

Aspergillosis

Fungus Ball

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- **Aspergillosis**

- is a disease of subcutaneous and deep mycoses caused by aspergillus fungus which usually affects the lungs.
- is a ball or aspergilloma arranged as a tangled mass of fungus fibers, blood clots, and white blood cells.

Figure 1

Case Study

- "Rapidly Progressive Invasive Pulmonary Aspergillosis in a Diabetic Man." Journal of Infection and Chemotherapy 13 (1): 46-50. 7 June 2007.
- 45-year-old man diagnosed with hyperglycemia.
- April 7, 2001 patient visited hospital for persistent cold.
- 2 days later hospital visitation indicated severe infection.
- Culture/ Laboratory Work
 - Chest X-ray
 - showed a reticular shadow
 - CT
 - revealed thickening of the walls of the large bronchus and diffuse bronchiolitis.
 - Sputum culture
 - Positive for aspergillus
 - Tuberculin skin test was positive.

Case Study

- Treatment
 - First given cefotiam HCl but high fever and black sputum continued.
 - Non-responsive to antibiotic indicated presence of fungal infection.
 - Treated with itraconazole and Meropenem trihydrate.
 - In addition 1mg of amphotericin B was taken daily and increased to 50mg daily.

Case Study

- Day 10 respiration status deteriorated
 - Chest X-ray and CT showed multiple cavities.
- Day 25
 - Respiratory failure led to the patients death
- Autopsy
 - weight of right lung was 1710 g ~ 3.7699 pounds
 - weight of left lung was 1650g ~ 3.6376 pounds
 - Healthy lungs together weigh 2.5 pounds ~ 1133.9 g

Etiological Agents

- Various Species
 - A. fumigatus
 - Most commonly isolated
 - A. flaxus
 - A. niger
 - A. clavatus
 - A. glaucus
 - A. nidulans
 - A. oryzae
 - A. terreus
 - A. ustus
 - A. versicolor
- Aspergillosis is commonly found in:
 - Airborne dust
 - Compost heaps
 - Air vents
- Effects open spaces in the body.
 - Lungs
 - Ear canal
 - Sinus

Symptoms

- Symptoms of allergic aspergillosis may include:
 - Fever
 - Malaise

- Cough
- Coughing up blood or brownish mucous plugs
- Wheezing
- Weight loss
- lung obstruction

Additional symptoms

- Chills
- Headaches
- Shortness of breath
- Chest pain
- Increased sputum production, which may be bloody
- Bone pain
- Blood in the urine
- Decreased urine output
- Meningitis
- Sinusitis
- Endocarditis
- Vision problems

Risk Factors

- Opportunistic infections
 - Bone marrow or stem cell transplant patients are greatly affected.
 - AIDS patients have increased risk
- Allergic states or cystic fibrosis
 - 7% of people have allergic response to aspergillus mold.
- Lung cavities
 - Mold spores grow in healed cavity
 - The larger the cavity the greater chance of developing an infection.
- Hospital stay
 - Patients with weakened immune system are susceptible.
- Low white blood count
 - Are more susceptible to invasive aspergillosis

Tests

- Chest x-ray
- CT scan
- Sputum stain and culture for *Aspergillus*
- Tissue biopsy
- *Aspergillus* antigen skin test
- *Aspergillus* precipitin antibody
- Complete blood count

Histopathology

- No special stain is needed because grains are quite visible.
- Usually stained with the haematoxylin and eosin.
- Stain is seen in the middle of polymorphonuclear leucocytes.
- Periodic acid schiff and silver reveal the details of colonies showing the

- segments on hyphae.
- GMS stain (figure 5)

Characteristics

- Grains may be circular or oval in shape composed of compact hyphae with or without spores.

Treatments

- Fungus ball
 - May cause no symptoms
 - Can be found by X-ray
 - Usually requires no treatment unless coughing up blood, then surgery is needed.
- Invasive aspergillosis
 - Treated within weeks of
 - amphotericin B- an antifungal medication given by an IV.
 - Itraconazole or voriconazole can also be used

Treatments

- Endocarditis
 - Can be treated by removing the infected heart valves
 - In addition long-term amphotericin B therapy is needed.
- Aspergillosis of the ear
 - Scraping out fungus and applying antifungal drugs.
- Allergic aspergillosis
 - Can not be treated with Antifungal agents
 - Treated with orally taking prednisone

Complications

- Amphotericin B can cause kidney impairment and bad side effects.
- Invasive lung disease can cause substantial bleeding from the lung.
- Infection of sinuses can destroy facial bones.
- Most damaging is the spreading of the infection.

Epidemiology and Ecology

- Noscomial infection
- Commonly found in the 1980's

- Effects immunocompromised patients

References

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