—NOTE—

Case Report: Coccidioidomycosis in a Holstein-Friesian Cow

Masuhiro SHIBATANI, Chitoshi ITAKURA, Ikuo ITO, Takashi UMEMURA, and Masanobu GORO

SUMO Livestock Hygiene Service Center, Sumoto, Hyogo 656, 1Department of Veterinary Pathology, Faculty of Agriculture, Tottori University, Koyama, Tottori 680, and 2Mihara Branch Office of Awaji Veterinary Central Clinic, Mihara, Hyogo 656, Japan

(Received 24 July 1985/Accepted 1 October 1985)

ABSTRACT. Coccidioidomycosis was diagnosed in a 9-year-old Holstein-Friesian cow slaughtered at an abattoir in the Awaji-shima of Hyogo Prefecture. The subject had a large abscess in one of the mediastinal lymph nodes. The abscess was surrounded by a thick pyogenic membrane with granulation tissue and contained young to mature spherules with endospores of Coccidioides immitis.—KEY WORDS: cattle, coccidioidomycosis, fungal disease.

Coccidioidomycosis, caused by dimorphic funnus Coccidioides immitis, has occurred as an endemic disease mainly in the south-western United States and the bordering regions of northern Mexico [1]. The first case was reported in 1892 in man and in 1918 in animals. In these regions the disease is found in many cattle at the time of slaughter [2, 4-6, 8]. Lesions in cattle are usually limited to nodules or diffuse enlargement of bronchial or mediastinal lymph nodes, and, in some instances, to small nodules in the lung [2, 4, 8]. The respiratory infection occurs by inhalation of the fungal spores originated from the soil, but the natural resistance of cattle normally prevents the fulminating infection often seen in dogs and man. Hungary is the only other country where the disease has been reported in cattle [3]. The infection has also been recognized in buffaloes in west Pakistan, an Asian country [3]. In Japan, human cases were described in 1937 and 1983 (7), but no infection has been recorded in animals.

A 9-year-old Holstein-Friesian cow was slaughtered at an abattoir in the Awaji-shima island of Hyogo Prefecture in September 1984 because of weakness and poor appetite. She was born and reared on this island.

At necropsy, one of the enlarged mediastinal lymph nodes contained spherical capsulated abscess filled with thick yellowish pus, about 2.5 cm in diameter (Fig. 1). No abnormality was noted in other organs including the lung.

Histologically, the abscess occupied a large area of the lymph node, and its parenchyma was atrophic in the periphery. The abscess consisted of abundant cellular debris with numerous neutrophils and a small amount of fluid. Spherules of C. immitis were scattered in the abscess; some were in neutrophilic pools (Fig. 2). The abscess was surrounded by a thick pyogenic membrane composed of inner granulation tissue and an outer fibrous capsule. The granulation tissue contained large numbers of macrophages, some giant cells, plasma cells and some fungi.

Two phases of c. immitis, spherules and endospores, were seen in the abscess and granulation tissue. The spherules were in various stages, young to mature, 7 to 54 μm in diameter with double-contoured walls. Large and mature spherules were filled with distinguishable endospores, 3 to 5 μm in diameter. Occasionally the walls of large
spherules appeared ruptured, scattering the endospores in the surroundings (Fig. 3). Various stages of these organisms were stained positively with periodic acid-Schiff (PAS). Some endospores and pieces of ruptured walls of spherules were surrounded with macrophages or present in the cytoplasm of giant cells in the granulation tissue. Some young spherules in the abscess were degenerated and calcified. In both abscess and granulation tissue there were a few young spherules surrounded with a corona of radiating acidophilic club-shaped structures (Fig. 4), indicating effective host resistance [2, 4]. Mycelia were not observed.

In the other mediastinal lymph node, we observed enlarged reticuloendothelial system cells, plasma cells in the medullary cords in increased numbers, and some eosinophilic infiltration throughout the parenchymal tissue.
COCCIDIOIDOMYCOSIS IN A COW

Fig. 3. A ruptured spherule releasing endospores in abscess. Arrows indicate pieces of the ruptured wall. PAS stain. ×620.

Fig. 4. A young spherule surrounded with a corona of radiating clubs in a neutrophilic pool. HE stain. ×620.

No significant lesions were found in other organs or tissues.

Lesions in the present case were characteristic of coccidioidomycosis in cattle [4, 8]. Namely, the lesions were limited to a large purulent focus of a mediastinal lymph node, which had spherules typical of the organism. The principal histological clue to the diagnosis of this infection is the indentification, in tissues or fluids, of spherules that contain endospores [1, 5]. The presence of the endospores and the absence of budding serve to distinguish C. immitis from Blastomyces or Cryptococcus (4).

It was uncertain whether c. immitis had lived in the region where the subject was reared. The sporadic infections in man and animals have been reported from countries other than the United States and Mexico, but endemic infection has never been found. In the sporadic infections, the disease appeared "imported" or the infections resulted from fomite transmission [5]. Direct transmission from one host to another apparently does not occur [4]. A remarkable correlation exists between animal and human cases in the endemic regions [5]. Therefore, the present incidence may have public health significance.

Macroscopical lesions of coccidioidomycosis in cattle resemble those of actinobacillosis [3] or actinomycosis [8] and other chronic suppuration. Thus, careful examination should be made at routine inspection of cattle slaughtered at the abattoir in Japan.

REFERENCES

要約

ホルスタイン乳牛1頭のコクジオイデス症（短報）：柴谷增博・板倉智敏1）・伊藤郁夫2）・梅村孝司3）・御領政信1）（岡山家畜保健衛生所、1）鳥取大学農学部家畜病理学教室、2）兵庫県農業経済組合連合会淡路基幹家畜診療所三原診療所）—淡路島産のホルスタイン乳牛にコクジオイデス症を認めた。病変は縦隔膜リンパ節に限局し、すでに詳しく記載されている牛の本症特有の像であった。