Hyalohyphomycosis

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Hyalohyphomycosis: *F. solani/F. oxysporum*

- Alternate name includes Hyaline Hyphomycetes
  - Fungal infection that has hyaline and non-pigmented hyphae
  - A mold that is commonly found in polluted water, soil, and decaying organic material

Hyalohyphomycosis

- **Taxonomy**
  - Kingdom: Fungi
  - Phylum: Ascomycota
  - Class: Sordariomycetes
  - Subclass: Hypocreomycetidae
  - Order: Hypocreales
  - Family: Nectriaceae
  - Genus: *Fusarium*
  - Species: *F. solani, F. oxysporum*
Fusarium solani and Fusarium oxysporum

- **Geographic Distribution**
  - Can be found worldwide
  - More prevalent in the United States, Canada, parts of Africa, parts of Europe (Italy), and parts of Asia (India)

- **Life Cycle**
  - Asexual reproduction: forms conidia and replicates by mitosis
  - Sexual reproduction: forms ascospores that are released from the ascus

http://www.uoguelph.ca/~gbarron/MISC2004/microf1.jpg
F. solani & F. oxysporum (cont.)

- Epidemiology
  - Patients who are immunosuppressed are at a higher risk; include cancer patients and patients undergoing organ/bone marrow transplants
  - Disseminated infections occur in patients with hematological malignancies and sometimes with severe burns
  - Due to contact with infected soil or dirty water
F. solani & F. oxysporum (cont.)

- Pathogenesis
  - Two possible routes of exposure: the skin and the respiratory systems
  - Skin: spores may come in contact with open wounds (burns from trauma, etc)
  - Respiratory: airborne conidia can be inhaled; suggested by the occurrence of pneumonia and/or sinusitis

http://jcp.bmj.com/content/54/6/488/F1.large.jpg
Diagnosis

• Culture identification
  • Important because of the histopathologic similarities between various hyalohyphomycosis agents.

• Staining with Fontana- Masson or Grocott's methenamine silver (GMS) or Gram stains
  • Silver method that stains melanin
  • This stains the dematiaceous fungi, therefore preventing confusion

• Body Fluids

• Immunohistological staining
  • Polyclonal fluorescent antibody reagents
Histopathology

- Basic tissue form:
  - Hyaline
  - Mycelial 3-8 µm in diameter
  - Light colored
  - Branched at acute angles
  - Sometimes toruloid
  - No pigment in wall

[Image of histopathology of hyalohyphomycosis]

http://www.mycology.adelaide.edu.au/Mycoses/Opportunistic/Hyalohyphomycosis/

Clinical Manifestations of *Fusarium* species

**Symptoms:**
- Persistent fever
- Cutaneous or subcutaneous lesions or nodules
- Cellulitis of the face and extremities
- Corneal infections
- Similar to Aspergillosis, however in *Fusarium* there are skin lesions
- Chest pain
- Ulcers
Clinical Manifestations of *Fusarium* species

- Can present as:
  - Subcutaneous infections, arthritis, cystitis, and pneumonia etc.

http://www.ncbi.nlm.nih.gov/pmc/articles/PMC149723/figure/f1/
Treatment/ Prevention

• Various antifungal agents
  • Amphotericin B, triazoles, capsofungin (not for *Fusarium*)
  • Surgery with extreme localized infections

• Preventions
  • Standard air control
  • Preventing exposure of high-risk individuals to tap water
  • Cleaning showers, encouraging better hygiene
Case Report 1 - a minor circumstance

- Cutaneous hyalohyphomycosis
  - *Scedosporium apiospermum*

- Female, 28.
- Gardener
- Cutaneous abscess on left forearm
- Misdiagnosed:
  - Ulcerative colitis

- Reexamination confirmed *S. apiospermum*
- Oral itraconazole, 100 mg/day
- Symptom free after 4 months.
Case report 2-

- 45 y/o, South Indian Man
- Renal allograft transplant
  - Tacrolimus, mycophenolate, prednisolone
- 6-months later returned with nodule on his calf
  - No fever, redness, or opportunistic infections
- Abscess was removed and biopsied
  - Positive for *Fusarium solani*
- Given oral voriconazole treatment

http://www.jmedicalcasereports.com/content/5/1/205
Just a side note…

- Do any of you wear contacts?

- Back in 2006 ReNu contact solution with MoistureLoc was forced to remove all of their products from stores.

- Why?
  - There was a major surge in *Fusarium keratitis* and it was linked to the product.
References

References