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Case Report

A Diagnostic Approach of Dermatophytic Pseudomycetoma in a Persian Cat

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Abstract: Dermatophytic pseudomycetoma is an uncommon manifestation of dermatophytosis, which can affect felines, canines, ferrets and humans, with Microsporum canis as the most common causing agent. This report focused on the diagnosis of dermatophytic pseudomycetoma in a Persian cat with alopecia in the nose and tail, in addition to intact and ulcerated subcutaneous nodules that varied from 1 to 3 cm in diameter in the head. The rare infection caused subcutaneous nodules. Diagnosis involved clinical examination, Wood's lamp, culture, and cytology, suggesting *Microsporum canis*. This case report underscored the need for a thorough diagnostic approach due to similar clinical presentations in various diseases.

Keywords: Dermatophytic; Diagnostic Methods; Fungus; Skin Lesions.

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1. Introduction

Dermatophytic pseudomycetoma is a rare, chronic fungal infection of an anthropozoonotic nature caused by the invasion of dermatophytes into the subcutaneous tissues and deep dermis [1]. Although this infection can affect several species, such as dogs, humans and ferrets, it is more common in cats, especially long-haired cats and immunocompromised animals [1, 2]. Among felines, the Persian breed shows an increased predisposition, possibly due to changes in the skin microbiota, which favors the manifestation of more chronic and severe clinical forms of the disease [3]. Dermatophyte transmission occurs mainly through direct contact with infected animals, as well as through contaminated fomites, infected hairs or crusts present in the environment [4].

The diagnosis of dermatophytosis, particularly dermatophytic pseudomycetoma, requires a combined approach of clinical assessment and the use of complementary tests. Clinical signs, like ulcerated or fistulated nodules are suggestive but not definitive, as they can mimic other conditions. A wood's lamp screening test can detect approximately 50% of Microsporum canis infections with emerald, green fluorescence, though it has limitations, as not all dermatophytes fluoresce. A trichogram can help identify hyphae or spores on hair shafts, indicating fungal infection [5].

Mycological culture is the gold standard for diagnosing dermatophytosis, enabling precise identification of the etiological agent. Samples of hair, scabs, or lesions are collected aseptically and grown on culture media like Sabouraud dextrose agar, with growth taking 1-3 weeks [6]. For deep skin infections, culture may be complemented by a biopsy for histopathology to differentiate from other conditions by identifying granulomas, necrosis, and fungal hyphae. Cytology also provides valuable information by revealing fungal structures directly from lesions [7].

Molecular methods, such as polymerase chain reaction (PCR), can also be used to quickly and accurately identify the pathogen's DNA, especially in cases where the diagnosis is uncertain or rapid confirmation is needed. These techniques are highly specific, but their availability can be limited to specialized laboratories [8]. In view of the epidemiological, clinical and laboratory aspects presented, this case report aims to describe the diagnostic process of dermatophytic pseudomycetoma in a Persian cat. The emphasis is on the importance of a comprehensive diagnostic approach, given the broad spectrum of diseases that can present clinical signs similar to those of dermatophytic pseudomycetoma.

2. Case Report

Initially, a five-year-old, neutered Persian cat weighing 3.2 kg was admitted to the Veterinary Dermatology Service at the Federal University of Jataí Veterinary Teaching Hospital (HV-UFJ) presenting with focal alopecia on the muzzle (Figure 1A) and at the base of the tail, as well as ulcerated nodules on the cranial parietal region. The animal exhibited moderate pruritus, especially in the cranial and dorsal areas. The owner reported that similar dermatological signs had been partially controlled two years earlier with antifungal therapy, although the specific medication and treatment duration were not recorded in medical history. Despite the initial improvement, lesions recurred over time, suggesting the possibility of incomplete clearance of the original infection.

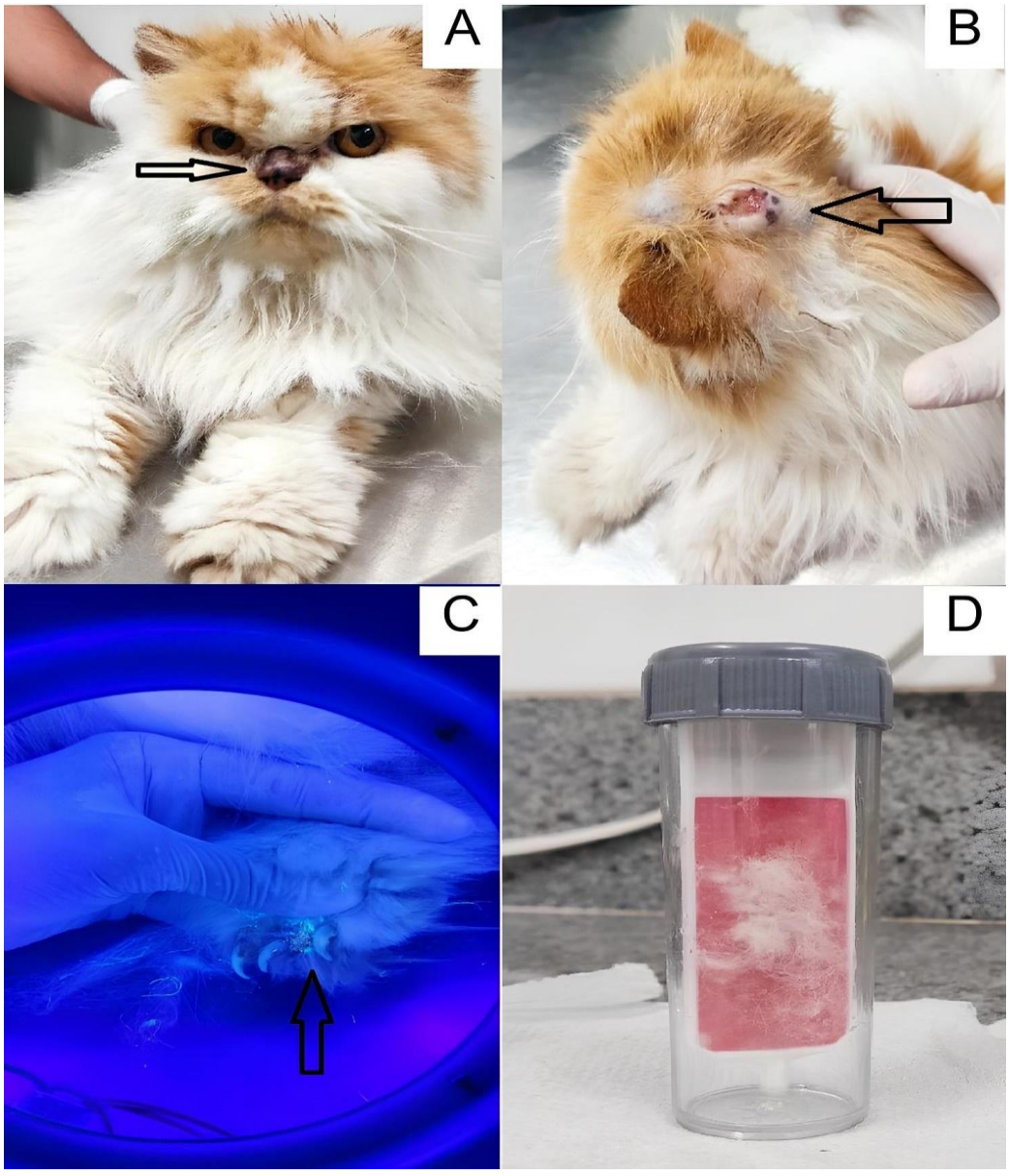
Over the course of approximately three weeks, one of the nodules increased in size, ulcerated, and began exuding a yellow discharge. Additionally, the animal developed persistent daily episodes of vomiting. Although the cat remained normodipsic and normorexic, there was no ectoparasite control in place, and vaccination was up to date. Notably, the owners reported similar skin lesions in human household members, which were treated empirically with satisfactory outcomes.

On dermatological examination, coalescing alopecic nodules ranging from 1 to 3 cm in diameter were observed, forming a plaque on the head, with one prominent ulcerated nodule on the parietal region (Figure 1B). Hyperpigmentation, alopecia, scaling, and crusting were also noted on the tail and muzzle. A Wood's lamp examination revealed marked apple-green fluorescence in the affected areas (Figure 1C). Samples from fluorescent hairs were collected and cultured using Dermatophyte Test Medium (DTM) with Dermatobac laminocultivation. Fine needle aspiration (FNAP) of the nodules was performed for cytological evaluation. Additionally, laboratory tests—including a complete blood count, serum biochemistry, and abdominal ultrasound—were requested to assess systemic health. The blood smear revealed Mycoplasma spp., while the biochemical profile showed elevated ALT levels (180 U/L; reference: 10–88 U/L). Ultrasound examination revealed a hypoechogenic liver, consistent with acute hepatopathy.

Based on clinical history, the physical examination, the dermatological lesions and the positive Wood's lamp result, a presumptive diagnosis of dermatophytic pseudomycetoma was made and treatment was instituted with itraconazole 10 mg/kg every 24 hours, orally. To treat the ulcerated nodule, cleansing with saline solution was prescribed, followed by the application of an ointment based on gentamicin sulphate, sulfanilamide, sulphadiazine, urea and vitamin A palmitate (Vetaglós®), every 12 hours. After 18 days of incubation, the macroscopic diagnosis of dermatophytosis was confirmed by the formation of a fungal colony with a cottony appearance (Figure 1D), and the growth of Microsporum canis was confirmed via 400x light microscopy (Figure 2).

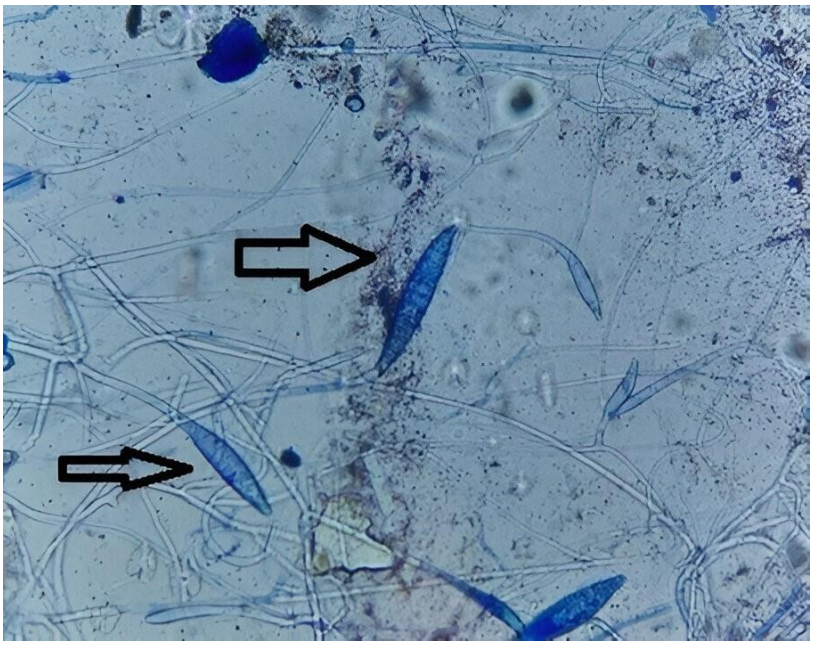
The morphology of the sample collected by FNAC from the nodules in the head region revealed moderate cellularity, composed predominantly of active macrophages, usually binucleated and multinucleated (giant cells), as well as intact and degenerated neutrophils, both in an amorphous background with reactive fibroblasts, plasma cells, cell debris and typical blood figurative elements. Phagocytosis of yeast-like structures (arthroconidia) was also observed, with a report suggesting a granulomatous inflammatory process with fungal involvement, compatible with dermatophytic pseudomycetoma (Figure 3).

Figure 1. A. Patient showing focal alopecia on the muzzle, with circumscribed hair loss and a reddish central area (indicated by the arrow). The lesion is evident on the back of the nose. B. Larger diameter ulcerated nodule (indicated by the arrow) located in the parietal region with erythematous borders and exposed tissue. C. Positive Wood's lamp fluorescence in the patient. The image shows the animal's nails (indicated by the arrow) with dots of apple-green fluorescence characteristic of *Microsporum canis* infection. D. Dermatobac showing a white fungal colony with a cotton-like appearance. The colony shows typical characteristics of filamentous growth, with a soft texture and cotton-like appearance, indicating the presence of fungi).



The treatment promoted satisfactory clinical improvement 45 days after it began, resulting in significant involution of the nodules and hair growth in the corresponding region (Figure 4). Despite the persistence of alopecic and crusted lesions on the tail and muzzle, the continuation of emetic symptoms and altered liver function meant that the administration of itraconazole had to be suspended before a clinical cure was achieved. However, the gastrointestinal signs worsened and the patient died after 11 days.

Figure 2. Microscopic examination of a trichogram stained with Mallory's triple stain, showing fungal hyphae (arrows) associated with dermatophytosis in a feline (400x). The structures indicate the presence of thick-walled fusiform macronidia and septations, characteristic of infections by fungi of the *Microsporum genus*.



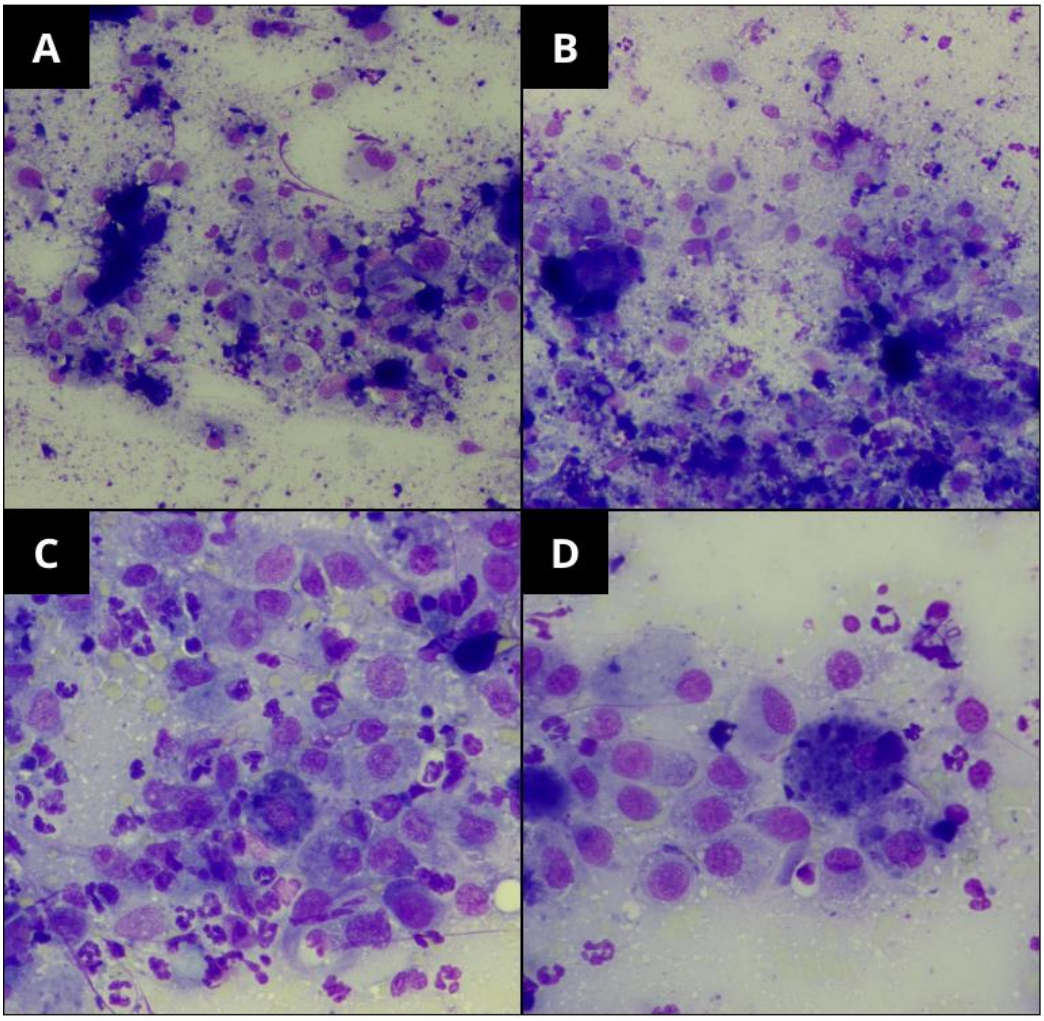
3. Discussion and Conclusion

Dermatophytic pseudomycetoma consists of a dermal and/or subcutaneous infection of fungal origin that affects mainly Persian cats [6] and long-haired cats since the fur acts as a facilitator for the fungi to adhere to the host, helping to inadvertently rupture follicular structures [1,9]. The fact that the animal in this report is a castrated, long-haired Persian female makes her predisposed to the less common clinical presentation of dermatophytosis, dermatophytic pseudomycetoma.

In the diagnosis of pseudomycetoma, cytological analysis, histopathology and possibly more recent immunohistochemical and molecular techniques are also indicated [3,9]. In the case reported here, several of the techniques mentioned by the authors were used, except for histopathological examination and molecular tests, since the diagnosis was confirmed by fungal culture and cytological analysis. Although histopathology is considered a gold standard for confirming dermatophytic pseudomycetoma and differentiating it from other granulomatous or neoplastic conditions [3,6,9], it was not performed in this case. The omission was due to the patient's clinical fragility and the owner's refusal of an invasive biopsy procedure, considering the risks of anesthesia and possible complications. Despite this, the diagnosis was corroborated by clinical presentation, positive Wood's lamp fluorescence, cytological evidence of granulomatous inflammation with fungal structures, and fungal culture confirming Microsporum canis. This combined approach, while not definitive as histopathology, provides strong presumptive evidence supporting the diagnosis.

While the clinical findings in this patient were broadly consistent with previous reports, the location and distribution of the nodules, particularly the formation of a coalescing plaque on the cranial region, represent a notable divergence. Most case series and reports describe dermatophytic pseudomycetoma nodules in the cervical, trunk, or tail base regions [4], with limited reference to cranial involvement. It is possible that such presentations have been underemphasized or overlooked, especially in early or mild cases. The formation of a plaque-like lesion composed of coalescing nodules is uncommon and may reflect either a more advanced local infection or individual variation in the immune response. Moreover, the cytological identification of phagocytosed arthroconidia within multinucleated macrophages reinforces the diagnostic value of cytology in cases where histopathology is not feasible. This finding aligns with descriptions in only a few reports [3,5], and its relevance may be underrecognized in routine diagnostic workflows.

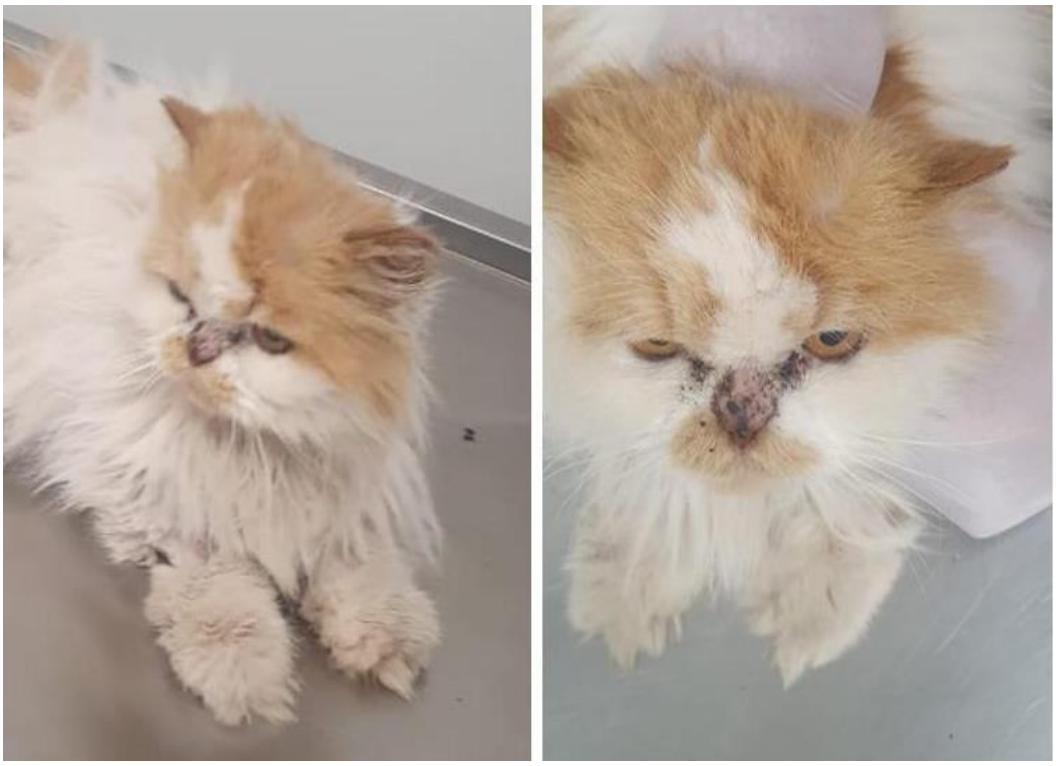
Figure 3. Cytological micrographs stained with Rapid Panoptic stain. Images A and B (20x magnification) show a highly cellular sample, composed predominantly of macrophages with abundant, intensely basophilic cytoplasm, along with a moderate number of neutrophils, scattered erythrocytes, and basophilic amorphous material in the background. Images C and D (40x magnification) reveal multinucleated cells, mild anisocytosis, and numerous activated macrophages with granular chromatin.



The cytology and fungal culture performed made it possible to rule out some differential diagnoses already mentioned in the literature, such as sporotrichosis, cryptococcosis, actinomycosis, histoplasmosis and neoplasms, especially when a good response to treatment with antifungal drugs was considered [10]. The cytology of the sample collected

by FNAB from the patient's nodules revealed a granulomatous inflammatory process with fungal involvement due to the presence of pleomorphic hyphae, inflammatory infiltration and connective tissue proliferation. These findings were compatible with the diagnosis of dermatophytic pseudomycetoma [5,11].

Figure 4. Patients present regression of nodules and resolution of alopecia in the parietal region, after 45 days of treatment with itraconazole.



The cytological findings in this case—marked by activated macrophages, multinucleated giant cells, neutrophils, and background debris—are consistent with chronic granulomatous inflammation, as described in established veterinary cytology references for felines [6,14]. This inflammatory pattern is commonly associated with persistent infectious agents such as fungi or mycobacteria. The arthroconidia observed were identified based on their typical morphology: round to oval yeast-like elements with refractile walls, located intracellularly within macrophages and associated with inflammatory infiltrates. Their presence within lesions—rather than on the surface or as isolated elements—argues against environmental contamination and supports a diagnosis of deep dermatophytic infection [3,11,15]

Granulomatous inflammation in cutaneous lesions may result from a broad spectrum of infectious and neoplastic diseases, including sporotrichosis, atypical mycobacteriosis, cryptococcosis, and cutaneous lymphoma. In this case, cytology revealed intracytoplasmic fungal-like elements suggestive of arthroconidia, and fungal culture confirmed Microsporum canis, reinforcing the diagnosis of dermatophytic pseudomycetoma. Although molecular or serological tests for other pathogens were not performed due to limited access and financial constraints, the clinical presentation and favorable (though partial) response to itraconazole therapy further supported the diagnosis. Nonetheless, we acknowledge this as a diagnostic limitation, and clinicians should remain aware of these important differentials when evaluating granulomatous nodular lesions.

Although itraconazole is a commonly used antifungal in the treatment of dermatophytic infections, including pseudomycetoma, its use is not devoid of risks, especially hepatotoxicity. In this case, elevated ALT levels and hypoechogenic liver parenchyma on

ultrasound suggested acute hepatopathy, which may have been exacerbated by the systemic antifungal. Although liver enzyme levels were monitored, the treatment was only discontinued after clinical signs worsened, which might have contributed to the fatal outcome. Earlier interruption of itraconazole or the adoption of alternative therapies—such as terbinafine, which has a more favorable hepatic profile, or topical antifungals for localized control—might have been beneficial. This case highlights the importance of rigorous hepatic monitoring and early consideration of drug-related adverse effects, particularly when pre-existing gastrointestinal symptoms or hepatic involvement is suspected.

It is also important to recognize that baseline hepatic function was not assessed prior to the initiation of antifungal therapy, representing a significant limitation in clinical decision-making. Although elevated ALT levels and hypoechogenic liver parenchyma were identified later during treatment, hepatic monitoring was delayed and constrained by logistical limitations and clinical deterioration. Furthermore, we cannot exclude the possibility of pre-existing hepatic dysfunction or concurrent hepatotoxic factors, which may have predisposed the patient to itraconazole-related toxicity. The decision to maintain itraconazole therapy, despite early hepatic alterations, was based on the initial favorable dermatological response and the lack of immediate clinical decompensation; however, we now recognize that earlier discontinuation might have been beneficial. This case underscores the need for routine baseline and sequential liver function testing during systemic antifungal treatment, especially in predisposed feline breeds.

It is important to acknowledge that, despite the diagnostic value of fungal culture and cytology in this case, the absence of histopathological and molecular diagnostic techniques represents a limitation. Histopathology remains essential for definitive diagnosis of pseudomycetoma, allowing identification of fungal elements within tissue and evaluation of the host's inflammatory response, particularly when nodular lesions are present [3,6,9]. Likewise, molecular diagnostics such as PCR can assist in rapid and specific identification of dermatophytes and help differentiate them from other fungal or bacterial pathogens, especially in cases with atypical clinical presentation or inconclusive culture results [8,9]. In future cases, integration of these complementary techniques would strengthen diagnostic certainty and help clarify unusual lesion distributions, such as the cranial location observed in this patient.

Furthermore, this case highlights the importance of structured monitoring protocols during antifungal therapy. Itraconazole, although effective, is known to carry hepatotoxic potential in cats and requires periodic liver enzyme evaluation during treatment [11,12]. Earlier recognition of hepatopathy and prompt modification or discontinuation of therapy may prevent fatal complications. Alternative antifungal agents such as terbinafine, which has demonstrated lower hepatotoxicity and successful use in similar cases, could be considered in refractory or high-risk patients [11,13]. Establishing routine hepatic monitoring and clinical surveillance protocols is critical to improving outcomes and avoiding iatrogenic complications in feline dermatophytic pseudomycetoma.

Mycological culture is the method of choice for diagnosing dermatophytosis because of its good sensitivity and specificity [12]. Therefore, this method was used to isolate and identify Microsporum canis, in line with the literature, which lists this microorganism as the main causative agent of pseudomycetoma [3].

The previous antifungal treatment administered two years earlier, although initially associated with partial clinical improvement, may not have resulted in complete fungal clearance. Unfortunately, the specific antifungal agent, treatment duration, and adherence were not documented in the medical records, limiting retrospective evaluation. Nevertheless, the recurrence of dermatological signs and the chronic progression of nodular lesions suggest a possible relapse or persistence of subclinical infection. This underscores the importance of long-term monitoring and mycological confirmation of cure in cases of dermatophytosis, particularly in predisposed breeds such as Persians, which are known to develop more severe and chronic manifestations like dermatophytic pseudomycetoma.

Although the diagnostic workup was extensive and included cytology and mycological culture, the lack of post-mortem analysis is a recognized limitation of this case. A necropsy could have confirmed systemic dissemination of the fungus or elucidated the precise cause of death, particularly given the worsening gastrointestinal signs and hepatic abnormalities. Unfortunately, the owner did not authorize a post-mortem examination, which restricted further investigation. This highlights a common challenge in clinical veterinary practice when dealing with client consent for post-mortem diagnostics.

In conclusion, dermatophytic pseudomycetoma, although uncommon, should be included as a differential diagnosis by veterinarians in cases of nodular lesions in cats. The association of a set of clinical signs with fungal culture accompanied by cytology and/or histopathology of nodular lesions in this species is essential in this investigation.

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