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Idiopathic Polymyositis in a Young Mature Alaskan malamute

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Abstract : Clinical and histopathologic features of idopathic polymyositis in twenty-month-old Alaskan malamute dog are described. The clinical signs were progressive exercise intolerance with acute exacerbation of weakness, muscle atrophy, synchronous pelvic limb gait, short stiff steps and tip-toeing as like walking on eggshells. Physical and clinical examination revealed no evidence of neurologic, skeletal and secondary muscular disorders associated with other diseases. Therefore muscle biopsy was performed at the most severe muscle atrophy lesions to confirm by histopathology. Histopathologic findings documented mononuclear cell infiltration and necrosis of muscle fiber and it was diagnosed as idiopathic polymyositis. Initial treatment was focused on pain relief. Prednisone at immunosuppressive dose (2 mg/kg) was administered orally twice daily. After 3 weeks of starting treatment, the patient showed improvement of gait, appetite, exercise as well as gradually return to normal state of hematologic and serum chemistry profiles.

Key words **:** idiopathic, polymyositis, stiff, immunosuppression, Alaskan malamute.

Introduction

Many of muscle disorders can originate from numerous sources, endogenous or exogenous problems. When practitioners faced with this problem, they easily can confuse with other neurologic disorders. Inflammatory myopathies are the result of infiltration of inflammatory cells into striated muscle, with or without an association with underlying causes. These inflammatory myopathies can be classified into two broad categories as follows: idiopathic inflammatory myopathy (IIM) and secondary inflammatory myopathies associated with other diseases (14). Idiopathic polymyositis (IPS) is an inflammatory myopathy in dogs and cats are not associated with any other systemic connective tissue disease or infectious cause (14). Large number of articles reported on the inflammatory myopathy in dogs, but most of occurrence were masticatory muscle myositis (4,6,13,16,17). However, this report documents that young mature female Alaskan malamute suffered from myopathy of extremities diagnosed as idiopathic polymyositis by muscle biopsy and responded to immunosuppressant therapy.

Case

A twenty-month-old, 20 kg, intact female with progressive exercise intolerance and loss of body weight was referred to the Veterinary Medical Teaching Hospital of Chungnam National University. The patient had a history of severe pain after mounting, and then showed anorexia, loss of body weight about 7 kg, exercise intolerance, depression for a month. On the physical examination, hyperthermia (39.8°C), emaciation, depression, 5% dehydration, exercise tolerance, mild ocular and vaginal discharge, significant weight-bearing of left hind limb, hunched appearance, gingerly tip-toeing, cervical ventroflexion and lordotic posture were showed. To rule out the bone and joint abnormality, the radiographs was examined however there were no significant findings on plane views. Neurological examination could not be performed because of general depression, but deep and superficial pains by pinch test were remained. In hematological profiles, severe leukocytosis (49.18 k/μl) and lymphocytosis (44.33 k/μl) were detected. In serum chemistry profiles, the levels of alkaline phosphatase was increased as 848 U/L (reference range; 23-212 U/L), creatine kinase 203 U/L (reference range; 36-155 U/L) and lactic dehydrogenase 794 U/L (reference range; 17-193 U/L) were documented. On the vaginal scope examination, purulent discharge showed in the vagina and cervix, and also remaining of Wolffian duct and redness of vaginal walls were observed, but other reproductive organs showed normal on ultrasonographs. On the basis of history and examination findings infection of reproductive organ or muscular disorders were suspected. Initially, to supportive care, Hartmann dextrose fluid and antibiotics ampicillin (20 mg/kg) were administered and vaginal flushing with normal saline and diluted 1% povidone-iodine was performed. After several days of treatment, the vaginal discharge was diminished significantly but other clinical signs and hematological changes were not improved. Additionally, muscle atrophy of hindlimb was getting more deteriorated.

Thus, to identify the cause of atrophy, muscle biopsy was

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performed in right hind limb. The patient was sedated with ketamine HCl (3 mg/kg) and α_2-adrenoceptor agonist, medetomidine (30 μg/kg). And local anesthetic, 2% lidocaine was injected around the incision region. The 0.5 × 0.5 × 1 cm of muscle tissue at the right biceps femoris muscle was collected. Sedation was reliably reversed with the specific α_2-adrenoceptor antagonist, atipamezole (120 μg/kg).

Infiltration of mononuclear inflammatory cells was observed in around of muscle fibers and perivascular region as well as invasion of necrotic fibers presented at several were observed on histopathology (Fig 1, 2). Although, this case was suspected with inflammatory myopathy, the cause of disorder remained as unknown due to lack of specific correlations. Prednisolone (2 mg/kg, bid, PO) at a dosage of immunosuppressant for 14 days was initiated and supportive care (e.g. pain relief, rehabilitation etc.) was continued. After 3 weeks of treatment, the patient showed improvement of gait, appetite, exercise as well as gradually return to normal state of hematological and serum chemistry profiles.

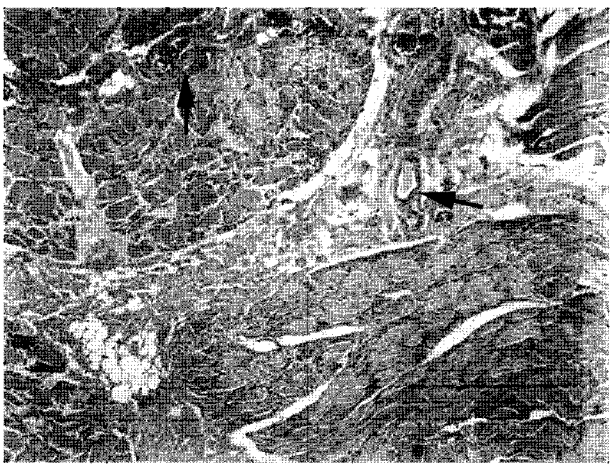

Fig 1. Histopathology from a biopsy of the biceps femoris muscle. A mononuclear cell infiltration with invasion of necrotic fibers and perivascular cellular infiltration were observed (arrow) (H-E stain: original magnification, × 100).

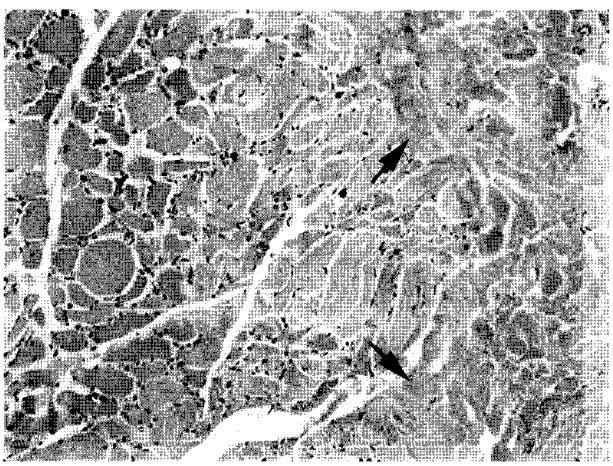

Fig 2. Biceps femoris muscle. Multifocal infiltration of inflammatory cells around the muscle fiber and severe muscle necrosis (arrow) were observed (H-E stain: original magnification, × 200).

Discussion

The polymyositis among the inflammatory myopathies has been occasionally reported in dogs (10,12,15). However, there was rare the case that origination of disease diffused at skeletal muscle except on ocular and mouth. Canine polymyositis is regarded as a T-cell-mediated disorder characterized by immunopathological attack on muscle fibers (11). Therefore, canine polymyositis is most probably the counterpart of the human disease (11), even if the pathogenesis of polymyositis has not yet been fully elucidated (1,3,5,8,9). Averill (2) described that polymyositis patients are presented for a variety of complaints which may be divided into four categories: weakness of gait with rapid fatigability; abnormalities of deglutition with esophageal dilatation and inhalation pneumonia; signs suggestive of musculoskeletal disease such as lameness or stiffness in gait; and generalized non-painful loss of skeletal muscle bulk. In this report documented most of complaints except for esophageal or masticatory problem. According to previous report, there was mentioned that the causes of polymyositis included infectious cause (*Leptospira australis*), parasites or immune-mediated disease (11,14,15). Although, there was no revealed any other cause of exogenous cause except purulent vaginal discharge in this case, however it was not severe condition enough to occur an acute progressive myopathy. It is considered that the mounting process distressed the patient with a vaginal deformity and affected the endogenous immune systems. But we did not find the positive evidence for the mechanism of occurrence.

Braund KG (12) reported that idiopathic polyneuropathy in Alaskan malamutes through the diagnostic tool as electromyography. Generally, diagnosis of myopathies is based on clinical signs, increased serum activities of muscle enzymes (e.g. creatine phosphokinase), electromyographic abnormalities, and histopathologic evidence of muscle necrosis and inflammatory cell infiltrates. Not all these criteria may be found in any one case; however, in this case the chemistry profile of muscle enzyme was not presented with significant changes, especially in creatine phosphokinase.

In conclusion, this case was tentatively diagnosed as inflammatory myopathy without specific cause on the clinical signs and examination results initially. After muscle biopsy, however, we identified the infiltration of mononuclear cells and necrosis of muscle fiber on histopathology. Therefore, we have diagnosed this case as idiopathic polymyositis of young mature Alaskan malamutes dog.

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젊은 성숙 알라스칸 말라뮤트에서 특발성 다발성근염 증례

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요 약 : 20 개월령의 알라스칸 말라뮤트 견에서 특발성 다발성근염의 임상증상과 병리학적 소견을 서술하였다. 임상증상은 급성 허약을 동반한 진행성 운동불내성, 근 위축, 후지의 동시적 걸음걸이, 계란 위를 발끝으로 걷듯 짧고 경직된 걸음 등을 보였다. 신체검사와 임상검사에서는 신경계나 골격계 그리고 다른 질병과 관련된 이차적인 근 질환의 증거가 없었다. 그래서 가장 근 위축이 심한 부위에서 병리조직 검사를 위한 근 생검을 실시하였다. 골격근의 병리검사 결과 근 섬유의 괴사와 함께 단핵세포의 침윤이 관찰되어, 특발성 다발성근염으로 진단하였다. 초기치료는 통증경감과 보조치료를 시작하여 프레드니손 2 mg/kg를 경구로 매일 투여하는 면역억제 요법을 시행하였다. 3주 후 환자는 혈액, 혈청학적 검사에서 정상으로 회복될 뿐만 아니라 걸음걸이, 식욕, 운동의 향상을 나타냈다.

주요어 : 특발성, 다발성근염, 경직, 면역억제, 알라스칸 말라뮤트