan State</td>
<td>13—Illinois</td>
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<td>2—Missouri</td>
<td>14—Saskatchewan</td>
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<td>3—Minnesota</td>
<td>15—Colorado State</td>
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<td>4—Iowa State</td>
<td>16—Auburn</td>
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<tr>
<td>5—Cornell</td>
<td>17—Texas A&amp;M</td>
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<td>6—Ontario</td>
<td>18—Tennessee</td>
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<tr>
<td>7—Purdue</td>
<td>19—Louisiana State</td>
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<td>8—Georgia</td>
<td>21—Virginia-Maryland</td>
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<td>9—California</td>
<td>23—Wisconsin</td>
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<td>11—Ohio State</td>
<td>25—Tuskegee</td>
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<td>12—Kansas State</td>
<td>28—Oklahoma</td>
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Note: North Carolina, Pennsylvania, Tufts, Montana, and Washington are not on the Purdue University VMDB.

References:


Dr. Ronald Riis is associate professor of clinical ophthalmology at the College of Veterinary Medicine, Cornell University. He received his D.V.M. degree from the University of Minnesota. He is a diplomat of the American College of Veterinary Ophthalmologists.
Subject Index 1981-1991

Anesthetics/Drugs:
A Guide to Feline Anesthesia, Spring '84
Cats and Pharmaceuticals, Summer '84
Synopsis of Cardiac Drugs, Vol 1(2)
Using Organophosphates to Control Fleas, Vol 1(3)
Side Effects of Megestrol Acetate Therapy, Vol 2(2)
Telazol: A New Injectable Anesthetic, Vol 2(3)
The Effects of Xylazine on Cardiac Function, Vol 2(4)
Isoflurane: A New Inhalant Anesthetic, Vol 2(4)
Analgesics: The Relief from Pain, Vol 5 (2)
New Computer Program for Veterinarians, Winter '85
Toxoplasmosis: Interpretation of Serologic Results,
Summer '85
Heartworm Antigen Test, Vol 1(2)
Biopsy Principles, Vol 3(1)
Panther Study Provides New Insight into
FeLV Tests, Vol 3(1)
Synbiotics' FIP Test, Vol 6(2)
New Diagnostic Test for Giardia, Vol 6(3)
Surgical Techniques for Liver & Kidney Biopsies,
Vol 6(3)

Bacterial Diseases:
Campylobacter jejuni and Cryptosporidia: Two
New Causes of Feline Diarrhea, Winter '83
Cats and Tuberculosis, Summer '83
Cat Scratch Disease, Fall '83
Salmonella Implicated as Cause
of Songbird Fever, Vol 3(3)

Behavior:
Feline Behavioral Problems, May '81

Cardiology:
New Cardiovascular Studies, June '82
Feline Heartworm Disease, Summer '85
Synopsis of Cardiac Drugs, Vol 1(2)

Client Relations:
The Veterinarian's Role in Bereavement, Oct '82
Memorial Program, Vol 6(3)

Dentistry
Feline Oral & Dental Diseases, Vol 6(4)

Dermatology:
Eosinophilic Granuloma, Vol 1(3)
A Differential for Oral Ulcers in Cats, Vol 2(2)

Diagnostic Tests and Aids:
ELISA for Detection of Feline Coronavirus
Antibodies, Nov '81
New Computer Program Aids in Diagnosis, Fall '83
Diagnostic Ultrasoundography, Winter '84
Feline Diagnostic Services at Cornell, Summer '84
Understanding Coronavirus Serology Titers, Fall '84

Endocrinology:
Management of Diabetes Mellitus in the Cat, Nov '81
Feline Hyperthyroidism, June '82
Update on Hyperthyroidism, Vol 1(1)
Treatment for Hyperthyroidism, Vol 1(2)

Gastroenterology
The Impact of Fecal Impactions, Vol 2(1)

Hematology
Basic Principles of Feline Blood Transfusions, Vol 1(4)
Anemia in Cats, Vol 5 (4) & Vol 6 (1)

Hepatic Diseases:
Feline Hepatic Lipidosis, Vol 4(3)

Hospital Management:
Virucidal Disinfectants, Vol 1(3)
Selecting the Right Suture Material, Vol 2(1)

Neurology:
Central Nervous System Diseases in the Cat, Aug '81
Autonomic Polyganglionopathy, Spring '83
Peripheral Vestibular Diseases, Fall '84

Nutrition
Guidelines to Selecting Patients for Nutritional
Support, Vol 5 (3)

Oncology:
Phototherapy of Cancer, Winter '83
A Case for Chemotherapy, Spring '85
Mammary Tumors Are Third Most Common Cancer
Feline Health Topics

in Cats, Vol 1(4)
Effect of Radiation and Chemotherapy on Wound Healing, Vol 4(2)

Ophthalmology:
Intraocular Inflammation in Cats, Winter '84
Complicated Ulcerative Keratitis, Vol 2(4)

Parasitology:
Feline Haemobartonellosis, Summer '83
Feline Heartworm Disease, Summer '85
Feline Blood Parasites, Vol 2(3)

Toxicology:
Ethylene Glycol Intoxication in the Cat, Oct '82
A Review of Anticoagulant Rodenticides, Vol 1(3)
Lead Poisoning in Cats, Vol 4(1,2)

Respiratory:
Eustachian Tube Polyps: A Cause of Chronic Respiratory Distress, Fall '83
Radiographic Evaluation of the Dyspneic Cat, Win'85
Feline Bronchial Diseases, Vol 5(1)
Dyspnea in a Cat with Otitis, Vol 5(3)
ICU Respiratory Therapy, Vol 6(2)

Urology:
Micturition Disorders in Cats with Sacrocaudal Vertebral Injuries, Nov '81
Part I: Understanding FUS, Fall '85
Part II: Understanding FUS, Vol 1(1)
Chronic Renal Failure, Vol 3(2)
Ruptured Bladder and Peritoneal Dialysis in a Cat, Vol 3(4)

Vaccines:
Compendium of Feline Vaccines, Fall '83
Rabies Vaccination Recommended for Cats, Fall '83
Using the New FeLV Vaccine, Spring '85
Explanation of FeLV Vaccine Guidelines, Summer '85
Vaccines and Adjuvants, Vol 4(1)
Should Cats be Vaccinated for FeLV?, Vol 5(3)
FIP Vaccination—Past and Present, Vol 6(2)

Viral Diseases:
Immunopathogenesis of FIP, Feb '81
Herpesvirus Induced Atherosclerosis, Feb '81
New Insights in Gastrointestinal Viruses, Feb '81
Transmission of FeLV, May '81
Diagnosis of Virus Infections in Cats, Aug '81
Geographical Distribution of FIP, Aug '81
Feline Chronic Polyrheumitis, Spring '83

Catpox Virus Infection, Summer '83
Recommendations for Prevention and Treatment of
Kitten Mortality Complex, Spring '83
Understanding Coronaviral Serology Titer, Fall '84
Is Feline Leukemia Transmissible to Man?, Fall '85
Feline Immunodeficiency Virus, Vol 3(3)
The Immune Response to FIP in Cats, Vol 3(4)

Zoonoses:
Cat Scratch Disease, Fall '83
Toxoplasmosis: Interpretation of Serologic Results, Summer '85
Update on Feline Lyme Disease, Vol 5(4)

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The new memorial card is slightly larger to allow more space for additional information such as your phone number and your preference regarding a follow up letter to your client.

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Feline
In Memoriam

Please type or print clearly:

I pledge $______ in memory of:

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