NORTH AMERICAN BLASTOMYCOSIS—A REPORT OF 2 CASES IN DOGS

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NORTH AMERICAN blastomycosis in a dog was first reported in Canada by Graham and Ketchell (9) in 1958 and later by Badame and Peck (3) in 1960. This report concerns 2 additional cases observed within 1 year in a small animal clinic in the Ottawa Valley District.

The clinical symptoms of North American blastomycosis, particularly the pulmonary form, are not specific and resemble those of other respiratory diseases making the disease difficult to diagnose clinically. For these reasons it is probable that the disease is more prevalent in Canada than is generally recognized.

The clinical signs of North American blastomycosis in dogs have been well described by Ausherman, Sutton and Oakes (2). In their observations on 55 animals they noted considerable variation in the signs of the disease but classified the majority of cases into 3 categories.

The chronic respiratory or pulmonary North American blastomycosis was the type most frequently observed. The first sign was acute pneumonia accompanied by a temperature of 103° to 105°F. These signs persisted for several days followed by slight improvement but with a persistent cough. The course of the condition varied but because of the public health significance, euthanasia was usually advised and the natural termination of these cases was not determined. Ausherman et al also mentioned skeletal North American blastomycosis involving principally the long bones. These cases started with a small sensitive puffy swelling which became extremely painful to the touch. Radiographs of the affected bones showed areas of localized osseous rarefaction.

Generalized North American blastomycosis was observed in a small percentage of the cases. This form of the disease usually started with a temperature of 103° to 105°F, a purulent nasal discharge, cough, accelerated rate of respiration and a poor appetite. A sanguineous nasal discharge, pronounced pneumonic sounds and multiple subcutaneous abscesses were among the signs which followed. The course of the disease varied from 5–30 days.

Reported herein are a case of generalized North American blastomycosis in a 4 year old Norwegian Elk Hound and a case of pulmonary North American blastomycosis in a 3 month old Golden Retriever.

CASE 1

A male Norwegian Elk Hound was presented to a small animal hospital[1] on Sept 9 1960 because of a poor appetite and a persistent cough. A diagnosis of bronchitis was made and the animal was treated accordingly.

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Two days later the dog was presented again. The animal had experienced no relief from the original signs and in addition, it exhibited a mild degree of lameness of the right hind limb. The animal was treated with cortisone.

Twenty-five days after the animal was first presented it was hospitalized because of a considerable loss in weight and an exacerbation of all the pulmonary signs except the cough which was much less pronounced. A temperature of 105°F was present (on the previous occasions, the temperature had been normal). The conjunctivae were congested, respiration was laboured and the pulse was weak. There was generalized enlargement of the lymph glands, particularly the prescapular and popliteal. Thoracic auscultation revealed no alveolar sounds on the left side and only a few on the right. There was a dull sound heard on percussion of the left side of the chest. The heart sounds were regular and distinct. There was no evidence of pain on abdominal palpation. Oedema of the right hind limb was evident and as the disease progressed the other limbs also became affected but to a lesser degree. Examination of the interdigital spaces of the right hind limb revealed multiple denuded areas 0.8 to 1.0 cm in diameter. These were pink in colour, dry and slightly granular. The borders of these areas were moderately elevated. Similar lesions were observed on the back. Haematologic examination showed a white blood count of 20,000 and a neutrophilia with 10% juvenile forms. Radiographs of the lung revealed enlargement of the bronchial lymph nodes and irregular patchy areas of increased density in the lung.

A tentative clinical diagnosis of generalized North American blastomycosis was made and treatment with chloramphenicol was initiated. The dog died on Oct 11 1960 on the thirty-second day of illness.

Necropsy was performed 48 hours after death. There was consolidation of the diaphragmatic lobe of the left lung. In the right lung several firm nodules 1–2 cm in diameter were found. On cut surface these contained a homogeneous grey necrotic material. There was no definite capsule and the outline of the nodules was irregular. The prescapular, popliteal, bronchial and mediastinal lymph glands were enlarged. On cut surface several of the lymph glands contained small foci (0.5 to 1.0 cm in diameter) of caseous material. These were not encapsulated. No changes were observed in other organs.

Histologic sections of lung and lymph nodes were stained with haematoxylin eosin and periodic acid Schiff stains. In sections of tissue from a grossly normal lung, fungi consistent morphologically with Blastomyces dermatitidis were observed in the alveoli or small bronchi (fig 1). These were inciting little or no inflammatory response. In sections of tissue taken from the consolidated areas of the lung there was a marked response to the organism. Large necrotic foci were bordered by a rim of dead and dying cells. The fungi were in and around these areas, lying free or in macrophages (fig 2). Epitheliod cells were numerous throughout as were focal collections of polymorphonuclear leucocytes. Lymphocytes were present to a lesser degree. The organisms measured from 9 to 17 microns in diameter and single-budding forms were observed. The reaction in the lymph glands was characterized by purulent foci surrounded by a band of necrotic tissue (fig 3). There was some fibrous tissue proliferation but little tendency towards encapsulation of the lesion. The skin lesions were not examined histologically. The morphologic features of the organism along with the type of

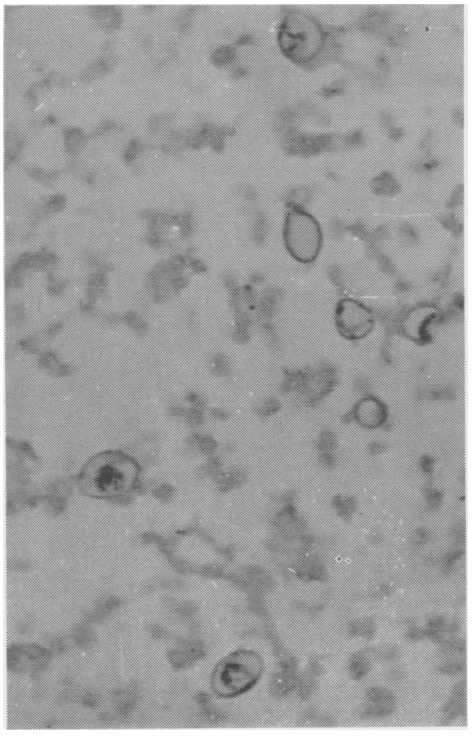

FIGURE 1 B dermatitidis in lung. Little inflammatory response. PAS stain 200X.

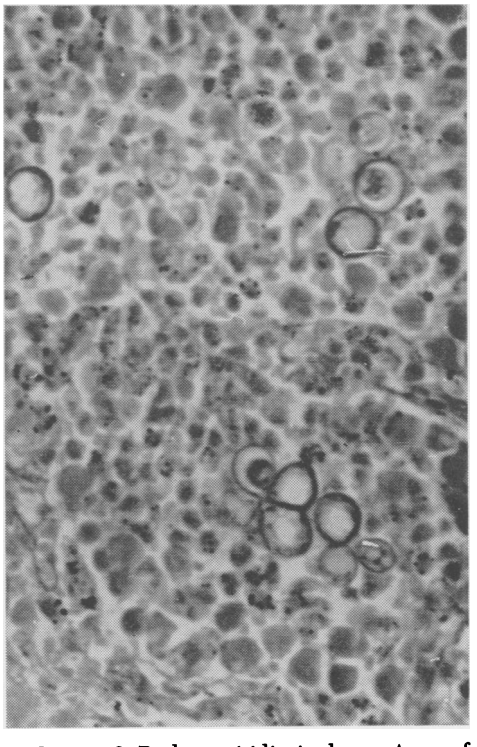

FIGURE 2 B dermatitidis in lung. Area of inflammation. PAS stain 200X.

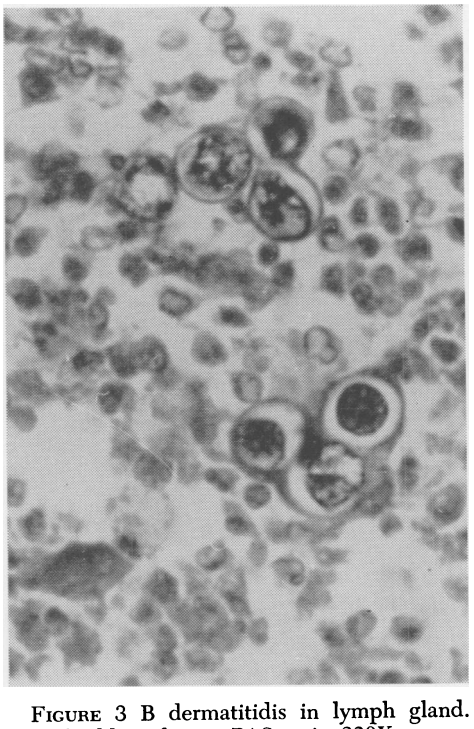

FIGURE 3 B dermatitidis in lymph gland. Note budding forms. PAS stain 320X.

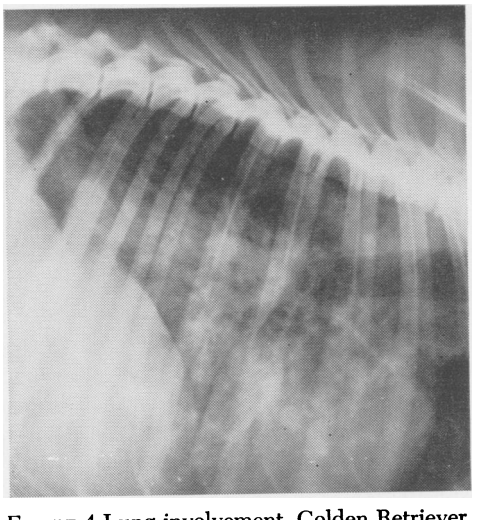

FIGURE 4 Lung involvement. Golden Retriever.

tissue reaction gave histologic support to the clinical diagnosis of North American blastomycosis. Although the skin lesions were not examined, the organisms were observed histologically in the popliteal and prescapular lymph glands. It was felt that this was sufficient evidence of spread of the organism to justify a diagnosis of generalized blastomycosis. Cultural confirmation was lacking in this case.

Case 2

A 3 month old male Golden Retriever from a breeding kennel was presented at the hospital in the early fall of 1959. The clinical symptoms suggested distemper complicated by "atypical" pneumonia. Radiographs of the thorax revealed lung involvement (fig 4). Euthanasia was requested one week later when the condition failed to respond to antibiotic and supportive therapy. A necropsy was performed.

Sections of lymph node (bronchial) and lung in 10% formalin and swabs from lung abscesses were submitted for laboratory examination. The entire cut surface of the lung was riddled with miliary, grayish nodules, some of which were confluent. The lymph nodes were moderately enlarged and contained grayish confluent nodules.

On histologic examination epithelioid cell tubercules were the prominent feature (generally with numerous giant cells), some nodules were intra-alveolar and others were interstitial. Many of the giant cells contained blastomycetes. In addition, polymorphonuclear leucocytes were seen prominently in and about the nodules. The reaction in the lymph node was identical to that described in Case 1.

Cultures were made from the swabs and also from the lymph node (formalized) on Sabouraud's dextrose agar and bovine blood agar. The Sabouraud plates were incubated at 22°C and the blood agar plates at 37°C. In addition direct wet mounts were made. In wet mounts the organism appeared as single-budding yeast cells approximately 8 microns in diameter with a thick, refractile wall. In 10 days, growth on blood agar at 37°C was waxy and cerebriform. A wet mount revealed organisms with a morphology similar to that seen in the original smears. On Sabouraud's agar, growth did not appear until the 16th day of incubation. A white, cottony aerial mycelial mat was present. Microscopically, pyriform microconidia were borne direct from the conidiophores and also sessile microconidia were observed on short lateral stalks. Conversion from the yeast phase at 37°C to the filamentous stage at 22°C was made with ease. The diagnosis was pulmonary North American blastomycosis.

It should be pointed out that no other dog from this kennel contracted the disease at the time the pup was affected and to date no signs suggestive of the condition have been observed.

Discussion

It has been suggested that a failure to perform routine necropsies and make histologic studies of the tissues of dogs, and a lack of knowledge of canine North American blastomycosis are no doubt partly responsible for the apparently low incidence of the disease in the USA (5). An analogous situation could conceivably exist in Canada. Although the disease occurs spontaneously in isolated cases an epizootic of canine blastomycosis has occurred in Alabama (11) and a culturally

documented epidemic was reported in 10 human patients in North Carolina (13). Ainsworth and Austwick (1) state that the disease is not contagious but point out that most cases have occurred in the geographical region where the incidence of blastomycosis in man is highest. It has been suggested that even if the condition is diagnosed while the animal is alive, the patient should not be treated because the disease is a public health hazard and can be transmitted to man (5). Whether or not a public health hazard exists is open to question for no definite proof has been found to indicate that blastomycosis is transmitted from man to man or from animals to man (4).

Several reports have appeared in the literature concerning the successful treatment of North American blastomycosis in man with amphotericin B (6,8,10,12). According to Baum and Schwarz (4) amphotericin B is a relatively safe and effective agent for the treatment of blastomycosis.

Toxic reactions, consisting of vomiting, diarrhea and gastrointestinal haemorrhage have been encountered with the administration of amphotericin B in dogs (7). Systemic reactions have been observed in humans with this agent but these reactions were minimized by the concomitant use of antipyretic and antihistaminic agents (12). Smith and Mathews (12) reported that toxic manifestations from using this drug occurred in all their patients, but suggested that the severity of these reactions did not prevent the effective use of amphotericin B.

Considering the fact that canine North American blastomycosis is not readily transmitted from animals to men, carefully supervised amphotericin B therapy might be indicated in selected hospitalized cases in animals.

Summary

Two cases of canine North American blastomycosis are described and a brief review of the clinical symptoms of the disease in dogs is given. The cases occurred approximately 1 year apart in Ottawa Ont.

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