SPONTANEOUS FELINE SPOROTRICHOSIS: A FINE STRUCTURAL STUDY

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Abstract

Fine structural details of the parasitic yeastlike phase of Sporothrix schenckii contained in biopsy tissue from a naturally-occurring case of disseminated feline sporotrichosis are described and illustrated by electron microscopy. Both free and phagocytosed fungal cells were observed. The fungal cells were contained within an extracellular, electron transparent vacuolar area which was bounded by a limiting membrane of probable host origin. The yeastlike cells were characterized by a conspicuous layer of osmiophilic microfilaments which occurred along the outermost surface of the cell wall. In many yeastlike cells, scattered, membrane-bound vacuoles containing electron opaque material were observed in the cytoplasm. Asteroid bodies were not observed.

Introduction

Sporotrichosis is a chronic, granulomatous, mycotic infection whose etiologic agent is the dimorphic fungus Sporothrix schenckii. The fungus is of world-wide distribution, but since the disease is not reportable, the demographic patterns of the disease in both man and animals are difficult to ascertain.

Although generally recognized as an important mycotic infection of man, the disease has been reported from a variety of animal species including the horse, mule, camel, cattle, fowl, dog, cat, rat, mouse, hamster, and chimpanzee (1, 16, 25, 26, 29). Its frequency in wild life populations is unknown. Most of the reports of naturally-occurring animal sporotrichosis have been in horses, dogs, and swine. Naturally-occurring disseminated sporotrichosis has been reported only in the dog and man (4, 16, 26). Recently, a case of naturally-occurring disseminated sporotrichosis was observed in a domestic short-hair cat in which S. schenckii was isolated from a large pyogranulomatous lesion of the right forepaw, from axillary lymph nodes of the affected forelimb, and from the lungs and liver (19). The diagnosis was established by histopathologic findings, special stains, cultures and mouse inoculations. A part of the diagnostic regimen included the fixation of biopsy materials for subsequent examination by electron microscopy.

Sporotrichosis in the laboratory animal has been reviewed by Lurie (22). A number of animals have been used as models to study the disease experimentally, although it is generally accepted that the disease produced has not closely resembled that seen in man. Recent studies have suggested that the adult cat can be readily infected with S. schenckii and that the course of the disease in many ways resembles that of human sporotrichosis (2). The present study describes the fine structural appearance of the parasitic yeastlike phase of S. schenckii contained in biopsy material obtained from the aforementioned naturally-occurring, disseminated feline infection (19). The results make possible comparison between the micromorphology of yeastlike S. schenckii obtained from culture and from a naturally-occurring environment.

Materials and methods

Biopsy material taken from the granulomatous lesion of the affected forepaw was immediately immersed in 3 % glutaraldehyde in 0.1 M phosphate buffer (pH 7.3). The biopsy specimen was minced into ca. 1 mm³ samples and allowed to stand for 3 h at 4 °C. After thorough washing in buffer, the specimens were postfixed in 2 % osmium tetroxide in 0.1 M phosphate buffer (pH 7.3) for 2 h at 4 °C. After washing, the fixed specimens were dehydrated in a
Fig. 1. Longitudinal thin section of a macrophage containing five yeastlike cells (YC) of *S. schenckii* in the plane of section. The macrophage cytoplasm contains a single nucleus (Nu), scattered mitochondria (Mi) and a lysosome (L). Note the outer clear area (CA) and microfibrillar material (FM) at the outermost portions of the fungal cell walls. Bar equals 1.0 μm.

Fig. 2. Longitudinal thin section of a free ovate yeastlike cell of *S. schenckii*. Note the microfibrillar material (FM) along the outer surface of the cell wall (CW), the electron transparent area (CA), remnants of the limiting membrane (M), nucleus (Nu) with nucleolus (Nc), mitochondria (Mi), lipid body (LB) and electron opaque bodies (EOB) contained within vacuoles (V). Bar equals 0.5 μm.