Primary intraosseous mast cell tumour of the third phalanx in a Quarter Horse

A. M. RITMEESTER, D. B. DENICOLA, W. E. BLEVINS and J. A. CHRISTIAN

Department of Veterinary Clinical Sciences, School of Veterinary Medicine, Purdue University, 1248 Lynn Hall, West Lafayette, Indiana 47907, USA.

Keywords: horse; mast cell tumour

Introduction

Few cases of equine mast cell tumour have been reported in the literature. Most describe solitary nodular lesions of the skin and subcutaneous tissue that occasionally involve the underlying musculature (Altera and Clark 1970; Doran and Collins 1986; Nyrop et al. 1986; McEntee 1991). Lesions are generally confined to soft tissues and appear to be hyperplastic rather than neoplastic. One case involving local invasion of bone by a cutaneous neoplasm has been reported (Riley et al. 1991). The present report describes a case of hindlimb lameness due to a pathological fracture of the third phalanx resulting from a primary intraosseous mast cell tumour. This unique clinical presentation demonstrates that equine mast cell tumours are not always benign soft tissue lesions.

Case history and clinical findings

A 6-year-old Quarter Horse mare was referred to Purdue University Veterinary Teaching Hospital for evaluation of a left hindlimb lameness of approximately 6 weeks' duration. According to the history, the onset of lameness was acute after the mare jumped a hurdle. On presentation the mare was noticeably lame at a walk. The lameness was exacerbated by a distal limb flexion test of the left hindlimb and improved significantly with perineural anesthesia of the medial and lateral plantar digital nerves at the proximal sesamoid bones. Radiographs of the distal limb revealed an intra-articular fracture of the lateral plantar process of the third phalanx, associated with a large, irregular, radiolucent region in the lateral aspect of the bone (Fig 1).

Differential diagnoses

Differential diagnoses for the radiolucent region in the third phalanx included osteomyelitis, digital vascular anomalies with secondary bone loss, keratoma and primary or secondary neoplasms of bone. The case history and physical examination findings did not support a chronic foot abscess or penetrating wound to the sole leading to osteomyelitis of the third phalanx. Standing arteriography of the lateral digital artery demonstrated a lack of vascularity within the radiolucent region, therefore ruling out a digital vascular anomaly. Neoplasia could not be excluded without surgical exploration of the foot and biopsy of the lesion. Due to the extensive loss of third phalangeal bone structure, the prognosis for successful healing of the fracture and return to riding soundness was poor and the mare was subjected to euthanasia at the owner’s request.

Pathological findings

A complete necropsy was performed. On sagittal section of the left hind foot the radiolucent region in the third phalanx was filled with a firm, grey, granular tissue forming a nonencapsulated mass. At its periphery, the mass was closely associated with necrotic and remodelling bone. Cytological preparations of tissue
scrapings from the mass were highly cellular, containing a monotonous population of round to polygonal mononuclear cells with moderate amounts of cytoplasm. Fine to coarse, deep blue to purple cytoplasmic granules were evident in the Wright's stained preparations. Variable numbers of eosinophils and moderate amounts of tissue debris were also present. Histologically, the mass consisted of solid sheets of mononuclear cells with metachromatic cytoplasmic granules evident with toluidine blue staining, intermixed with dense infiltrates of eosinophils and aggregates of necrotic cellular debris were also present. This cytological and histological appearance is typical of a well differentiated mast cell tumour. No other mast cell tumours were observed grossly or microscopically elsewhere in the body.

Discussion

Mast cell tumours are rare in horses. They are usually confined to the dermis and subcutaneous tissues, and present as discrete nodular swellings varying from 2 to 20 cm diameter. They can occur anywhere on the body but are most frequently found around the head (Altera and Clark 1970; Stannard 1976; Pulley and Stannard 1990b; McEntee 1991). In addition, cases of scleral mastocytosis (Ward et al. 1993) and nasopharyngeal mast cell tumour (Richardson et al. 1994) have been described in the horse. In dogs, mast cell tumour is one of the most common neoplasms are generally benign soft tissue lesions that appear to be hyperplastic rather than neoplastic. They grow slowly without evidence of invasion or metastasis, and mitotic figures are rarely seen (Stannard 1976; Pulley and Stannard 1990b; McEntee 1991). Recurrence of cutaneous mast cell tumours has not been reported even after incomplete excision, and spontaneous regression was observed in a case of generalised cutaneous mastocytosis in a foal (Cheville et al. 1972). One case of malignant mast cell tumour that invaded the distal tarsal joint and metastasised to the inguinal lymph nodes in a horse has been described (Riley et al. 1991).

However, in that report, the primary tumour was confluent with the dermis over the dorsal aspect of the hock and invasion of the bony structures by the tumour occurred secondarily. To our knowledge, primary mast cell tumours arising within trabecular bone have not been reported in any species. In the case presented in this report, the mast cell tumour originated within the third phalanx and caused active bone resorption and remodeling, which resulted in a pathological fracture and lameness. Our findings conflict with the current perception that equine mast cell tumours are benign lesions confined to the skin and subcutaneous tissues.

The acute onset of lameness in this case probably coincided with fracture of the lateral plantar process of the third phalanx into the distal interphalangeal joint, secondary to bone resorption caused by the mast cell tumour. This case demonstrates that equine mast cell tumours may be a rare cause of bone resorption, pathological fracture and lameness in the horse, and suggests that this tumour should be considered in the differential diagnosis for locally invasive masses in any tissue.

References