

Case Report

Use of PCSO-524[®] (Antinol[®]) for Treatment of Chronic Pododermatitis in Fighting Cocks

Teerapat Rungnirundon¹, Napapon Senarut²

¹ Exotic Pet Clinic, Kasetsart University Animal Hospital, Bang Khen campus

² Rehabilitation Medicine Clinic, Kasetsart University Animal Hospital,
Bang Khen campus



Antinol (PCSO-524®)
Case Study Contest 2020

Use of PCSO-524® (Antinol®) for Treatment of Chronic Pododermatitis in Fighting Cocks

Teerapat Rungnirundon¹, Napapon Senarut²

¹ Exotic Pet Clinic, Kasetsart University Animal Hospital, Bang Khen campus

² Rehabilitation Medicine Clinic, Kasetsart University Animal Hospital, Bang Khen campus

Abstract

A 2-year-old male fighting cock with 2.4 kilograms body weight had been showing sign of left leg lameness for 2 months. The left plantar area was swollen and unable to bear weight. On physical examination, the cock was diagnosed with chronic pododermatitis or bumble foot.

Only non-surgical procedures were allowed for the treatment according to the owner's decision. **NSAID, antibiotic and PCSO-524®** (Antinol®) were administered for 2, 4 and 5 weeks, respectively.

Improvement of performance was evaluated using **kinetic gait analysis** to measure the peak vertical force of weight bearing on pressure mapping platform.

After NSAID was terminated, while PCSO-524® was prolonged, the weight bearing and other clinical signs continued to improve.

In conclusion, PCSO-524® is proved to be effective for treatment of chronic pain in this fighting cock.

Keywords: bumble foot, fighting cock, gait analysis, PCSO-524®, pododermatitis

Pododermatitis or bumble foot is the inflammation of foot pad in chickens. The lesion may range from mild inflammation to severe infection of bone tissues. The disease is common in poultry industry and can be found in broilers, layers, pet chickens, birds of prey, and fighting cocks.

The clinical symptoms include swelling, infection and inflammation of foot pad resulting in mobility impairment, slow growth rate, infertility, and risk of death from infection. The risk factors are usually associated with improper management such as high density in the cage that chicken movement and physical gesture change are limited, accumulation of waste in the cage, high humidity or low ventilation that enhance the growth of microorganisms, and poor bedding management.

Various causes of the disease include exposure of chicken feet to coarse bedding materials that cause too much scrub irritation or skin abrasion, contamination of foreign materials in the bedding, cockfighting wound, and malnutrition such as obesity and hypovitaminosis A that can result in inflammation of foot pads.

Microorganism that is most identified as cause of the disease is **Staphylococcus aureus**. It is commonly found in the environments and can be easily transmitted from animals or contaminated materials to humans via open wound. Endotoxin synthesized by the bacterium can stimulate hypersensitization mechanism that consequently causes tissue damage, vasculitis, and caseous abscess which is a form of infection in avian species. Other microorganisms can be isolated from pododermatitis lesion in chickens include *Escherichia coli* and *Proteus*.

Essential protocol for treatment of pododermatitis in pet birds is **management of animal habitat for long-term care** and prohibition of lesion progress and recurrence of the disease. Wound dressing, bandaging, and empirical treatment such as non-steroidal anti-inflammatory drugs (NSAIDs) and antibiotics in case of infectious wound are effective for the therapy.

Surgical treatment to remove pus and tissue debris is necessary in case of deep tissue infection, caseous abscess and necrosis of the foot pads. Bandage of foot pads is also effective for the treatment. Within 2-5 weeks after the treatment, tissue reconstruction is observed (Rafee, MA et al., 2016). However, the damage caused by foot pad inflammation may affect living quality of the animals due to pain and impairment of weight bearing and limb function. There is **limitation in use of NSAIDs in avian animals** to reduce pain and inflammation due to adverse effects of long-term use.

Neutraceutical substances containing **essential fatty acids** that are elements of omega-3 and omega-6 are effective for long-term treatment of pain and inflammation in pododermatitis, and can be used in conjunction with NSAIDs. Studies to develop supplementation of omega-3 and omega-6 in poultry industry demonstrated its efficacy for enhancement of growth, immunity and fertility performance (Alagawany, M. et al., 2019).

Assessment of the treatment outcomes is conducted by observation of chicken behavior in the usual environments by the owner and physical examination by veterinarians. The most valid method for treatment evaluation is the measurement of weight bearing as it can assess the complete restoration of the limb function. **Gait analysis** in veterinary use is now widely accepted as an effective tool for assessment of weight bearing and treatment outcome. Additionally, the analysis is classified as objective assessment that effectively eliminates the bias of the observers.

PCSO-524® (Antinol®) is supplement made from New Zealand Green lipped mussels that contain essential fatty acids belonging to main elements of omega-3. The supplement is effective against inflammation and can be used in conjunction with NSAIDs for treatment of chronic pododermatitis in brood cocks. It enhances the treatment outcome and restores fertility of the brood cocks. The follow-up examination to evaluate the treatment outcome are performed by observation of daily activities by the owner and assessment using gait analysis with pressure mapping platform.

Case History

A male 2 years old fighting cock weighed 2.4 kilograms was submitted to the exotic pet clinic at the animal hospital, Kasetsart university, Bang Khen campus. Presented clinical signs include swollen left foot pad that was unable to bear weight for over 2 months. The cock was alert with normal appetite.

Physical examination



Figure 1. The fighting cock submitted for examination on day 1 showing sign of leg lifting, swollen foot pad, and complete loss of weight bearing of the left leg.

Examination from distance inspection found that the cock lifted his left leg the entire time while walking and weight bearing on this leg was avoided (Figure 1).

Response to other environmental stimulus was normal. The left tarsometatarsal joint was swelling, red and warm on palpation. Neither accumulation of secretion nor crepitus sound was found at the joint. Body condition score was categorized as normal (3/5).

Further diagnosis was done by radiographic image and biopsy of the foot pad for cytological examination and bacterial culture and sensitivity test.

Result of radiographic examination

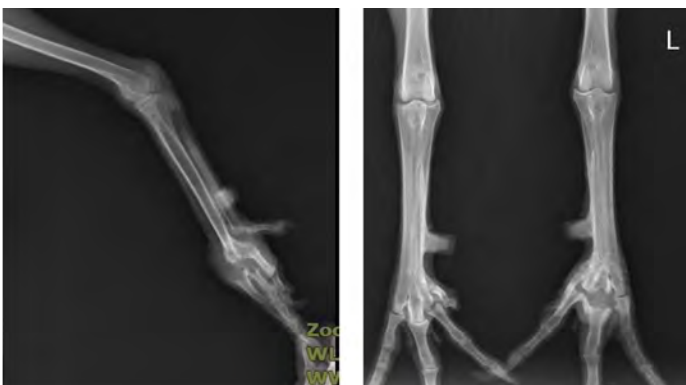


Figure 2. Radiographic images show lysis of the left tarsometatarsal bone.

Radiographic images taken from distal tibiotarsal to metatarsal bones showed radiolucent area at the left distal tarsometatarsal bone which indicated bone lysis in this area (Figure 2).

Cytological test and bacterial culture results

A large number of red and white blood cell was found at the lesion.

Majority of the white blood cell included heterophils and monocytes, which indicated inflammation of the foot pad. Bacterial culture found no growth of bacteria.

Diagnosis of chronic pododermatitis or bumble foot was then concluded based on preliminary examination and case history.

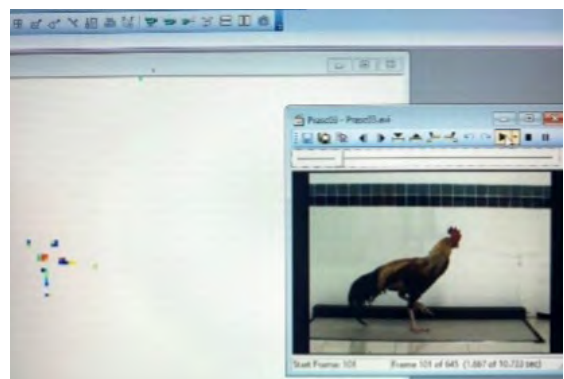
Treatment and Follow-up

Empirical treatment consisting of NSAIDs, antibiotic, and nutraceutical supplement was designed for the animals.

The NSAID; 0.5 mg/kg Meloxicam sid for 2 weeks, antibiotic; 125 mg/kg Amoxicillin-clavulanic acid bid for 4 weeks, and 1 capsule of PCSO-524® (Antinol®) sid for 5 weeks were prescribed.

The kinetic gait analysis was performed by setting the cock on standing position on the pressure mapping platform for 10 seconds. Pressure on the foot pad was measured by determining Peak vertical force (PVF) of each leg and then averaging over 10 seconds.

The measurement was repeated 5 times and the average was calculated for each kinetic gait analysis (Table 2).



Kinetic gait analysis.



Figure 3. The cock lifted its left leg for the entire time during the first kinetic gait analysis.



Figure 4. Improved weight bearing of the left leg after 2 weeks of treatment



Figure 5. After 5 weeks, the cock showed improvement of weight bearing of the left leg.

Kinetic gait analysis using pressure mapping platform on day 1 showed **complete loss of weight bearing on the left foot** (figure 3).

After 2 weeks, the follow-up examination found improvement of clinical signs as partial weight bearing was restored (Figure 4). However, the pad swelling was still present.

After 3 weeks, continuing improvement was observed. The owner reported that the cock was able to run on sand ground and chase female chickens in the habitat. Examination using pressure mapping platform showed increased weight bearing of the left leg (Figure 5).

After 5 weeks, the cock had improved walking mobility and was able to mount a female chicken. Other clinical signs were within normal range. The swelling of the left foot was reduced and weight bearing was improved.

Table 1. Treatment and follow-up examination.

Week	Treatment and follow-up			
	Antibiotic	NSAIDs	PCSO-524	Gait analysis
0	✓	✓	✓	✓
2	✓	✓	✓	-
3	✓	-	✓	✓
5	-	-	✓	✓

Table 2. Results of kinetic gait analysis using pressure mapping platform

Visit (Body weight)	% Body weight	
	Right leg	Left leg
1 (2.4 kg)	101.6%	0
2 (2.47 kg)	71.65%	29.92%
3 (2.46 kg)	54.91%	45.03%

Conclusion and Discussion

Pododermatitis or bumble foot is a disease of birds living in limited captive space such as pet birds and fighting chickens. It is also reported in birds of prey, penguins, and teals (Wyss, F. et al., 2015).

The infection of foot pad can cause chronic inflammation and pain that decreases the living quality of the animals. The most common etiology of the disease is improper management.

Further diagnosis is performed by radiographic examination in order to assess bone lysis from deconstruction of bone and tissue. Bacterial and sensitivity test are necessary for selection of effective antibiotics.

Treatment of pododermatitis in birds is consisting of 4 principle rules that are

- 1) Oral antibiotic for infection control,
- 2) Direct injection of antibiotic to the lesion,
- 3) Surgical removal of damaged tissue,
- and 4) Bandage after the surgery.

Such treatment is accepted widely and the treatment outcome is usually satisfied

(Remple, JD. Et al., 2006).

The studied case was a 2-years old fighting cock presented with swollen left foot pad and complete loss of weight bearing for more than 2 months.

Chronic pododermatitis was diagnosed. Cytological test performed to evaluate the severity of bone lesion showed presence of inflammatory cells without other indication of cell abnormality. Bacterial culture did not find any growth of bacteria possibly due to lack of bacteria at the spot where sample was collected or the lesion that was truly free from bacterial infection.

It is recommended that samples should be collected from affected tissues during the surgical treatment for further bacterial culture. However, in this case, surgical treatment was not approved by the owner so medication was selected as the treatment of choice.

During the first 2 weeks of treatment, antibiotic was administered to control infection in conjunction with NSAIDs and PCSO-524® to reduce pain and inflammation. **Long-term use of NSAIDs was limited** due to side effects on kidney and gastrointestinal tract, therefore not applicable in this chronic pododermatitis case. Visceral gout is reported as a result of diclofenac use in quail and psittacine birds (Palocz, O. et al., 2015). Use of **PCSO-524®**, which is a neutraceutical substance that is effective for relief of tissue inflammation, is recommended for **long-term administration** without any adverse effects.

Reduction of observer bias is done by application of objective assessment using pressure mapping platform to measure the weight bearing in conjunction with physical examination by veterinarians. The agreement of results of the 2 approaches are confirmed.

The first evaluation of **Peak vertical force (PVF)** using pressure mapping platform before beginning of the treatment showed only weight bearing of the right leg and none of the left leg. After 2 weeks of treatment, the owner reported improvement of mobility such as walking and jumping. The weight bearing of the left leg was increased by approximately 30%.

During the third examination on the pressure mapping platform and 5 weeks in the treatment, the weight bearing of the left leg increased from 30% to 45% and the weight bearing gap difference between both legs was reduced. The measurement result was consistent with owner's report of the cock behavior and the physical examination.

The antibiotic and PCSO-524[®] was terminated after 4 and 5 weeks, respectively.

The study showed that **long-term use** of PCSO-524[®] is effective against chronic pain and inflammation without causing any adverse effects. Use of nutraceutical supplementation that is consisting of **essential acids of omega-3** is widely accepted for its anti-inflammatory effect (Zawadzki, M. et al., 2013).

Conclusion

Essential fatty acids are also used in poultry industry for enhancement of growth, fertility, immunity, egg and feed conversion (Alagawany, M. et al., 2019).

In this study, the cock received PCSO-524[®] for 5 weeks and showed improvement of weight bearing, daily activity, and fertility which is consistent with previous studies that demonstrate **the benefit of adding omega-3 and omega-6 in poultry diet** for farming industry.



References

1. Alagawany, M.; Elnesr, S.S.; Farag, M.R. et al. Omega-3 and Omega-6 Fatty Acids in Poultry Nutrition: Effect on Production Performance and Health. *Animals* 2019, 9, 573.
2. Carpenter, J.W. *Exotic animal formulary* fifth edition. Elsevier Inc. 2018.
3. Hassan, A.H.; Hussein, S.A. and AbdulAhad, E.A. Pathological and bacteriological study of bumblefoot cases in Sulaimaniyah province. *Al-Anbar J. Vet. Sci* 2012., Vol.: 5 No. (1).
4. Palocz, O.; Gal, J. and Csiko, G. Differences in NSAID toxicity in four avian species. *J Vet Sci Med Diagn* 2016, 5:2.
5. Poorbaghi, S.L.; Javdani, M.; Nazifi, S. Surgical treatment of bumblefoot in a captive golden eagle (*Aquila chrysaetos*). *Veterinary Research Forum*. 2012; 3 (1) 71 – 73.
6. Rafee, M.A. Surgical management of bumble foot in a cock. *Int J Vet Health Sci Res* 2016. 4(5), 130-131.
7. Remple, J.D. A multifaceted approach to the treatment of bumble foot in raptors. *J Exo Pet Med* 2006. 15(1): 49–55.
8. Wyss, F.; Schumacher, V.; Wenker, C. et al. Pododermatitis in Captive and Free-Ranging Greater Flamingos (*Phoenicopterus roseus*). *Veterinary Pathology* January 2015.
9. Zawadzki, M.; Janosch, C. and Szechinski J. Perna canaliculus lipid complex PCSO-524 demonstrated pain relief for osteoarthritis patients benchmarked against fish oil, a randomized trial, without placebo control. *Mar Drugs* 2013. 11(6): 1920-1935.