



CASE OF INTEREST

A case of Methicillin-resistant *Staphylococcus aureus* (MRSA) dermatitis in a cat

By Richard Fox, Veterinary Pathologist

A twelve-years-old domestic long haired cat presented with an ulcerated discharging nodular mass on the right hand side of the face beneath the eye. Various types of systemic antibiotics had been used with no improvement. The right submandibular lymph node was enlarged and radiographic examination of the chest and skull did not reveal any abnormalities. A large incisional biopsy was taken and sent for histopathological examination together with a dry swab for bacterial culture and sensitivity.

Histological examination of the skin biopsy revealed two portions of haired skin. These displayed diffuse ulceration with marked, granulocyte serocellular crusting. There was severe diffuse dermal inflammatory infiltrate with effacement of adnexal structures in areas of most intense inflammation. This extended into the underlying muscle. There were areas of eosinophilic coagulation necrosis surrounded by bands of macrophages and eosinophils with smaller numbers of neutrophils and plasma cells.

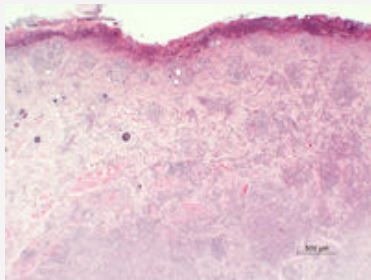


Figure 1. Histological section of the skin displaying ulceration and surface exudation with loss of dermal adnexae by the marked inflammatory infiltrate. (x2.5 obj.). HE Stain.

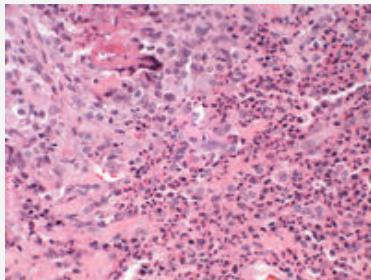


Figure 2. Histological section of the dermal inflammation. Large number of eosinophils are present and towards the top of the photograph there is a foreign body-type multinucleate macrophage surrounding eosinophil granules. (x40 obj.). HE Stain.

There were colonies of bacteria visible on the ulcerated surface but on staining with Gram moderate numbers of Gram positive coccoid intracellular and extracellular bacteria were observed.

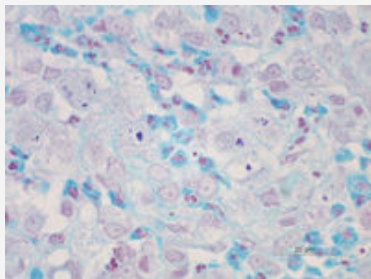


Figure 3. Histological section of the inflammation with a mixture of macrophages, fibroblasts and granulocytes with single and multiple Gram positive coccoid bacteria (x100 obj.). Gram Stain.

Culture of the swab identified *Staphylococcus aureus* which was identified as Methicillin-resistant *S. aureus*.

Most studies indicate that *S. intermedius* is the most prevalent coagulase-positive staphylococcal species isolated from dogs and cats. *S. aureus* is capable of colonising the healthy canine hair coat, but the frequency of *S. aureus* isolation from dogs and cats is generally low, typically being recovered from <10% of samples.

Several reports have documented an apparent increase in the number of MRSA infections in companion animals in recent years. The majority of these infections are associated with post-operative infections and open wounds. The presence of implants such as suture material or orthopaedic devices appears to be associated with the persistence of MRSA infection. Foreign bodies with large surface area are thought to increase the potential for bacterial adherence and perpetuation due to the tissue trauma and devitalisation.

Formation of inflammatory granulation tissue with prominent eosinophil infiltration in cats occurs as part of the feline eosinophilic granuloma complex or with inflammation in response to parasites.

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JOURNAL Articles(with e-links)

1. Kondo H, Onuma M, Shibuya H, Sato T. Spontaneous tumors in domestic hamsters. Vet Pathol. 2008 Sep;45(5):674-80. [Link](#)

A total of 90 tumors from 85 domestic hamsters (70 Djungarian hamsters and 15 Syrian hamsters) were examined by histology. In the Djungarian hamsters, 64 neoplastic and 11 non-neoplastic lesions were identified, whereas 14 Syrian hamsters showed neoplastic disease, and one showed non-neoplastic disease. The Djungarian hamsters showed a high prevalence of neoplastic disease, similarly to laboratory Djungarian hamsters. In the Djungarian hamsters, almost all tumors were integumental, whereas hematopoietic tumors were the most common type in the Syrian hamsters. The most common integumental tumors in the Djungarian hamsters were mammary tumors, atypical fibromas and papillomas, and a spectrum of integumental tumors that have not been reported in laboratory Djungarian hamsters were identified. Most mammary tumors occurred in the females, whereas all atypical fibromas were observed in the males. In the Syrian hamsters, plasmacytomas and lymphomas were the most common tumors. The small number of Syrian hamsters in this study may reflect the low prevalence of spontaneous tumors seen in laboratory Syrian hamsters. The mean age of the affected hamsters was 19.8 months, which is relatively advanced.

2. Anders BB, Hoelzler MG, Scavelli TD, Fulcher RP, Bastian RP. Analysis of auditory and neurologic effects associated with ventral bulla osteotomy for removal of inflammatory polyps or nasopharyngeal masses in cats. J Am Vet Med Assoc. 2008 Aug 15;233(4):580-5. [Link](#)

This was a study to determine whether cats undergoing ventral bulla osteotomy (VBO) for removal of inflammatory polyps or nasopharyngeal masses have altered ability to hear and whether polyp or mass removal affects auditory function as measured via air-conducted brainstem auditory evoked response (BAER). 21 cats were sedated and had otic-oral examinations to confirm presence of nasopharyngeal masses; BAER testing was done immediately prior to and following the completion of a VBO and polyp or mass removal. Recheck examination, including otic examination and BAER in sedated cats, was performed when possible. 17 cats met final inclusion criteria, and long-term follow-up was available for 15. Six of 17 had deafness as measured via air-conducted BAER prior to surgery. Mean followup time was 161 days, and there was no change from presurgical status in auditory ability in any cat. Eleven of 17 developed ipsilateral Horner syndrome in the immediate postoperative period, and 1 of 16 had polyp regrowth. Results suggested that in cats, VBO for removal of inflammatory polyps or masses is unlikely to affect hearing as measured via air-conducted BAER. Most cats developed short-term Horner syndrome. Cats with deafness prior to surgery did not regain auditory function. Ventral bulla osteotomy to remove nasopharyngeal polyps or masses provided no functional advantage with regard to restoration of hearing, compared with other surgical techniques.

Lesions of the eosinophilic granuloma complex are usually formed in the skin and oral cavity and are characterised by nodular or diffuse granulomatous dermatitis with multifocal "flame figure" formation. The flame figures are variably sized foci of degenerate collagen bundles. Pathogens are usually absent from these lesions, except in ulcerated areas.

The presence of eosinophils in the dermal inflammatory reaction in this case was initially thought to be representative of the eosinophilic granuloma complex but identification of numerous Gram positive cocci in the inflammation and the subsequent isolation of the MRSA indicated a primary infectious process, possibly due to traumatic implantation or possibly from rupture of adnexae (furunculosis).

Identification of colonised or infected animals is important but routine screening of animals before admission to first opinion practices is probably not practical. However, identification of infection in MRSA suspect cases is important. Samples for microbiological analysis should be collected from animals with non-healing wounds, with non-antibiotic responsive infections or with nosocomial infections.

References:

1. Leonard, F. & Markey, B., 2008. Methicillin-resistant Staphylococcus aureus in animals: A review. The Veterinary Journal, 175(1), 27-36.
2. Ozaki, K. et al., 2003. Abscess-Forming Inflammatory Granulation Tissue with Gram-Positive Cocci and Prominent Eosinophil Infiltration in Cats: Possible Infection of Methicillin-resistant Staphylococcus. Vet Pathol, 40(3), 283-287.

Polyp recurrence and long-term adverse effects were uncommon.

3. Durham AC, Popovitch CA, Goldschmidt MH. Feline chondrosarcoma: a retrospective study of 67 cats (1987-2005). J Am Anim Hosp Assoc. 2008 May-Jun;44(3):124-30. [Link](#)

The histories of 67 cats diagnosed with chondrosarcoma (CSA) from 1987 to 2005 were reviewed. The mean age was 9.6 years, and males were 1.9 times more likely to be affected than females. Chondrosarcomas were diagnosed in the following sites: appendicular and axial skeleton, nasal cavity, facial bones, and extraskeletal sites. Of the 46 (70%) CSA associated with bone, 63% arose in long bones and 37% arose in flat bones. The remaining (30%) CSA arose in the subcutis. In cases available for follow-up (n=24), no definitive evidence of metastases was found. Cats that underwent radical surgical therapies were more likely to achieve long-term control or cure.

LATEST NEWS

Abbey Joins the Vet-XML Consortium.

The VetXML Consortium is dedicated to the creation and specification of VetXML, a proposed common data format for the Veterinary Profession. The purpose of VetXML is to enable the straight-forward exchange of information between disparate IT systems within the profession.

VetXML is a non-proprietary standard under the control of the VetXML Consortium, whose overall direction is under the auspices of SPVS.

We have joined the consortium in order to become involved in this technology as we are undertaking a major re-design of our computer database system which will hopefully be rolled out in 2009. The latter will aid us to access data faster and incorporate new technology in our lab to speed up reporting. Our bespoke reporting however will not change.

Additional info: [External Link](#)

SIDE STORY

High fibre diet prevents gastric ulceration in donkeys.

New research conducted by the Donkey Sanctuary, and announced by Spillers has shown that donkeys receiving a high fibre diet are less likely to suffer from gastric ulceration than those fed a cereal-based diet.

Gastric ulceration is now recognised as a significant problem, particularly in actively trained racehorses, but until now there have not been any studies on the incidence of gastric ulceration in donkeys.

"Donkeys have traditionally been thought of as stoic animals that do not display signs of stress or disease," said Faith Burden, veterinary projects and development manager at the Donkey Sanctuary. "However during routine necropsy examination of donkeys at our Devon sanctuary it became apparent that gastric ulcers were common and that ulceration was, in some cases, extensive."

Examination of 426 donkeys revealed that 41% had been suffering from gastric ulcers and that the composition of the diet had had an effect on the prevalence of gastric ulceration. Donkeys that had been fed a diet including cereal-based concentrates were over 20% more likely to have gastric ulcers when compared to donkeys on a fibre concentrate or forage-only diet.

At Abbey Veterinary Services we undertake all of the routine histopathology for the Donkey Sanctuary. We work closely with the organisation to gather clinicopathological information helping to identify common diseases in donkeys.

For further information on the Donkey Sanctuary visit www.thedonkeysanctuary.org.uk

OUR DETAILS

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BIOPSY TIPS

Cerebrospinal Fluid (CSF) Cytology

The location for CSF collection should be based on the neurological localisation of the lesion. Examination of CSF consists of an examination of the physical characteristics of the fluid (colour, turbidity), the total nucleated cell count, erythrocyte count, protein concentration and cytological examination.

Analysis of CSF should be done as fast as is reasonably possible. Because of the low protein concentration of CSF, cells degenerate very quickly. It should be completed within 30 mins of sampling. After this time significant distortion and cell rupture occurs reducing the cell counts and when very autolysed can often lead to a null cell count.

Dilution 1:1 with 40% ethanol should be undertaken if there is a delay but this will affect the protein concentrations. Fluid samples can also be placed on ice to prolong this time but the sample transport needs to be expedited usually using a same day courier.