

## A CASE REPORT OF CRYPTOCOCCAL MENINGITIS

*Moghadami M., D.V.M., MPH., D. Myco.*

*Kordbacheh P., M.D., MPH.*

*Emami M. Pharm. D., D. M. Myco.*

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### ABSTRACT

A case of cryptococcal meningitis is reported in a 26 year old man by the Medical Mycology Department of the School of Public Health, Tehran University. The patient with the symptom of meningitis was admitted to the hospital. Lumbar puncture was performed in the hospital. After direct examination and culture of cerebrospinal fluid, cryptococcus neoformans were isolated.

### INTRODUCTION

Cryptococcosis is caused by the yeast like fungus cryptococcus neoformans (2,7,12) which is an encapsulated yeast and reproduces by budding (15) and divides into two varieties: *C. neoformans* Var. *neoformans* (serotypes A and D) and *C. neoformans* Var. *gattii* (serotypes B and C)(8). The organism is a saprophyte type distributed throughout the world (2,12).

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Med.Myc., Publ. Health Faculty, Teh. Med. Sc. Univ.

The Carbohydrate capsule of the organism is its major virulence factor and the presence of a large capsule has been shown to decrease the ingestion of the organism by polymorphonuclear leukocytes. Finally, the lack of complement on the surface of cryptococci reported from infected cerebrospinal fluid may contribute to the organism's survival in the central nervous system (15). Whereas normal serum has a heat-stable, fungistatic anticryptococcal factor and saliva a heat stable fungicidal one, the CSF has no such inhibitor and, is indeed, a good nutritional medium for *C. neoformans*, since it contains glucose, thiamine, and other small-molecular-weight substances of importance (15). Cryptococcal meningitis affects persons of all ages, although most are usually 30 to 60 years old. It is twice as common in males than in females.(15)

About 50% of infections occur in immunosuppressed patients (7). In most instances, the initial infection is pulmonary, but dissemination to the brain and meninges is common(2). The pulmonary form of the disease may be mild, and usually is transitory and is thought to precede the systemic form of the disease (9).

Disseminated cryptococcosis, which generally is manifested as meningitis, occurs most likely through hematogenous or Lymphatic spread from the primary foci(9). Central Nervous System cryptococcosis can cause both a chronic and an acute meningeal disease (11).

The most common symptoms and sign associated with cryptococcal meningitis are headaches, fever, nausea,

vomiting , mental status changes and neck stiffness. It is important to note that some patients with cryptococcal meningitis are asymptomatic, for this reason, the CSF must be examined whenever *C.neoformans* is isolated from any site (15).

The diagnosis of cryptococcal meningitis is based on the presence of encapsulated yeast cells seen with india ink or nigrosin preparations of the patient's cerebrospinal fluid as well as on culture of the fungus(13).Bernard et al (1980), have shown that the classical method of diagnosis by Indian ink preparation has a positive yield of only 50% and false positives are frequent (13) and they recommend that nigrosin be used routinely for the diagnosis of cryptococcosis (13).

## MATERIALS AND METHODS

A 26 years old man living in Shirgah Mazandaran north of Iran was admitted to hospital in January 1986 because of a 2-week history of headache, fever, malaise, nausea, neck stiffness and subcoma status.

Sampling cerebrospinal fluid of a patient was obtained in hospital, and transported to the diagnostic laboratory of Medical Mycology School of Public Health. Direct examination was from CSF performed in 10% KOH and india ink preparation. The specimen was cultured on Shields-Ajello, Sabouraud's dextrose agar, blood agar(BA),brain heart infusion agar (BHI) and incubated at 26°C and 37°C. Potassium hydroxide and india ink preparation showed

budding yeast encapsulated cells and Pseudohyphae (Fig.1)

After 3 days on Shields-Ajello medium brown colonies ( $26^{\circ}\text{C}$  and  $37^{\circ}\text{C}$ )(Fig.2) and on S, BA, BHI ( $26^{\circ}\text{C}$  and  $37^{\circ}\text{C}$ ) mucoid colonies with cream colour produced (Fig.3) and after examination with india ink preparation yeast cells with thick capsule were observed, biochemical and haematological tests of CSF shown, protein 40mg, glucose 20mg WBC 120 with differential cell count of 75% Lymphocytes and 25% polymorphonuclear.

## RESULTS AND DISCUSSION

*Cryptococcus neoformans* is a relatively common cause of infection of the central nervous system, it is a saprophyte organism distributed throughout the world. It can be isolated from the soil and organic debris of a variety of locations. Although the organism grows to high concentrations in pigeon feces, the birds are not clinically affected (15). Susilo et al (1972) have shown that despite *C. neoformans* being readily cultured from soil contaminated by pigeon droppings, human infection is exceedingly rare (16). Cryptococcosis is well recognized in the USA, Australia, UK and in South East Asia (12).

In Iran *C. neoformans* isolated from pigeon excreta and soil of different areas (Esfahan, Golpayegan, Gilan and Mazandaran, Mashad) (4,5,15) and the organisms were also isolated from crop of pigeon in Tehran (6). The first case of disseminated cryptococcosis in Iran was

reported by Alilou et al in 1978 (1). The disease mostly occurs in immunocompromised patients.

Definite diagnosis of cryptococcal meningitis should be based on positive CSF culture and the culture of large volumes of CSF (5-10 ml of centrifuged sediments) has been recommended (10). In our patient even without centrifugal of spinal fluid, direct examination and culture were positive. Also in this patient, in direct examination of CSF with india ink preparation, yeast cells and pseudohyphae was observed.

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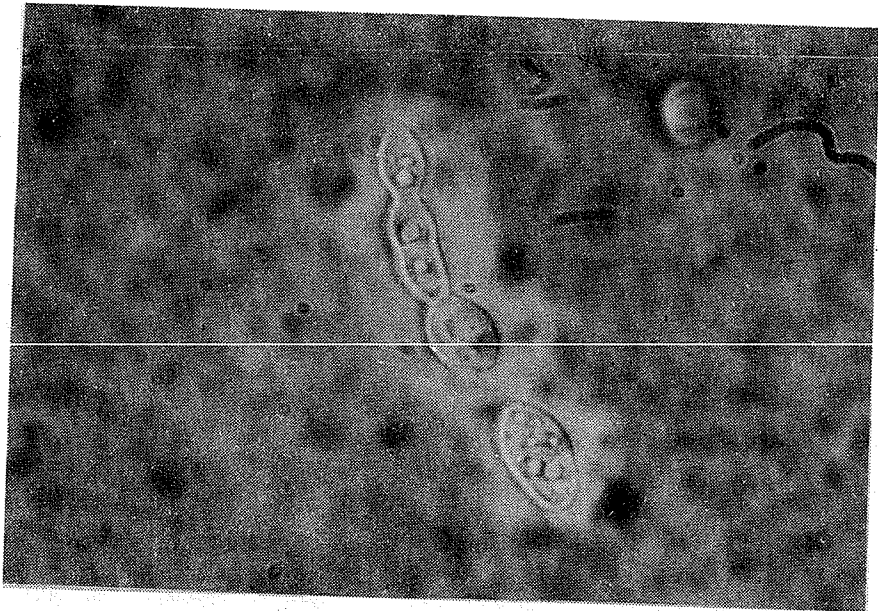


Fig 1-Budding yeast encapsulated cells and Pseudohyphae with india ink Preparation x 400.

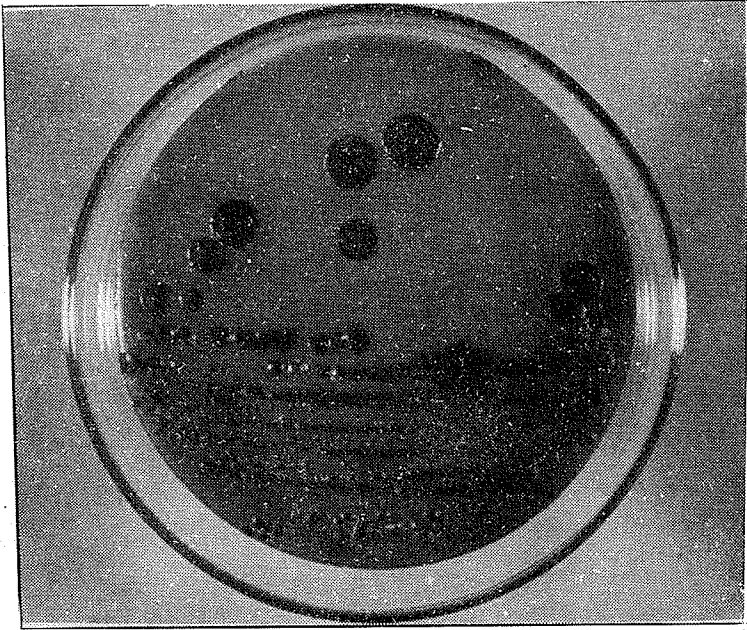


Fig 2- Brown colonies of *C. neoformans* on Shields-Ajello medium

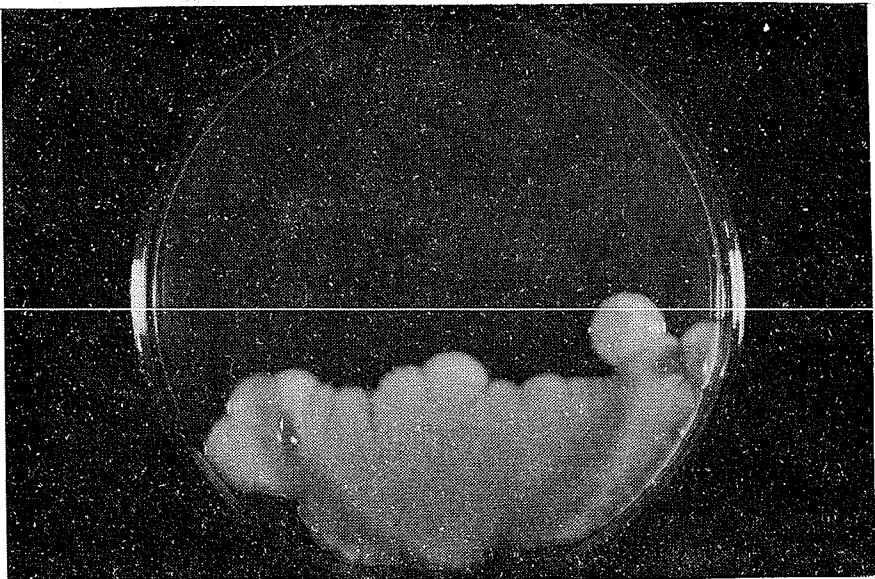


Fig 3- Mucoid colonies with cream colour of *C. neoformans* on Sabouraud's dextrose agar.