Chronic Progressive Polyarthritis in a Female Cat

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ABSTRACT. Feline chronic progressive polyarthritis is a rare immune-mediated disease that has only previously been reported in male cats. A one-year-old female cat was presented with anorexia, lassitude and lameness. The tarsal, carpal and elbow joints revealed swelling, pain, stiffness, crepitus and regional lymphadenopathy, and fever was present. The cat was clinically diagnosed with chronic progressive polyarthritis based on the fever, swelling of joints, imaging of erosive proliferative periostal polyarthritis, positivity for antinuclear antibody, synovial fluid analyses and urinalyses. Both feline leukemia virus antigen and feline immunodeficiency virus antibody were positive. Using hair root DNA, polymerase chain reaction amplification targeting the sex-determining region on the Y chromosome gene amplified the fragment of DNA from a normal male cat, but not amplified from a normal female cat or the present cat. Accordingly, the present cat was classified as genetically female. Cyclosporine treatment was started, and the general condition and movement quickly improved and continued for 8 months post-diagnosis. This is the first report of chronic progressive polyarthritis in a female cat.

KEY WORDS: chronic progressive polyarthritis, cyclosporine, feline leukemia virus, female feline, immune-mediated disease.

Feline polyarthritis is uncommon. Noninfectious polyarthritis in cats has previously been reported as systemic lupus erythematosus (SLE)-induced polyarthritis, idiopathic polyarthritis, and chronic progressive polyarthritis. Feline chronic progressive polyarthritis is a rare immune-mediated polyarthrits and its pathogenesis may involve exposure to feline syncytium-forming virus (FeSFV) and feline leukemia virus (FeLV). Affected cats show clinical signs that are mainly characterized by limb joint swelling, pain, fever and depression. There are two types of the disease, comprising an erosive proliferative periostal polyarthritis in young adult cats and a more severe deforming erosive disease in older cats. The disease has been thought to only affect male cats, since there have been no previous reports describing the disease in female cats [1, 3, 7, 10]. The present report is the first to describe chronic progressive polyarthritis in a female cat.

A one-year-old female cat, weighing 3.4 kg, was presented to a private animal hospital with anorexia, lassitude and lameness for the duration of one week. Physical examination showed swelling and pain, particularly in the right-side tarsal joint. Since the cat was an outdoor breed, an infectious arthritis was suspected, and antibiotic and nonsteroidal anti-inflammatory medications were initiated. The general condition and lameness improved after these treatments. However, the tarsal, carpal and elbow joints gradually revealed swelling, pain, stiffness, crepitus and regional lymphadenopathy, and fever was detected, indicating that the antibiotic and nonsteroidal anti-inflammatory medica-

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Feline chronic progressive polyarthritis has been thought to be confined to male cats [1, 3, 7, 10]. Therefore, a genetic sex determination was carried out. In mammals, the Y chromosome induces testis formation and male sexual development, while absence of the Y chromosome leads the gonads to differentiate into the ovaries and female development ensues. A sex determination is therefore performed by the presence or absence of the sex-determining region on the Y chromosome (Sry) gene [9]. Genomic DNA was extracted from hair roots taken from a normal male, a normal female and the present cat using ISOHAIR (Nippon Gene Ltd., Tokyo, Japan) according to the manufacturer’s protocols. Polymerase chain reaction (PCR) amplification was performed on the DNA samples with the following primers designed using Primer3 (http://frodo.wi.mit.edu/) based on the cat sequence in GenBank (DQ095188): 5’-CCTACCTCAAATTACCGGTGTGA-3’ (110F) and 5’-CTCA-GAGATCAGCAGCAGC-3’ (262R). The PCR mixture consisted of 2 µl (10 pmol/µl) of each primer, 25 µl of 2× GoTaq Green Master Mix (Promega, Madison, WI, U.S.A.), 0.5 µl (0.1 ng/µl) of template DNA and 22.5 µl of distilled water. The PCR amplification was performed with the following cycle conditions: 3 min at 94°C; 5 cycles of 30 sec at 94°C, 2 min at 50°C and 1 min at 72°C; 35 cycles of 30 sec at 94°C, 30 sec at 55°C and 1 min at 72°C; and a final step of 10 min at 72°C. The PCR products were electrophoresed in 2% agarose gels and photographed. The results of the PCR amplification are shown in Fig. 3. The 163-bp length band of the Sry gene was amplified from the DNA from a normal male cat, but not detected from the DNA from a normal female or the present cat. Consequently, the present cat was classified as genetically female, based on the lack of amplification of the SRY fragment [9].

Fig. 1. Radiograph of the carpus and tarsus of the female cat. Subchondral bone erosion (white arrow), periarticular soft tissue swelling (black arrows), proliferative new bone formation (white arrowheads) and radiolucent foci (black arrowhead) are observed. a: ventrodorsal; b: lateral.
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chlorambucil and azathioprine [7]. Although there have been no previous reports of cyclosporine administration for the treatment of feline chronic progressive polyarthritis, good efficacy of cyclosporine for the treatment of neutrophilic dermatosis was reported in a dog with polyarthritis [2]. In addition, cyclosporine did not have any deleterious side-effects and showed efficacy for feline dermatoses, plasmacytic stomatitis and pure red cell aplasia associated with FeLV infection [6, 11]. Therefore, we started the immunosuppressive therapy with mainly cyclosporine. Cyclosporine (25 mg/head, PO, q24h) and dexamethasone (0.5 mg/head, PO, q24h) were administered for 8 days. Subsequently, the cyclosporine dosage was decreased (25 mg/ head, PO, q48h for 30 days) and dexamethasone was no longer administered. Since then, cyclosporine administration (10 mg/head, PO, q48h) has been ongoing, currently for 8 months. In addition, a green-lipped mussel extract (Bomazeal Cat-Pep; Zenoaq, Koriyama, Japan) [4] was concurrently administered to protect the joint cartilage. The swelling and pain of the joints were remarkably decreased and the general condition was improved at 6 days after the initiation of cyclosporine administration. Subsequently, the clinical signs did not worsen, despite the end of the dexamethasone administration. We observed intermittent fever and limb arthralgia, but the addition of short-term prednisolone administration was effective. Although slight stiffness and pain were detected when the carpal joint was flexed, the general condition and movement have continued to improve for up to 8 months post-diagnosis.

It has not been apparent why feline chronic progressive polyarthritis is only observed in male cats [3]. The joint lesions of this disease resemble those of Reiter’s arthritis in humans [3]. Furthermore, Reiter’s arthritis occurs almost entirely in male humans with the leukocyte antigen B-27 histocompatibility type [3, 8]. However, it remains to be determined whether cats with chronic progressive polyarthritis share a predisposing histocompatibility antigen [3]. It was suggested that one of the reasons of the sex deflection was caused by the rare occurrence of the disease, and that there would be reports of the disease in female cats as the case numbers increase.

Pederson et al. [7] reported that FeSFV was positive in all cats with chronic progressive polyarthritis, and that FeLV was positive in 60% of the cats. However, this type of arthritis cannot be reproduced using FeSFV isolated from diseased cats. Therefore, they proposed a hypothesis that this type of arthritis may be an uncommon manifestation of FeSFV, and that FeLV may act in some way to potentiate the pathogenic effects of FeSFV. The present cat was positive for both FeLV and FIV. Although an FeSFV test was not performed, the possibility that FeLV or FIV participated in the disease onset was suggested.

Cyclosporine has been suggested to suppress the expression of inflammatory cytokines in cats [5]. In the present cat, cyclosporine showed good efficacy for immunosuppressive therapy without side-effects such as myelosuppressions. Therefore, cyclosporine administration is considered to have value for immune-mediated diseases including polyarthritis.

Feline chronic progressive polyarthritis is a rare disease, and furthermore this is the first report of this disease in a female cat. It is considered that a strict differential diagnosis including chronic progressive polyarthritis is necessary when a cat presents with clinical signs of polyarthritis, regardless of the sex.

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