

Feline cutaneous histoplasmosis: The first case report from Thailand



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ABSTRACT

A 2-year-old, neutered female domestic shorthaired cat presented with a history of multiple papules and nodules on pinnae, nodules on the nose, and chronic wound at the lateral surface of left radial area for four months. Skin biopsy demonstrated moderate numbers of small, oval-to-round, single-walled yeasts inside the macrophages. In addition, PCR confirmed the sequence of *Histoplasma capsulatum*. This is the first case report of feline cutaneous histoplasmosis in Thailand.

1. Introduction

Histoplasma capsulatum is a dimorphic soil-borne fungus. It forms mycelia in the environment and changes to be a yeast form in the host's body [1–3] and [4]. It can affect both humans and animals (dogs and cats). Besides, it is the second most reported fungal infection in cats following cryptococcosis [5]. *H. capsulatum* grows in soils contaminated with bird or bat droppings. The primary route of infection is inhalation of mycelium from contaminated areas. The endemic areas of *H. capsulatum* include North, Central, and South America, Africa, India, and Southeast Asia [6]. Histoplasmosis is also prevalent in Thailand. A previous study reported that people in Chiang Mai and other northern provinces of Thailand were infected by this fungus living in the environment [7]. In addition, that study indicated that soil samples contaminated with bat guano, pigeon or chicken droppings were the cause of infection. Besides, a retrospective study revealed that patients had a higher risk of histoplasmosis infection than healthy people [8]. Nevertheless, no information on histoplasmosis has been reported in small animals in Thailand. Consequently, this is the first case report of feline histoplasmosis in Thailand, diagnosed with clinical presentation, cytology, histopathology, and polymerase chain reaction (PCR).

2. Case report

The case was a 2-year-old, neutered female domestic shorthaired cat, mostly living indoor but with access to outdoor areas contaminated with a great amount of pigeon feces. She was referred to the Kasetsart University Veterinary Teaching Hospital with a history of multiple papules on surface of the pinnae and nodules on the nose for four months. In addition, a chronic wound was presented on the lateral surface of the left radial area. According to physical examination, the cat had no clinical signs of systemic involvements e.g., gastrointestinal

or respiratory signs. On day 0, the general health condition was good, together with pink mucous membrane and normal hydration. Complete blood count and serum chemical profiles were in normal ranges. Serological examination was negative for feline leukemia virus and feline immunodeficiency virus. Thoracic radiographs demonstrated no nodular in lung field. Abdominal sonogram showed homogenous parenchyma without mass effect. Besides, gall bladder and both kidneys were unremarkable at.

Samples from nasal swab and chronic wound area were collected for cytology. The cytological findings demonstrated hypocellularity of intracellular narrow-based budding yeasts with thin wall capsules, indicating fungal infection. Skin biopsy was conducted from the pinnae for histopathology; the results revealed that the samples were positively stained with Periodic Acid Schiff (PAS). The organisms were identified as 2–5 µm in diameter, oval-to-round shape, narrow based budding yeasts in the macrophages. These characteristics were consistent with *Histoplasma* spp. PCR was performed using extracted DNA from paraffin embedded tissues of the pinnae. This genomic DNA was amplified in the region of internal transcribed spacer (ITS) using universal ITS1 and ITS4 primers. The sequences of the primers were: ITS1 5'-TCC GTA GGT GAA CCT GCG G-3' and ITS4 5'-TCC TCC GCT TAT TGA TAT GC-3'. Then, the sequences of 600 base pairs PCR products (accession number KY434018) were blasted with the data in GenBank BLAST system. The results revealed 99% homology to *H. capsulatum*.

Based on these diagnostic results, the cat was initially treated with 5 mg/kg itraconazole PO every 12 h for 21 days. It was found that this treatment did not improve clinical signs of the cat. On day 21, itraconazole dose was adjusted to 10 mg/kg PO twice a day in order to accelerate the regression rate of clinical signs. This was efficient to improve the clinical signs of the cat. The wound at left forelimb started to heal and got smaller. The size of nodules at the nasal bridge and the number of papules at ear pinnae started to decrease. However, after

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Fig. 1. Nodules on the nasal bridge at lateral and front views.

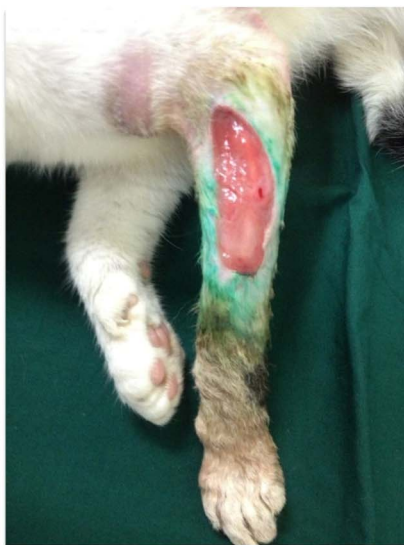


Fig. 2. Multiple papules on both pinna and chronic wound on the left lateral radial area.

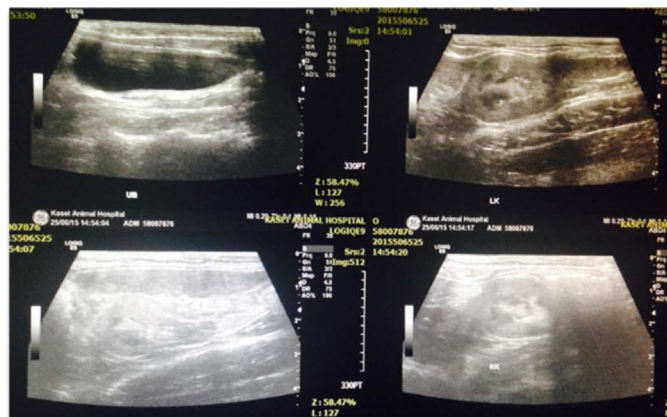


Fig. 3. Thoracic radiographs reveals no nodules in lung field. Abdominal ultrasonography shows homogeneity of liver parenchyma without mass effect.

itraconazole at 10 mg/kg for 35 days was applied, recurrence of papules on pinnae and nodules at nasal bridge in the same area was observed. On day 56, amphotericin B Desoxycholate was used to treat the cat by 0.5 mg/kg 2 times a week, together with 5 mg/kg itraconazole PO every 12 h. Amphotericin B Desoxycholate was diluted with 200 ml of 0.9% sodium chloride and 2.5% dextrose solution before injecting

the cat subcutaneously. Thereafter, itraconazole dose was declined to 5 mg/kg in order to avoid liver toxicity. The number of nodules at the ear and the nasal bridge decreased significantly but never completely disappeared after 8 injections. On day 84, a firm nodule was palpated at the injection site after the 8th injection. The treatment protocol was changed to fluconazole 50 mg PO once a day. Although the number of

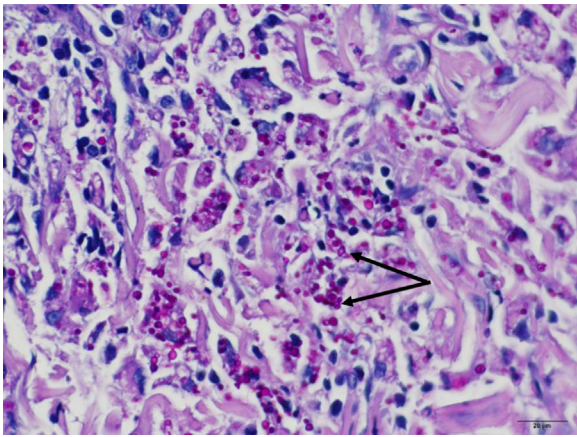


Fig. 4. The small 2–5 μm , oval-to-round, single-walled yeasts are found in the macrophages. PAS.

papules and nodules did not further decreased, no new lesions developed. The cat still ate and had normal daily activities. Subsequently, the owner did not further bring the cat for follow up to the hospital. However, by the phone communication, the owner gave the information that the cat was still stable after a month of fluconazole treatment. (Figs. 1–4)

3. Discussion

This is the first case report of feline cutaneous histoplasmosis in Thailand, which was confirmed by cytology, skin biopsy, and PCR. The infected cat was usually an indoor cat, but could access the contaminated outdoor areas. The mode of transmission of histoplasmosis to the cat was suspected to be inhalation of bird droppings contaminated with the organisms. Apart from skin lesions, this cat did not have any systemic sign. Chest radiography and abdominal ultrasonography did not reveal any abnormality of the organs. Cats affected with histoplasmosis normally present with non-specific findings, including anemia, weight loss, lethargy, fever, anorexia, and interstitial lung disease, depending on the affected organ. In most cases of histoplasmosis, the lung is affected [5]. In this case, the clinical presentation was only cutaneous lesions. It appears possible that lung lesions in this cat were so small that they were missed at diagnostic imaging. However, biopsy or cytology of other organs were not performed in this case. In Europe, a case of feline histoplasmosis that had clinical signs limited to the skin was recently reported. The authors suspected that the infectious agent rapidly spread to other organs after the inhalation; it, therefore, might be difficult to detect lesions in the lung tissue by radiographs due to their small size. Providing that lung lesions were found, it should be noticed predominantly at postmortem examination [9]. Another possibility of transmission in this cat was transcutaneous infection, which was reported in humans caused by accidental infections, such as contaminated needle puncture [10]. In Japan, the former studies demonstrated that canine histoplasmosis could be cutaneous in origin, including dogs with surgical wounds contaminated with the organism [11,12]. Moreover, the preceding studies found that cutaneous lesions of histoplasmosis were confined to the interdigital regions of the dog's paws [13,14]. These case reports might support that *H. capsulatum* was possible to infect animals via percutaneous inoculation.

After 10 mg/kg itraconazole was prescribed twice a day, a chronic

wound at the left forelimb showed an obvious improvement, and were completely healed within 28 days. This demonstrated that itraconazole at 10 mg/kg twice a day was more efficient than that at 5 mg/kg twice a day. After 35 days of treatment with 10 mg/kg itraconazole twice a day, the cat started to have recurrent skin nodules at the bridge of the nose and both ear pinnae. The recurrence of those lesions might have been caused by an incomplete clearance of infection or development of drug resistance. Subcutaneous injection of amphotericin B at 0.5 mg/kg twice a week was performed, together with itraconazole treatment, resulting in some improvements. Unfortunately, a firm nodule was subsequently developed at the injection site. It was suspected that the firm nodule was caused by either an adverse effect of amphotericin B or an irritation from injection.

This case report confirmed that histoplasmosis could occur in any young cat with a history of contact with contaminated bird feces. Furthermore, histoplasmosis should be considered as a differential diagnosis in cat with chronic skin wounds in endemic areas.

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Conflict of interest

There are none.

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