A 15-year-old castrated male domestic shorthair cat presented with a 2-month history of progressive lameness, swelling, and pain in its right front paw.

**HISTORY**
The patient was an indoor only cat. No other animals in the household were showing clinical signs. He was anorectic and had vomited a few times after eating in the recent past.

The previous attending veterinarian had taken radiographs of the affected paw and conducted a basic serum biochemical profile; however, results were not definitive. Therapy for the pain and lameness, including butorphanol, was administered, and the patient received a vitamin and mineral supplement (Lixotinic, zoetisus.com). No apparent changes in the patient's condition were noted while receiving these treatments.

**PHYSICAL EXAMINATION**
On initial physical examination, the patient appeared depressed and painful. He was hesitant to bear weight on the affected limb, and sedation (acepromazine, 0.02 mg/kg IM, and hydromorphone, 0.075 mg/kg IM) was required to perform a full physical examination.

Upon closer examination, the cat's right front paw demonstrated severe inflammation, and a bloody, purulent discharge was present between the footpads and interdigitally. All of the nail beds varied from eroded to ulcerated (Figure 1).

In addition, a small cranial abdominal mass was palpated, and a mild heart murmur was auscultated. The patient also had moderate dental disease. The remainder of the examination was normal.

**DIAGNOSTICS**
**Laboratory Analysis**
Complete blood count (CBC), serum biochemical profile, and urine analysis were conducted by the in-house laboratory.

- CBC showed a mild nonregenerative anemia, neutrophilia with left shift, and mild lymphopenia, suggesting inflammation and stress.
- Serum biochemical profile revealed increased blood urea nitrogen (37 mg/dL; reference range, 18–32), decreased potassium (2.9 mEq/L; reference range, 3.2–4.5), and decreased calcium (8.4 mg/dL; reference range, 8.8–11).
- Urinalysis values were within normal limits.

**FIGURE 1.** Ulceration of the nail fold (A); all digits were affected. A bloody, purulent discharge was associated with the areas of ulceration (B).
Imaging
Radiographs of the thorax and right forelimb were performed under sedation. Thoracic radiographs revealed a solitary 2.9 cm (height) mass in the left caudal lung lobe (Figure 2). Right forelimb radiographs suggested bone lysis of the P3 of digits 1 and 2.

Skin Cytology
Skin samples from the ulcerated areas of the nail beds were collected by scraping the surface of the skin with a scalp blade and then were stained with Diff-Quik for cytologic evaluation. Bacterial rods and cocci were visualized. Neutrophilic inflammation and multinucleated epithelial cells were also present.

Skin Pathology
The skin samples were submitted to a clinical pathologist for analysis. Large clusters of neoplastic epithelial cells were noted, as well as many inflammatory leukocytes, rods, and cocci. The pathologist’s diagnosis was carcinoma, chronic neutrophilic inflammation, and bacterial infection. The owner declined further diagnostics for the abdominal mass.

DIAGNOSIS
Initial Diagnosis
Combined with radiographic evidence, primary pulmonary carcinoma with metastasis to the digits of the right front foot and bacterial infection were tentatively diagnosed.

Definitive Diagnosis
Due to the presence of a mass in the lung and the lysis of the digits, the final diagnosis was primary bronchial carcinoma with metastasis to the digits, also known as lung-digit syndrome.

Cats with pulmonary neoplasia commonly have a history of increased lethargy, depression, anorexia, diarrhea, and vomiting.1 Our patient showed signs of systemic disease, including anorexia, depression, digital pain, and lameness.

However, of all cats with pulmonary neoplasia, only 25% to 50% present with respiratory signs over the course of their disease.2,3 Since this patient did not show respiratory signs, he fit well into the defined clinical picture of primary metastatic bronchial adenocarcinoma.

Although little information is available, metastasis of a pulmonary neoplasm to the digits appears to be rare. In one report of 116 cases of feline primary pulmonary neoplasia, only one case had digital involvement.4 Much like our patient, the most common presenting complaint for cats with metastasis to the digits is lameness and pain associated with one or more limbs.

Differential Diagnosis
The differential diagnosis for the skin lesions in this cat includes neoplasia, infectious paronychia (bacterial or fungal), and immune-mediated disease.5

THERAPEUTIC OPTIONS
Prognosis for cats with metastasis of primary pulmonary carcinoma to the digits is generally grave. Advanced age may contribute to this shorter survival time, but treatment options are limited. A recent retrospective study of 36 cats with this condition found mean survival time to be 58 days (median, 64 days), with a range of 2 to 122 days.5

FIGURE 2. This lateral radiograph shows an approximately 2.9 cm (height) soft tissue mass most likely residing in the left caudal lung lobe.
In this case, we did not attempt treatment, and the owners opted for euthanasia due to short survival time associated with current available treatments and poor quality of life of the patient. Palliative care would have consisted of pain control and treatment of the secondary infections.

Amputation
For those with digit metastasis, digital amputation as a treatment option has limited benefit; the median disease-free interval in cats with and without evidence of a lung mass at time of amputation was found to be 24 days, with median post amputation survival time being 104 days.6

Tumor Removal
An older retrospective study showed that surgical removal of primary lung tumors resulted in a...
median survival time of 115 days (range, 13–1526 days). Median survival times were 698 days for cats with moderately differentiated tumors, and 75 days for cats with poorly differentiated tumors. However, the survival times did not take into account the presence or absence of metastatic disease at time of surgery.

In a more recent study, signs, such as dyspnea and pleural effusion, as well as evidence of metastasis, were shown to be associated with significantly lower survival times.2

Chemotherapy
Limited studies have evaluated the use of chemotherapy in cats with evidence of primary pulmonary neoplasia and metastatic disease. One case report documents management of a single cat that had a well differentiated pulmonary carcinoma and no evidence of metastatic lesions, using lobe resection and adjuvant therapy with mitoxantrone.8

IN SUMMARY
• Primary metastatic bronchial carcinomas can be difficult to diagnose and may present with lameness as a primary complaint, as opposed to respiratory signs.
• Consider lung-digit syndrome as a possible differential diagnosis for an older cat presenting for progressive single or multiple limb pododermatitis and lameness.
• Difficulties of treatment and prognosis should be considered during management.
• The majority of cats diagnosed with metastatic primary pulmonary adenocarcinoma are euthanized due to continued lameness or nonspecific signs of disease, including anorexia, depression, and lethargy.

CBC = complete blood count; FNA = fine needle aspiration

References

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