Alopecia, Easily Epilated Hair, & Inappetence in a Cat

Jennifer C. Olson, DVM and Gary D. Norsworthy, DVM, Diplomate ABVP (Feline)
Alamo Feline Health Center, San Antonio, Texas

J. Scot Estep, DVM, Diplomate ACVP
Texas Veterinary Pathology, San Antonio, Texas

A 14-year-old spayed female domestic medium-hair cat was referred for evaluation of progressive nonpruritic dermatologic changes, inappetence, and decreased water consumption over 4 weeks; anorexia had developed in the past week.

PHYSICAL EXAMINATION
Upon presentation the cat had a body condition score of 4/9 and weighed 3.82 kilograms. The cat was euhydrated and, based on records from the referring veterinarian, had lost 1.32 kg during the past 12 months. No signs of excessive grooming were reported by the owner.

Clinical examination findings included shiny, symmetrical alopecia on the ventral abdomen and chin, periorcular alopecia and inflammation, perionychitis, and easily epilated hair (Figures 1–3).

DIAGNOSTICS
Laboratory Analysis
Diagnostics performed the day prior to referral revealed elevated BUN, normal creatinine, mild eosinophilia, and mild hyperglycemia (Table 1). These biochemical and hematologic abnormalities were nonspecific and clinically insignificant.

<table>
<thead>
<tr>
<th>VALUE</th>
<th>Result</th>
<th>Reference Interval</th>
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<tbody>
<tr>
<td>Blood urea nitrogen (mg/dL)</td>
<td>37</td>
<td>10–30</td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>1.9</td>
<td>0.3–2.1</td>
</tr>
<tr>
<td>Eosinophils (× 103/mcl)</td>
<td>1.13</td>
<td>0–1</td>
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<tr>
<td>Glucose (mg/dL)</td>
<td>155</td>
<td>70–150</td>
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View a video that demonstrates the appearance and characteristics of easily epilated hair at tvpjournal.com
Imaging
Abdominal ultrasound identified multiple hypoechoic masses in the liver (Figure 4). The pancreas could not be identified due to gas acoustic impedance. The remainder of the ultrasound study was unremarkable. Thoracic radiographs were normal.

Cytopathology
Under sedation, fine-needle aspiration biopsy samples were collected from a hepatic mass using ultrasound guidance. The findings are listed in Table 2.

PRESUMPTIVE DIAGNOSIS
The vague acini led the pathologist to suspect biliary or pancreatic origin, but there were not enough features for definitive diagnosis. However, this information, in context of the clinical picture, led to a presumptive diagnosis of hepatobiliary adenocarcinoma and feline paraneoplastic alopecia. Based on the presumptive diagnosis and prognosis, the owners elected euthanasia.

POSTMORTEM DIAGNOSTICS
Gross Pathology
Significant gross pathologic findings at necropsy included numerous multifocal soft pale hepatic nodules (Figures 5 through 7) while the lung, pancreas, and intra-abdominal lymph nodes appeared grossly normal.

**TABLE 2. HEPATIC MASS FINENEEDLE ASPIRATION FINDINGS**

- Multiple clumps of atypical epithelial cells with round-to-oval nuclei
- Marked anisokaryosis
- Prominent nucleoli
- Indistinct cell borders
- High nuclear to cytoplasmic ratio
- Vague acini, suggestive of carcinoma

Histology
- **Histopathology** revealed glandular and solidly cellular areas that had replaced most of the pancreas and aggressive invasion of the tumor into the liver and lungs (Figures 8–10, page 14).
- **Immunohistochemistry** of the neoplastic cells was pos-
tive for pancytokeratin, cytokeratin 7, cytokeratin 20, vimentin, and negative for TTF-1, synaptophysin, chromogranin, and calcitonin. These markers were designed to differentiate primary from metastatic hepatic neoplasia, and the results supported a differential of cholangiocarcinoma or pancreatic carcinoma, while ruling out thyroid, pulmonary, thymic, and neuroendocrine neoplasia.

- **Dermatohistopathology** revealed a mostly eroded stratum corneum, with some focal areas of parakeratosis, moderate to severe acanthosis, and telogenized hair follicles, which were diffusely miniaturized (Figure 11). Sebaceous glands were unaffected and appeared enlarged.

According to the World Health Organization tumor staging for pancreatic tumors in domestic animals, this patient was classified as T1 N0 M1 (Table 3).

### DISCUSSION

The pathophysiology of *feline paraneoplastic alopecia* is unknown. It is one of very few cutaneous paraneoplastic syndromes identified in veterinary medicine and is linked to pancreatic and biliary carcinoma. The first case series of 3 cats with this syndrome was published in 1994. A case report demonstrated that excision of the primary tumor was followed by resolution of dermatologic lesions, and subsequent metastatic disease mirrored a recurrence of dermatologic lesions. This particular case report demonstrated that, while pancreatic disease may be present and is likely the location of the primary tumor, metastatic hepatic lesions may be the most easily identifiable pathology ante-mortem. Therefore, it is important to determine if pancreatic pathology is also present.
The Dermatology Component: Differential Diagnoses
Differential diagnoses for the alopecia are listed in Table 4. Rule outs were based upon:
- No evidence of skin fragility on physical examination, as reported in cats with hyperadrenocorticism
- No ectoparasites identified on examination
- In this case, skin scraping, skin cytology, trichogram, and fungal cultures were not performed as the imaging and fine-needle aspiration biopsy results indicated a neoplastic process. No perifollicular inflammation or mites/fungal spores were seen in biopsy samples
- Normal total T4 level 3 weeks prior to referral (1.8 mcg/dL; reference interval, 0.8–4).

Telogen effluvium was possible as a consequence of internal or systemic disease as a synchronous trigger for the onset of telogen phase. However, the characteristic clinical appearance, absence of findings consistent with other disorders, and dermatohistopathology findings made paraneoplastic alopecia the most likely diagnosis in this case.

<table>
<thead>
<tr>
<th>TABLE 4. Differential Diagnoses for Nonpruritic Symmetrical Alopecia</th>
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<tr>
<td>• Alopecia areata</td>
</tr>
<tr>
<td>• Demodicosis</td>
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<tr>
<td>• Dermatophytosis</td>
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<tr>
<td>• Hyperadrenocorticism</td>
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<tr>
<td>• Hyperthyroidism</td>
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<tr>
<td>• Paraneoplastic alopecia</td>
</tr>
<tr>
<td>• Self-induced alopecia secondary to allergies or ectoparasitism</td>
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<tr>
<td>• Telogen effluvium</td>
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Clinical Signs
Classic physical examination findings include shiny, nonpruritic symmetrical alopecia affecting the ventral body, face, and medial aspect of limbs, with easily epilated hair. Less commonly, pinnal and periocular alopecia can occur. Abnormally soft footpads, dry footpad fissures, crust-ed footpads, and lightening of hair color have been reported as well. Pruritus has been linked to secondary Malassezia species infection in one report. The most common sign of systemic illness is weight loss.

Relation of Alopecia to Tumor
Feline paraneoplastic alopecia is characterized histopathologically by loss of the stratum corneum and severe follicular atrophy, with miniaturized hair bulbs. The shiny to glistening appearance of the skin is attributed to exfoliation of the stratum corneum, which may occur during normal or excessive grooming.

It is theorized that humoral factors are excreted or triggered by the tumor, but specific factors have not been identified. By definition, though, the dermatologic lesions are themselves noncancerous; they are, instead, neoplasm-related lesions that occur at a site distant from the primary tumor or its metastasis.

Therapy & Prognosis
Cats with pancreatic adenocarcinoma have a grave prognosis, and most have metastatic disease at the time of diagnosis. To the best of our knowledge, there are currently no effective treatments.

SUMMARY
Feline pancreatic adenocarcinoma is a rare condition; however, the uniqueness of dermatologic changes should be a sentinel for possible intra-abdominal malignancy. Recognition of these signs may facilitate detection of pancreatic adenocarcinoma.

Key Point: Application in Practice
The unique dermatologic signs associated with feline paraneoplastic alopecia—shiny, nonpruritic alopecia and easily epilated hair—should be a sentinel for possible intra-abdominal malignancy. Recognition of these signs may facilitate detection of pancreatic adenocarcinoma.

To view the references for this article, go to todays.veterinarypractice.com/resources.asp#resources.

Jennifer C. Olson, DVM, practices at Alamo Feline Health Center in San Antonio, Texas. She received her DVM from Cornell University and completed an internship at VCA Alameda East Veterinary Hospital in Denver, Co.

Gary D. Norsworthy, DVM, Diplomate ABVP (Feline), is the owner of Alamo Feline Health Center in San Antonio, Texas, one of the largest feline practices in the United States. He is a frequent lecturer and the editor of the textbook, The Feline Patient. He received his DVM from Texas A&M University.

J. Scot Estep, DVM, Diplomate ACVP, is the owner of Texas Veterinary Pathology in San Antonio, Texas. He received his DVM from Oklahoma State University and completed a residency in pathology at the Armed Forces Institute of Pathology.
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