A RARE FUNGAL BRAIN ABSCESS CAUSED BY CLADOSPORIUM TRICHOIDES. A REVIEW OF THE LITERATURE

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SUMMARY:

Cladosporium trichoides is a rarely seen fungal infection of the central nervous system. Since spores are found in nature, the portal entry is still obscure. It has a strong neurotropism which has been proved in experimental studies. In a modified LEVINE preparation, the effects of mannitol. In the central nervous system it mostly produces brain abscess. in some cases multiple. The prognosis is bad in the majority of cases. Fluocytosine seems useful in conjunction with surgery.

KEY WORDS:

Cladosporiosis, Fungal cerebral abscesses

INTRODUCTION

Fungal brain abscesses due to cladosporium trichoides are very rare. Since the first description of this fungus in 1952 (6), only 37 cases have been reported. This paper is a review of the literature of the infections caused by this neurotropic. non-opportunistic fungus, Cladosporium trichoides.

TERMINOLOGY AND HISTORY

Reported cases in the literature have been termed "Cladosporium trichoides", "Cladosporium bantianum", "Hormodendrum", "Cladosporiosis", "Chromoblastomycosis" and "Phaeohyphomycosis" (6,8,11,12,28,32,33,46,47,51).

In 1952, Binford and co-workers in Maryland, published an unusual brain abscess (6). The aetiological agent was a darkly pigmented fungus which had not been reported before as a cause of disease in man. Dr. Emmons identified that this fungus was different from the previously described species of cladosporia and named it Cladosporium trichoides. In 1960, Borelli reported that there is a similarity between Cladosporium trichoides and the brown fungus isolated from a brain abscess by Banti in 1911 (3,9). One year later, in 1912, it was named Torula Bantiana by Saccardo (41). Borelli revised the name Cladosporium trichoides to Cladosporium Bantianum but the spores of Torula Bantiana were reported to be nearly twice the size of Cladosporium trichoides and borne in simple in stead of branched chains (9). In 1981, McGinnis and Borelli studied Banti's fungus and Cladosporium trichoides and reported that Cladosporium trichoides is a synonym of Cladosporium bantianum (34). Kwon Chung and co-workers in 1983 revealed that Cladosporium Bantianum was different from Cladosporium trichoides morphologically and physiologically (29).

Chromoblastomycosis was used for two clinical forms: first cutaneous chromoblastomycosis and the other cerebral chromoblastomycosis (46). In this second clinical form, except for a few examples the infection is limited only to the central nervous system and the main causative agent is Cladosporium trichoides. Some authors do not agree with this classification (5,18). Chromoblastomycosis is described as a chronic cutaneous infection caused by any one of such fungus and if one of these fungi caused a central nervous system infection, then it is called cerebral chromoblastomycosis.

Hormedendrum is a synonym of Cladosporium and by reason of priority Cladosporium is the correct generic name (33,39,49). Phaeohyphomycosis is various infectious processes in which the aetiological agent is a brown pigmented fundus (1). Dematiomycosis describes all brain infections caused by brown-walled fungus and Cladosporium trichoides is one of the dematiaceous fungi (42). In the recent literature this fungus is mentioned as phaeohyphomycosis (21,32,37,42).

HISTOLOGICAL AND CULTURAL ASPECTS

Cladosporium trichoides is the only fungus producing brown pigmented septate round bodies and pigmented branching hyphae in tissues (Figure 1) (19,42,43). The round or oval yeast-like forms are 2-5x4-20μm in diameter (Figure 2). Some of them appear to be budding and producing tube-like extensions into hyphae (Figure 3). The branching irregular hyphae are composed of elongated and chain-arranged cells usually 2-7μm wide and 10-12μm long.
Figure 1: Fungal hyphae are composed of chained, elongated elements of 4x10 micrometer in size (methenamine-silver stain. x200)

Figure 2: Chains of budding fungal elements septate and shield shaped buds at two or more points are seen in direct examination (Fresh preparation. x400)

Figure 3: Chains of budding fungal elements and septate basal spores from Sabouraud’s culture are seen in direct examination (Fresh preparation. x200)

The hyphae segments are sepetated by cross walls (6.32). Although unstained material and hematoxyl-eosin is enough to demonstrate this fungus, the specimen is also stained with methenamine silver, periodic acid-Schiff, Lillie. GMS, Gridley (31.32). In sections stained with hematoxylin-eosin and in unstained preparations, the hyphae seem to be light brown in colour. Histological examination of the microorganism is not enough to determine the type of the fungus. The second step must be to demonstrate the cultural aspects of the fungus. Cladosporium trichoides grows on Sabouraud’s media or any other common culture medium at room temperature or at 37°C in approximately six days. It produces dark brown coloured colonies (Figure 4) (6.10.36). Animal inoculation is successful but not an essential step in diagnosis. When inoculated intravenously into mice and rabbits the fungus can be found in various organs but commonly it produces fatal cerebral lesions similar to that seen in human infections (6.18.19.20.33.39.45). Strong neurotropism is an important feature of this fungus as confirmed by experimental studies.

CLINICAL FEATURES AND TREATMENT

The age of the reported cases varies between 6 months and 79 years. Onset of the disease is more frequently in the second and third decade. Most of the patients are male in the reported cases and the male: female ratio is about 3:1. This infection has a wide geographical distribution. Cases are reported from all continents (4.14.15.16.23.50.51). Cladosporium spores are found commonly in decaying vegetation and on wood (13). Also this fungus has been recovered from soil (17.27). Two cases of brain abscess caused by Cladosporium trichoides in cats were reported by Jang et al in 1977 (24). Although there does not appear to be any occupational predisposition, the infection is most common in farmers. The portal entry of Cladosporium is most common in farmers. The portal entry of Cladosporium trichoides is generally obscure. Kim et al reported a case of traumatic implantation of this fungus due to orbital trauma (25).

The majority of patients seem to be in good health when infected. Immunological deficiency has rarely been shown (36.44). Cladosporium trichoides does not seem to be an opportunistic fungus. The duration of symptoms has also been variously reported from a few weeks to many years. Clinically there has been no reason to suspect such a rare fungal infection. Diagnosis was made in all reported cases after surgery and postmortem examination. The signs and symptoms of central nervous system infection due to this fungus are no different from an increased intracranial pressure signs such as headache and vomiting. In most cases there is an acute onset of the
symptoms. Seizures, hemiparesis, papilledema, ataxia etc. are the most common manifestations. Signs and symptoms of meningeal irritation are reported in some patients (5,15,18,30,31). Generally there is no sign of an infectious disease. Cerebrospinal fluid findings have been reported in relatively few cases and lumbar cerebrospinal fluid culture has never been positive. In one case fungus was isolated from the ventricular fluid (14). In the majority of cases, except diagnosed as meningitis, cerebrospinal fluid pressure, cell count, glucose and protein levels were within normal limits. The computerized tomography scan reveals a well-defined mass with an irregular capsule surrounded by an area of radiolucency (Figure 5) (32,43,44).

Cladosporium trichoides causes a central nervous system infection in either the cerebral or meningeal form. The most reported form is cerebral abscess. In a number of cases multiple abscesses are seen in the brain (10,22,26,30,31,33,36,43). The presence of multiple brain abscesses in some cases supports the theory of dissemination of the fungus to the central nervous system by a haematogenous route (22,26,30,31,33,36,43). Usually the surgical specimen is an uncapsulated mass with a firm thick periphery and a soft centre containing grayish-brown pus. At histological examination fungal cells in the non necrotic part of the lesion are seen as an intensely pigmented wall but in the necrotic areas this pigment is less prominent. In some cases meningitis was observed (5,15,18,30,35). Empyema is a rarely seen complication and in one case empyema extended up to the upper thoracic spinal cord (5,15). In two cases intraventricular pus was found (10,14).

REFERENCES


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