**Paracoccidioidomycosis**

- Systemic endemic disease
- Discovered in 1908 by Lutz
  - cultured from a lesion and isolated it
- Alternate names
  - South American blastomycosis
  - Lutz-Spendore-Almedia disease
  - Lobo disease
- Etiological agent
  - *Paracoccidioides brasiliensis*

**Geographical Distribution**

- Endemic to South & Central America
  - Restricted to coffee- or tobacco-growing areas
    - Acidic soils
    - Temperature 12°C-30°C
    - Mexico to Argentina
  - Most common in southeast Brazil
    - About 80% of cases
    - 1-3 cases per 100,000 inhabitants
  - Rare outside endemic areas
    - North America infections may be linked to latent infections (all cases once resided in endemic areas)

**Paracoccidioidomycosis Taxonomy**

- Kingdom: Fungi
- Phylum: Ascomycota
- Subphylum: Ascomycotina
- Genus: *Paracoccidiodes*
- Species: *Paracoccidioides brasiliensis*

**Pathophysiology**

- Natural habitat remains unknown
- Resides in humid and rich in protein soils
- Acquired via inhalation of conidia
  - Followed by an asymptomatic pulmonary infection
  - Person-person transmission does not occur
- Cultivated from fruit bats and armadillos

**Life Cycle**

- Mitosporic fungus
- Lacks sexual stage (teleomorph)
- Thermally dimorphic
  - Mold
    - Room temperature
    - Thin septate hyphae with occasional chlamydospores and conidia
  - Yeast
    - Body temperature (37°C)
    - Characterized by oval/round budding yeast cells of varying sizes (4 to 40 microns)
    - Typical appearance is of a large mother cell surrounded by multiple budding daughter cells (blastocystis); "pilot's wheel"
Epidemiology

- No racial predilection
- Rare in children and teenagers
  - 3-5% of cases
- Common in persons 30 years and older
- More common in men
  - 15:1 male to female ratio
  - Farmers & hunters
- Risk factors
  - Agricultural work
  - Malnutrition
  - Smoking
  - Alcoholism
  - Immunocompromised condition

Clinical Manifestations

- Signs and symptoms progress slowly
  - Months to years to manifest
  - Fungus can remain dormant for years within lymph nodes and appear in response to some immunodeficiency
  - Patients typically do not seek immediate medical attention
- Any organ can be affected upon inhalation of conidia
  - Single or multiple organs
- If not contained early infection develops into chronic or acute/subacute form
  - Over 90% chronic form

Clinical Manifestations Continued...

- Asymptomatic
  - Occurs in most cases
- Mucosal lesions
  - Ulcer-like lesions
  - Affect any structure
- Pulmonary
  - Cavity lesions may be found
  - Affect central and basal zones
  - Pulmonary tuberculosis
- Skin
  - Ulcerative, crusty lesions
  - Cutaneous and subcutaneous
- Other
  - Spleen, GI tract, liver, bones, CNS, male genitourinary tract

Diagnoses

- Latent
  - Diagnoses often occurs years after exposure
- Clinical material
  - Skin scrapings, sputum and bronchial washings, and tissue biopsies from various visceral organs.
- Direct Microscopy
  - Skin scrapings should be examined using 10% KOH and Parker ink. Tissue sections should be stained Grocott’s methenamine silver (GMS)
- Immunodiffusion test used to detect circulating P. brasiliensis antibodies

Treatment

- High mortality rate if untreated
- Juveniles have poor prognosis
- Antifungal treatment
  - Triazoles
    - 95% effective
  - Imidazole
    - 85-90% cure rate
    - Significant toxicities
  - Sulfamides
  - Amphotericin B
    - Severe cases
    - In combination with other treatments
    - Not curative

Treatment Continued...

- Supportive care
  - Correction of anemia and improved diet
  - Patient rest
  - Stop smoking and drinking
- Complications
  - Pulmonary
    - Hemoptysis
    - Pulmonary fibrosis
    - Chronic pulmonary
  - Endocrine
    - Addison syndrome
Case Study: Paracoccidioidomycosis and Cervical Cancer

- 41 year old female cleaner
- rural area of São Paulo, Brazil
- follow-up visit for stage IIIB cervical carcinoma
- undergoing radio-therapy
- reported skin lesion three months prior
- coinciding with clinical deterioration of her primary disease

Case Study One continued...

- single ulcerated lesion with a granulations, hemorrhagic spots, and infiltrated border
- 3.0 cm in diameter
- lateral surface of left arm
- anatomopathological examination confirmed paracoccidioidomycosis
- finding of typical multiple budding cells
- died one month later due to progression of primary disease

Case Study: Multifocal Chronic Paracoccidioidomycosis

- 56 year old Colombian male
- 10 month history of papular lesions on lips and gums
- compromised whole oral cavity
- necrotic areas developed on certain fingertips

Case Study Two continued...

- multiple-budding blastoconidia observed through serological tests
- diagnosed with chronic multifocal paracoccidioidomycosis
- confirmed through biopsy
- amphotericin B treatment
  - every 12 hours for 3 months

Case Study Two continued...

- showed improvement of mucosa and pulmonary lesions
- presented marked limitation to open the mouth
- developed fibrosis
- suggested plastic surgery and otolaryngology evaluation
- since then, patient discontinued follow-up appointments

References


### Questions

1. What phylum does the etiological agent of paracoccidioidomycosis belong?
   - Ascomycota
   - Basidiomycota
   - Zygomycota
   - Deuteromycota

2. True or False: Paracoccidioidomycosis is most common in the United States.

3. True or False: Paracoccidioidomycosis is more common in men than women.

4. Treatment of Paracoccidioidomycosis includes:
   - Triazoles
   - Sulfonamides
   - Amphotericin B
   - All of the above
   - None of the above

5. True or False: Paracoccidioidomycosis is immediately diagnosed after exposure.