Mass on a lip of a horse

Abigail Guija de Arespacochaga[1], Verena Zehetner[2], Martin Reifinger[3], Ilse Schwendenwein[1]

[1] Clinical Pathology Platform, [2] Equine Internal Medicine, [3] Institute of Pathology, University of Veterinary Medicine Vienna, Austria

Corresponding Author: abigail.guija@vetmeduni.ac.at

Case presentation

A 19-year-old, Arabian mare was presented to the Equine Clinic at the Veterinary University of Vienna for evaluation of a lesion located on the upper lip below the left nostril. The mass had been noticed by the owner 4 weeks prior to presentation when it had the size of a pea with an intact skin surface. The horse scratched the lesion inciting leakage of whitish viscous material followed by granulation and crust formation. The mass increased significantly in size during the last week, with the recurrence of non-healing ulcerated areas and drainage of viscous fluid. Cleaning of the lesion with chlorhexidine was the only treatment. There were no other significant medical problems in the patient's history.

Clinical examination

Clinical examination revealed normal vital parameters and good body condition. The mass was about 2.0 cm in diameter, well-circumscribed, firm and ulcerated in some areas. No other systematic abnormalities were detected at the time of presentation. Ultrasonographic examination of the lip mass revealed a 2,5cm well-defined solid round mass, without infiltration of the surrounding tissue. Samples for cytologic evaluation were obtained by fine-needle aspiration; the slides were air-dried and stained with a modified rapid Romanowsky stain (Hemafix®).

Cytology description

The smears were highly cellular with moderate cell preservation. Moderate amount of red blood cells in the background accompanied by large amounts of granular cellular debris; in some areas clusters of irregular basophilic and eosinophilic granular material was noted. There was a population of round cells with large amounts of clear cytoplasm and centrally to slightly eccentrically positioned nuclei with uniform nuclear size and clumped chromatin. Some cells showed few metachromatic cytoplasmic granules; in others foamy cytoplasmic vacuoles were noted. Numerous eosinophils were observed along the smear but they also formed coalescing aggregates of medium size. Moderate numbers of macrophages and neutrophils were present. Round cells were suspicious of mast cells, and cells were stained with toluidine blue and Wright stain (Hematek®) to support the diagnosis by enhancing visualization of metachromatic granules. No parasitic organisms were seen.

A cytological diagnosis of a mast cell tumor was made.

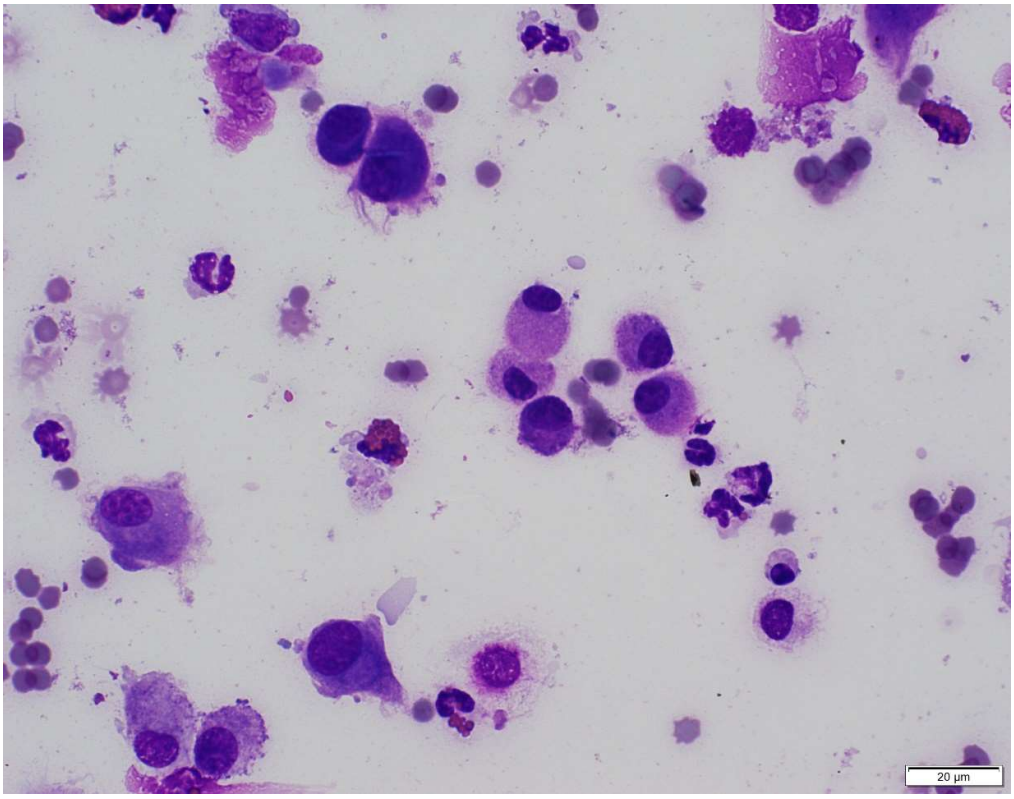

Fig. 1 – FNA ulcerated lesion, modified rapid Romanowsky-Stain (Hemafix®) (x400)

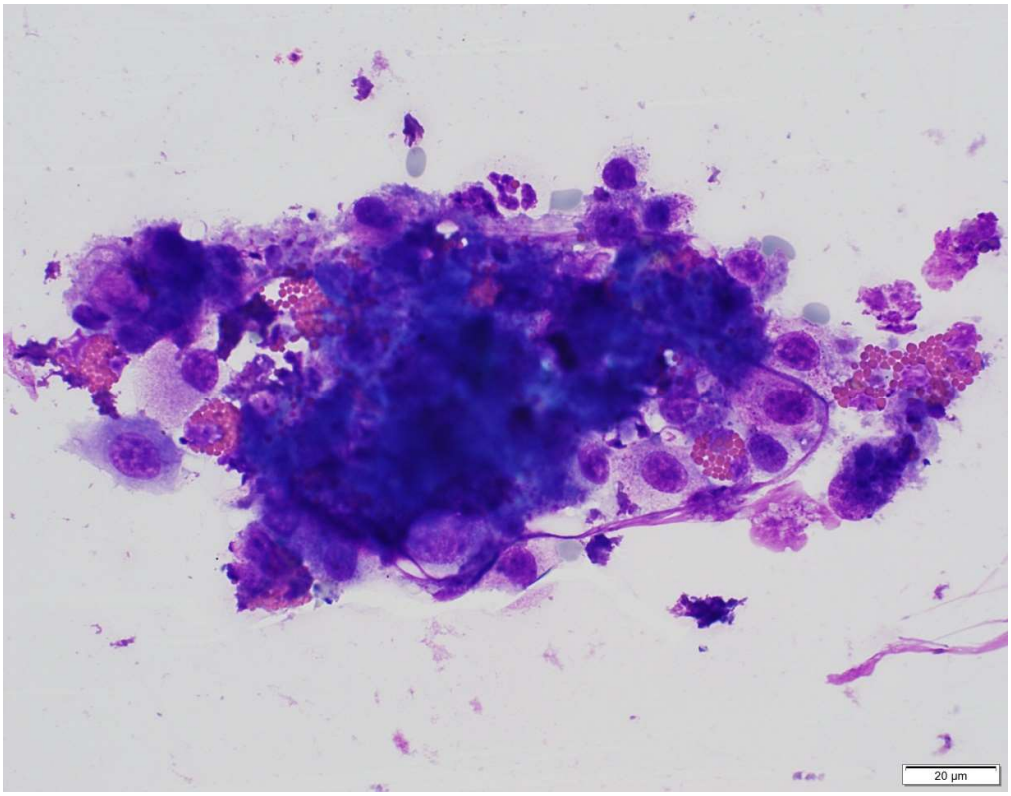

Fig. 2 – FNA ulcerated lesion, modified rapid Romanowsky-Stain (Hemafix®) (x400)

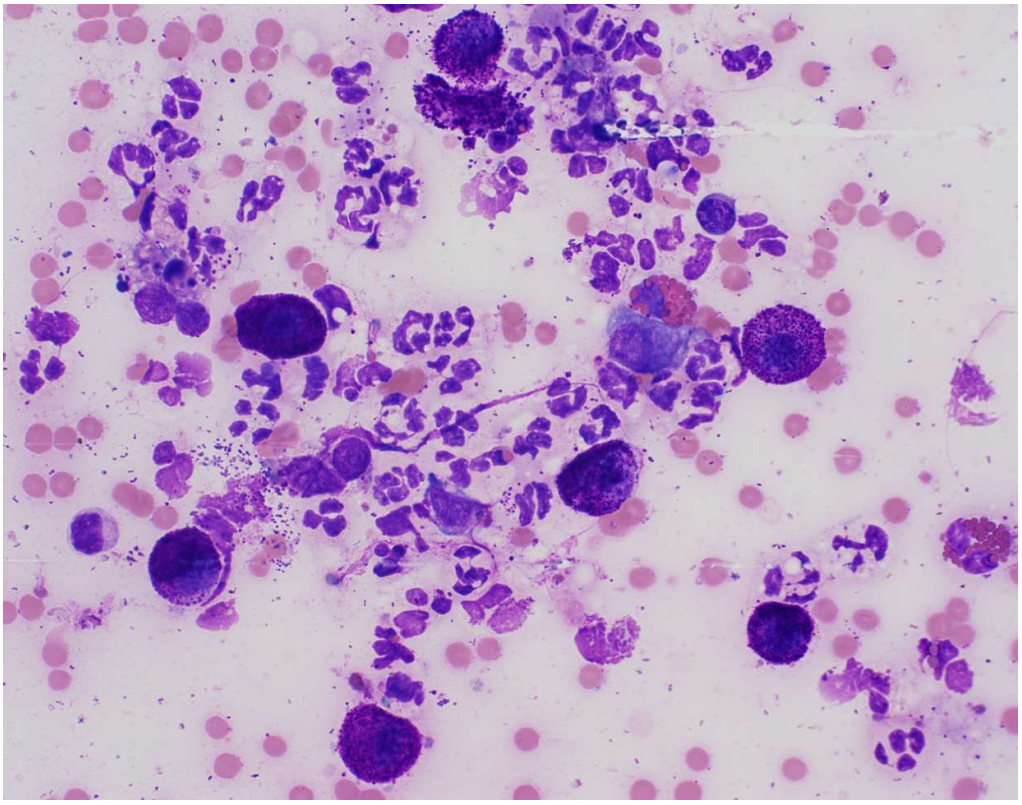

Fig. 3 – FNA ulcerated lesion, Wright Stain (Hematek®) (x400)

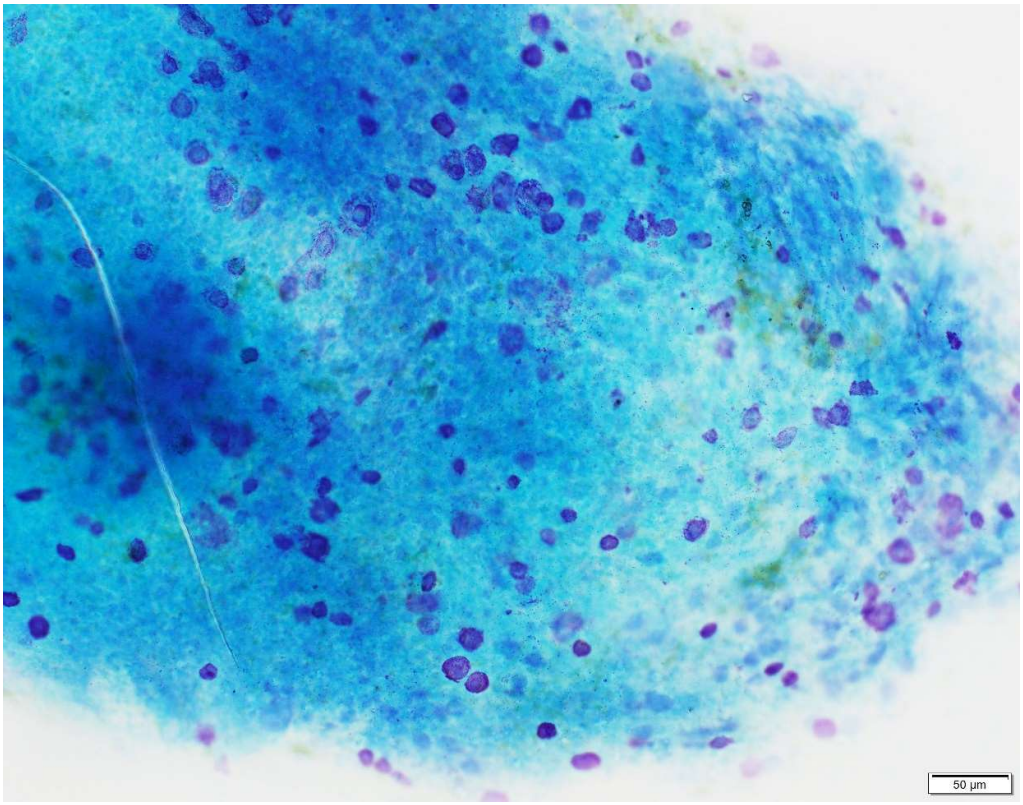

Fig. 3 – FNA ulcerated lesion, Toluidine blue (x200)

Questions:

What are the possible differential diagnoses?
What stains would you use to confirm the diagnosis?

Follow up

The mass was surgically removed and the tissue was fixed in 10% neutral-buffered formalin and routinely processed for histologic evaluation, which confirmed the cytologic diagnosis of a mast cell tumor. 3 years later the horse presented a mass lateral of right nostril with approximately 3.5 cm in diameter. Cytology and histology confirmed a mast cell tumor.

Histologic description

The specimen for histological examination represents the transition zone from skin to oral mucosa. H.E.-staining revealed a solid tumor in the region of seromucous salivary glands, reaching from the aboral side of the glands to the papillary body of the skin. The tumor mainly consisted of roundish to polygonal cells with oval to round nuclei and ample cytoplasm with pale violet granulation. The cells were intermingled with varying numbers of eosinophilic granulocytes. Furthermore, multifocal masses of inhomogenic eosinophilic material demarcated by collagenous tissue and/or histiocytes were distributed throughout the tumor. Toluidine blue staining confirmed metachromasia of the cytoplasmatic granulation.

Discussion

In horses mast cell proliferations are mainly observed in two forms either systemic mastocytosis of young foals during the first months of life or cutaneous mast cell tumors in adult animals. Opposed to small animals cutaneous mast cell tumors in horses represent only 3% of all cutaneous tumors. Equine mast cell tumors are solitary well demarcated cutaneous tumors, located mostly on the head and trunk sometimes associated with joints on limbs. Usually they show a benign behavior. In one study only one third of mast cell tumors exhibited nuclear pleomorphism which was associated with local infiltrative growth. Recurrence and visceral metastasis are rare. Surgical excision is curative in 90% of the cases. Superficial ulceration and prominent eosinophilic infiltration together with fibrosis and necrosis and sometime calcinosis are common in equine mast cell tumors. Prominent eosinophilic infiltration makes differentiation between eosinophilic granuloma and mast cell neoplasia challenging. Presence of mitotically active mast cells corroborates the diagnosis of a mast cell tumor.

Recognition of mast cells may be hampered by poorly granulated cells and/or poor staining of the granules. Mast cells are notorious for inappropriately staining results with modified Romanowsky-type quick stains, which are routinely used in most clinics. This does not only affect neoplastic mast cells, because specials stains such as Wright, May-Gruenwald-Giemsa or toluidine-blue are recommended for the enumeration of mast cells in bronchoalveolar fluid. Increased solubility of granules in aqueous solutions or their insufficient fixation by some staining protocols are suggested reasons for poor staining results. Prolongation of fixation times in methanol before staining as well as increased staining times had no positive effect on staining results. A low concentration of substances such as heparin or glycosaminoglycans in poorly differentiated cells might be another explanation for the lack of well stained granules but seems less likely as the problems also occur with well differentiated cells.

However the presence of eosinophil infiltration together with a round cell population should trigger the application of special stains either to confirm or rule out a mast cell neoplasia.

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