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CLINICAL AND CYTOLOGICAL CHARACTERISTICS OF SKIN LESIONS IN PERSIAN CATS WITH SUSPECTED DERMATOPHYTIC PSEUDOMYCETOMA

Gambaran Klinis dan Sitologi Lesi Kulit Dugaan Dermatophytic Pseudomycetoma pada Kucing Persia

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Abstract

Deep dermal mycosis (DDM) is an infection caused by various groups of fungi that affects the cutaneous or subcutaneous tissues and is rarely reported in Indonesia. Dermatophytic pseudomycetoma is one form of DDM, with a known predisposition in Persian cats, characterized clinically by nodular swelling that may ulcerate and form draining sinuses. This study aimed to describe the clinical and cytological characteristics of DDM in Persian cats. The research was a descriptive study involving three Persian cats aged 3–5 years, which exhibited subcutaneous nodular and ulcerative skin lesions on the dorsal region and tail. Clinical examinations were performed by physical observation, and cytological evaluation was performed on smears from ulcerated nodules. The physical examination revealed multiple skin lesions; subcutaneous nodules were present in one cat, and ulcerative lesions were present in two cats. Cytological evaluation demonstrated a pyogranulomatous inflammatory response, including macrophages, neutrophils, and multinucleated giant cells, along with the presence of fungal hyphae indicative of infection. In conclusion, for Persian cats with subcutaneous nodules and ulcers, the combination of clinical and cytological findings provides an effective preliminary method for detecting dermatophytic pseudomycetoma.

Keywords: *Deep dermal mycosis*, fungal, Persian cat, *Pseudomycetoma*

Abstrak

Deep dermal mycosis (DDM) merupakan infeksi akibat berbagai kelompok fungi dan pseudofungi pada kutaneus atau subkutaneus yang jarang dilaporkan di Indonesia. Salah satu

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kasus DDM, yaitu *dermatophytic pseudomycetoma* secara klinis ditandai dengan adanya nodul yang dapat menjadi ulserasi dan membentuk saluran fistula yang mengeluarkan eksudat, serta adanya *grains* di jaringan yang merupakan kumpulan fungi. Penelitian ini bertujuan untuk menggambarkan karakteristik lesi kulit dan sitologis DDM pada kucing persia. Penelitian ini merupakan studi deskriptif terhadap 3 ekor kucing persia umur 3-5 tahun yang menunjukkan lesi kulit berupa nodular subkutan dan ulseratif pada bagian dorsal dan ekor. Pemeriksaan yang dilakukan meliputi pemeriksaan klinis secara fisik dan sitologi dari apusan ulseratif pada nodul. Hasil pemeriksaan fisik ditemukan adanya beberapa lesi pada kulit yang bersifat multifokal yang secara makroskopis berupa nodul subkutan (1 ekor) dan ulseratif (2 ekor) pada bagian dorsal dan ekor, sedangkan sitologi terlihat adanya sel-sel inflamasi seperti makrofag, neutrofil, dan sel raksasa multinukleus, serta hifa yang mengindikasikan adanya infeksi fungi. Kesimpulan penelitian ini yaitu temuan klinis berupa gejala patognomonis dan sitologi dapat menjadi metode awal yang efektif untuk mendeteksi infeksi fungi subkutan pada kucing.

Kata kunci: *Deep dermal mycosis*, fungal, kucing persia, *Pseudomycetoma*

INTRODUCTION

Deep dermal mycosis (DDM) is an infection caused by various groups of fungi and pseudofungi that invade cutaneous and subcutaneous tissues. One form of infection categorized under DDM is dermatophytic pseudomycetoma (DPM), also referred to as subcutaneous mycosis. This designation is based on the fact that DPM is a dermatophyte infection in which lesions extend beyond the epidermis, infiltrating the deeper dermis and damaging follicular structures, ultimately leading to multifocal nodular dermatitis. Among dermatophytosis cases, Microsporum canis is the most frequently reported causative agent (Cho et al., 2024; Dehghanpir, 2023; Sudjaidee et al., 2019).

The pathogenesis of the progression of cutaneous dermatophytosis into the subcutaneous form remains poorly understood. It is presumed to occur through direct penetration of dermatophytes into the dermal tissue following rupture of the hair follicle. In addition, DPM may demonstrate recurrent infections. Transmission of dermatophytes generally occurs through direct contact with infected animals, contaminated fomites, infected hairs, or fungal-laden crusts present in the environment (Chang et al., 2011).

Clinically, DPM is typically characterized by one or more ulcerated dermal nodules of varying sizes accompanied by yellowish exudate, without any history of skin trauma. Lesions are commonly located on the neck, back, tail, flank, or limbs, though several reports have also described distribution in the axilla, ventral thorax, and ventral abdomen. The condition is most frequently observed in Persian cats and is often associated with immune deficiency (John et al., 2020). Diagnosis of DPM is based on cytological and/or histopathological evaluation, supported by microbiological culture (Barrs et al., 2024).

The objective of the present study was to describe the clinical and cytological features of a suspected case of Dermatophytic Pseudomycetoma (DPM) in a Persian cat. Although several reports of DPM in Persian cats exist, such cases remain rarely documented in Indonesia, particularly those involving relapse following antifungal treatment without surgical intervention. Through detailed observation of skin lesions and cytological analysis of inflammatory cells and fungal structures (hyphae or spores), this study aims to provide a more comprehensive understanding of the clinical and cytological characteristics of DPM and to support early diagnostic efforts for subcutaneous dermatophyte infections in cats.

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MATERIALS AND METHODS

Study Animals

This study involved three Persian cats aged 3–5 years and weighing 2–3 kg, each presenting with subcutaneous nodular and ulcerative skin lesions located on the dorsal region and tail. One case, the second cat, represented a relapse occurring after four weeks of itraconazole administration, during which the initial lesions had resolved without surgical intervention. The study employed an observational descriptive approach; no experimental treatments or therapeutic interventions were applied to the animals, and therefore ethical committee approval was not required. All procedures were conducted with the informed consent of the animal owners.

Clinical and Ancillary Examinations

Data collection consisted of clinical and ancillary examinations. Clinical assessment included measurement of body temperature and body weight, followed by a comprehensive physical examination through palpation from cranial to caudal and ventral to dorsal regions. Ancillary examination involved cytology using the swab technique, in which samples were collected from ulcerative nodules and stained with Diff-Quik. The smear samples were fixed in methanol for 2–3 seconds, then immersed in eosin for 5–10 seconds. They were subsequently transferred to methylene blue for 5–10 seconds, rinsed under running water to remove excess stain, air-dried, and examined under a microscope at 1000× magnification using immersion oil.

The characteristics of the skin lesions such as shape, consistency, presence or absence of ulceration, exudate, and anatomical location were recorded. Cytological findings included evaluation of inflammatory cells and identification of fungal structures (hyphae or spores). All observations were documented accordingly.

Data Analysis

The data obtained in this study were presented using a descriptive narrative approach, in which clinical and cytological findings, supported by photographic documentation, were described based on direct observation.

RESULTS AND DISCUSSION

Results

Clinical examinations showed that all three cats had body temperatures within the normal range and weighed 2–3 kg. One cat exhibited sneezing. Physical examination revealed focal to multifocal skin lesions on the dorsal region and tail, accompanied by alopecia surrounding the affected areas (Figure 1). All three symptomatic animals were long-haired Persian cats. The characteristics of the lesions are presented in Table 1. Macroscopically, one cat had firm, slightly elastic bluish nodules, while the other two showed granulomatous or ulcerative lesions that were either focal or multifocal. Cytological evaluation of ulcerated nodules revealed inflammatory cells, including neutrophils, macrophages, and multinucleated giant cells. Additionally, septate hyphae were observed, indicating a fungal infection (Figure 2). Based on these findings, all three cats were diagnosed with suspected deep dermal mycosis consistent with dermatophytic pseudomycetoma (DPM).

Discussion

Dermatophytic pseudomycetoma (DPM) is a rare anthropozoonotic fungal infection resulting from the penetration of dermatophytes into subcutaneous tissues and deeper dermal layers. Although it can occur in various species, including dogs, ferrets, and humans, DPM is most commonly reported in cats, particularly long-haired breeds or animals with compromised immunity (Silveira De Moraes et al., 2025). Persian cats appear to be predisposed, possibly

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due to alterations in the skin microbiota or impaired innate immune responses, which may lead to chronic and clinically severe disease (Barrs et al., 2024; Silveira De Moraes et al., 2025; Sudjaidee et al., 2019). These reports align with the present findings in which all affected animals were long-haired Persian cats.

The pathogenesis underlying the progression of superficial dermatophytosis to its subcutaneous form remains unclear, but it is believed to occur through direct invasion of dermatophytes into dermal tissue following rupture of hair follicles (Chang et al., 2011). DPM is typically characterized by swelling, ulceration, or sinus tract formation, as well as tissue grains composed of aggregated dermatophytes. The disease generally follows a chronic course, originating from superficial dermatophytosis and producing focal or multifocal lesions. These lesions are usually non-painful and non-pruritic, most commonly appearing on the back, tail, and dorsal body regions (John et al., 2020). These descriptions correspond with the clinical signs observed in the present study, including nodules, ulceration with sinus formation, and focal to multifocal distribution on the dorsal region and tail (Figure 1). The predominance of ulcerative lesions over nodules may be attributed to chronic infection, which promotes a persistent pyogranulomatous response. This process increases local tissue pressure, leading to tissue damage and ulcer formation.

Diagnosis of DPM requires a comprehensive evaluation combining clinical examination with ancillary diagnostics. Although case history and macroscopic lesion morphology contribute to clinical suspicion, definitive identification of the causative agent requires fungal culture. According to Cho et al. (2024) and John et al. (2020), diagnosis can be supported by cytology and/or histopathology to demonstrate pyogranulomatous inflammation with the presence of hyphae or spores. Additional diagnostic tools include Wood's lamp examination and trichography of broken hairs infected with fungal hyphae (Sudjaidee et al., 2019). Differential diagnoses for DPM include other nodular or pyogranulomatous diseases, such as sporotrichosis, cryptococcosis, actinomycosis, histoplasmosis, and neoplasia (Silveira De Moraes et al., 2025). However, cytological findings in these diseases do not reveal fungal structures. Histologically, pseudomycetomas are characterized by pseudogranules composed of fungal hyphae surrounded by eosinophilic homogeneous material, known as the Splendore–Hoeppli reaction (Hobi et al., 2024).

In this study, diagnostic techniques were limited to clinical examination and cytology. Nonetheless, the cytological findings (Figure 2) were consistent with those described by John et al. (2020) and Silveira De Moraes et al. (2025), including the presence of multinucleated giant cells, neutrophils, macrophages, cellular debris, and septate hyphae, together with characteristic lesion morphology. A limitation of the present study was the absence of histopathology and fungal culture, which are considered the gold standard for diagnosing DPM. These procedures could not be performed due to the owner's refusal to consent to invasive biopsy and the unavailability of fungal culture media, preventing definitive etiological confirmation. Consequently, all three cases were diagnosed as suspected dermatophytic pseudomycetoma (DPM).

The prognosis of DPM is poor, and treatment is often challenging. Antifungal therapies—including griseofulvin, ketoconazole, terbinafine, and itraconazole—with or without surgical intervention yield variable and inconsistent outcomes. In some cases, lesions recur following surgical excision, and disease progression may occur during treatment (Duangkaew et al., 2017). This aligns with the findings of the present study, in which one cat experienced relapse after receiving itraconazole (10 mg/kg BW) once daily for four weeks without surgical intervention, while the remaining cats represented first-time cases currently under itraconazole therapy at the same dosage. Another therapeutic option shown to produce favorable outcomes

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in cats is the administration of inactivated dermatophyte vaccines to enhance specific immunity against fungal infections (Moriello et al., 2017).

CONCLUSION AND RECOMMENDATIONS

Conclusion

Based on the clinical and cytological examinations, all three cats were diagnosed with suspected Dermatophytic Pseudomycetoma (DPM), characterized by nodular lesions, ulceration, and the presence of septate hyphae on cytology.

Recommendations

In light of these findings, histopathological examination and microbiological culture are recommended to strengthen the diagnosis and confirm the causative agent. Continued monitoring of antifungal therapy is also advised to determine the optimal treatment duration for DPM cases.

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Table

Table 1. Characteristics and Locations of Skin Lesions

Animal	Lesion Type	Consistency	Exudate	Location
I	Bluish nodule	Firm, slightly elastic	None	Dorsal; tail
II	Multifocal granulomatous/ ulcerative lesion	Thickened surrounding skin	Present	Dorso-caudal
III	Multifocal granulomatous/ ulcerative lesion	Ulcerative	None	Dorso-caudal

Figure

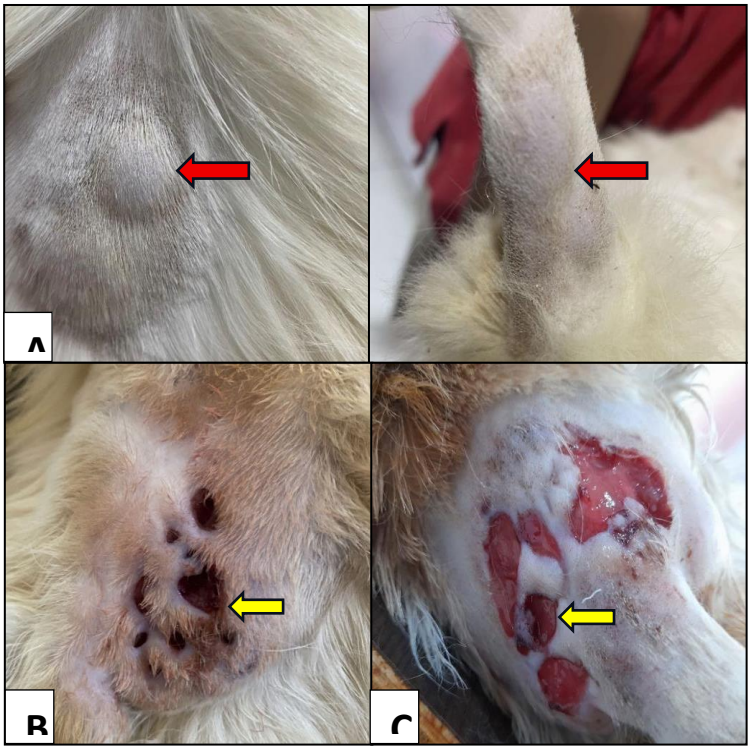

Figure 1. Clinical presentation of skin lesions in the three Persian cats. (A) Presence of multifocal subcutaneous nodules on the dorsal area and tail (red arrows); (B, C) Granulomatous/ulcerative lesions in the dorso-caudal region (yellow arrows).

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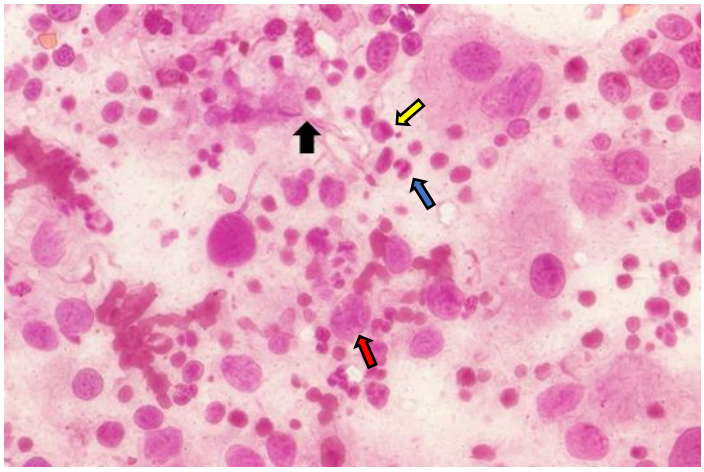

Figure 2. Cytological findings showing neutrophils (blue arrows), macrophages (yellow arrows), and multinucleated giant cells (red arrows). Septate hyphae were also observed (black arrows). [1000× magnification].