

## Case Report

# Cutaneous Mastocytosis and Mucinosis with Gross Deformity in a Shar pei Dog

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**Abstract**—An 8-year-old Chinese Shar pei dog was examined because of gross deformity of the hind limbs. The deforming soft tissue swellings were associated with mucinosis and mastocytosis.

**Key Words:** Mucinosis; Mastocytosis; Shar pei.

### INTRODUCTION

Generalized demodicosis, skin-fold dermatitis, folliculitis and cutaneous manifestations of hypothyroidism are commonly recognized skin disorders in Chinese Shar pei dogs (1). The apparent high risk of the Shar pei for skin diseases was evidenced by a recent publication showing that 49.2% of 118 dogs examined over a 2-year period at the New York State College of Veterinary Medicine had skin disease (2). One disorder that appears somewhat unique to the Chinese Shar pei is cutaneous mucinosis; six of the 118 dogs examined in the New York State Veterinary College study had mucinosis as a primary complaint or as a concurrent problem to another skin disorder, and in a review of seven dogs in another study with focal mucinosis, three were Shar peis (3). In the present report, a Shar pei dog with gross limb deformity associated with cutaneous mucinosis and mastocytosis is described.

### CASE REPORT

An 8-year-old neutered female Shar pei dog was examined at the University of California Veterinary Medical Teaching Hospital because of gradual distension of the soft tissues of the distal hind limbs over a 2-year period of time. The animal had received only brief periods of prior treatment with glucocorticoids without apparent benefit. The dog had undergone two prior surgical procedures for entropion.

Physical examination revealed gross soft tissue enlargements of the distal hind limbs that did not

extend to or involve the digits or metatarsal regions (Fig. 1). The mass-like lesions were soft and fluctuant, and non-painful to the animal on palpation. There were superficial skin excoriations overlying these lesions, which were attributed to urine scald and trauma associated with the dog trying to ambulate with these bulky and cumbersome swellings. The soft tissues overlying the tail were also swollen and fluctuant. The left popliteal lymph node was prominent and firm on palpation. The dog also had a short tail, a freckled coat color, and many short stiff hairs throughout the hair coat; the owner described these traits as undesirable deviations from the breed standard.

The hemogram and serum biochemical findings were normal. The resting  $T_3$  and  $T_4$  concentrations were normal. The serum immunoglobulin A concentration was  $0.32 \text{ mg.ml}^{-1}$  (normal,  $0.11\text{--}0.93 \text{ mg.ml}^{-1}$ ). Lymphoscintigraphy was done using  $^{99m}\text{Tc}$  injected subcutaneously into the interdigital web of both hind limbs to evaluate lymphatic drainage through the distal extremities and lymph nodes. There was no evidence of deep lymphatic obstruction or extravasation of colloid into the soft tissues of the extremities, and progression of lymph from the interdigital webs to the general circulation was unimpeded. Both popliteal lymph nodes were aspirated for cytologic examinations, and the soft tissue swellings were explored surgically at which time incisional biopsy specimens were obtained. Skin biopsy specimens were also collected from the tail base, and a section of seemingly uninvolved skin was obtained from the proximal thigh.

### CYTOLOGIC AND PATHOLOGIC FINDINGS

Air-dried smears collected from the popliteal lymph nodes were stained with Wright's and examined microscopically. The smears contained sheets of mast cells with well-developed granules and few mitotic figures (Fig. 2).

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Figure 1. Gross soft tissue deformity of the hind limbs in an 8-year-old Shar pei dog.

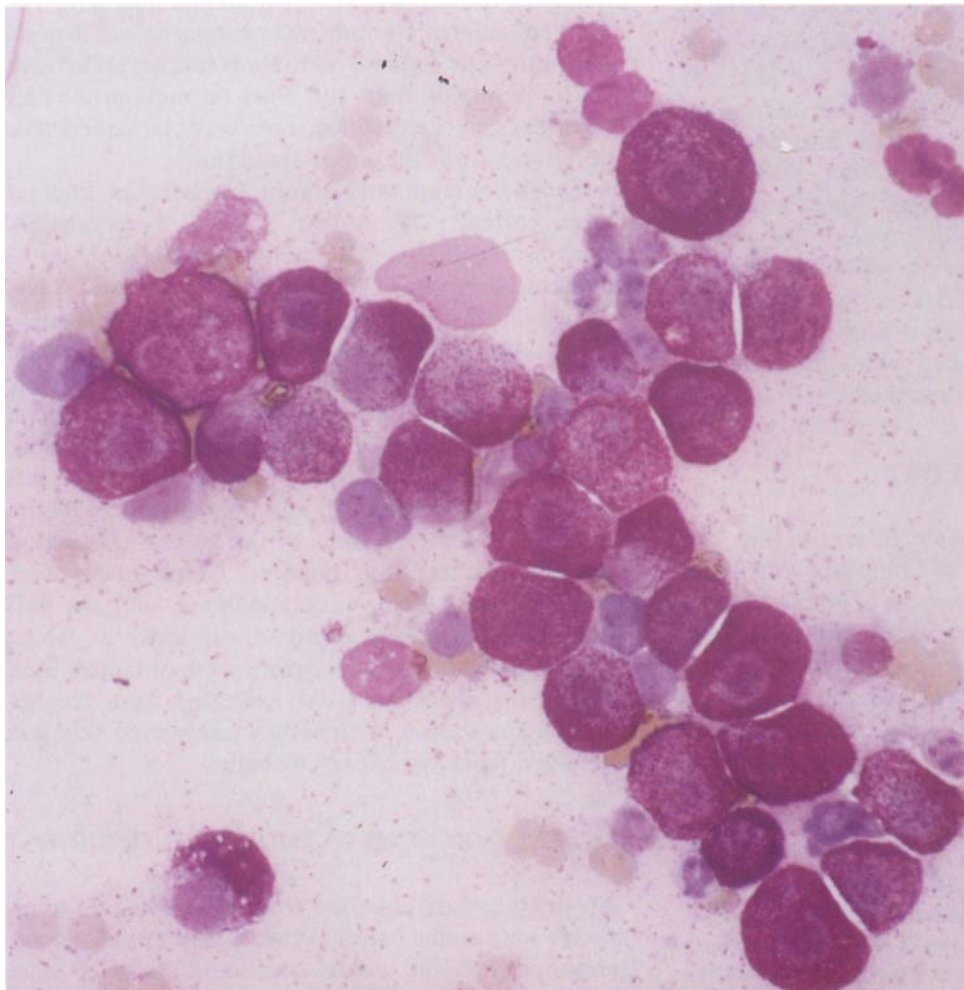


Figure 2. Cytologic preparation from popliteal lymph node showing mast cells with well-developed granules (Wright's,  $\times 400$ ).

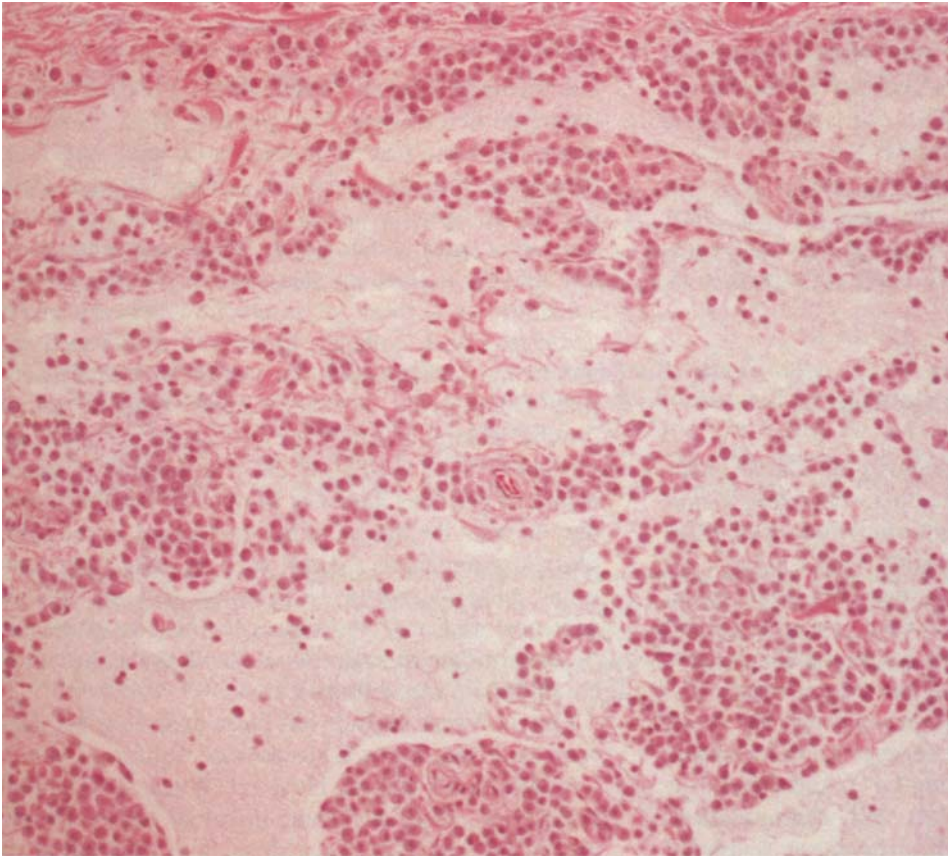


Figure 3. Skin biopsy showing large spaces containing mucinous material in mid-depth and deep dermis, and multifocal aggregates of mast cells (H & E,  $\times 100$ ).



Figure 4. Lateral view of hind limbs 4 weeks after surgery.

The incisional biopsy specimens were fixed in 10% neutral buffered formalin, paraffin-embedded, sectioned and stained with hematoxylin and eosin for microscopic examination. Multiple sections from the soft tissue swellings of both hind legs were examined. All sections were haired skin and had similar pathologic findings. The mid-to deep dermis had numerous coalescing, large spaces that contained

amorphous to slightly vacuolated basophilic material interpreted as mucin (Fig. 3), which stained with Alcian blue dye. There were multifocal mild to moderate infiltrates of polygonal to round cells that had round granular basophilic nuclei and moderate amounts of basophilic cytoplasm with scant to numerous fine basophilic intracytoplasmic granules. The granules were stained metachromatically with

toluidine blue. These cells were interpreted as mast cells. There were also a few lymphocytes and macrophages that had brown granular to vacuolated intracytoplasmic material. The overlying epidermis had mild to moderate acanthosis.

Sections from the tail appeared similar to those previously described except the aggregates of mast cells were lacking. Sections from the apparently uninvolved proximal thigh were compatible with normal Shar pei dog skin.

### CLINICAL COURSE

Following the histologic diagnosis of mastocytosis and mucinosis, additional attempts were made to find evidence of systemic dissemination of mast cells. Mast cells were not observed in buffy coat smears. An abdominal ultrasound examination was done; intra-abdominal organs and structures appeared normal, and cytologic examination of a fine needle aspirate collected from the spleen did not reveal mast cells. Bone marrow aspiration and cytology were not done.

The dog was prepared for surgery using intramuscular diphenhydramine ( $1.0 \text{ mg.kg}^{-1}$ ) and cimetidine ( $5.0 \text{ mg.kg}^{-1}$ ) to inhibit mast cell degranulation. Anesthesia was induced with intravenous thiamylal ( $5 \text{ mg.kg}^{-1}$ ) and diazepam ( $0.3 \text{ mg.kg}^{-1}$ ), and maintained with inhalational isoflurane and oxygen. At the time of surgery, most of the redundant skin and mucin-containing soft tissues were excised from the hind legs, although the mucinous material was much more infiltrative in the left leg than the right rendering excision difficult. Penrose-type drains were inserted, and removed 3 days later. Histologic examination of the excised tissues confirmed the findings described above, revealing diffuse dermal mucinosis and widely scattered mast cell infiltrates extending to the cut edges of tissues excised from both hind limbs. At the time of suture removal 10 days after surgery, the surgical edges were intact, although there was considerable discharge of mucinous material from the distal aspect of the suture line of the left leg, and both legs again felt soft and fluctuant suggesting recurrence of the mucinous material in the soft tissues. The animal was placed on corticosteroid (prednisone) as suggested for control of idiopathic mucinosis of the Shar pei (1) for 3 weeks using a tapering dose ( $20 \text{ mg.M}^{-2}$  body surface area once daily per os for 7 days;  $10 \text{ mg.M}^{-2}$  body surface area once daily for 7 days;  $10 \text{ mg.M}^{-2}$  body surface area every other day for 7 days). Re-examination during week 4 revealed marked reduction in the sizes of the distal extremities, and little clinical evidence of fluctuant material in the soft tissue swellings (Fig. 4). Continued corticosteroid administration (prednisone,  $10 \text{ mg.M}^{-2}$  body surface area given per os every second day) appeared to control the clinical signs associated with mucinosis for the 5 month period of observation following surgery.

### DISCUSSION

Cutaneous mucinosis complicated by mastocytosis is described in a Chinese Shar pei dog. Most previously described Shar peis with mucinosis have had focal cutaneous mucinosis, i.e., a solitary asymptomatic papule, nodule or plaque (3). This dog had profound mucinosis causing deformity. It is tempting to speculate that the deforming mucinosis in this dog evolved somehow as a result of interaction between mucin associated with collagen fibers and multifunctional mediators released from mast cells. It is conceivable that components of the dermal mucoid gel-sol ground substance might be influenced by mast cell mediators. Although all of the components of canine mast cell granules have not been clearly defined, they may include mediators either preformed in the cytoplasmic granules of the cell such as histamine, serotonin, heparin and/or chondroitin sulfates, neutral proteases and acid hydrolases, or may be generated by appropriate stimulation such as the products of arachidonate metabolism (4).

Over a 2-year period, 104 individual Shar pei dogs were examined at the University of California Veterinary Medical Teaching Hospital. Within that clinical population, there were nine histologically confirmed neoplasms affecting eight dogs, and at least three dogs with focal mucinosis (two additional Shar peis with clinical evidence of focal mucinosis were not biopsied for confirmation). Of the nine neoplasms, four dogs had cutaneous mast cell tumors, one dog had intestinal adenocarcinoma and hepatoma, one dog had a benign epibular melanoma, and two dogs had lymphosarcoma.

In the dog described herein, surgical excision of redundant skin and mucinous stromal material improved the dog's appearance, and corticosteroid has provided at least short term (5 months to date) control of the mucinosis. The long term outlook for clinical management of mucinosis and mastocytosis in this dog is unknown.

### ACKNOWLEDGEMENT

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**Résumé**—Un Shar Peï de 8 ans a été examiné pour une déformation au niveau des membres postérieurs. Les épaississements des déformations des tissus mous étaient associés à une mucinose et une mastocytose. [Madeuill, B. R., Akita, G. Y., Vogel, P. Cutaneous mastocytosis and mucinosis with gross deformity in a Shar Peï dog (French title here). *Veterinary Dermatology*, 1992; 3: 171–175].

**Zusammenfassung**—Ein 8 Jahre alter Chinesischer Shar Pei wurde wegen makroskopischer Verformung der Hintergliedmaßen untersucht. Die deformierenden Weichteilschwellungen standen in Zusammenhang mit einer Muzinose und Mastozytose. [Madewell, B., Akita, G., Vogel, P. Cutaneous mastocytosis and mucinosis with gross deformity in a Shar Pei dog (Mastozytose and mucinose der haut mit makroskopischen Veränderungen beim einem Shar Pei hund). *Veterinary Dermatology* 1992, 3: 171–175].

**Resumen**—Un perro Shar pei de 8 años de edad se examinó, debido a la presencia de vastas deformidades de los cuartos traseros. La deformidad de los tejidos blandos se asoció con mastocitosis y mucinosis. [Madennell, B. R., Akita, G. Y., Vogel, P. Cutaneous mastocytosis and mucinosis with gross deformity in a Shar pei dog (Mastocitosis y mucinosis cutánea asociada con vastas deformidades en un perro de la raza Shar pei). *Veterinary Dermatology* 1992; 3: 171–175].