Generalised lymphadenoapthy in a Miniature Schnauser

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Part One

A female, neutered, one year old, Miniature Schnauzer presented to the first opinion veterinary surgeon lethargic and depressed. Clinical examination detected generalised lymphadenopathy. The bitch's temperature was within normal limits. A blood sample was taken for haematology and biochemical evaluation. These tests were performed "in-house" at the veterinary clinic and although the full data were not recorded, no biochemical abnormalities were reported. The haematology analyser utilised was a Coulter counter and the total white blood cell count was elevated, although neither the absolute count nor the differential counts were recorded in the clinical record.

Fine needle aspirates were obtained from the right axillary, right popliteal and left prescapular lymph nodes (Figures 1 and 2). These were submitted to TDDS Ltd for cytological evaluation.

- What is the most likely cytological diagnosis for the lymphadenoapthy?
- What are the major differentials for this cytological diagnosis in general and for this breed in particular?
- What further investigations would you perform in this case?

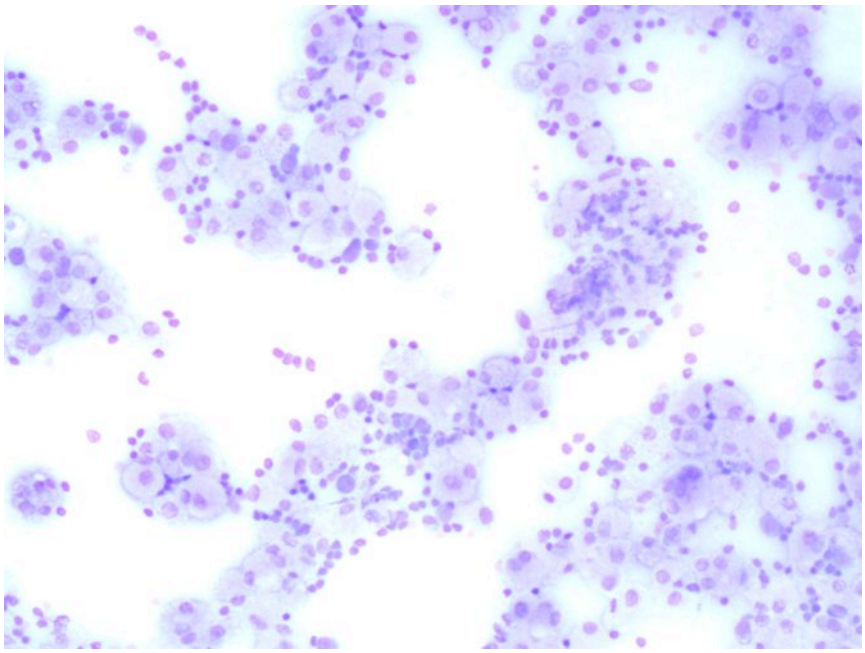

Figure 1: Fine needle aspirate from a lymph node. Modified Wright-Giemsa stain, magnification x400

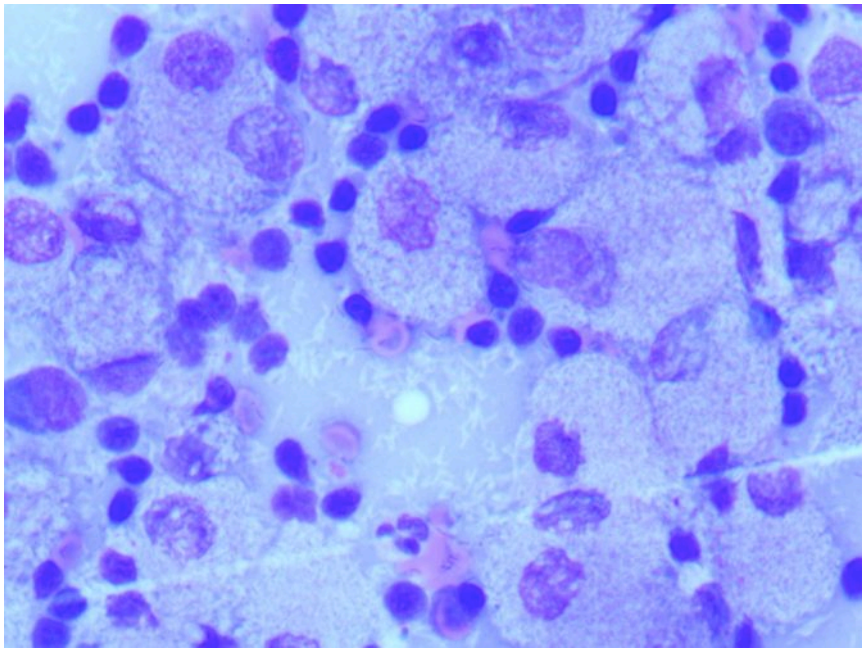

Figure 2: Fine needle aspirate from a lymph node. Modified Wright-Giemsa stain, magnification x1000

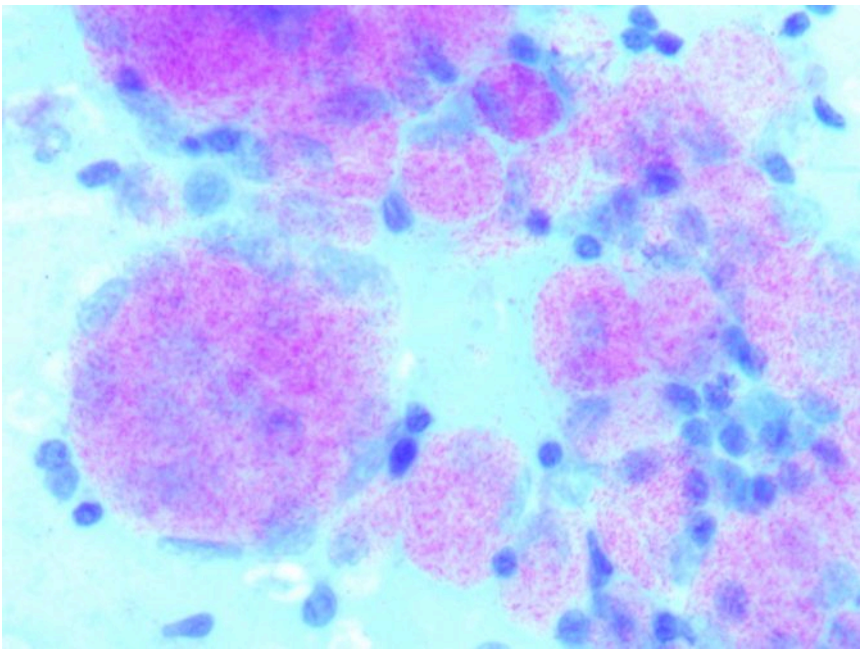

Figure 3: Fine needle aspirate from a lymph node. Ziehl-Neesen stain, magnification x1000

Part Two

Cytological evaluation revealed aspirates of high cellularity with good cell preservation. A mixed cell population was present but abundant large macrophages predominated, many of which were epitheloid. An occasional multi-nucleated giant cell was seen. The cytoplasm of the macrophages were packed with negatively staining, rod-shaped structures, which were also visible free in the background. Lower numbers of small lymphocytes and occasional neutrophils were present. The interpretation of these findings was granulomatous lymphadenitis. General differential diagnoses for this granulomatous response include fungal infections (e.g. blastomycosis, cryptococcosis, histoplasmosis), leishmaniosis, salmon fluke poisoning and protothecosis, but all of these conditions are extremely uncommon in the United Kingdom (UK). The negative staining rod-shaped structures and the signalment (breed) in this case are highly indicative of a mycobacterial infection. This suspicion was strengthed by demonstrating that the negative staining structures are acid fast and stain bright red upon Ziehl-Nieelsen staining (Figure 3) and a diagnosis of suspected *Mycobacterium avium* complex (MAC) was reported.

In light of the dog's dull demeanor, the poor prognosis and potential public health risk, she was euthanised. Necropsy was not performed, but at euthanasia a sample of enlarged lymph node was collected and submitted to the UK Government's Animal Health and Veterinary Laboratories Agency. Polymerase chain reaction (PCR) confirmed the diagnosis of *Mycobacterium avium* complex posthumously.

Discussion

The MAC are a group of opportunistic, saprophytic mycobacteria. There is considerable overlap in the properties of different *M. avium* strains and the closely related *M. intracellulare* which together are referred to as the *Mycobacterium avium* complex. In common with other mycobacteria the high lipid content of mycolic acid in their cell wall results in failure to stain with Wright's stain and confers their acid-fast staining properties [1].

These organisms are ubiquitously disseminated in the environment with widespread mammalian exposure, but healthy dogs are generally considered resistant to infection, further supported by the inability to infect dogs experimentally through feeding contaminated material. The source of naturally contracted infections is rarely identified. Canine MAC infections have been reported previously in dogs [2] [3] [4] [5] [6] [7] [8] but are not common. Horn *et al.* (2000) summarise details of 18 previously reported cases of canine MAC infections [2] and subsequently a further infection in a miniature schnauser has been reported [3]. It is notable that of these 20 documented cases there is over-representation of two breeds: the Basset Hound (7 of 20 cases) and the Schnauser (7 of 20 cases). All of the cases reported in Schnausers have affected young dogs under four years old. Furthermore the occurrence of disseminated MAC infection in three Miniature Schnauser littermates [4] and three Bassett Hounds with common ancestry [5] have raised the suspicion that there may be a genetic basis to these breed predispositions. In the report of the three affected, related Miniature Schnausers Eggers *et al.* (1997) documented a depressed T-lymphocyte response in mitogen stimulation tests [4]. Cell mediated immunity is critical for clearing Mycobacterial infections. To date the molecular defect in Schnausers responsible for the susceptibilty has not been identified but currently ongoing research studies hope to elucidate the underlying pathology, which preliminary data suggest is a simple, autosomal recessive trait (personal communication Prof. Giger, University of Pennsylvania).

The clinical signs of presenting animals are variable, but depression, lethargy, innapetance and diarrhoea are commonly reported. The prognosis for the condition is poor, with no successful response to treatment reported. Along with other mammals, humans are widely exposed to MAC found ubiquitously in the environment, but infected canines can shed organisms in the faeces and hence pose a potential risk to immunocompromised individuals.

References

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