Cutaneous Mycoses: Dermatophytoses

- "Ringworm" – zoonotic
  - describes clinical appearance
  - *Trichophyton* / *Microsporum*
  - Skin, hair, nails - dermis.
  - No systemic disease

- Infections (contagious)
  - Arthrospores/conidia
  - Penetrate skin at abrasions

- Spores germinate - hyphae
  - penetrate stratum corneum + hair follicles

- Subclinical/clinical
  - Circular alopecia, erythema
  - “asbestos” plaques (*T. verrucosum*)
Dermatophytoses

- *M. gypseum* - worldwide, geophilic, rodents, dogs, horses, Humans. Less commonly in other species

- *M. nanum* - (NA, SA, Australia, N.Z) geophilic, swine. Rarely in other species

- *M. gallinae* - (Europe, NA, SA) zoophilic, chickens and turkeys

- *T. verrucosum* - worldwide, zoophilic, most common species in cattle (occasionally in sheep, horses, humans)
  - Macroconidia rare (Chlamydospores in chains), inositol/thiamine

- *T. equinum* - worldwide, zoophilic, most common species in horses (occasionally in other species). Nicotinic acid

- *T. mentagrophytes* - worldwide, zoophilic, rodents (guinea pigs, mice), dogs plus wide range of other hosts including humans.

Dermatophytoses: gone awry!

- Four 5 week old kittens arrive at foster home from SPCA
- Kittens quickly develop skin problems - activity, appetites good
- One has “circumscripted lesion” at base of tail
- 10% KOH examination of hair from edge of lesion
- Ectothrix anthroconidia and septate hyphal
**Dermatophytoses: go away!**

Presumptive dx: *Microsporum canis*

Kittens “sequestered”

Physical spaces decontaminated bleach

Kittens Txt

3-6 % Lime Sulfur (3-4 days) – Nope!

Felines: Itraconazole (Sporanox®)

10 mg/kg/SID (capsules 100 mg)

Dog/Human – topical miconazole cream

**Dermatophytoses: Diagnosis**

- Woods’ Lamp (*M. canis* only)
- 10 - 20% KOH + LPCB
  - Direct examination - arthrospores/hyphae
- Routine Culture: SAB or Mycosel™ agar
  - Selective (Chloramphenicol/Cycloheximide)
  - 3 – 8 wks, room temp.
  - Colony morphology, color
  - Scotch tape wet mount
  - Septate Hyphae and macroconidia

- Dermatophyte Test Medium (DTM)
  - Selective + Presumptive i.d.
  - yellow-to-red 10-14 days
  - Trichophyton speciation difficult
  - Molecular dx
**Dermatophytoses: Treatment**

- **Disinfect animal holding areas, equipment**
  - 1% formalin, bleach, enilconazole spray

- **Segregate, clip hair to i.d. lesions**

- **Topical antifungals**
  - Chlorhexidine, Povidone–iodine: don’t work (clearance is likely CMI)
  - **3-6% Lime sulphur** (topical dogs/cats/horses/cattle) 2 x wkly, 6-10wks
  - Imidazole creams, shampoos or rinses available: Plumb says Ho-Hum
    - Miconazole, Ketoconazole ($$ so dogs/cats only), Clotrimazole
  - **Captan** (orchard antifungal), Bleach (1:10) have been used on cattle

**Dermatophytoses: Txt/Vaccines**

- **Systemic Antifungals**
  - **Griseofulvin** (p.o.) **dogs/cats/horses/cattle** (teratogenic!) if topicals fail or aren’t practical.
  - ITZ (p.o.) if topical or Griseofulvin fail (dogs, cats, horses)
    - Terbinafine (p.o.) – dogs, cats may be most efficacious
  - **Lufenuron** (Program®/Sentinel®– Novartis) fleas + fungus?

- **Vaccines not currently available in N.A.**
  - Fel-O-Vax® MC-K (Fort Dodge) no longer available (post Pfizer)
  - Bovilis® RINGVAC (Intervet) – attenuated *T. verrucosum* : in Europe used therapeutically and prophylactically
**Cutaneous Dermatomycoses**

- *Malassezia pachydermatis* - lipophilic yeast
  - 1-3 μm “footprint”, *otitis externa*
  - skin/anal gland/ear commensal
- Chronic *seborrheic dermatitis*
  - Inflammation, erythema, scaling, pruritic
  - Localized (chest, forelegs etc./generalized

- 10% KOH /Gram-stain (>10 per high dry)
- SAB - 1 wk or less

- Seborrheic Dermatitis:
- topical ‘azole + chlorhexidine, ITZ (p.o.)
- Ear Preparations:
- Burow’s Sol’n (Aluminum acetate)
- **OtoMax®** - Abx, Steroid, Clotrimazole
- **Surolan™** - Abx, Steroid, Miconazole
- Panalog® Tresaderm®

**Subcutaneous Mycoses**

- *Sporothrix schenckii* – Sporotrichosis
- Worldwide (tropical/subtropical)
- soil + decaying vegetation
- Exogenous infection → wounds
  - localized cutaneous
  - ascending lymphocutaneous (more common)
  - Disseminated (less common: dog/cat)
- Saprozoonotic and zoonotic
  - Rose handlers disease

- Most common in dogs (head,trunk)
  - lymphocutaneous form
- Cats - head/ base of tail (zoonoses!!)
  - Shed high numbers yeast in exudate
- **Ulcerative Lymphangitis** (equidae)
Sporotrichosis

- Dx (signs, geography, thermal dimorphism)
  - Direct Examination (exudate, skin biopsy, blood smear)
  - **Cigar Bodies** (+/- intracellular in PMNs)
  - Culture (1 week) BHI (37°C), SAB (R.T.)
  - Yeast phase - 37°C / Mold Phase - 22°C
  - septate hyphae, microconidia (flowerettes)
- IHC is available for animals

- Txt
  - Equine: K/Na iodide (p.o.) for 2-3 weeks
  - Canine: same (ITZ for iodide sensitive)
  - Feline: ITZ (iodide sensitivity is problem)
  - AMB with Flucytosine (i.v.) has also been used in D/C

Exotic or Rare SubQ pathogens

- Epizootic Lymphangitis: (notifiable in N.A.)
- *Histoplasma capsulatum* var. *farciminosum*
  - Equids North Africa, EU, India

- Dematiaceous Fungi (rare: melanin)
  - Multiple Genera – (ie. Phialophora, Cladophialophora)
  - Chromoblastomycosis
    - firm, protruding, ulcerative nodules on extremities
  - Eumycotic (fungal) Mycetoma
    - Swelling, fistulous tracts, exudate rains/granules
  - Phaeohyphomycosis – non-mycetoma presentation
  - Bovine Nasal Granuloma – nasal cavity/trachea