Skin Infections…
More than a bug bite!

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Scabies
Clinical

- Female mite
- Larvae, or newly hatched mites, travel to the skin surface,
- Mite is scratched off the skin, it can live in bedding up to 24 hours
- May be up to a month before a newly infested person will notice the itching, especially in people with good hygiene and who bathe regularly
Norwegian Scabies
Scabies Prep

- Scabies prep
- Scybula
Histopathology

- Mite or scybula limited to stratum corneum
- Dermal eosinophilia
- Nodular aggregates in childhood
- DDX: Scabid, id
Tuberculoid Leprosy
The Scourge of Satan

- Appears in an Egyptian papyrus inscribed about 1552-1350 B.C.
- Indian writings dated at 600 B.C., describe a disease that most experts agree was leprosy.
- Does not appear in the records of ancient Greece until the army of Alexander the Great came back from India in 326 B.C.
- In Rome, the first mention coincides with the return of Pompey's troops from Asia Minor in 62 B.C.
Leprosy - Clinical

- Anesthesia, thickened nerves
- 90% of patient present with numbness
- Neuropathy
  - Temperature, light touch, deep pressure
- Hypopigmented macule is often the first cutaneous lesion
Indeterminate leprosy (IL)

- Early form causes one to a few hypopigmented, or sometimes erythematous, macules
- Sensory loss is unusual
- Most cases evolve from this state into one of the other forms, depending on the patient's immunity to the disease
Tuberculoid leprosy (TT)

- Erythematous large plaque with well-defined borders that are elevated and slope down into an atrophic center
- Both types of lesions are anesthetic and involve alopecia
- Tender, thickened nerves with subsequent loss of function
- Great auricular nerve and superficial peroneal nerves are often prominent
Histopathology

- Non-caseating granulomas with occasional giant cells
- Rare necrosis
- Mixed chronic inflammatory infiltrate
- Perineural involvement
Lepromatous leprosy (LL)

- Early pale macules
- Macular lesions are small, diffuse, and symmetric
- Lateral eyebrows are affected by alopecia (i.e., madarosis)
- Diffuse, nodules (lepromas), or plaques - Leonine
- Cannot convert back to the less severe borderline or tuberculoid types of disease
Histopathology-Lepromatous

- Diffuse infiltrate of foamy macrophages with Grenz zone
- Numerous AFB and globi (clumps)
- Numerous bacilli invade nerves
- Rule out histoid leprosy (Mycobacterium spindle cell tumor)
Syphilis
The physician who knows syphilis knows medicine.

----Sir William Osler
Syphilis in the United States

- 1940-100,000 cases (pre-antibiotic era)
- 1956-10,000 cases
- 1990-45,000 cases
  - AIDS
  - intravenous (IV) drug and crack cocaine abuse
  - Prostitution
- 1995-16,500 cases
Primary Syphilis

- Develops at the site of transmission
- Incubation period of 10-90 days (mean 21-28 days)
- Heals spontaneously in 3-7 weeks
Secondary Syphilis

- About 4-10 weeks after the appearance of the primary lesion
- Malaise, fever, myalgias, and arthralgias
- Generalized body rash and lymphadenopathy
- Symptomatic secondary syphilis usually resolves without treatment
Latent Syphilis

- **Early**
  - Encompasses the first 1-2 years of the disease and is marked by occasional relapses of active secondary lesions

- **Late**
  - Asymptomatic and generally noninfectious
  - About one third of untreated patients develop tertiary syphilis
  - Latency period lasting years to decades and manifests as gummatous or cardiovascular syphilis or neurosyphilis
Secondary Syphilis Histopathology

- Psoriasiform dermatitis with superficial and deep mixed infiltrate with plasma cells
- Plasma cells absent (10-15%)
- Rarely granulomatous, neutrophilic dermatosis, or pseudolymphoma
Tertiary Syphilis-Histopathology

- Warthin-Starry stains or other silver stains are usually positive for the organisms
- Silver stains may be negative in tertiary disease
Dermatophytosis
Wet Mount

- Wet mount potassium hydroxide preparation (KOH prep)
- Stain such as lactophenol blue may be added and the slide is examined under the microscope
- Dermatophytes often take weeks to culture
Culture

- Plate on Sabouroud’s Dextrose
- Look at both sides of the plate
Histopathology

- Classic pattern - PMNs within the stratum corneum*
- Sandwich sign (compact orthokeratosis and a layer of compact orthokeratosis underlying normal orthokeratosis)
- Endothrix vs exothrix
- Using a ultraviolet Wood's lamp, endothrix infections will not fluoresce as opposed to exothrix infections
A Classic Pattern?

- Retrospective case-control study on 303 cases of spongiotic or psoriasiform dermatitides over a 35-month period-PAS and H and E
- Sensitivity and specificity for diagnosing dermatophyte infection based upon neutrophils within the stratum corneum were 62 and 59%, respectively
- Neutrophils within the stratum corneum is neither sensitive nor specific in the diagnosis of dermatophytosis

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Leishmaniasis
Sandfly

- **Vector Sandflies** (*Phlebotomus* species)
- *Leishmania* are intracellular parasites that infect the mononuclear phagocytes
Clinical Variants

- Visceral
  - *Leishmania donovani* causing visceral leishmaniasis (kala azar)

- Cutaneous
  - *Leishmania tropica* and *Leishmania brasiliensis*
  - *L. tropica* is seen mainly along the shores of the Mediterranean, through the Middle East, central Africa, and parts of India
  - Cutaneous leishmaniasis caused by *L. brasiliensis* is confined mainly to Central America and South America
Histopathology

- Parasitized macrophages widely disseminated
Irregular acanthosis

Dense dermal infiltrate of mixed inflammatory cells, particularly plasma cells, lymphocytes, and histiocytes

Early, organisms may be numerous

With time, noncaseating granulomata in which few or no organisms

Ulcerated lesions commonly may become infected secondarily

Biopsy specimens from old (>6 mo), partially treated, or low-burden infections frequently are nondiagnostic
Chromoblastomycosis
Chromoblastomycosis

- Trauma to the skin with long interval
- Over time leads to nodule or plaque
- Rarely lymphatic and hematogenous dissemination
- On the surface of both types of clinical variants, numerous black dots may be observed where the causative organisms are preferentially found
- Secondary infection with bacteria common
Fungal Causes

- Four different genera:
  - *F. pedrosoi*, *P. verrucosa*, *C. carrionii*, and *F. compacta*
  - Different species of *Exophiala* have also been reported.

- *C. carrionii* is the most common agent of chromoblastomycosis in that country
Histopathology

- Pseudoepitheliomatous hyperplasia
- Microabscesses, granulomas, granulomatous reactions
- Giant cells contain brown-colored, thick-walled fungal cells
  - Muriform fungal cells may be single, 2-celled, or multiple-celled
  - Copper pennies, Medlar bodies, sclerotic bodies
- Transepidermal elimination of the fungal cells is the histologic counterpart of the black dots clinically evident
Eczema Herpeticum

- Also known as Kaposi varicelliform eruption
- Caused by HSV-1
- Commonly develops in patients with atopic dermatitis, burns, or other inflammatory skin conditions
- Children are most commonly affected
Herpetic Whitlow

- Vesicular outbreaks on the hands and the digits, was most commonly due to infection with HSV-1
- Usually occurs in children who sucked their thumbs and, prior to the widespread use of gloves in health care workers
- Occurrence of herpes whitlow due to HSV-2 is increasingly recognized, probably due to digital-genital contact
During the acute phase, significant inflammation of the skin, dorsal root ganglia, and peripheral nerves is present.

Evidence for early denervation of skin tissue, hemorrhagic necrosis, and neuronal loss in dorsal root ganglia is present.

Inflammatory changes may persist for months and lead to scarring.
Histopathology

- Characteristic multinucleated ground glass cytoplasmic changes
- Perineural lymphocytic infiltrate with Zoster
Congenital CMV Infection
Congenital Cytomegalovirus Infection

- Presumed to be transplacental
  - May be transmitted perinatally, both by aspiration of cervicovaginal secretions in the birth canal and by breastfeeding
  - More than 50% of infants fed with breast milk that contains infectious virus become infected with CMV
- Infants who are not infected congenitally or perinatally with CMV are at high risk to acquire infection in day care centers
  - Prevalence of CMV infection in day care center attendants, particularly children younger than 2 years, approximates 80%
- May be transmitted via saliva, urine, and fomites
  - Children, in turn, may transmit infection to their parents
  - Major role in the epidemiology of many CMV infections in young parents
Differential Diagnosis

- TORCH agents
- Congenital toxoplasmosis
  - Intracranial calcifications observed in congenital toxoplasmosis tend to be scattered diffusely throughout the brain and not in the classic periventricular distribution of CMV
- Other congenital infections to be considered include lymphocytic choriomeningitis virus (LCMV) infection, HSV infection, syphilis, enteroviral disease, HIV infection, and rubella