

Brief Communication

A CASE OF CANINE TUBERCULOSIS CAUSED BY
MYCOBACTERIUM TUBERCULOSIS

Along with the eradication of bovine tuberculosis caused by *Mycobacterium bovis*, canine tuberculosis has decreased considerably with the result that tuberculosis in dogs is now caused almost exclusively by *M. tuberculosis* (*Schliesser* 1967). Moreover, as recently emphasized by *Liu et al.* (1980), the disease is said to have an insidious and chronic course without specific symptoms or pathological changes. The various aspects of tuberculosis in the dog and cat has been reviewed by *Snider* (1971). In Norway *Berg* (1956) described 8 cases of canine tuberculosis which occurred during the period 1949—53. Later an undescribed case occurred in 1954 and another in 1958, 1 described case (*Vanke* 1974) in 1973, and most lately 1 in 1981, which is described below.

The dog, a 5 year old male Golden retriever, had been wasting for several months, showing lethargy, anorexia, loss of body weight and anaemia. Moreover, it had some digestive trouble, intermittent diarrhoea and 2 convulsive attacks. The dog was euthanized. There was no evidence of association with tuberculous human beings.

At necropsy, no changes were found in the thorax. In the abdomen there was some serohaemorrhagic fluid, and numerous submiliary to almond-sized grayish-white firm nodules were found on the peritoneum. On the diaphragm the nodules were confluent and formed a nodular carpet. The liver was enlarged and contained small and large, partly confluent sarcomatous nodes with a uniform cut surface without liquefaction, but with a few small calcifications. In the kidneys there were some smaller nodes similar to those in the liver, 2 of them with necrosis and liquefaction. The mesenteric lymph nodes were moderately enlarged and had a homogenous cut surface. Histologically, the lesions consisted of a granulomatous tissue of macrophages and fibroblastic strands with scattered lymphocytes and a few neutrophilic granulocytes. In some places the macrophages, which had the character of epithelioid cells, were arranged in small

nests surrounded by fibroblastic tissue. The separate lesions, consisting of several nests, were demarcated by a zone infiltrated with lymphocytes and plasma cells or by a fibrous capsule with a peripheral zone of lymphocytes. The larger lesions consisted of conglomerations of such smaller units which rarely had central necroses but rather a centrally located fibrous core which underwent hyalinisation and necrosis as the size increased. In these necroses small calcifications and a few acid-fast bacilli were seen. The smaller units which represented peculiar miliary tubercles without giant cells were particularly developed on the peritoneum. Liquefactive changes were few and were mostly observed in the kidneys.

Direct smears revealed few acid-fast bacilli in the liver. Inoculation of oxalic acid-treated liver material on Petragani's, Stonebrink's and Löwenstein-Jensen's medium resulted in pure growth of mycobacteria which, according to the biochemical tests described by *Wayne & Doubek* (1968), were identified as *M. tuberculosis*. The organism proved to be pathogenic for the guinea pig and rabbit with development of tuberculous lesions in the lung, liver and spleen of inoculated guinea pigs and in the lungs of rabbits. The lesions were of proliferative character with few bacilli, as described by *Chors et al.* (1958). No pathogenicity for chicken was shown.

The above detailed description of the histopathology has been given because tuberculosis in the dog (and cat) is said by most authors to have nonspecific lesions. According to our experience from the present case and previous cases, in spite of the absence of Langhans' giant cells, the lesions show a picture which is quite characteristic. Moreover, the necroses which are mostly microscopic, have a unique development.

According to *Snider* (1971), *Farrow & Love* (1975) and *Wheeldon et al.* (1977) the thoracic form is the most common manifestation of tuberculosis in the dog which is supposed to inhale infected nasal secretions from human beings. However, what is peculiar to the present case and all the previous cases in Norway, except 1 thoracic case described by *Berg*, is that all of them have been predominantly abdominal with lesions almost invariably in the liver, kidneys and peritoneum. Uraemia occurred in 3 of the cases described by *Berg* who suggested that a dog who suffered from uraemia, might have tuberculosis. If the dogs in the respective cases have contracted infection from tuber-

culous human beings, it seems likely that they have rather ingested than inhaled contaminated secretions or food. However, in only 2 cases could the infection of the dog be associated with a tuberculous owner. The question then arises how the remaining 10 dogs were infected. According to *Hawthorne & Lauder* (1962) the possibility of a dog contracting infection from another tuberculous dog cannot be precluded. Particularly at the present time this might be the case when people in densely populated places meet perhaps several times per day in order to exercise their dogs.

Finn Saxegaard and Rolf Svenkerud, the National Veterinary Institute and the Veterinary College, Oslo, Norway.

REFERENCES

- Berg, O. A.*: Tuberculosis in dogs. *Acta tuberc. scand.* 1958, 32, 351—356.
- Cohrs, P., R. Jaffé & H. Messen*: Pathologie der Laboratoriumstiere. (Pathology of Laboratory Animals). Vol. 2, Springer-Verlag, Berlin 1958, p. 32—37.
- Farrow, B. R. H. & D. N. Love*: Tuberculosis. In: *Ettinger, S. J. (ed.)*: Textbook of Veterinary Internal Medicine, Vol. 1: Diseases of the Dog and Cat. W. B. Saunders Co., London 1975, p. 223—225.
- Hawthorne, V. M. & I. M. Lauder*: Tuberculosis in man, dog and cat. *Amer. Rev. resp. Dis.* 1962, 85, 858—869.
- Liu, S., I. Weitzman & G. G. Johnson*: Canine tuberculosis. *J. Amer. vet. med. Ass.* 1980, 177, 164—167.
- Schliesser, Th.*: Die Fleischfressertuberkulose und ihre Beziehungen zur Tuberkulose des Menschen. (Tuberculosis in the carnivores and its relation to human tuberculosis). *Kleintierpraxis* 1967, 12, 191—197.
- Snider, W. R.*: Tuberculosis in canine and feline populations. Review of the literature. *Amer. Rev. resp. Dis.* 1971, 104, 877—887.
- Vanke, V.*: Et tilfelle av tuberkulose hos hund. (A case of canine tuberculosis). *Norsk Vet.-T.* 1974, 86, 83—84.
- Wayne, L. G. & J. R. Doubek*: Diagnostic key to mycobacteria encountered in clinical laboratories. *Appl. Microbiol.* 1968, 16, 925—931.
- Wheeldon, E. B., H. M. Pirie, F. W. Fisher & R. Lee*: Chronic respiratory disease in the dog. *J. small Anim. Pract.* 1977, 18, 229—246.

(Received May 4, 1982).

Reprints may be requested from: Finn Saxegaard, the National Veterinary Institute, P. O. Box 8156, Dep., Oslo 1, Norway.