Case of the month: What's your diagnosis?

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History

A 4-year-old Arabian mare was presented to the Equine Hospital, University of Zurich, because of a firm non-painful swelling dorsal to the first phalanx (P1) of the right forelimb. The swelling had been present for three weeks and there was no history of injury to the area. Clinical examination showed mild right forelimb lameness (1/5 American Association of Equine Practitioners (AAEP)[1] scale, grade 1-5) and a negative flexion test. A subcutaneous, firm, nonmobile, nonpainful, 5×3 cm mass was palpated dorsal to P1. The common digital extensor and lateral digital extensor tendons could not be palpated in the region of the swelling. There was no effusion present in the adjacent proximal interphalangeal and metacarpophalangeal joints.

Radiographs of the right front fetlock and pastern joint were taken (Figure 1). An untrasound examination was then performed (Figure 2).

Based on the clinical presentation and diagnostic imaging examination, what is your differential diagnosis? Describe the radiologic and ultrasonographic findings – then turn the page.

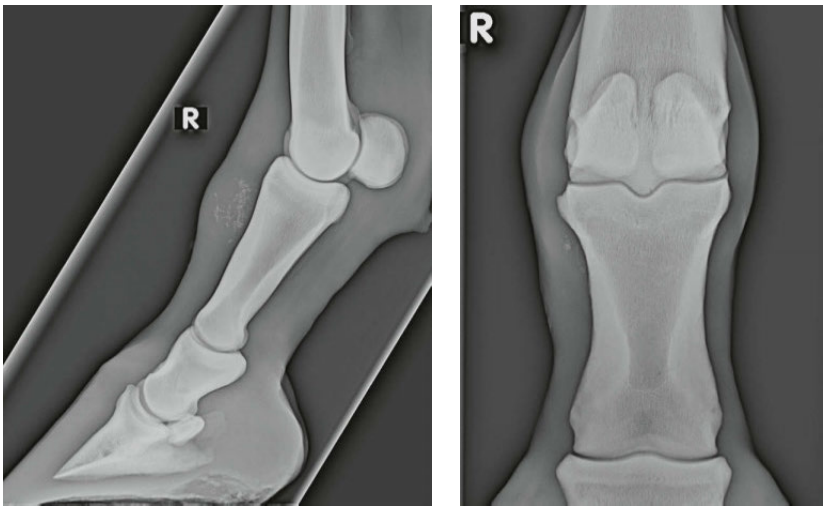

Figure 1: Lateromedial (left) and dorsopalmar (right) radiographic view of the right front distal limb of a 4-year-old Arabian mare presented because of a progressive, firm, non-painful swelling dorsal to the first phalanx.

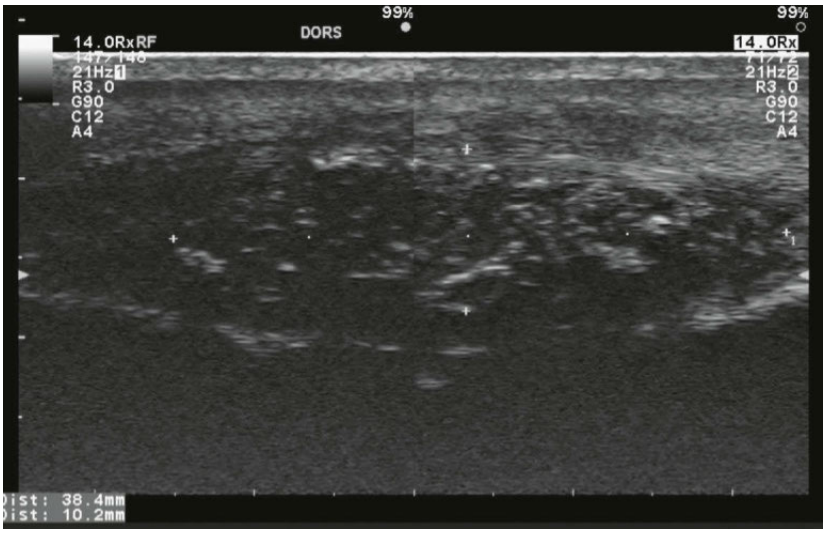

Figure 2: Longitudinal ultrasonographic view of the soft tissue swelling dorsal to P1

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Diagnostic Imaging Findings and Interpretation

On the lateromedial radiographic projection, a soft tissue swelling was visible dorsal to P1 and extended from the level of the proximal metaphysis to the mid-diaphysis (Figure 3). The soft tissue swelling had a heterogeneous content with multifocal opaque areas that were consistent with mineralisation or calcification. There were no abnormalities in the underlying margin of the first phalanx or the distal interphalangeal and metacarpophalangeal joints.

Ultrasonographic examination showed that the mass was approximately 4×3×1 cm and contained multiple hyperechoic foci with acoustic shadowing (Figure 4). The common digital extensor tendon was displaced dorsally and medially by the mass but had a normal echogenic fibre pattern. The proximal extent of the mass was about 1 cm distally to the metacarpophalangeal joint.

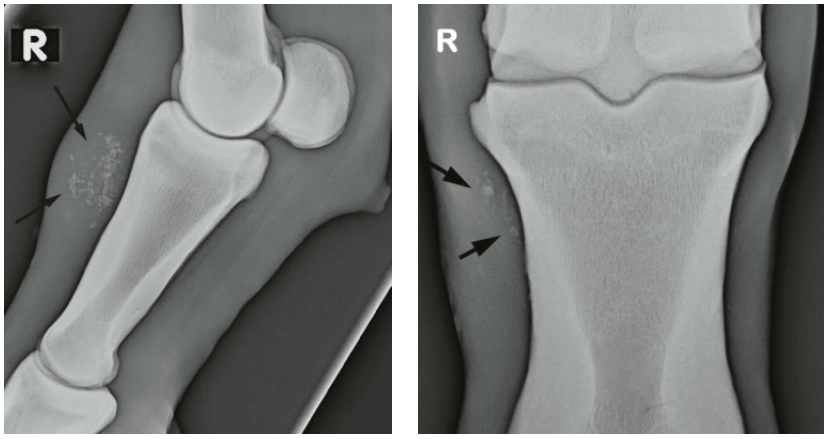

Figure 3: Lateromedial (left) and dorsopalmar (right) radiographic view of P1 of the right forelimb showing multifocal opaque areas consistent with mineralisation or calcification (arrows).

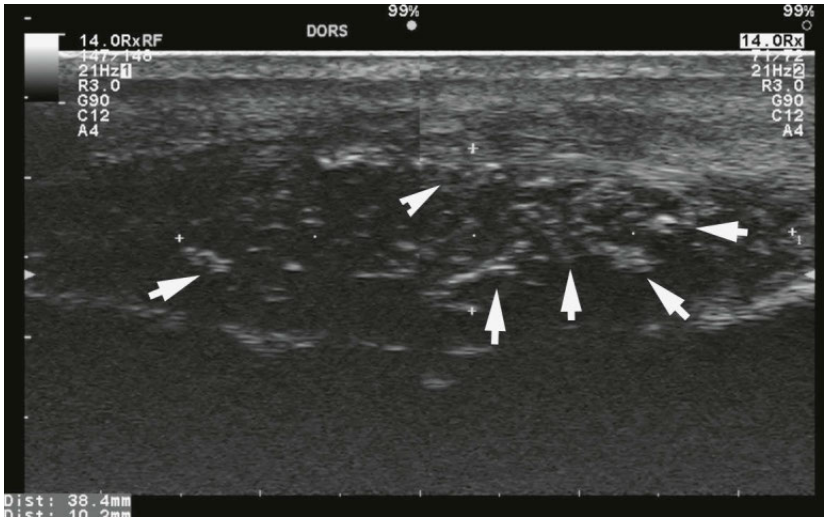

Figure 4: Longitudinal ultrasonographic view of the soft tissue swelling dorsal to P1 showing multiple hyperechoic foci consistent with areas of mineralisation or calcification (arrows).

Based on the radiographic and ultrasonographic findings, our differential diagnosis included mastocytoma, calcinosis circumscipta in an unusual location and/or a mineralised hematoma.

What further diagnostic procedures would help make a definitive diagnosis?

With fine needle aspiration a limited amount of material could be obtained revealing just a few highly differentiated mast cells (Figure 5). Based on this and the clinical as well as the diagnostic imaging findings a presumptive diagnosis of mastocytoma was made.

How would you manage the case?

Treatment and Outcome

Because of the progressive growing of the mass and its proximity to the adjacent synovial structures, it was decided to surgically excise the suspected mastocytoma under general anaesthesia. The next morning, an indwelling catheter was placed in a jugular vein and the mare was premedicated with penicillin G (Penicillin Natrium 10 Mio. IE/20 ml NaCl[a]; 30,000 IE/kg bwt (IV)), gentamicin (Vetagent 50 mg/ml[b]; 7 mg/kg bwt (IV)) and flunixin meglumine (Fluniximin 50 mg/ml solution for injection[c]; 1.1 mg/kg bwt (IV)). The mare was sedated with acepromazine (Prequillan 10 mg/ml solution for injection[d]; 0.03 mg/kg bwt (IM)) and medetomidine (Dorbene 1 mg/ml solution for injection[e]; 1 mg/kg bwt (IV)) and anaesthesia was induced with ketamine (Narketan 100 mg/ml solution for injection[f]; 2 mg/kg bwt (IV) and diazepam (Valium 5mg/ml solution for injection[g]; 0.2 mg/kg bwt (IV)). An orotracheal tube was placed, and anaesthesia was maintained with isoflurane [Isofluran Baxter][h]. For surgery, the mare was positioned in left lateral recumbency, with the affected leg uppermost. After sterile preparation, a curved skin incision was made to access the subcutaneous tissues, which were separated from the tumour for removal of the mass. The common digital extensor tendon was firmly attached to the mastocytoma and therefore was

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completely resected at the level of the tumour. The mass was sharply excised with a safety margin of 0.5 cm. After curettage of the surrounding tissues, primary closure of the wound was carried out in two layers. The subcutis was closed with 2-0 Glycomer 631 (Biosyn) suture in a continuous suture pattern, and the dermis was closed with 2-0 Polybutester (Novafil) suture material in a simple interrupted suture pattern. A half limb cast was applied for recovery and left in place for two weeks because of moderate tension on the sutures and resection of the common digital extensor tendon. Phenylbutazone (2.2 mg/kg sid)[b] was administered orally for the first four days after surgery, and the mare were confined to box rest for 30 days. There was no wound swelling at the time of cast removal and radiographic re-evaluation showed no calcification in the tissues. The sutures were removed and a light bandage was applied before discharge from the hospital; the mare had good weight bearing on the operated limb and no signs of weak or absent digital extensor function.

Histologic examination of the excised mass revealed multiple sheets of a mildly polymorphic population of round cells with abundant pale basophilic cytoplasm (Figure 6). Giemsa staining highlighted intracytoplasmic granules and confirmed the diagnosis of mastocytoma.

The wound healed without complications and two months after surgery, the mare was sound on trot. No recurrence of the mastocytoma was observed in the following two years.

What information regarding the lesion could you give the owner?

Discussion

Mastocytomas are uncommon tumours in horses. Different forms have been described with the most common being solitary tumours, which are often located in the skin[2] and tend to be slow growing, nonmetastatic and superficial. A congenital form of widespread cutaneous mastocytosis has been described in foals, but is considered rare[3]. There have also been a few reports of malignant mast cell tumours affecting bone and synovial tissues with spread to the thoracic and abdominal cavities[4,5].

Solitary cutaneous mastocytomas are often located on the head, trunk and limbs[6]. When located on the limbs, they frequently occur near articular structures[7] and are firm and non-mobile. Although a breed predilection has not been reported, most of the horses in the reports were Arabians[6,8], similar to the present case. Because of the calcified nature of cutaneous mastocytomas located on the limbs, radiographic examination frequently shows soft tissue swelling with a variable amount of tissue mineralisation, often near adjacent synovial structures[9].

In horses, cutaneous mastocytoma should be differentiated from calcinosis circumscripta and nodular necrobiosis, both of which have similar radiographic and

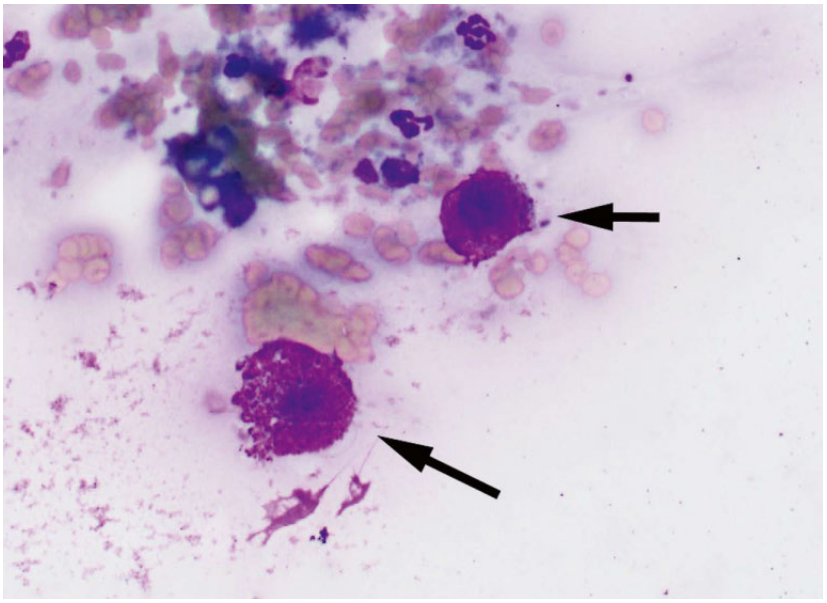

Figure 5: Cytological smear of a sample obtained by fine needle aspiration showing multiple mast cells (arrows), Modified Wright's stain (50×).

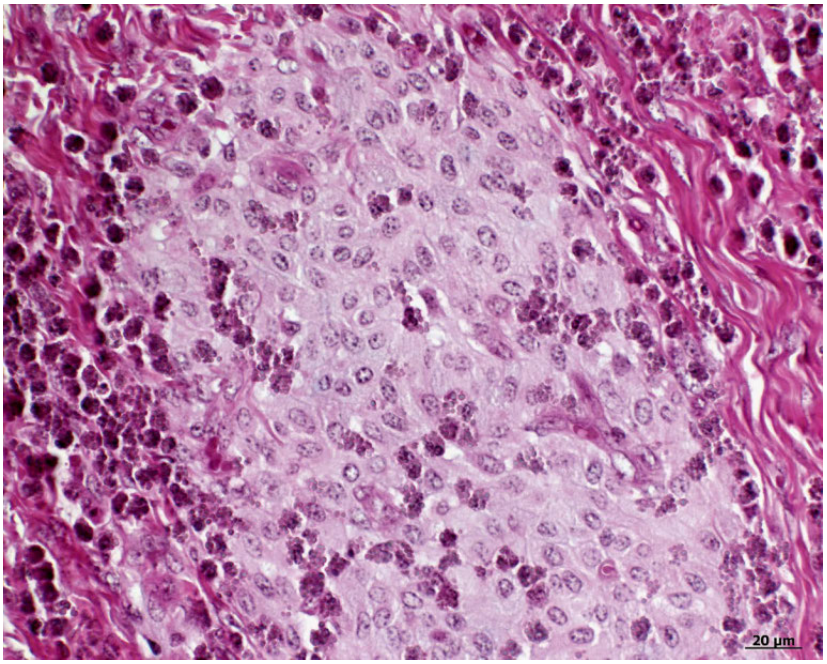

Figure 6: Histological section from the mastocytoma composed of sheets of round cells surrounded by thin strands of connective tissue and eosinophils, that mildy infiltrate the neoplastic sheets. The neoplastic cells have central, variably sized nuclei and abundant pale basophilic cytoplasm with poorly stained or invisible. H&E, 40×

ultrasonographic features[9]. Therefore, a definitive diagnosis requires microscopic evaluation of a sample collected by fine needle aspiration or excisional biopsy[6].

Although many treatment options for cutaneous mastocytoma have been described, including intra- and sublesional injection of corticosteroids, cryosurgery and radiotherapy, surgical excision is the therapy of choice and generally carries a good prognosis. Even incomplete surgical excision or biopsy of a mastocytoma has been associated with spontaneous remission in horses[2]. In the present case, since the mass showed a progressive course and the mare showed a mild lameness of the affected limb, it was decided to remove the mastocytoma surgically.

Manufacturers' addresses

[a] Streuli Pharma AG, Uznach, Switzerland.
[b] MSD Animal Health GmbH, Lucerne, Switzerland.
[c] Biokema SA, Crissier, Switzerland.
[d] Arovet AG, Dietikon, Switzerland.
[e] Graeub AG, Bern, Switzerland.
[f] Vétoquinol SA, Lure, France.
[g] Roche Pharma AG, Reinach, Switzerland.
[h] Baxter AG, Volketswil, Switzerland.

Aknowledgements

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