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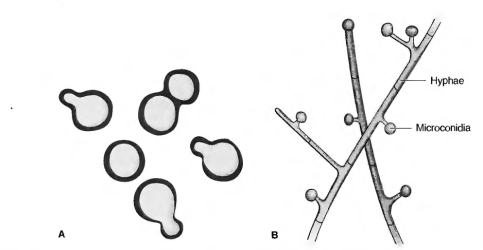
**Dep. of Microbiology**

**Mycology**

**Blastomycosis**

Blastomycosis is an acute or chronic suppurative and granulomatous infection. Its etiologic agent is *Blastomyces dermatitidis.* Infection starts in the lungs by inhaling conidia or hyphal elements and it can spread to involve the lungs, long bones, soft tissue and skin.

**Properties of Blastomyces:**

* B. dermariridis is a dimorphic fungus that exists as a mold in soil and as a yeast in tissue.
* The yeast is round with a doubly refractive wall and a single broad-based bud
* Note that this organism forms a broad-based bud, whereas *Cryptococcus neoformans* is a yeast that forms a narrow-based bud. 

**Pathogenesis:**

Infections with this fungus begin with inhalation of spores into the lung. If the organism evades nonspecific host defense mechanisms , the fungus undergoes a phase transition to yeast cells; the cells increase in number in the parenchyma of the lung and spread to other organs via the bloodstream. With the development of immunity, inflammatory pyogranulomatous reactions occur at the initial pulmonary site and at the widespread foci of infection. The initial response to the fungus is suppurative and is followed by formation of granulomas. This mixed neutrophilic and mononuclear cell response is distinctive of blastomycosis, although necrosis or fibrosis may also occur. Typically, the granuloma of blastomycosis does not caseate, as it does in tuberculosis. Despite spontaneous resolution of the pneumonia in some cases, endogenous reactivation may occur at either pulmonary or extrapulmonary sites, with or without previous therapy.

**Clinical findings:**

1. **Acute**

**Flu-like symptoms** (fever, muscle pain, joint pain, chills, chest pain, cough)

**Pneumonia**

Spontaneous resolution is rare, Most patients go on to chronic or recurrent infection. CXR – lower lobe consolidation

2. **Chronic/Recurrent**

* + Pulmonary : chronic pneumonia( cavitation , pleural involvement)
  + Skin 40-80%skin and mucosa, pustular (verrucous), heaped-up , ulcerated lesions
  + Subcutaneous nodules
  + Bone/joint infection
  + GU tract, prostate, epididymis

**Diagnosis:**

Specimens of choice for isolating Blastomyces include cutaneous lesions, sputum,Prostatic fluid, Pus (skin, etc.) and a biopsy of the affected organ.

The specimens can be **examined directly** using a KOH preparation or various histological stains such as PAS, Methenamine silver stain, and the H&E stain. These specimens are examined for spherical budding yeast that have a single bud that is connected to the parent cell by a broad base. The yeast is generally 8-15 um in size. **The mold phase** of *Blastomyces dermatitidis* can be **cultured** on Sabouraud’s and Inhibitory Mold agars. Good growth occurs at 1-4 weeks. *Blastomyces* will not grow on Mycosel agar. The culture media is incubated at 25-30ºC in ambient air for up to 4-6 weeks.

**Colony morphology** of Blastomyces dermatitidis has a white to beige colony on its surface and the reverse is pale to brownish. The colony texture is downy.

**Microscopic morphology** will have hyaline, septate hyphae. The conidiophores are short and unbranched. The conidia are hyaline, pyriform, unicellular, terminal, and solitary. Basically the mold form of *Blastomyces* is very nondescript. Upon culturing the mold form in the lab, **the yeast form** must be demonstrated to determine the identification of Blastomyces dermatitidis. Cottonseed conversion agar can be used and it should be incubate at 35ºC in ambient air for 1 week. Blastomyces is the only instance where mold-to-yeast conversion is feasible in the clinical lab. **Colony morphology** for the yeast form has a white to beige colony that is creamy and granular to verrucose in texture. The microscopic morphology for Blastomyces dermatitidis is the diagnostic form. **The yeast cells** have thick refractile walls, and a single bud with a broad base. An easy way to remember this is a “Broad Based Budding yeast” has a lot of B’s in it and Blastomyces dermatitidis begins with B.

**Serological Tests:**

More likely to be positive later in disease (>6 wk)

**1-Complement Fixation Test (CFT)**

* + Insensitive (<50%),Non-specific (X-reactions)

**2-exoantigen test performed by Immunodiffusion**

* + Sensitivity 52-80% using A Ag, Good specificity >90%
  + Disseminated disease 88% positive, Local disease 33% positive

**3-ELISA**

* + Best with A Ag, Sensitivity 80%, Specificity 80-92%
  + Single titre of ≥1:32 strongly supports diagnosis, 1:8 – 1:16 suggestive

**4- the nucleic acid amplification assay.**

**Treatment:**Treat all active cases

**1.*Itraconazole***(200-400 mg OD x 6 months)Except CNS blastomycosis

**2.*Amphotericin B***  *IV* (x 6-10 weeks)Life-threatening disease, CNS disease, Lack of response to ICZ, ICZ toxicity.

**3- Surgical excision** may be helpful.

* There are no means of prevention