Lacaziosis
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History of Lacaziosis
- First discovered in 1938 by Jorge Lobo
- Named Lobo Disease in 1938
- Name changed to lobomycosis in 1958
- Lacaziosis suggested as new name in 2005
- Initially described as keloidal blastomycosis

History of Lacaziosis
- First discovered in Brazil
- Has since been reported in many South American nations
- Also found to infect 2 species of dolphins

What is Lacaziosis?
- A chronic fungal infection of the skin
- Endemic to Brazil and other South American Nations
- Natives of the Brazilian rain forest call this disease miraip or pirai, meaning "that which burns"

What Causes Lacaziosis
- The causative agent has never been cultured in vitro
- Most of our knowledge of the etiologic agent of lacaziosis is derived from histopathologic, electron microscopic, and molecular studies
- As mentioned before, the causative agent is known by many names, but is correctly referred to as Lacazia loboi
**Taxonomy of Lacazia loboi**
- **Kingdom:** Fungi
- **Phylum:** Zygomycota
- **Subphylum:** Zygomycotina
- **Order:** Entomophthorales
- **Family:** Uncertain
- **Genus:** Lacazia
- The only species in the Lacazia genus

**Lacazia loboi**
- A yeast-like fungus that causes infection in humans and bottle-nosed dolphins
- The natural reservoir of *L. loboi* is unknown
- Aqueous environment appears to be mandatory for the life cycle
- Saprophytic in water and is transmitted to the vulnerable host via contact

**Biology of Lacazia loboi**
- Under a microscope, numerous yeast-like, round, thick-walled cells are visible
- Chains of yeast cells are typically formed
- Small, tube-like, connections are visible between the yeast cells

**Produced granuloma and yeast-like cells around 5-12µm in size**
- Cells are often phagocytosed by histiocytes
- Periodic Acid-Schiff (PAS), Gomori's-Grocott's and Gridley's silver stains are used for examination

**Disease Manifestations**
- Only one case has ever been reported in the United States
- No deaths have ever been reported
- 64% of all cases occur in Brazil
- 62-94% infected are males
- Most common in farmers
- Average age of infection: 38 years old

**Disease Manifestation**
- Disease manifests as keloids, verrucoid and nodular lesions, crusty plaques, and tumors
- Grows as "glob" of cells that are connected to each other by a narrow neck
- Lesions are well defined, smooth, painless and lie in deep tissues
Sources

- Lacazia spp.." Dr. Fungus 7 Jan 2007: n. pag. Web. 1 Aug 2010

Pathogenesis

- Acquired after skin trauma and exposure to Loboi propagules
- Environmental factors
  - Geography
  - Large forests
  - Rivers
- Host factors
  - Age
  - Sex
  - Ethnicity
  - Occupation
  - Immune factors

Pathogenesis Continued

- Occurs in healthy hosts
- Suggested to gain entrance to tissues after skin damage and exposure to organic materials
  - Soil
  - Plans
  - Water
- L. Loboi develops very slowly
  - Possibly months to years

Pathogenesis Continued

- Characterized by mucocutaneous lesions
  - Nodular
  - Vegetating
  - Verrucose
  - Cauliflower-like
  - Hyper/hypo-pigmented
- Lower extremities and ears most common
- Nasal and labial lesions rarely reported

Pathogenesis Continued

- Aquarium employees and farmers constitute highest number of cases
- Other high-risk occupations
  - Gold-mining
  - Fishing
  - hunting
- Previous cutaneous trauma enhances the entry of the fungus through the skin
- No current evidence of person-to-person transmission

Diagnosis

- 1. Clinical material: Tissue sample obtained by curettage or surgical biopsy
- 2. Direct Microscopy: Tissue macerated and mounted in 10% KOH and Parker ink or calcofluor white mounts
- 3. Culture: "Loboa loboi" remains to be cultured
Diagnosis Continued

4. Serology: Currently no serological tests available

5. Identification: Clinical features, geographic location and microscopic morphology are all important

Disease Management

- *Most Successful*: surgical excision of affected area
- Care must be taken to prevent contamination of surgical wounds
- Relapse is very common
- Clofazimine
  - 100-200 mg/day
  - Used with varying results
- Appears that antifungal drugs are ineffective for treatment
- Course of infection is slow and chronic
- Not life threatening

Case Report

Lobomycosis in Man and Lobomycosis-like Disease in Bottlenose Dolphin, Venezuela

- Small, solitary hard nodule developed
- Eventually accompanied by satellite lesions that were becoming confluent and harder nodules
- Sometimes hyper-chromic with flat, shiny surfaces
- Nodules slowly invaded entire posterior border and lobule of ear
- Occasionally caused pruritus and a tingling sensation
- Patient refused otoplasty
- Treated with itraconazole
- Some nodules partially regressed

Human

- 62-year-old fisherman from central coast of Venezuela
- Extensive lesions of left ear
- Recalled his illness began at age 52
  - Accidentally injured posterior portion of helix of ear with a fishhook
Dolphin
- Adult male, bottlenose dolphin
- Found after recently dying
- Margarita Island, Venezuela
- Severe Lobomycosis-like disease
  - Large numbers of white, gray, and pink proliferating, congregating lesions (some bleeding)
  - Had keloidal and verrucous characteristics that formed rosettes on beak, back, flanks, dorsal fin, tailstock, and tail

Conclusions
- Dorsal fin severely affected
  - Asymmetric distribution of lesions caused fin to bend
- Granulomas extended into oral cavity between maxillary teeth and palate
- Unknown if poor health favored dissemination or whether disease was primary factor

Fisherman- likely contracted disease from marine environment after pathogen inoculation with a fishing hook
- Human and dolphin case most likely not related
  - Although marine environment is likely natural habitat for L. loboi and reservoir for infection

Conclusions
- Many aspects of transmission, pathogenesis, and ecology still poorly understood
- Dolphins
  - May occur by contact
  - Mother-to-calf
- Humans
  - Acquire infection from infected dolphin

Lesions similar in both humans and dolphins
- Larger in dolphins
- Typically smooth and shiny nodular lesions with keloidal aspect to extensive and confluent verrucous lesions
- Usually located on most exposed areas (typically cooler areas)
- Emergence of lobomycosis is a cause for concern
  - May be indicative of increased biological contamination and environmental changes
  - Poses potential threat to human health
Sources