Mycobacteriosis in a Brolga (*Grus rubicundus*)

James Gill

Summary

An adult female brolga from a wildlife park was presented with an ulcerating cloacal mass ,weight loss and a palpable egg size and shape abdominal mass after laying only one egg in her clutch.

Biopsy of the cloacal mass revealed a cutaneous mycobactcrial granuloma. Treatment was not attempted and the bird was euthanased ,Post mortem revealed that the palpable abdominal mass was also a mycobacterial granuloma. As well there were granulomas in the liver and scattered throughout the abdomen.

Culture isolated two mycobacterial species 1 from the *Mycobacterium avian* complex and 2 *Mvcobacterium scrofulaceum,*

An attempt is made to give a working overview of Mycobacterial classification.

Case Report

An adult female Brolga (Grus rubicundis) was presented to the clinic with two 6 centimetre ulcerating masses protruding from the cloaca. They appeared to arise from the mucocutaneous junction. She had laid one egg in a clutch of what would normally be two eggs several weeks earlier. She had considerable weight loss and a palpable oval egg-shaped and -sized (six to seven centimetre long axis) mass in her caudal abdomen.

The bird was anaesthetised with an Isoflurane induction and maintenance and a biopsy was performed on !he cloacal mass. Treatment was started with Clavulox per os awaiting for the histopathology results.

Thc histopathological diagnosis was of a mycobacterial granuloma.

No further treatment was attempted and the bird euthanased and post mortemed.

There were multiple granulomas in the liver and the gizzard wall . The granulomas were surrounded by giant cells and had central fibrinoid coagulum with some cleft spaces. The granulomas in the gizzard were considered to be more recent and had masses of degenerate heterophils and obvious bacterial colonies in the central debris.

Zeihl Neelsen stains revealed colonies of acid fast bacilli in the more recent granulomas in the gizzard wall but they were very scarce in the liver lesions,

It is interesting to note that with Diff Quik stains, acid fast bacilli fail to stain and appear as elongated vacuoles with the macrophages on impression smears.
Smears from fresh tissue revealed low numbers of acid fast bacilli (6 per slide).

Culture isolated two Mycobacteria 1, From the *Mycobacterium avium* complex and 2. *Mycobacterium scrofulaceum*.

The wildlife park has by Australian standards a considerable waterfowl and wetlands collection and several low wetland paddocks including the free flying ibises common to all Australian Zoos. Although birds are regularly post mortemed from this Park this is the first case of mycobacteriosis that has been diagnosed.

Discussion

Brolgas occur throughout northern and eastern Australia. The total population is estimated to be between 20,000 and 100,000 birds and is probably stable overall. The most significant threat to brolgas is the loss and degradation of wetland habitats especially from heavy livestock grazing and drainage and reclamation for agriculture. Brolgas have adapted to increased agriculture by breeding in marginal or man-made wetlands and by wintering in grain fields. The preferred nesting sites are freshwater swamps were the birds feed on tubers, insects and small mammals. Brolgas will often nest in brackish water and are the only crane species to have a salt gland (located at the corner of the eyes through which they excrete excess salt).

It is estimated that there are less than 50 Brolgas held in captivity in general collections the majority in Australia. In addition approximately another 50 are held at the Serendip Wildlife Centre. As of 1994 a total of 53 birds were maintained at Serendip; 14 pairs and 25 birds less than 4 years of age.

Mycobacteria have been described as the ducks of the microbial world. The environmental Mycobacteria are often found in wet environments. Because of their hydrophobic cell wall and their aerobic metabolism they are found at the interface of the water and air, like ducks on a pond. In fact the name Mycobacterium means fungus bacterium and this refers to the fungus-like growth of the organisms on the surface of liquid cultures in the laboratory.

There are more than 70 species of Mycobacteria. The classification of them is constantly changing and will be further relined with the application of DNA mapping.

When ranking mycobacteria for their ability to cause infection remember that they can range from opportunistic to obligate pathogen and this can vary between host species. For example M. avium is a rare opportunist in humans but causes disease in birds.

Of these 70 species there are two major human pathogens.

1. *Mycobacterium tuberculosis* which consists of *M. tuberculosis*, *M. africanum*, M. bovis and *M. microti*. The last three are now considered subspecies of *M tuberculosis*. *M. tuberculosis* has a smaller genome than the environmental mycobacteria. It is an obligate pathogen. The question has been asked has it lost the genes required an independent existence.

2. *Mycobacterium leprae*. The remaining mycobacteria are environmental organisms or organisms causing disease in specific species of animals and are collectively known as MOTTS (mycobacteria other than tuberculosis).

Most organisms generally cause opportunistic infections in humans. Person to person transfer does not occur.

The important MOTT organisms which can cause disease in humans are:

1. M. avium intracellulare Complex (MAI or MAC). Infection is uncommon in imrnunocompetant people but it is the most common bacterial infection in AIDS patients in the USA.

1. *M Kansasii*
2. *M scrofulaceum*
4. *M marinum*
5. *M ulcerans*
6. *M fortuitum-chelonae* complex

Some important specific animal mycobacteria include:

M. lepraemurium causing cat leprosy.
M. paratuberculosis causing Johne's disease in ruminants. Using DNA probes *M paratuberculosis* and the Wood

pigeon strain of M. avium had been detected in human patients with Crohns Disease. (McFadden et al, 1992). The mycobacteria causing canine leprosy is still not properly identified as far as I am aware.

MOTT organisms are generally resistant to drugs used for TB treatment and combinations of several agents and surgery may need to be used.

The identification to species and subspecies level is becoming increasingly important to study the epidemiology and therapy in human and animal disease. DNA technology will be essential in this process.

I could find one reference to the treatment of a Whooping crane with Avian Tuberculosis. Snyder and Richard (1994) describe a debilitated Whooping Crane (*Grus americana*) with a granulomatous mass protruding from thc cloaca from which *M. avium* complex was isolated. Once stabilised it was given two tuberculocidal drugs for 1 year (Rifampin 45mg/kg and ethambutol 30mg/kg daily) and two doses of an experimental immunostimulant (M. vaccac antigen]. Attempts were made to use Isoniazid at 30mg/kg as well but the bird becarnc anorexic on that regime. The bird's condition returned to normal during the course of the treatment and tuburcular process remained in apparent remission for 20 months post-admission.

Treatment was not attempted in the Brolga because of the relative prevalence of' the species and the open public nature of the particular wildlife park and the obvious zoonotic potential of any immunocompromised visitors. It is interesting to note that both Mycobacteria isolated from this bird can cause disease in humans.

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References

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