Case Report

Successful treatment of juvenile sterile granulomatous dermatitis and lymphadenitis in a Pomeranian aged 5 months using topical hydrocortisone aceponate and systemic antibiotic

Nutjira Sawatmongkol[1] Sirada Tayayouth[1] Suttiwee Chermprapai[2*]

Abstract

A 5-month-old intact male Pomeranian puppy was presented with a 2-week history of acutely swollen face, eyelids, lips, and muzzle. A physical examination revealed focal alopecia, folliculitis, and erythema on the muzzle, periocular, and perianal areas; crusts were also found around the muzzle. The puppy received monthly oral afoxolaner and milbemycin oxime. No ectoparasite was observed based on a trichogram test. Skin cytology revealed intracellular cocci and neutrophils. A skin biopsy taken from the muzzle revealed pyogranulomatous perifollicular dermatitis with epidermal spongiosis, intraepidermal pustules, and a superficial crust. This condition was diagnosed as juvenile cellulitis on the basis of age, clinical signs, distribution of the lesions, and the biopsy results. Initially, the puppy was treated with oral amoxicillin/clavulanic acid 25 mg/kg every 12 hours in combination with topical 4% chlorhexidine once daily. After 2 weeks of treatment, the puppy showed marked improvement, with only skin inflammation remaining. Therefore, 0.584 mg/ml hydrocortisone aceponate topical spray was additionally applied once daily for 2 weeks. Systemic antibiotic was continued for 6 weeks until clinically resolved.

Keywords: juvenile cellulitis, hydrocortisone aceponate, Pomeranian, puppy

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Introduction

Juvenile cellulitis (also known as juvenile pyoderma, puppy strangles, juvenile sterile granulomatous dermatitis and lymphadenitis) is an uncommon disorder in puppies, usually between the ages of 3 weeks and 4 months (Muller and Kirk, 2013). In addition, the condition has been recognized in adult dogs with a similar clinical presentation and histopathology (Jeffers *et al.*, 1995; Bassett *et al.*, 2005; Inga *et al.*, 2020). Lesions are involved on the face, pinnae and submandibular lymph nodes (Muller and Kirk, 2013). The typical appearance is facial swelling, pustular dermatitis, and cellulitis (Hnilica and Patterson, 2016). Affected dogs can be febrile and may present with anorexia and depression. Although numerous breeds have experienced disorder, golden retrievers, dachshunds, labradors, and Gordon setters appear to be predisposed (Muller and Kirk, 2013, Inga *et al.*, 2020). Systemic glucocorticoid is the treatment of choice (Muller and Kirk, 2013). However, some affected dogs have had adverse responses to glucocorticoids in combination with other immunomodulatory agents such as ciclosporin (Bajwa, 2022).

Case description

A 2.15 kg, intact male Pomeranian puppy aged 5 months was brought to the Small Animal Outpatient Unit at the Kasetsart University Veterinary Teaching Hospital, Kamphaeng Sean Campus, Thailand with a 2-week history of acute swelling of the face, eyelids, lips, and muzzle. On physical examination, the puppy was alert and not pruritic. The body condition score (BCS) was 5/9. Heart and lung sounds were normal. The heart and respiratory rates were within normal ranges. The mucous membranes were pink and moist, with a capillary refill time (CRT) of less than 2 seconds. Rectal temperature was 37.8°C. This was the only dog in the household and lived mostly indoors with the owner. The dog had been vaccinated at age 8 weeks and also received monthly oral afoxolaner and milbemycin oxime. A dermatological physical examination revealed focal alopecia, folliculitis, erythema on the muzzle, periocular, and perianal areas, with many crusts also found around the muzzle (Fig. 1). The patient exhibited moderate discomfort during the palpation of the facial lesions. The pain score was assessed at 1/4 based on the Colorado State University scale. Additionally, the submandibular lymph nodes were firm and considerably enlarged (approximately 2 x 2 cm in diameter). Close inspection revealed that the initial lesions were papules around the nasal planum, followed by pustules, which developed rapidly to purulent exudation on the muzzle, face, and periocular area, with crusts eventually seen around the muzzle. A complete blood count (CBC) and blood chemistry profile were performed to evaluate the patient's systemic health and identify any underlying inflammatory processes. The CBC revealed mild anemia, while the serum chemistry test results, including blood urea nitrogen, creatinine, and alanine transaminase, were unremarkable. The diagnostic process was conducted systematically to exclude other differential diagnosis. Despite a history of regular ectoparasite control, a trichogram (hair plucking) was performed to rule out demodicosis and follicular abnormalities, which showed no evidence of mites. After that, a Wood's lamp examination was conducted to screen for dermatophytosis, which also showed negative results. Subsequent cytological examination of a skin swab from the dorsal muzzle and periocular area revealed the presence of intracellular cocci and neutrophils, indicating bacterial dermatitis. Due to the age of onset, acute presentation, severity, and distinct clinical pattern highly suggestive of juvenile cellulitis, a skin biopsy of the muzzle was performed to confirm the suspected diagnosis. The histopathology revealed pyogranulomatous perifollicular dermatitis with epidermal spongiosis, intraepidermal pustules, and a superficial crust (Fig. 2). Consequently, this condition was diagnosed as juvenile cellulitis on the basis of age, clinical signs, distribution of the lesions, and the biopsy results.

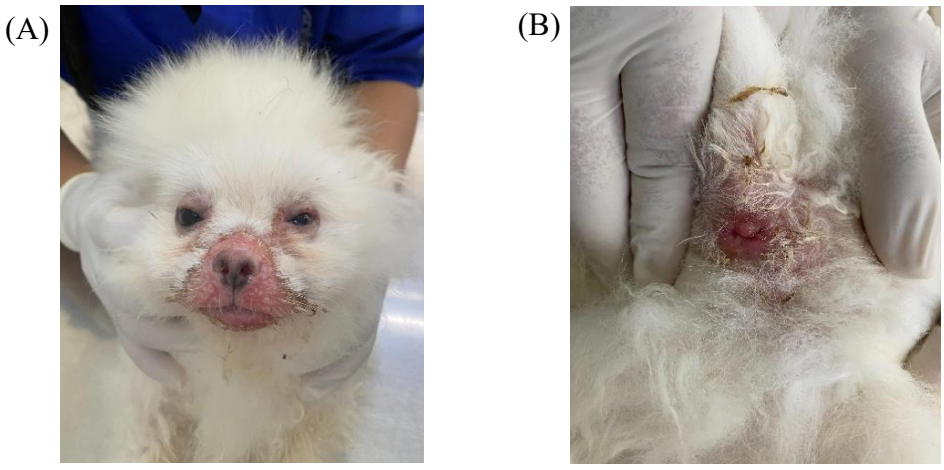

Figure 1 First clinical visit. Notable erythema, edema, exudation, and alopecia on (A) muzzle and periocular area, with crusts also found around the muzzle (B) Perianal area.

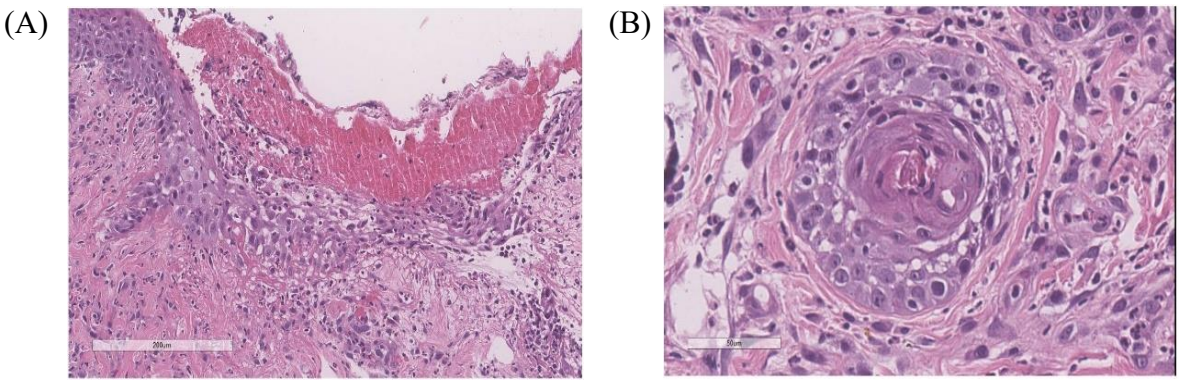

Figure 2 Histopathological images of the biopsy sample. (A) The dermis exhibits dense, diffuse pyogranulomatous infiltration. (B) High-power view demonstrating macrophages and neutrophils surrounding a hair follicle.

Based on the results of skin cytology, the puppy was initially treated with oral amoxicillin/clavulanic acid (Clavamox® drops, Zoetis, USA) 25 mg/kg every 12 hours in combination with topical 4% chlorhexidine once daily. After 2 weeks of treatment the puppy showed marked improvement; no crust or discharge were observed (Fig. 3), with only skin inflammation remaining. Therefore, 0.584 mg/ml hydrocortisone aceponate topical spray solution (Cortavance®, Virbac, France) was applied once daily for 2 weeks. After 4 weeks of treatment, the puppy had almost fully recovered from the previous lesions; partial hair regrowth was observed on the affected areas (Fig. 4). Treatment with systemic antibiotic was continued for 6 weeks until clinical improvement was confirmed, after which the puppy was lost to follow-up. During a telephone interview, the owner reported that full hair regrowth occurred within 1-month post-treatment. There has been no recurrence of clinical signs, and the patient has remained in excellent health for 2 years following the initial diagnosis. Long-term monitoring confirmed a successful outcome.

Figure 3 Condition after 2 weeks of treatment with systemic amoxicillin/clavulanic acid and topical chlorhexidine.

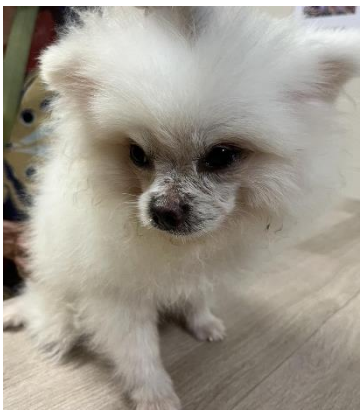

Figure 4 Condition after 4 weeks of systemic amoxicillin/clavulanic acid and 2 weeks of topical corticosteroid treatment.

Discussion

Juvenile cellulitis in puppies is an uncommon granulomatous and pustular disorder of the face, pinnae, and submandibular lymph nodes. The exact cause is unknown. Differential diagnosis includes staphylococcal dermatitis, demodicosis, dermatophytosis, angioedema, canine distemper, and adverse cutaneous drug reaction (Miller *et al.*, 2013; Hnilica and Patterson, 2016).

Initially, staphylococcal dermatitis and deep pyoderma were included in the differential diagnosis due to similar clinical presentations such as crusting, ulceration, and painful lesions. However, the acute onset and the distribution of lesions specifically affecting the lips, muzzle, chin, bridge of the nose, and periocular area, are highly characteristic of juvenile cellulitis (Miller *et al.,* 2013). While intracellular cocci were identified based on cytology, the biopsy revealed sterile lesions, providing evidence that the bacteria represented a secondary infection rather than the primary cause. Furthermore, the absence of identifiable bacteria within the deeper tissue in biopsy samples strongly supported a diagnosis of juvenile cellulitis over deep pyoderma (Gross *et al.,* 2005).

Demodicosis can be mistaken for early lesions of juvenile cellulitis on the faces of young dogs because of similar lesions (Hnilica and Patterson, 2016). Thus, deep skin scraping should be performed to rule out demodicosis (Mueller *et al.,* 2020). In this case, given a pain score of 1/4 based on the Colorado State University scale (Enomoto *et al.,* 2022), a trichogram was prioritized over deep skin scraping as a minimally invasive method to evaluate for ectoparasites.

Dermatophytosis was included in the differential diagnosis because of similar lesions including alopecia, folliculitis, papular or pustular eruption, especially Trichophyton mentagrophytes that cause symmetrical nasal or facial folliculitis and furunculosis and most often affect the muzzle followed by the head excluding the pinnae (Pieper *et al.,* 2023). Additionally, dermatophytosis is usually a disease of young animals (aged than 1 year). In this case, diagnosis using a Wood's lamp produced a negative result and cytological examination revealed bacterial infection. There were no hyphae or arthrospores based on the microscopic examination and the dog also responded well to the course of antibiotics. Therefore, dermatophytosis was less likely to be a definitive diagnosis. On the other hand, if the dog showed no response to the previous treatment, fungal culture may be necessary to confirm the diagnosis, since there is no test defined as the gold standard (Moriello *et al.,* 2017).

Angioedema is an uncommon hypersensitivity disorder in dogs that causes swelling of the face and ventral neck, which is similar to an early lesion of juvenile cellulitis (Miller *et al.,* 2013). However, in this case, the swelling lesion on the face rapidly progressed to pustules and a crust, which ruled out angioedema.

Although skin lesions are observed in only a small percentage of canine distemper cases (Ettinger *et al.,* 2024), the presence of dry, crusty lesions in the periocular and nasal areas of a young dog can be suspicious of distemper infection. In this case, canine distemper was ruled out because the puppy showed no other related signs, such as fever or respiratory or gastrointestinal signs, and did not have any ocular or nasal discharge.

Since the dog had been vaccinated at age 8 weeks, cutaneous adverse drug reaction was included in the differential diagnosis because of the age of onset and the booster dose of vaccinations prior to the onset. Usually, eruptions most commonly occur within 1–3 weeks after initiating therapy. Some reactions may occur weeks or months after the drug is administered (Miller *et al.,* 2013). Vasculitis and ischemic dermatopathy are more often associated with vaccine reactions (Miller *et al.,* 2013). However, the puppy in this case did not exhibit lesions suggestive of cutaneous adverse reactions and the biopsy revealed pyogranulomatous perifollicular dermatitis, suggesting that a cutaneous adverse drug reaction was less likely to be clinically relevant.

This condition is also frequently associated with otitis externa (Miller *et al.,* 2013). Therefore, even in the absence of pinnal swelling or edema, ear cytology and an otoscope should be performed to check for any mild or early lesions of otitis.

Oral amoxicillin/clavulanic acid was administered because cytology revealed cocci, suggesting a secondary staphylococcal infection (Valenciano and Cowell, 2019). As the patient had no prior history of antibiotic exposure, the risk of resistance was considered low; therefore, the treatment was initiated without bacterial culture and sensitivity testing. The initial dose was 25 mg/kg every 12 hours, based on clinician preference and established therapeutic ranges at the time of treatment (Budde and McCluskey, 2023). However, according to latest ISCAID guidelines (Loeffler *et al.,* 2025) a lower dosage of 12.5 mg/kg every 12 hours is now recommended for managing such secondary infections. Future management of similar cases could potentially utilize this reduced dosage to minimize drug exposure while maintaining clinical efficacy.

In general, large doses of systemic glucocorticoids are the treatment of choice. Glucocorticoids are considered the main therapy for canine and feline autoimmune skin conditions. Therefore, they are typically the first choice for starting treatment in active cases that have not yet received any medication (Tham and Davis, 2024). Hence, oral administration of prednisolone (2 mg/kg every 24 hours) is recommended, until the disease is inactive (usually within 14–28 days) (Miller *et al.,* 2013; Hnilica and Patterson, 2016). However, if prednisolone therapy is tapered off or discontinued too soon, a relapse may occur (Hnilica and Patterson, 2016). In this case, the puppy was treated with topical corticosteroid due to a marked improvement after 2 weeks of systemic antibiotics prescribed previously. The possible explanations could be that topical corticosteroid may help reduce inflammation in a case of mild-to-moderate severity and/or the dog may have experienced a spontaneously self-limiting process of the disease that resolved within 1–3 months (Muller and Kirk, 2013).

Juvenile cellulitis in dogs should be considered on the basis of age, clinical signs, distribution of the lesions, and histopathological examination. After excluding other differential diagnoses, early treatment is indicated to avoid undesirable outcomes. In mild-to-moderate cases, topical corticosteroids may be considered in combination with other medications to help minimize systemic side effects. Long-term follow-up is recommended to monitor clinical improvement and symptom resolution until full recovery.

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Conflicts of interest: The authors declare no conflicts of interest.

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