Cutaneous and Subcutaneous Mycoses

Cutaneous Mycoses: Dermatophytoses

- “Ringworm” – zoonotic
  - describes clinical appearance
  - *Microsporum* + *Trichophyton*
  - Skin, hair, nails - dermis.
  - **No systemic disease**

- Infections (contagious)
  - Arthroconidia/spores
  - 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. gallinae** - (Europe, NA, SA) zoophilic, chickens and turkeys
- **M. nanum** - (NA, SA, Australia, N.Z) geophilic, swine. Rarely in other species
- **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!

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

Presumptive dx: *Microsporum canis*
- Kittens “sequestered”
- Physical spaces decontaminated bleach
- Contagious/virulent – adult cat/dog/human

Kittens Tx
- 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 i.d. difficult
  - PCR-based can speciate most, some from clinical samples
Dermatophytoses: Intervention

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

- Quarantine, 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
    - Terbinafine, Miconazole, Eniconazole (Imaverol®)
  - 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.
  - Itrafungol® for cats, ITZ (dogs)
  - Terbinafine (p.o.) – dogs, cats (+/- efficacy?)
  - 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
Misc. Cutaneous Dermatomycoses

- **Malassezia pachydermatis** - true yeast
  - skin/anal gland/ear commensal

- Chronic seborrheic dermatitis
  - concurrent with skin problems (ie. atopy)
  - Basset hounds, Highland white terriers, poodles
  - Localized (chest, forelegs etc.)/generalized
  - Inflammation, erythema, greasy exudate, hyperpigmentation

- Dx – dermatitis
  - Skin-scotch tape lift – Wrights stain
  - Skin scraping + 10% KOH/gram stain ( > 10 yeast/HPF)
  - SAB – *M. pachydermatis* does not require lipids

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**Txt:**

- Dermatitis: topical ‘azole +/- chlorhexidine shampoo, ITZ (p.o.)
- Otitis Externa:
  - Burow’s SoL’n (Aluminum acetate)
  - **OtoMax®** - Abx, Steroid, Clotrimazole
  - **Surolan™** - Abx, Steroid, Miconazole

Subcutaneous Mycoses: Sporotrichosis

- **Sporothrix schenckii** - Worldwide (tropical/subtropical)
- soil + decaying vegetation

- Exogenous infection → wounds
  - lymphocutaneous form – dogs/horses (ascending)
    - **Ulcerative Lymphangitis** (horses)
  - Lymphocutaneous and Disseminated - cats
  - Cats shed high numbers in exudates

- **Saprozoontotic and zoonotic (cats)**
  - Rose handlers disease
**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
  - AMB + Flucytosine (i.v.) has been used in D/C