

**Antinol®  
Case Study  
Contest**

**2017**



**Case Report :**  
**The Trial Treatment of Feline Osteoarthritis**  
**in an Eleven-Year-Old Cat**



Napaporn Senarat, DVM  
and IrinKwananocha, DVM  
VET KU Research Support Center  
Faculty of Veterinary Medicine,  
Kasetsart University

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## Abstract

A domestic short hair cat aged 11 years was taken to the hospital due to shaking and weakened hind legs. The cat could not perform high jump for 1 month. Preliminary diagnosis included early stage of osteoarthritis of left hip and capsulitis. Pain killers, NSAIDs and gabapentin, were administered but the response was not satisfied. Therefore, multimodal treatment program was initiated. Physical therapy using electrical stimulation and laser beam class 4 in conjunction with PCSO-524<sup>®</sup> were used. Measurement of joint movement angle (active range of motion; active ROM) in 2 dimensions using Kinovea program was conducted for follow up. The study found increased active ROM and decreased lameness score after the treatment. The owner described that the cat showed less isolation behavior and was able to perform vertical jump again. Overall quality of the cat's life was improved.

Keywords: Osteoarthritis of hip joint, cat, PCSO-524<sup>®</sup>, Kinovea, ROM

## Introduction

Osteoarthritis is damaged joint that consists of degenerative cartilage within joint, osteophyte and capsulitis. Tissues surrounded the joint is thickened from fibrosis (1) and biochemistry of materials in the joint is altered. The causes of osteoarthritis are various, for example, age, body weight, accident, and genetics. Osteoarthritis can lower quality of life in affected animals, particularly in severe cases (2).

Diagnosis of osteoarthritis in cats is different from that performed in dogs. Osteoarthritic cats show signs of lameness that is less apparent when compared to dogs. Palpation may not be as effective as in dogs. Cats usually show changes of behavior such as less activity, easily irritated, poor ability to perform high jump (3). Radiographic examination is a standard method for diagnosis of the disease. However, inconsistency of clinical signs and images could occur (4). Therefore, measurement of active range of motion (Active ROM) is developed to improve accuracy of the diagnosis of osteoarthritis.

Treatment of osteoarthritis in cats commonly uses Non-Steroidal Anti-Inflammatory Drugs (NSAIDs). Osteoarthritis is considered chronic and can not be completely cured, so use of NSAIDs to reduce pain in osteoarthritic cats may not be appropriate since it affects function of kidney and gastrointestinal tract when used for a long-term (6). Additionally, senile cats with osteoarthritis usually have renal disorder and using NSAIDs is contradicted. Supplements containing essential fatty acid such as New Zealand Green Lipped mussel extract is a nutraceutical that is used for multimodal management in osteoarthritic animals. The extract is consisting of several fatty acids that can reduce inflammation of joint, especially in animals that NSAIDs are prohibited, and consequently reduce pain and improve life quality.

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## Case history

A domestic short hair cat aged 11 years was taken to Kasetsart University Veterinary Hospital due to shaking and weakened hind legs. The cat could not jump and conduct activities as usual. Preliminary treatment included NSAIDs (Tolfenamic acid 4 mg/kg sid) for 3 consecutive days. Follow up after 1 week showed no signs of improvement. Weakened hind limbs and lameness still existed. Further neurological examination could not detect any disorders. Pain killer, gabapentin 5 mg/kg bid and vitamin B1, 6,12 were prescribed for 14 days, but could not improve the hind leg weakness, lameness and jumping. The cat was then referred to rehabilitation unit for further physical therapy.

## Physical and orthopedic examination

Physical examination found that the cat was lively, normal mucous membrane, no dehydration, normal lung and heart sound, chronic rhinitis that was under on-going treatment. Gait analysis showed lameness and weakness of both hind legs. The lameness score of the left leg was 3/4 (Table 1) and was higher than that of the right leg. The cat was not able to perform vertical jump, even for a short distance, and walking past obstruction. Palpation did not detect pain of the hind limbs and vertebral column but found atrophy of both hind leg muscle.

**Table 1. Definition of lameness score (7)**

Signs	Score
Normal walking and running. No lameness	0
Normal standing. Slightly lame while running	1
Normal standing. Slightly lame while walking	2
Normal standing and walking. Apparently lame while walking	3
Not normal posture while standing and especially while walking	4

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## Radiographic examination

Radiographic images of both hip joints showed mild sclerosis of caudal acetabular rim, particularly at the left hip joint. Osteoarthritis and capsulitis were diagnosed.

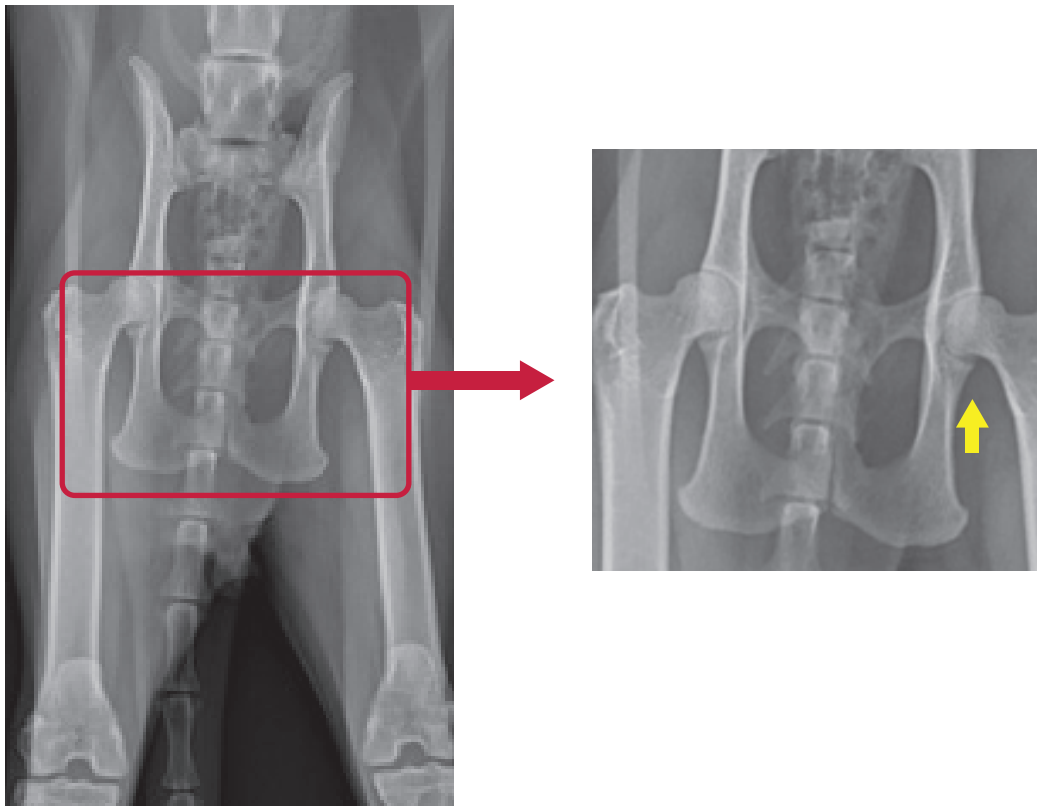


Figure 1. Radiographic images of left hip joint showed mild sclerosis of caudal acetabular rim (arrow)

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## Physical therapy

Treatment with laser beam class 4 was used to reduce pain of the left hip joint once a week for 4 consecutive weeks. Each session lasted 4 minutes and used energy level at 5 joules/cm<sup>2</sup> in 30 cm<sup>2</sup> of treated area. Electrical stimulation was applied at the quadricep and hamstring of both hind legs to enhance muscle restoration once a week for 4 consecutive weeks and 15 minutes for each leg.

## Medication

New Zealand Green Lipped mussel extract, PCSO-524<sup>®</sup>, 1 capsule sid was administered for 30 days, starting 2 weeks after the beginning of physical therapy. Three weeks of follow-up was scheduled.

## Treatment outcome and follow-up

After initiation of physical therapy and medication, the cat showed improvement of lameness score (1/4) of the left leg. Cat activities, walking past obstruction and high vertical jump were resumed. Palpation did not detect any joint pain. Further follow-up by measurement of joint movement angle (Active ROM) in 2 dimensions using Kinovea program was conducted before PCSO-524<sup>®</sup> administration (week 0) and 3 weeks after the start of PCSO-524<sup>®</sup> administration (week 3) (Figure 2 and 3). The joint movement angle increased 28 degrees which was consistent with signs of improved behaviors and orthopedic examination that showed reduced lameness score

**Table 2. Joint movement angle (Active ROM) measured by Kinovea program**

	Prior to treatment (week 0)	After treatment (week 3)
Active ROM at left hip	102°	130°

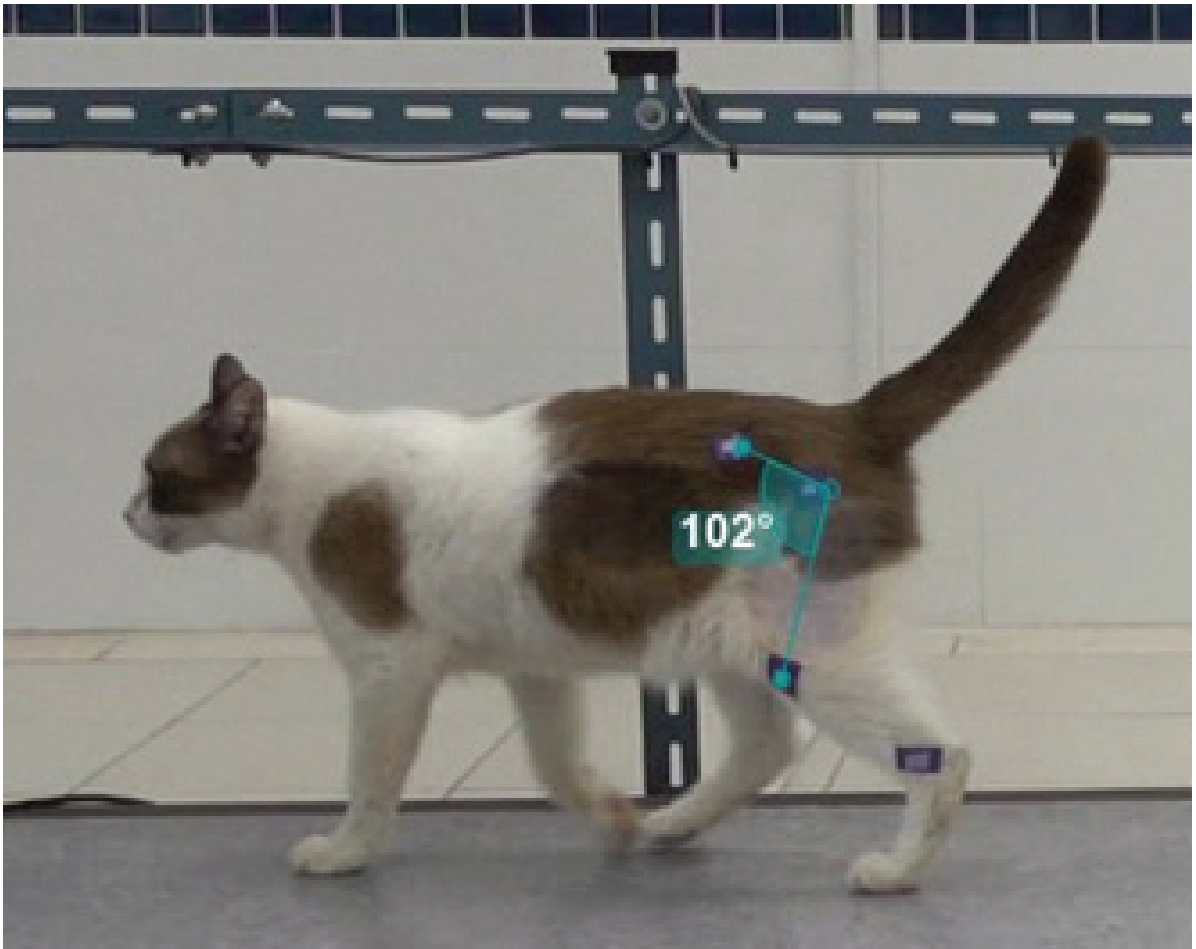


Figure 2. Measurement of joint movement angle (Active ROM) in 2 dimensions using Kinovea program prior to nutraceutical treatment

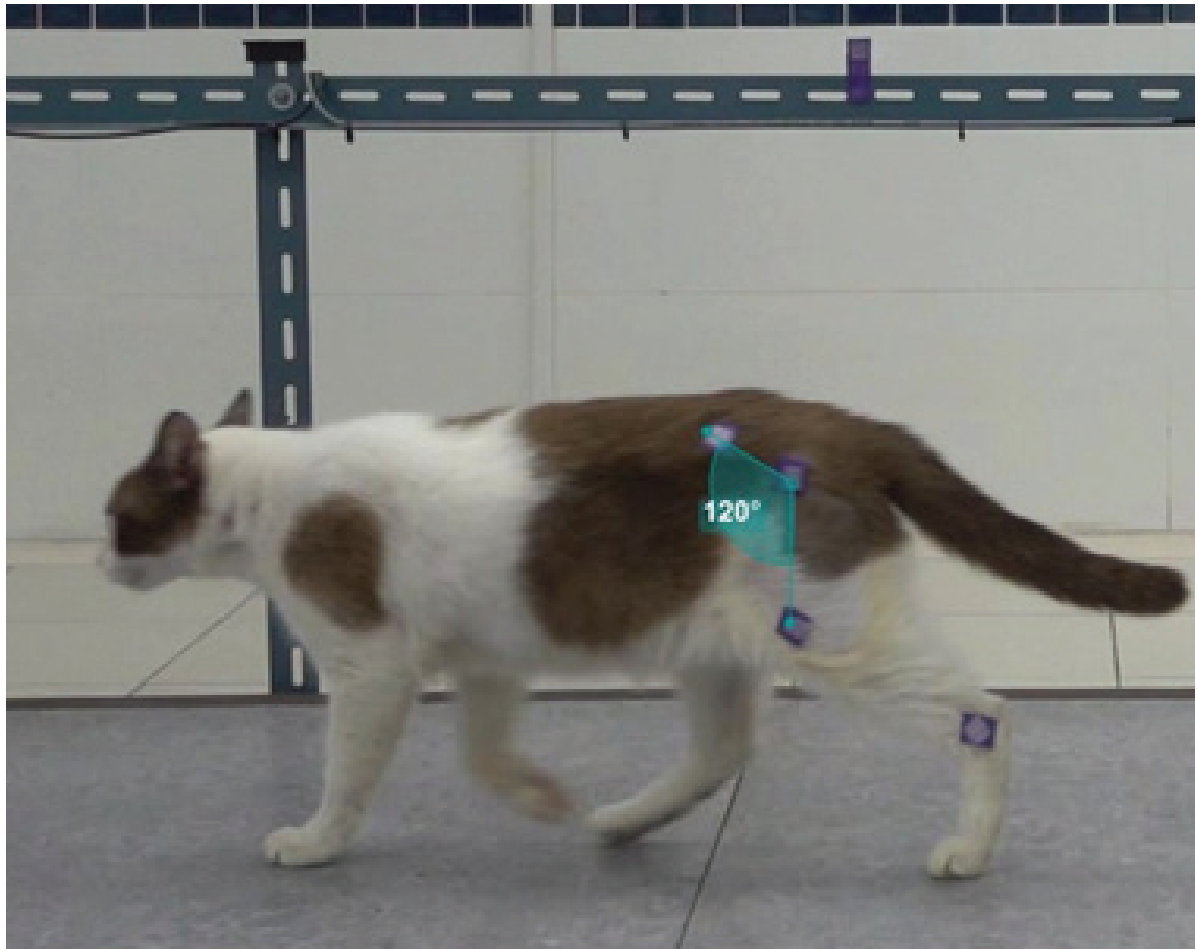


Figure 3. Measurement of joint movement angle (Active ROM) in 2 dimensions using Kinovea program 3 weeks after starting nutraceutical treatment



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## Conclusion and discussion

Osteoarthritis is a complicated disease to treat especially that of senile cats with renal disorder. Radiographic examination may find multiple joints that are affected with osteoarthritis in senile cats. Radiographic imaging is a basic tool that is important for diagnosis of osteoarthritis and commonly used along with physical examination. Images can identify alteration within joint (4). There are several studies reporting that osteoarthritis in cats often occurs at the limbs more than the core skeleton (3). Osteoarthritis can be treated using NSAIDs to reduce pain in conjunction with physical therapy. However, treatment with NSAIDs is contradicted in senile cats, among which renal disorder is common. Cats in this category usually suffer from chronic pain and degraded life quality.

Our case was a senile cat with osteoarthritis and capsulitis in the early stage and kidney function was normal. So NSAIDs and gabapentin were used for preliminary treatment, but the response was not satisfied. The treatment was then terminated and changed to multimodal program consisting of laser beam class 4, electrical stimulation to restore muscular system, and nutraceutical PCSO-524® administration continuously. The follow-up showed improvement of behaviors and increased activities and life quality without any adverse effects of PCSO-524®.

Standard method of osteoarthritis diagnosis is radiographic imaging together with palpation and measurement of joint angle. A study found that cats with osteoarthritis had decreased angle of joint movement (8). Conflict of the accuracy of diagnosis using joint angle occurred when another study found no difference of joint angle between healthy and sedated cats (9) and a study by Duncan et al found a slight difference. Various programs were developed to analyze body movement in 2 and 3 dimensions in humans and later were applied in animals. For instance, gait analysis and weight bearing force analysis in osteoarthritic dogs (10). This study used Kinovea program to compare the angle of joint movement before and after multimodal treatment. It was found that the angle increased after the treatment and was consistent with the improvement of ability to jump, walking past obstruction, and decreased frequency of isolation behavior.

Physical therapy in osteoarthritic animals is aimed to reduce pain and strengthen the muscle and tendon surrounding the joint to increase quality of life. Physical therapy used for treatment of osteoarthritis includes, for example, ultrasound, electrical stimulation, laser, and hydrotherapy. The cat in this study had atrophy and lameness of hind legs, so electrical stimulation and class 4 laser were used to strengthen the muscle and to reduce pain, respectively. There are reports describing that class 4 laser was effective for reducing pain (11, 12).

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Nutraceutical for medication usually consists of essential fatty acid, particularly omega-3, which is an effective anti-inflammatory substance (13). Administration of PCSO-524, in which omega-3 is a principle component, was effective for restoring the body movement, vertical jump, and quality of life in our study. This is consistent with a study in osteoarthritic dogs that found that dogs fed high omega-3 diet had increased omega-3 and decreased omega-6 in blood circulation and better movement when compared to dogs fed regular diet (14).

There were missing data during week 6 of our study since the cat's owner was out of the country. The follow-up could have been more completed if goniometer and pressure mapping platform had been used to measure the joint angle and weight bearing force.

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