

Figure 4. Electron micrograph. Pulmonary arteriole; dog. Neoplastic lymphocytes free within lumen. Bar = 6 μ m.

plastic cells are all consistent with the disease as it has been described in humans and dogs. The clinical presentation in this case is unique because it centers around the involvement of bone marrow rather than the central nervous system. Additionally, the vast majority of cases that have been examined in humans and the few in dogs have expressed cell markers of either B or T lymphocytes. Although definitive immunohistochemical characterization of lymphocyte type was not accomplished, the current case appears to have neoplastic cells originating from poorly or undifferentiated lymphoid cells that prior to malignant transformation had not devel-

oped the capability to express those antigens examined in this report.

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Dermoid cysts in cats: two cases and a review of the literature

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A 10-year-old neutered male domestic shorthair cat (no. 1) was presented for examination of a subcutaneous left sublumbar mass. The mass had been palpated by the owner approximately 1 month prior to examination. The mass was firm, nonpainful, oval, and approximately 6 x 4 cm. Pal-

pation suggested the mass was located deep within the abdominal muscles of the left flank. Surgical exploration revealed a well-circumscribed, encapsulated mass between the internal abdominal oblique and transversus abdominis muscles. The minimal vascular supply to the mass was ligated, and the mass was removed. Closure of the wound was routine. The incision healed uneventfully, and 1.5 years later there was no recurrence of the mass or other complication. Histologic examination of the mass revealed a keratin-filled cyst lined by stratified squamous epithelium resembling normal epidermis. Widely scattered adnexae were associated with the cyst wall. The histologic diagnosis was dermoid cyst.

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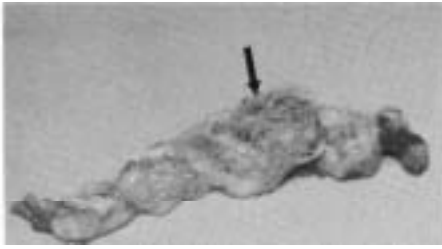


Figure 1. Dermoid sinus excised from the flank of cat no. 2. The sinus has been opened to show the hair that lines the sinus (arrow.)

A 7-month-old spayed female domestic shorthair cat (no. 2) was presented for examination of a sinus in the right flank. Two deep masses had been palpated by the owner for the previous 4 months. Shortly prior to examination, 4 masses were palpable and the sinus had begun to drain. The owner observed a tuft of hair protruding from the drainage site, but no pain, irritation, or systemic signs were reported.

Physical examination revealed a healthy cat with a small draining sinus in the right paralumbar region. Hair protruded from the sinus, and the sinus was neither painful or inflamed. Deep palpation identified 4 separate masses that varied in size from 0.5 to 1 cm in diameter. The 4 masses were aligned in linear array.

Surgical exploration of the sinus revealed that the 4 masses

were connected by a strand of connective tissue that descended through the muscle layers to the peritoneum at the midpoint of a line drawn from the iliac crest to the inguinal canal (Fig. 1). After excising the tract, the muscle, subcutaneous, and skin layers were anatomically reapposed. The incision healed uneventfully, and no further problems have been reported by the owner.

Histologically, the masses were haired skin with dermal cystic structures lined by stratified squamous epithelium. The cyst lumen contained squamous debris and numerous hair shafts extending from the wall of the cyst. Hair follicles and sebaceous and apocrine gland adnexal structures were also observed (Fig. 2). The histologic diagnosis was dermoid cyst.

Histologically, dermoid cysts/sinuses are lined with stratified epithelium resembling normal skin with adnexae and filled with keratinous material.⁷ They usually occur on the dorsal midline but can occur in other locations.⁵ In the veterinary literature, cutaneous dermoid cysts or sinuses have been described as structures arising on the dorsal midline of dogs as a result of failure of the skin to separate from the neural tube.^{1-6,8} The dermoid sinus may provide an open conduit from the skin surface to the dura mater.³ Leakage of cerebrospinal fluid or ascending infection and meningitis or meningomyelitis may result.

Cutaneous dermoid cysts are most often seen in the Rhodesian Ridgeback, Shih Tzu, Boxer, and Kerry Blue terrier breeds and are usually diagnosed in young animals.³ Dermoid cysts are considered to be inherited as a simple recessive trait in Rhodesian Ridgebacks.

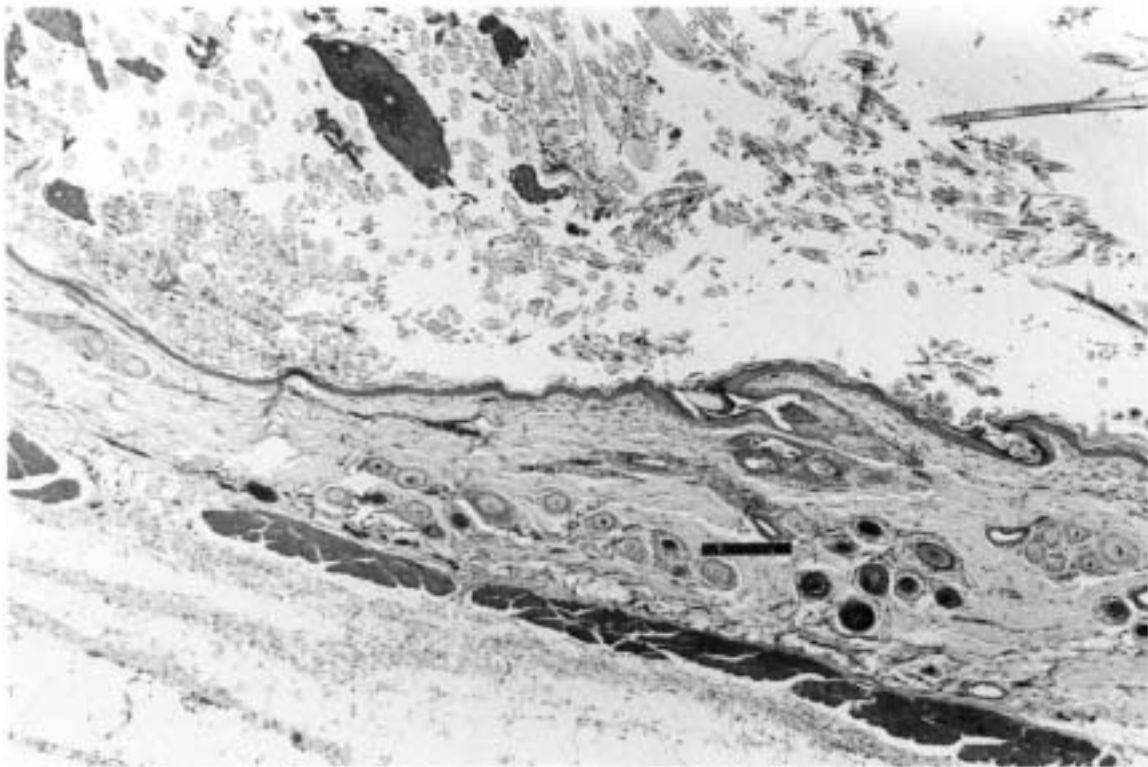


Figure 2. Dermoid cyst in cat no. 2. The cyst wall is composed of well-differentiated keratinizing stratified squamous epithelium with numerous hair follicles and adnexal structures. The lumen of the cyst contains keratinaceous debris and hair. HE, bar = 200 μ m.

Cutaneous or subcutaneous cysts of all types are considered rare in cats.² A literature search yielded no reports of cutaneous or subcutaneous dermoid cysts in cats.

The structures reported here were histologically compatible with the description of the dorsal midline structures in dogs but, because they did not communicate with the spinal canal, these cysts posed no danger or potential danger to the animal from central nervous system infection.

These structures were present in the flank instead of along the dorsal midline, possibly as a result of faulty embryologic fusion of adjacent dermatomes. The dermoid cyst in cat no. 2, considering its young age, probably was a congenital disorder; however, cat no. 1 was 10 years old at the time of presentation. It was not known how long the cyst in cat 1 had been present or if it had grown in size immediately prior to presentation.

Dermoid cysts have been classified according to depth of penetration of the sinus.¹ Class I cysts extend from the skin to the supraspinous ligament, class II cysts do not extend as deeply but are connected to the supraspinous ligament by a fibrous band, and class III cysts are similar to class II cysts but have no connecting band to the ligament. A fourth class has been proposed, in which the cyst extends to the spinal canal and is attached to the dura mater.^{1,2} This class is analogous to the pilonidal sinus of human beings, which usually occurs in the coccygeal region.² The term pilonidal cyst, which by definition means any cyst containing a tuft of hair, is usually used synonymously with the term dermoid cyst in veterinary medicine.

Perhaps 1 reason for the confusion over the term dermoid cyst is that many deep anomalous structures can have structural components of epithelium and can be loosely termed dermoid cysts by pathologists. A recent textbook⁵ has subclassified these cysts in an effort to more clearly define each type from a histologic standpoint. In this classification system, dermoid cysts are considered a type of follicular tumor. More widespread application of the classification system may

be helpful to pathologists and clinicians for separating benign lesions from those with potential for serious complications.

The surgical treatment of dermoid cysts is straightforward and involves careful dissection of the cyst. Although dermoid cysts are reported to involve only the skin or subcutaneous tissues, the cyst in cat no. 1 was found isolated between muscle layers of the flank and the sinus in cat no. 2 extended to the peritoneum. When excision of the cyst involves creation of an abdominal wall defect, care should be taken to ensure that anatomic closure of the defect is accomplished to avoid subsequent herniation of abdominal contents.

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Central nervous system neosporosis in a foal

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Neospora caninum is a tissue cyst-forming protozoan parasite that is a recognized cause of abortions in cattle^{1,3,9,16,19,20} and of neonatal morbidity and mortality in dogs,^{6,8,9} Molec-

ular biologic¹⁵ and immunologic¹⁷ studies indicate that isolates from dogs and cattle are identical. Developmental stages of *N. caninum* are structurally similar to *Toxoplasma gondii*, and the 2 parasites are not readily differentiable using routine histologic methods.^{9,13} *Neospora caninum* has also been reported in goats,^{2,5} sheep,⁷ black-tailed deer,²² and horses.^{10,12}

A 1-month-old female Quarter Horse foal was presented for examination to the School of Veterinary Medicine, Madison, Wisconsin. The foal had circled its mare since birth, always to the right. If the foal was separated from the mare, it could not find her without assistance, and it tripped over

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