Original

Feline Acne: A Retrospective Study of 74 Cases (1988–2003)

猫のざ瘡：74 例に関する後向き研究（1988–2003）

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Abstract: Feline acne was diagnosed in 74 cats. No age, breed, or sex predilections were found. No triggering agents were identified. Most cats (58.1%) had the asymptomatic, noninflammatory comedonal stage of feline acne, and received no treatment. Some cats (41.9%) presented with feline acne and secondary bacterial folliculitis/furunculosis. Secondary bacterial infections responded well to antibacterial treatment. Follow-up information was available for 82.4% of all cats, and the comedonal stage of feline acne persisted in every case.

Key words: cat, feline acne

要約: 74例の猫が、猫のざ瘡と診断された。好発年齢、品種または性別などは認められなかった。また本症の病因となる病態を特定することはできなかった。猫の多く(58.1%)が、猫のざ瘡の病勢別分類のうち自覚症状を伴わない非炎症性面皰のステージに属し、何らかの治療は行われていなかった。猫の一部(41.9%)では、ざ瘡に伴い二次的な細菌性毛包炎/せつ腫症が認められた。二次的な細菌感染症は、抗菌薬を用いた治療により良好に管理することができた。82.4%の猫では予後調査が可能であり、調査した全ての猫で面皰のステージが持続して認められた。

キーワード: 猫、猫のざ瘡

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Introduction

Feline acne (FA) is a well-known dermatosis of cats²³⁾. It was described by Dr. George Muller in 1969¹³⁾. In spite of being reviewed in numerous textbooks^{4, 7–9, 11–19, 22, 23, 25)} and journal articles^{1–3, 5, 6, 10, 20, 21, 24)}, most information on FA is anecdotal. Only two journal articles contain actual case material^{10, 24)}. As is frequently the case when most information on a disorder is anecdotal, there is disagreement on various aspects of FA in the veterinary literature.

FA is an idiopathic, localized disorder of keratinization⁷⁾.

^{10, 12, 23, 24)}. Several factors have been hypothesized to participate in the pathogenesis of FA: poor grooming habits of individual cats, abnormal sebum production, hair cycle abnormalities, localized keratinization defect, stress, viral infections, immunosuppression, and allergies (atopic dermatitis, food allergy, allergic contact dermatitis)^{3, 5, 6, 9, 13–15, 17, 18, 20, 23, 24)}. However, none of these hypotheses has been corroborated by scientific investigation. Cats with FA are typically otherwise healthy, making underlying immunosuppression very unlikely. Most cats with FA are not infected with feline leukemia virus (FeLV) or feline immunodeficiency virus (FIV)²⁰⁾. Because

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occasional outbreaks of FA have been seen in catteries and multicat households, viral infections and stress have been given etiologic consideration^{7,9,20}. However, more recent investigations of multiple cats with FA in multicat households revealed no evidence for stress, dermatophytosis, or viral infections (feline calicivirus, feline herpesvirus) being etiologic factors^{10,24}. Lifestyle (whether cats live indoors, outdoors, or both of these) appeared to have no influence on the occurrence of feline acne²⁴.

FA is usually localized to the chin^{3,5,7,9,12–19,20–23,25}. Less commonly, lesions may also occur at the margins of the lower or upper lips. The initial and primary lesions of FA are brown-to-black comedones and hair casts^{3,5,7,9,12–19,20–23,25}. These lesions are noninflammatory, nonpruritic, and nonpainful, and affected cats are otherwise healthy. In some cats, lesions progress to superficial papules and crusts (folliculitis) or deep-seated papules, pustules, crusts, and draining tracts (furunculosis). These inflammatory lesions are typically associated with secondary bacterial infection. When secondary bacterial infection occurs, the chin area may become markedly edematous and swollen, pruritic and/or painful, and regional lymph nodes may be enlarged. Rarely, cats with secondary bacterial infections may be febrile, depressed, lethargic, and inappetent. Chronic cases can develop fibrosis, foreign body granulomas (due to free keratin and hair fragments subsequent to furunculosis), hair follicle and/or epitrichial sweat gland cysts (due to obstructive fibrosis and scarring), and pit-like scars^{19,23}.

The purpose of our article is to report the results of a retrospective study of 74 cats with FA.

Materials and Methods

A retrospective study was conducted on 74 cats with FA examined by the Dermatology Service of the Cornell University Hospital for Animals (CUHA) from 1988 to 2003. Medical records were reviewed for the following information:

1. Signalment (breed, age, sex).
2. First-opinion or referral case.
3. Duration of disease prior to examination.
4. Dermatological findings.
5. Concurrent disorders.
6. Laboratory findings.
7. Therapeutic protocols.

8. Total duration of disease, with or without treatment.
9. Follow-up period.

Various data for the cats with FA were compared with those for the general CUHA cat population for the same time period using the relative risk (RR) calculation.

$$RR = \frac{\text{data for acne cats}}{\text{data for CUHA cats}}$$

An RR of 2.0 or greater was considered significant.

Results

FA was diagnosed in 5.3% (74/1407 cats) of the feline dermatology cases and 0.3% (74/22,135 cats) of all cats examined at the CUHA over a 15-year period. Forty-eight cases (64.9%) were first-opinion, and 26 (35.1%) were referred. Domestic shorthair cats accounted for 97.3% (72/74 cats) of the cats with FA, and 79.7% of the CUHA cat population (RR=1.2). Although Persian cats accounted for 1.6% of the CUHA cat population, we did not diagnose FA in this breed. Spayed females, castrated males, intact females, and intact males accounted for 54.1%, 35.1%, 6.8%, and 4%, respectively, of the cats with FA. These same sexes accounted for 38.2%, 38.4%, 10.8%, and 10.1%, respectively, of the total CUHA cat population (for 2.5% of these cats, the sex was not recorded). The RRs for spayed females (1.4), castrated males (1.2), intact females (0.9), and intact males (0.0) did not reach significance.

The age of affected cats when presented to the Dermatology Service ranged from 7 months to 17 years, and ages were fairly evenly distributed across the range. However, the absolute age of onset of disease was known for only 10 cats (13.5%): 8 months to 12 years. Only 8 cats (10.8%) were presented for the sole problem of asymptomatic comedonal acne, and the owners of only three of those cats were sure of the time of onset. In 31 cases (41.9%), the cats were presented with feline acne with secondary bacterial folliculitis/furunculosis. When the secondary infections were resolved, the comedonal stage persisted, and the owners did not know if this had been present prior to the onset of infection. In 56 cases (75.7%), the cats were presented for other dermatologic disorders – especially allergies and secondary bacterial folliculitis/furunculosis – and the owners had not noticed the FA. When the secondary infections and other concurrent dermatoses were treated, the comedonal stage of FA persisted.

Fig. 1. The asymptomatic comedonal stage of feline acne. Note black comedones and hair casts on chin, lower lip, and upper lip.

Fig. 3. Feline acne with secondary bacterial folliculitis and furunculosis. Note comedones, pustules, furuncles, and hypotrichosis.

Fig. 2. Same cat as in Fig. 1. Note black comedones and hair casts on chin.

Fig. 4. Same cat as in Fig. 3. Note furuncles and draining tracts.

Forty-three cats (58.1%) presented with the comedonal stage of FA (Figs. 1 and 2), and 31 cats (41.9%) had secondary folliculitis/furunculosis (Figs. 3, 4, and 5). Concurrent dermatoses were present in 56 cats (75.7%). The most common concurrent dermatoses were allergic diseases (27/56 cats; 48.2%). In all, cats with FA had concurrent allergies in 36.5% of the cases. However, cats with allergies (atopic dermatitis, food allergy, and “allergic dermatitis”, or combinations of these) also accounted for 38.4% of the cats examined by the Dermatology Service. Hence, the $RR=0.9$ for allergies in cats with FA was not significant.

Skin scrapings, cytology, and trichography were

^aThese cats had historical, clinical, and therapeutic findings typical of allergic cats. Allergy testing was not permitted. Hence, they could have had atopic dermatitis, food allergy, or both of these.

Fig. 5. Chronic feline acne. Furunculosis and fibrosis have resulted in the formation of bluish colored follicular and epitrichial sweat gland cysts.

performed in all 31 cats with secondary folliculitis/furunculosis. Skin scrapings and trichography were negative for *Demodex* mites and dermatophytes, respectively, in all cases. Cytology revealed suppurative inflammation (folliculitis) or pyogranulomatous inflammation (furunculosis) with cocci in all cases. Bacterial cultures were not performed. *Malassezia* yeasts were not seen. Fungal cultures were performed in only three cats. These three unrelated cats lived in the same household and were referred to the Dermatology Service. Fungal cultures were negative. No skin biopsies were performed in our 74 cats. None of our cats had a recent history of viral respiratory infection, and all cats were FeLV- and FIV-negative. In none of our cases was stress thought to be a triggering factor. Food and water bowls had been changed in 25/74 cats (33.8%), but no improvements were seen.

Cats with the asymptomatic comedonal stage of FA (58.1%) received no treatment. Follow-up was available for 33/43 cats (76.8%) for periods of 2 months to 8 years. FA was persistent in all cats. Cats with secondary folliculitis/furunculosis (41.9%) received treatment with systemic and/or topical antibiotics. Systemic antibiotics used included amoxicillin clavulanate, cefadroxyl, clindamycin, and tylocin. Topicals used included chlorhexidine, benzoyl peroxide, and mupirocin. Follow-up information was available for 28/31 cats (90.3%) for periods of 2 months to 10 years. Infections resolved in all cats for which follow-up information was available. The comedonal stage of FA persisted in all of these cats. One cat developed contact dermatitis to benzoyl peroxide. Two cats required maintenance applications of mupirocin (for 2 to 4 years) for recurring infections.

Follow-up information was available for 61/74 cats (82.4%). This information was available for 40/48 (83.3%) first-opinion cases and 21/26 (80.8%) referred cases.

Discussion

FA is reported to be a “common¹²⁾”, “relatively common^{7, 24, 25)}”, or “uncommon^{18, 23)}” disorder. In our study, FA was uncommon (5.3% of cases) in terms of cats examined by the Dermatology Service, but rare (0.3% of cases) in terms of the general hospital cat population. However, the prevalence of FA in our general hospital cat population is probably greater than recorded in our study. The Dermatology Service consults on many cats

from other hospital services. For many of these consultations, the dermatologic information is not entered on the problem list or discharge statement, and does not get coded into the CUHA computer data base. Hence, we decided to only include cases that had been managed by the Dermatology Service. In addition, because most owners of cats with FA in our study had not been aware of the presence of the disorder, reports of FA may underestimate the true prevalence.

It is generally agreed that there is no age predilection for FA^{3-5, 9, 12, 16, 18, 20-23)}. White *et al.*²⁴⁾ reported an age at onset of 0.25 to 15 years (mean 4.2 years). Other authors state that affected cats are usually fully mature¹⁵⁾ or usually less than 1 year of age^{6, 7, 17)}. There was no age predilection for FA in our study. Again, because the age of onset was known for only 13.5% of our cases, data on this parameter from other studies must be cautiously interpreted. Our data and those of other investigators^{10, 24)} demonstrate that FA does not usually begin in cats that are less than 1 year of age.

Although most authors indicate that there is no sex predilection for FA^{3, 5, 9, 14, 17, 18, 20, 23)}, Jazic *et al.*¹⁰⁾ reported that 73% of their cases were castrated males. However, no information on their general hospital cat population was presented. In our study, sex and neutering were not significantly associated with the prevalence of FA.

While most authors agree that there is no breed predilection for FA^{3, 5, 9, 14, 17, 18, 20, 23)}, White *et al.*²⁴⁾ reported that 24% of their cases were in Persians or Persian crosses. Again, no information on their general hospital cat population was presented. In our study, Persians accounted for 1.6% (354/22,135 cats) of the general hospital cat population, but we did not diagnose FA in this breed.

There is no information in the literature on what percentage of cats with FA remain in the initial comedone stage and what percentage progress to the inflammatory/infected stage. In our study, 58.1% of the cats presented with the comedonal stage, and 41.9% presented with secondary bacterial folliculitis/furunculosis. Cats that were treated for their secondary infections had persistent comedones and hair casts.

In most cases, FA is visually distinctive, and a good history and physical examination are sufficient for diagnosis^{4, 5, 9, 12-18, 20-23, 25)}. When inflammatory lesions are present, cytological examination is indicated to assess the presence of bacterial infection. Anecdotal reports indicate that infections with dermatophytes, *Malassezia*

yeasts, or *Demodex* mites may occasionally mimic inflammatory FA, and that these differential diagnoses should be particularly suspected in cases that are refractory to standard treatments^{6–9, 12, 17, 18, 20, 23}. However, data from two detailed studies^{10, 24} revealed: negative skin scrapings for *Demodex* mites in 47/47 (100%) cats, *Malassezia* yeasts in cytology of only 4/47 (8.5%) cats, and positive dermatophyte cultures in only 3/47 (6.4%) cats. The yeasts and dermatophytes in these cases were not shown to be causing disease. Skin-biopsy specimens from 25 cats revealed no *Demodex* mites or dermatophytes, and *Malassezia* yeasts in only 1/25 (4%) cats^{10, 24}.

We were not able to corroborate any triggering factors for FA in our study. Viral infections or stress were not documented in any cases. Lifestyle (indoor, outdoor, both of these) was not associated with the development of FA, which is in agreement with the findings of White *et al.*²⁴. Although 36.5% of our cats with FA also had allergic skin disease, this was not significant when compared with our Dermatology Service caseload. Demodicosis, dermatophytosis, and *Malassezia* dermatitis were not diagnosed in our cats with FA. We do not remember seeing any of these diseases isolated to the chin, nor are we aware of any published cases of this occurring. Because we found no association of FA with age, sex, or neutering, we agree that the disorder does not appear to be influenced by sex hormones^{13–15}. Although some authors^{8, 9} have suggested that contact reactions (e.g., plastic food and water bowls) may be responsible for some cases of FA, 33.8% of our cases had food and water bowls changed with no benefit.

Secondary bacterial folliculitis/furunculosis was documented in 41.9% of our cats with FA. Phagocytosed cocci were seen in cytological specimens from all cats. Anecdotal information indicates that the most commonly isolated bacteria from infected FA are *Pasteurella multocida*, streptococci, and staphylococci^{3, 5, 6, 12, 16–18, 20–23}. Coagulase-positive staphylococci and streptococci were the most common isolates in the report by Jazic *et al.*¹⁰. We did not perform any bacterial cultures, but assume that the bacteria seen were staphylococci (most likely) or streptococci. As all cats in our study with inflammatory lesions had cytological evidence of bacterial infection and responded to antibacterial treatment, we conclude that all cats with FA and inflammatory lesions have secondary bacterial infection until proven otherwise. Again, we documented no instances of demodicosis,

dermatophytosis, or *Malassezia* dermatitis in these cases, and all cats responded to antibacterial therapy.

Histopathology findings in skin-biopsy specimens from cats with FA vary with the stage of the disease. The early comedonal stage is characterized by hyperkeratosis and distension of hair follicles^{7, 10, 23}. Some hair follicles may be distended to the point of frank cyst formation. Portions of the follicular keratin may exhibit light brown-to-dark brown agranular discoloration, the nature of which is not known⁷. Sebaceous gland ducts are also commonly distended and filled with sebum. A mild-to-moderate lymphoplasmacytic periductal inflammation may be present^{7, 10}. In the later inflammatory/infected stages, histological findings may include perifolliculitis, suppurative luminal folliculitis, pyogranulomatous furunculosis, pyogranulomatous sebaceous adenitis, and combinations of these^{7, 10, 23}. We biopsied none of the cats in our study.

Treatment varies with the severity of the disease, the owner's desires and capabilities, and the cat's personality^{3–6, 8, 9, 12–18, 20–25}. For cats in the asymptomatic comedonal stage, observation without treatment is justified. For owners who find the cosmetic appearance of their cat's chin unacceptable, various topicals can be applied, as needed, to minimize comedone and hair cast accumulation. Comedolytic, antiseborrheic shampoos (sulfur, salicylic acid) and alcohol swabs are often recommended^{9, 12–18, 20–23}. Benzoyl peroxide shampoos or gels have also been recommended, but may cause contact dermatitis^{6, 8, 9, 12, 17, 18, 20, 23}. Tretinoin (a topical retinoid) ointment has also been recommended, but may also cause contact dermatitis^{8, 9, 11, 19, 23}. None of these products have been critically evaluated.

For cats in the inflamed/infected stage, various combinations of clipping the hair on the chin, application of topical cleansers and antimicrobials, and administration of systemic medications have been recommended^{3–6, 8, 9, 12–18, 20–25}. Recommended topical antimicrobial agents include benzoyl peroxide, chlorhexidine, clindamycin, metronidazole, and mupirocin. Only mupirocin has been clinically investigated, and was reported to be effective in 24/25 (96%) cats over a three-week period²⁴. One cat in the study developed contact dermatitis and the mupirocin was discontinued.

In severe or deep bacterial infections, systemic antibiotics are necessary^{3–6, 8, 9, 12–18, 20–25}. Recommended antibiotics include amoxicillin clavulanate, cefadroxyl, clindamycin, and trimethoprim-potentiated sulfonamides.

A short course (five to seven days) of systemic glucocorticoids may be useful at the beginning of treatment in order to reduce pain, pruritus, and swelling^{9, 20, 23}. Anecdotal reports indicate that isotretinoin (2 mg/kg PO q24h) may be effective in about one-third of the chronic, medically-refractory cases^{8, 12, 17, 19, 20, 23}. Anecdotal information also suggests that the oral administration of fatty acid supplements may be effective for treatment or prevention of recurrences^{17, 18, 20}.

Although rare cats may suffer only one episode of FA^{7, 18, 23}, most cats have life-long disease that may be constant, cyclic, or recurrent^{3, 6, 7, 12, 13, 17, 18, 20–23, 25}. Follow-up information was available for 82.4% of our cats with FA. All cats had persistent comedonal disease. No cat was known to be cured, and no cat was known to have cyclic or recurrent disease. Two of our cases (2.7%) required maintenance therapy with topical mupirocin to prevent recurrent secondary bacterial folliculitis/furunculosis.

None of our cats with the asymptomatic, noninflammatory comedonal stage of FA (58.1%) received treatment, and none were known to progress to the inflammatory/infected stage. Cats with secondary bacterial folliculitis/furunculosis were successfully treated with various systemic and topical antibacterial agents. Only two cats were known to relapse. However, the comedonal stage persisted in all cats.

It is generally believed that follow-up information is more likely to be available from referred cases than from first-opinion cases. However, in our study, follow-up information was available in over 80% of the cats in both categories.

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