

Skin Infections

Bacteria

Impetigo

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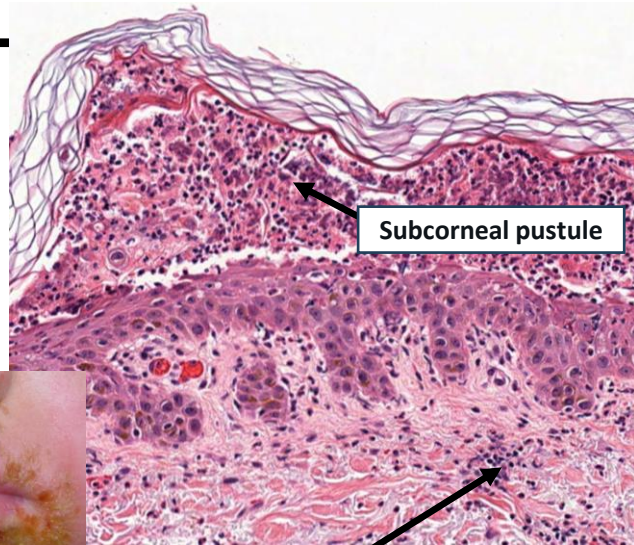
Acute, pyogenic infection. Dx usually made clinically
 Caused by ***Staphylococcus***, ***Streptococci***, or both.
 Most common bacterial skin infection
 Most common in **kids**. Classically: **face** and extremities.

Two forms: Bullous and Nonbullous
Subcorneal pustule with PMNs and acantholytic cells.
 Cocci not always obvious.
 Sparse dermal perivascular inflammation

Treat with antibiotics (topical or oral).



Pustules and erosions with honey-colored crusts

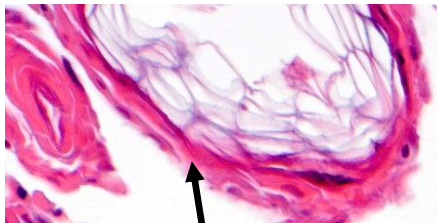


Sparse dermal perivascular mixed dermal inflammation

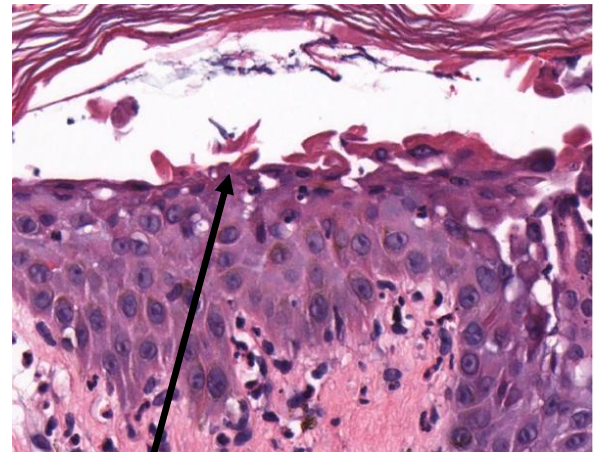
Staphylococcal "Scalded Skin" Syndrome (SSSS)

Clinically resembles SJS/TEN. Tender, flaccid bullae
 Bacterial toxin (exfoliatin) causes a split between the stratum corneum and underlying epidermis.
 There is **no** dyskeratosis or interface change.
 Usually younger kids on face/trunk.

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A frozen SSSS peel roll shows: cleavage at granular cell layer, non-inflammatory, no organisms



Superficial acantholysis with subcorneal separation. The intracorneal acantholysis can have some PMNs.

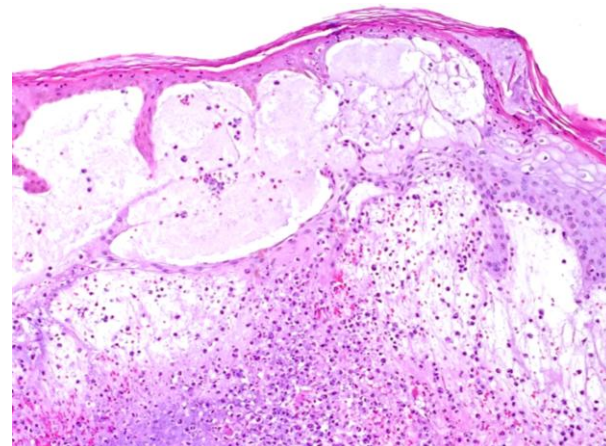
Cellulitis

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Deep, pyogenic (non-follicular) infection of skin/soft tissue.
Usually diagnosed clinically and treated with antibiotics.
 Most commonly *S. aureus* and *S. pyogenes*.
 Trauma usually introduces pathogen.

Expanding inflammation (red, hot, painful) →

Marked edema and vascular dilation
 Neutrophilic inflammation



Necrotizing Fasciitis

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Life-threatening, deep, acute, necrotizing soft tissue infection.

Best diagnosed clinically.

(But, also, can be hard to diagnose clinically early)

Usually **polymicrobial**, but frequently *Strep. pyogenes*

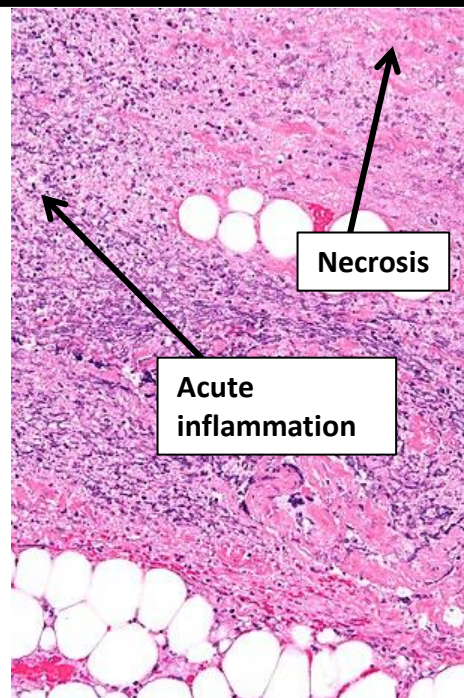
Clinical signs: Disproportionate severe pain, failure to respond to initial antibiotics, systemic toxicity with altered mental status, edema, bullous lesions, gas or crepitus, skin necrosis, and ecchymosis.

Gross clinical findings: Gray necrotic fascia, foul smelling 'dishwater' fluid, lack of bleeding, and lack of resistance to blunt dissection.

Common pathology findings: **Necrosis, Acute inflammation, Bacteria, Thrombi, Karyorrhexis, and Fibrin.**

Histologic evaluation has poor sensitivity and specificity for the diagnosis. Notably, frozen section diagnosis is not accurate.

[PMID: 29243739](#)



Cat Scratch Disease/Bacillary angiomatosis

Caused by *Bartonella henselae*. Domestic cats are vector.
History of exposure to cats (scratch, bite, etc..), especially kittens.

Cat Scratch Disease

Papules/pustules at site of exposure + Regional lymphadenitis
Skin: Neutrophils, nuclear debris, and fibrin with surrounding chronic inflammation. Lymph node: Suppurative, "stellate" granulomas.

Bacillary angiomatosis

Seen in immunocompromised hosts
Vascular proliferation in a lobular pattern, with associated lymphs, histiocytes, neutrophils, karyorrhectic debris, and bacteria.
Think: Pyogenic granuloma + acute inflammation and nuclear debris

See bacteria on Warthin-Starry. Also, specific IHC, PCR, and serology.

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Syphilis

Caused by *Treponema pallidum*.

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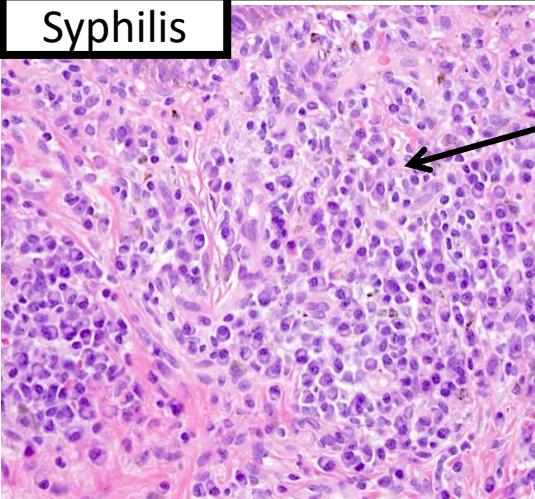
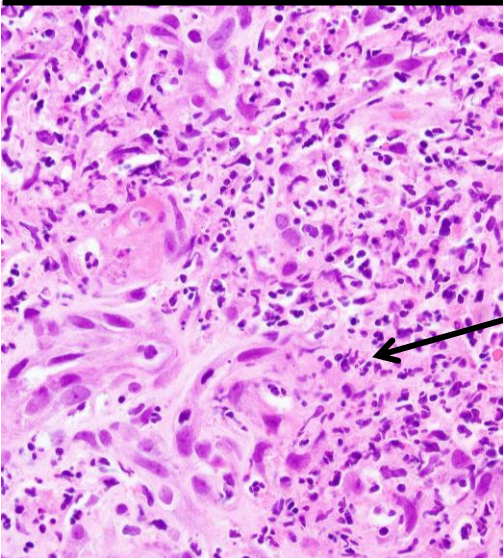
Histologic findings vary ("*great mimicker*"), but generally involve lymphohistiocytic infiltrate with **prominent plasma cells**.

Primary: Painless chancre & lymphadenopathy weeks after infection.

Secondary: Papules on the trunk and extremities, palms and soles, fever and adenopathy months after infection

Tertiary: neurologic and cardiac involvement years after infection

Confirmatory specific IHC. Also, serology testing.



Lyme Disease

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Multisystemic disease caused by spirochete *Borrelia burgdorferi*

Vector: Ixodes ticks

Findings depend on stage.

Plasma cells are a clue to spirochete involvement.

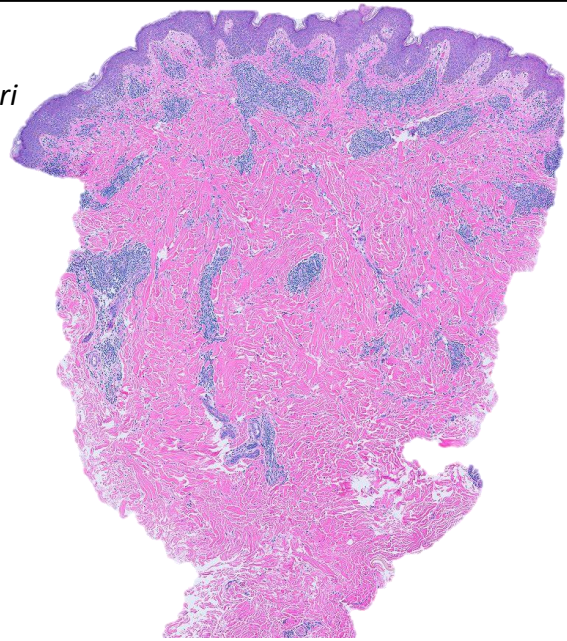
Erythema chronicum migrans: Early-stage localized rash

Dermal tightly cuffed superficial and deep perivascular dermatitis with plasma cells, lymphs, and maybe eos.

Loss of pilosebaceous units

Later: disseminated, chronic

Characteristic early
"targetoid" expanding
oval rash with bite in
center



Tuberculosis

Caused by *Mycobacterium tuberculosis*

Can get to skin through direct inoculation or hematogenously

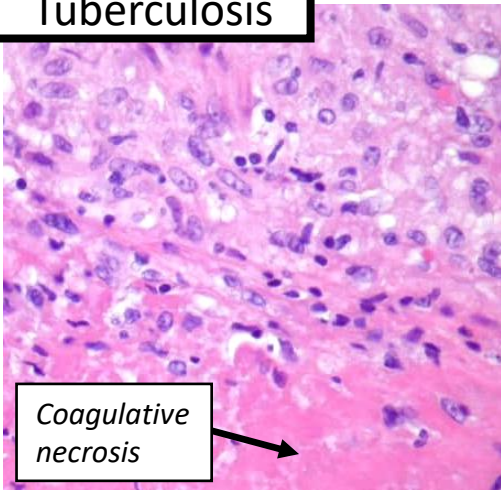
Many cutaneous clinical variants (e.g., scrofuloderma, gumma, etc.), have similar histologic findings.

Tuberculoid granuloma: loose aggregate of histiocytes ($\pm$ multinucleate) surrounded by a mantle of lymphocytes, classically central necrosis (but not always present)

Acid fast bacilli seen within areas of necrosis. See on AFB, FITE, Ziehl-Neelsen.

Additional testing options: Culture (gold standard), PCR, Serum QuantiFERON (detects the host T-cell immune response to TB-specific antigens.).

Coagulative
necrosis



Bacilli appear red ("red snappers") on AFB



[Virtual slide](#) [AFB](#)

Leprosy

aka "Hansen disease"

Caused by *Mycobacterium leprae* and *M. lepromatosis*

Key finding: Lymphohistiocytic infiltrate (esp. with granulomas) around nerves, perivascular, and periadnexal.

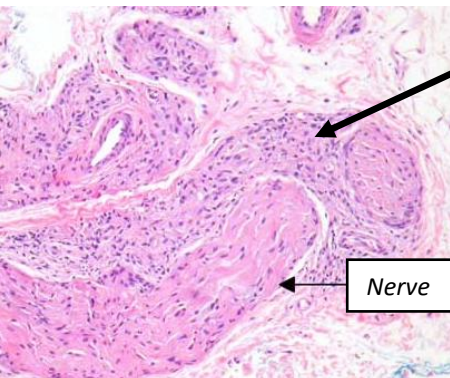
Nerve damage $\rightarrow$ numbness $\rightarrow$ tissue damage secondary to unrecognized trauma (think: like diabetes) $\rightarrow$ can cause severe disfiguration & amputation.

Preferentially infects "cooler" parts of body (limbs, ears, nose...)

Clinical findings: Skin lesions, enlarged peripheral nerves, skin anesthesia (numbness).

Preferred stain: Ziehl-Neelsen (Fite-Faraco)

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Nocardia & Actinomyces

Both are **thin filamentous bacteria**
+GMS, partially acid fast.

Microscopically: both show **filamentous bacteria in neutrophilic abscesses**

Nocardia asteroides

Lung infection most common with severe systemic illness
Can involve skin.

Gram-positive with right-angle branching

Actinomyces israelii

Normally present in nose/throat

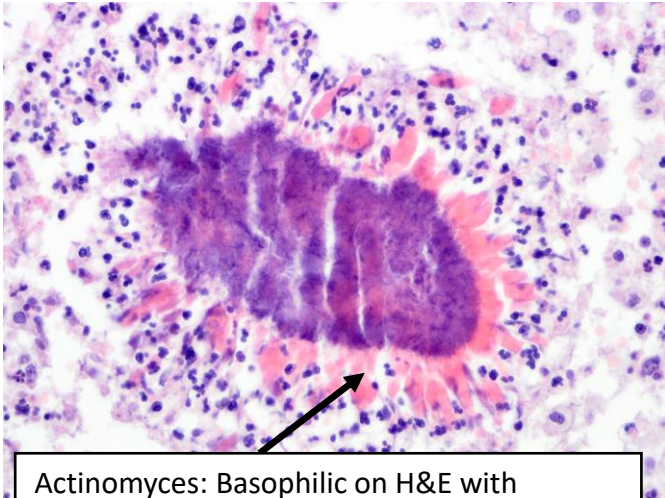
Infection often after dental surgery or trauma

Chronic head and neck infection

Abscess produces yellow purulence ("sulfur granules")

Bright pink on PAS

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Actinomyces: Basophilic on H&E with intensely eosinophilic projections around periphery (Splendore-Hoeppli phenomenon, composed of immunoglobulin & debris)

Rocky Mountain Spotted Fever

Caused by *Rickettsia rickettsii*

Intracellular gram-negative coccobacilli transmitted by tick vector (Ixodes).

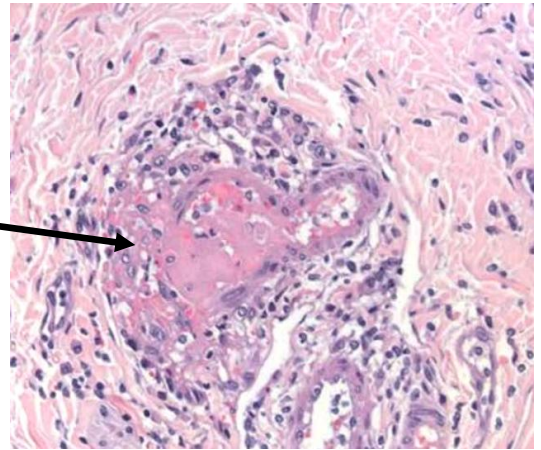
Infects endothelial cells → **leukocytoclastic vasculitis**
± fibrin thrombi.

Don't actually see bacteria (Dx made clinically).

Multi organ, potentially fatal. Fever, headache.

Macules/papules ±petechiae/purpura.

Classically involves wrists/ankles → palms/soles → body



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Rhinoscleroma

Caused by *Klebsiella pneumoniae*.

Rare chronic condition.

Nasal/nasopharyngeal involvement almost always, but can extend down respiratory tree → nasal destruction and obstruction.

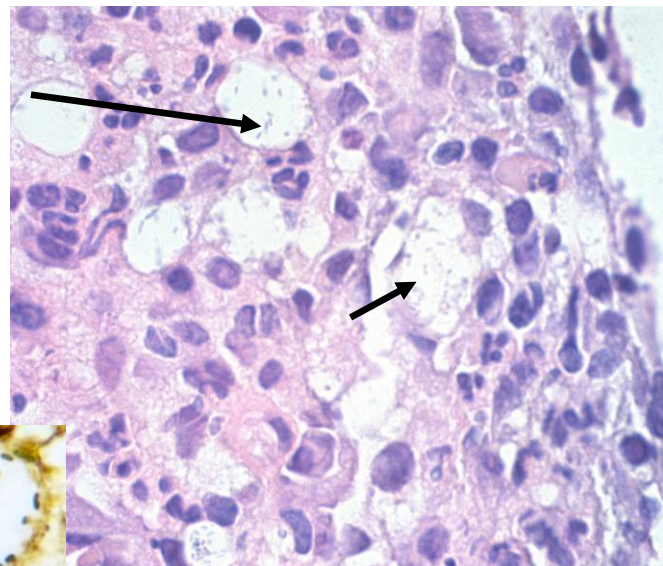
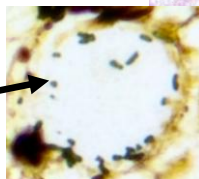
Hypertrophic granulation tissue with granulomas and mixed inflammation. Russel bodies common.

Mikulicz cells: Large round vacuolated histiocytes.

Bacilli present intracellularly in cytoplasm!

Bacteria (+) PAS, Giemsa, Warthin-Starry

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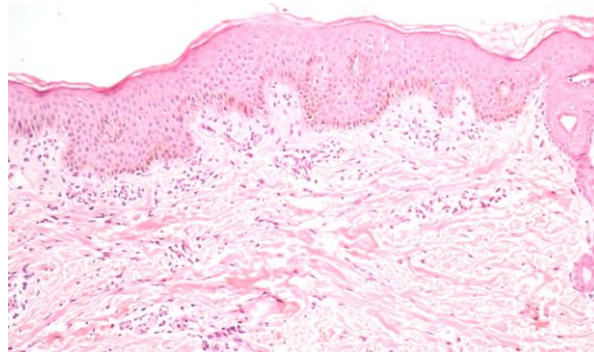
Viruses

Viral exanthem

Acute, widespread self-limited eruptions of erythematous macules, papules, and vesicles associated with viral infection. Usually systemic symptoms: **fever, malaise**, headache. More common in **kids**.

Nonspecific superficial perivascular lymphocytic infiltrate. Eosinophils are usually not present. Can have focal interface.

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Molluscum contagiosum

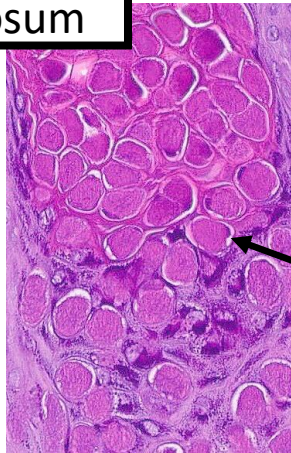
Caused by poxvirus, transmitted by skin contact. Mostly infects **kids**. In adults, often STD.

Dome-shaped papules with central umbilication; Few or many.

Hyperplastic epidermis with crater filled with distinct molluscum bodies (**Henderson-Patterson bodies**: large, eosinophilic to basophilic intracytoplasmic inclusions that push aside nucleus)

Usually no tx (spontaneously resolve)

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Herpes Simplex Virus (HSV)

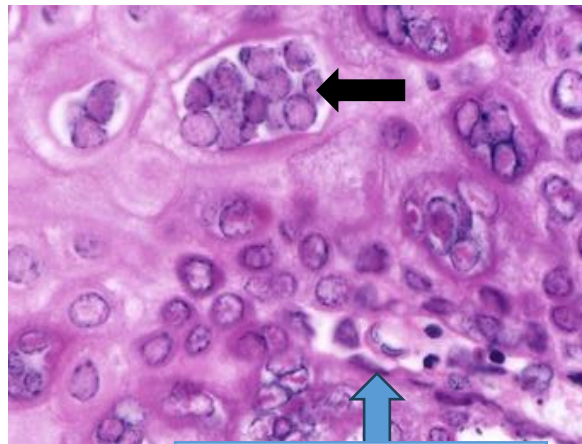
Clear, fluid-filled **vesicles**, usually on mucosa sites (lip, genitals) Acute inflammation. Necrotic keratinocytes.

Viral inclusions at edges of ulcers in epithelial cells
3M's → **M**olding, (chromatin) **M**argination, **M**ultinucleation

Self-limited in healthy patients; may disseminate in immunocompromised patients

Findings the same in HSV1&2. IHC stain identifies both. Treat with Acyclovir.

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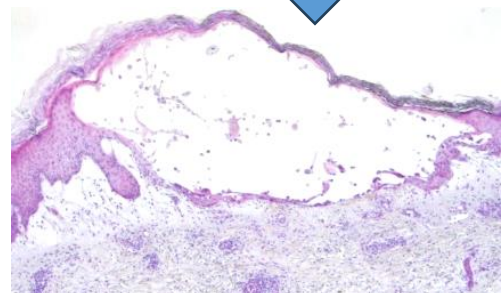
Herpes Zoster Virus

Varicella-zoster virus (VZV) causes chicken pox (primary varicella) in previously unexposed individuals → virus persists in dorsal root ganglion → may later reactivate to cause herpes zoster (shingles)

Chicken pox: widespread vesicles on red papules ("dewdrop on a rose"). Usually kids. Less common now with vaccination.

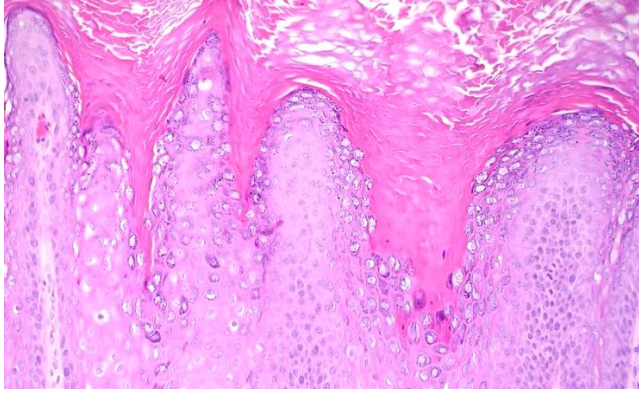
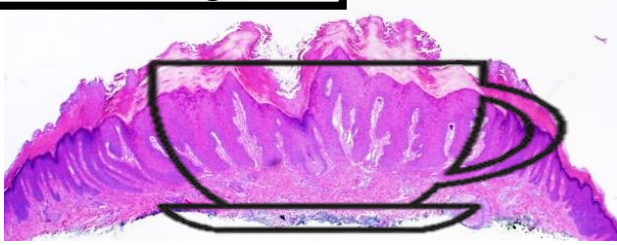
Shingles: Grouped vesicles on erythematous base within a single sensory dermatome. Usually older adults.

Histologically identical!



Verruca vulgaris

aka Wart



Common. Benign. HPV-induced, circumscribed squamoproliferative lesion.

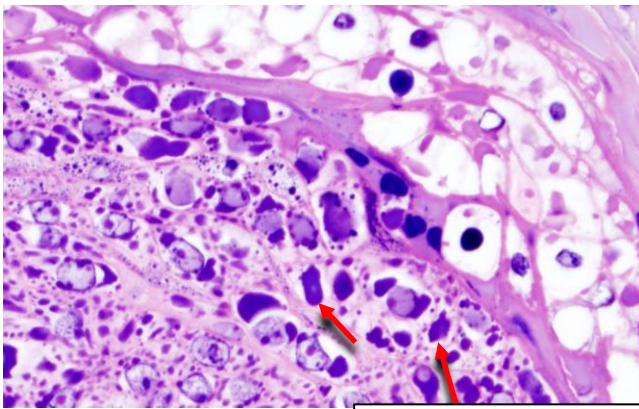
Single or multiple verrucous, keratotic papules.
Cup-like rete ridges (angled toward the center).
Papillomatosis ("church spires"). Acanthosis.
Hyperkeratosis often with **parakeratosis** (classically in columns over papillae)
Hypergranulosis. Keratohyalin granules.
Koilocytes may be variably present.
Can see other viral inclusion-like nuclear changes.

Most common on hands and fingers.
Most common HPV subtypes: 1, 2 (usually different from genital infections)

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Verruca plantaris and Verruca palmaris

aka Palmoplantar Wart



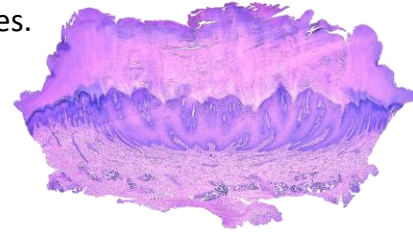
Keratohyalin granules

Common. Benign. HPV-induced, circumscribed squamoproliferative lesion on the soles (*plantaris*) or palms (*palmaris*). Can be single or multiple. Often painful.

Similar to above, but often with more *mild* papillomatosis.

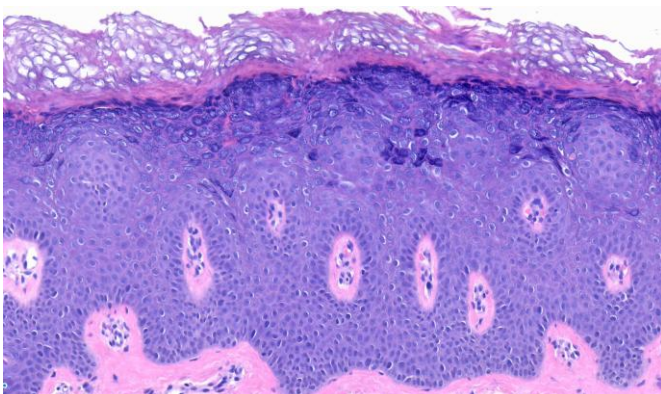
"*Myrmecia*" (ant-hill) form can be endophytic and has coarse, prominent keratohyalin granules.

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Verruca plana

aka Flat Wart



HPV-induced benign epidermal proliferation characterized by several smooth, skin-colored to light brown **flat-topped papules**.

Orthokeratosis
Mild acanthosis;
Hypergranulosis;
Koilocytosis.
Minimal papillomatosis (hence flat)

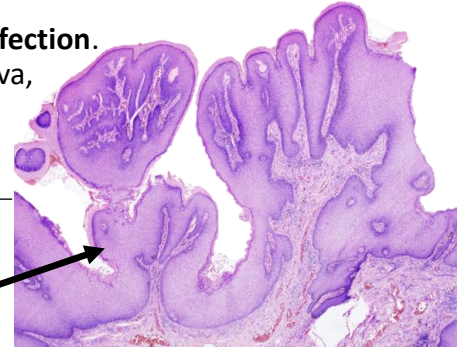
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Squamous Intraepithelial Lesion (SIL)

Intraepithelial (in situ, non-invasive), squamous **dysplasia due to HPV infection**.

Present in the "**Lower Anogenital Squamous Tract**," which includes, vulva, vagina, cervix, anus, and penis. "-IN" Terminology depends on location.

(Cervix = CIN, vagina = VaIN, vulva = VIN, anus = AIN, and penis = PeIN)



Low-grade Squamous Intraepithelial Lesion (LSIL) (-IN 1)

Condyloma acuminatum → aka "**Genital warts**." Grossly evident verrucous LSIL. Composed of acanthotic papillary fronds with acanthosis, parakeratosis, and hyperkeratosis. Often multiple.

Mostly due to low-risk HPV (types 6 and 11). Most common during reproductive age. Low risk of progression to cancer.

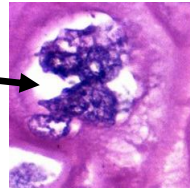
Proliferation of hyperchromatic basal-like cells that extends no more than 1/3 of the way up the epithelium

Cells differentiate (gain cytoplasm) in upper epithelium

Mitoses confined to lower zone. Epithelium often thickened.

Many nuclei are **hyperchromatic with irregular nuclear contours** (at all levels)

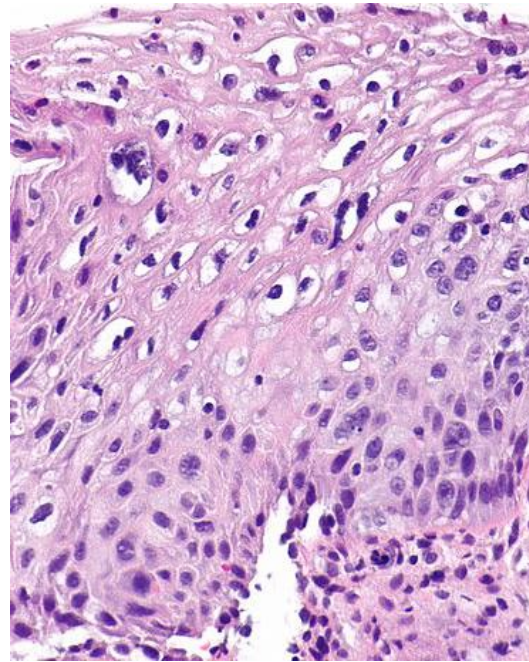
Koilocytes = large superficial cells with perinuclear halos and large, irregular, "Raisinoid" nuclei. Sometimes binucleated.



Often spontaneously regresses.

Can observe, or do excision, cautery, imiquimod.

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High-grade Squamous Intraepithelial Lesion (HSIL) (-IN 2/3)

aka "**Bowenoid Papulosis**." Usually flat.

Associated with High-risk HPV (usually type 16).

Higher risk of progression to invasive carcinoma if left untreated compared to LSIL, but not super high absolute risk.

Little to no superficial maturation. Proliferation of hyperchromatic basal-like cells that extend 2/3 of the way up (VIN2) or full-thickness (VIN3/CIS) of the epithelium.

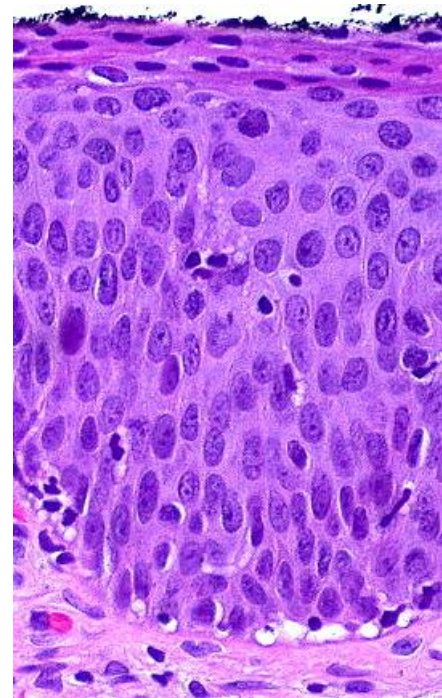
Cells have **enlarged, hyperchromatic nuclei with irregular nuclear contours and increased N:C ratios**.

Mitoses common at all levels, including atypical mitoses

Nucleoli are unusual → raise the possibility of inadequately sampled invasive carcinoma (p16+) or metaplasia (p16-)

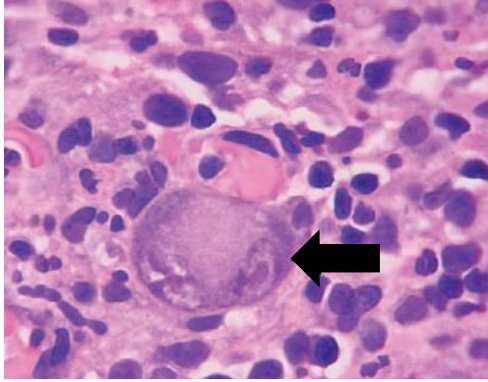
Can colonize skin appendages → mimicking invasion!

Treatment includes: excision, laser ablation, topical chemotherapy



[Virtual slide](#)

Cytomegalovirus (CMV)



Most people are asymptomatic, with latent infection. Clinical infection primarily seen in **immunocompromised**. Skin manifestations are uncommon and non-specific (Maculopapular rash, ulcers, blisters).

Non-specific inflammatory response.

Viral inclusions in mesenchymal cells (mostly endothelium)
← Large, eosinophilic, amphophilic, or basophilic intranuclear inclusions ± halo (owl's eye) and/or cytoplasm

Fungus

Highlight fungi with: **PAS** and **GMS** stains.

**** Important note:** Definitive speciation often requires laboratory testing (culture and/or molecular methods) as many of these fungi are morphologically indistinguishable!**

Dermatophytosis

Superficial fungal infection by dermatophytes (*Trichophyton*, *Epidermophyton*, *Microsporum*) aka "Ringworm" (obviously a bad/confusing name)

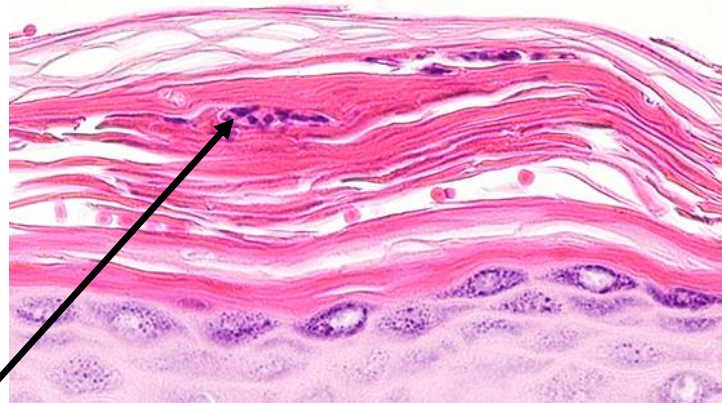
Often Dx as "**Tinea** ____" (depending on location) (foot = Tinea pedis, body = Tinea corporis, etc..)

Helpful Clue = Neutrophils in stratum corneum
Fungal stains (**GMS**, **PAS-D**) highlight hyphae

"Sandwich sign" = Parakeratosis or compact orthokeratosis beneath basket-woven stratum corneum (fungus hiding where basketweave meets compact keratin)

Epidermis shows variable spongiosis.
Dermis shows variable inflammation.

Treat with topical or oral antifungals.



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Annular plaque of erythema with scale at advancing border

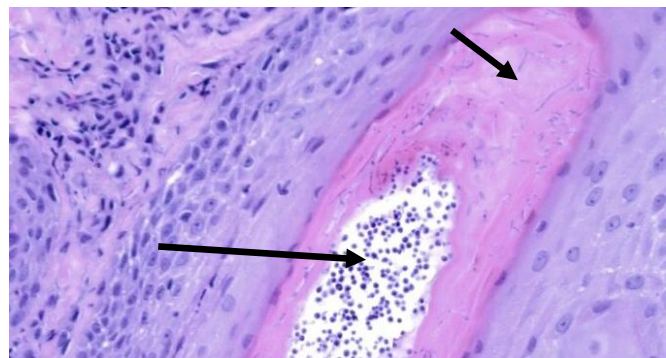
Majocchi Granuloma

Granulomatous, folliculocentric, nodular, or pustular variant of tinea infection.

Often in areas of shaving.

Dermal or perifollicular dermatophytes with ruptured follicles and hair shaft fragments.

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Onychomycosis

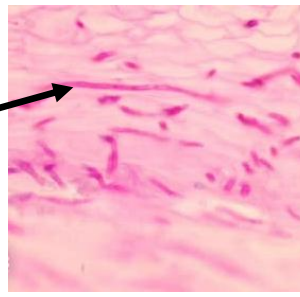
Fungal nail infection.

Nails are yellow, thick, cracking

Hyphae present in nail.

Highlight with PAS or GMS

Often hyperkeratosis. $\pm$ neutrophils



[Virtual slide](#)



Pityriasis (tinea) versicolor

Caused by *Malassezia*.

Near normal skin histologically.

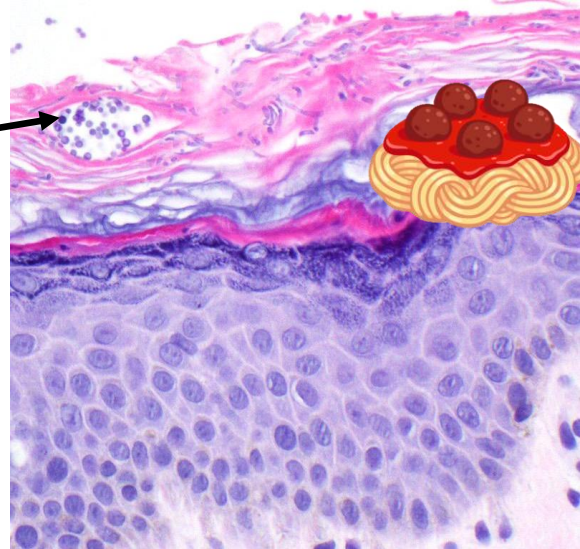
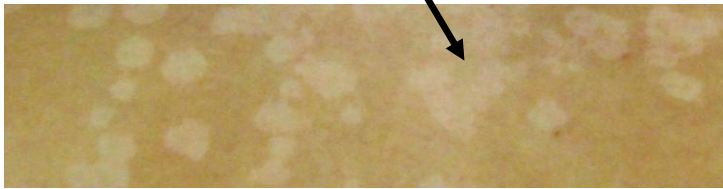
Abundant spores and **hyphal elements in stratum corneum**.

"Spaghetti and meatballs" = Hyphae and yeast

Little or no inflammation.

(Need to see the hyphae as spores are commensal)

Small patches with scale and hyper/hypopigmentation
Often on trunk or shoulders



[Virtual slide 2](#)

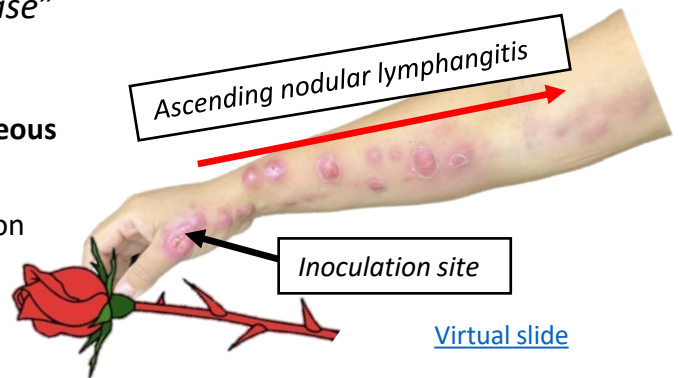
Sporotrichosis "Rose gardener's disease"

Caused by *Sporothrix schenckii*.

Traumatic inoculation (e.g. thorn) $\rightarrow$ **lymphocutaneous ascending nodular lymphangitis**

Nonspecific pathology: Granulomatous inflammation with abscess and variable chronic inflammation.

Culture is gold standard for Dx.



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Blastomycosis

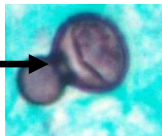
[Virtual slide](#)

Caused by *Blastomyces dermatitidis*

Found naturally in soil.

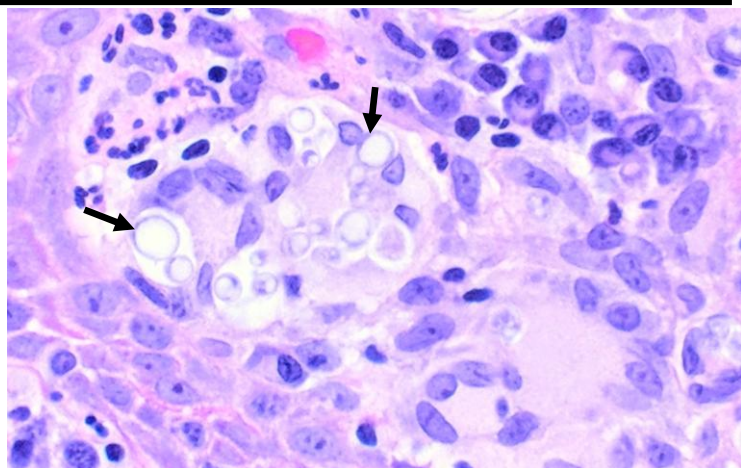
Thick-walled spores (8-15 μ m) in giant cells and free in tissue.

Characteristic Broad-based buds (think "B, B, B," like Blastomycosis)



Acute and chronic dermal inflammation with multinucleated giant cells.

Can induce overlying skin hyperplasia.



Candida

[Virtual slide](#)

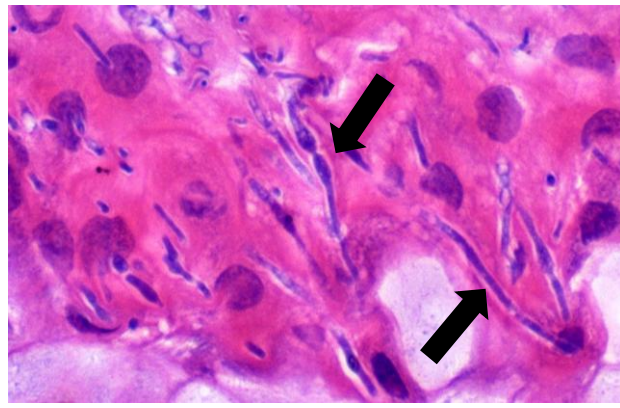
Common. Usually *Candida albicans*.

Most common sites: **Mucus membranes** (e.g., thrush) and **interiginous folds**. Esp. common in immunocompromised.

Neutrophils in epidermis with subcorneal pustules.

Pseudohyphae and spores esp. in areas of parakeratosis.

Invade perpendicular to skin surface.



Histoplasmosis

[Virtual slide](#)

Caused by *Histoplasma capsulatum*.

Endemic to Ohio, Missouri, Mississippi river valleys.

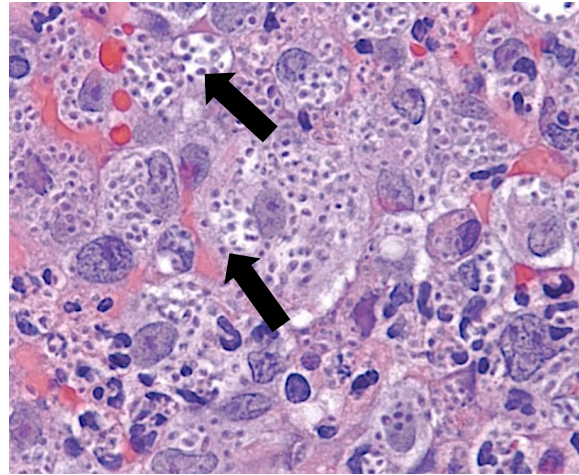
Can cause localized or disseminated disease (more common in immunocompromised). Lung most common site.

Often **lymphohistiocytic infiltrates**. Granulomas.

Intracellular 2-5 µm fungi in macrophages.

Surrounding clear space (pseudocapsule).

(+) GMS (vs leishmaniasis, which is also intracellular, but is -)



Cryptococcus

Ubiquitous. Often from avian droppings (think: "**Pigeons**")

Usually **immunocompromised** (e.g., AIDS, organ transplant, etc...)

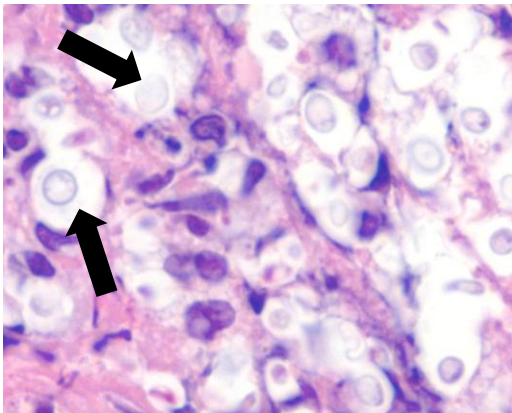
Very "**pleomorphic**" (lots of different sizes), round to oval, Narrow-based buds. Unstained, refringent capsules give "halo" or "**soap bubble**" appearance. Capsule stains with mucicarmine.

Variable inflammatory response (depending on immune state). Can have granulomas or suppurative necrosis. Intra and extracellular.

Can be localized or disseminated disease.

Other common sites are lung and meninges

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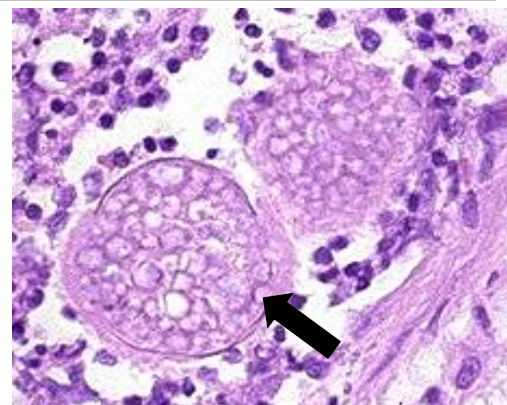
Coccidioidomycosis

Caused *Coccidioides immitis* and *posadasii*.

"**Valley Fever**." Found in soil in southwestern United States and South and Central America. Higher risk if immunocompromised. Can have localized or disseminated disease.

In host, spores develop into large, thick-walled endospore-containing **spherules**, which enlarge and rupture. There is often associated granulomatous and chronic inflammation.

[Virtual slide 2](#)



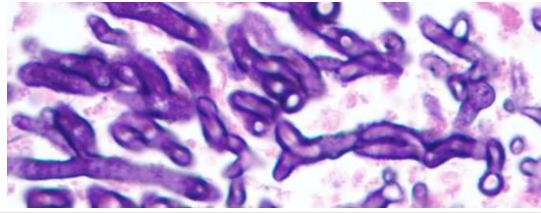
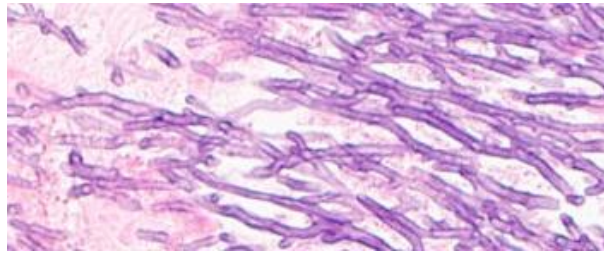
Aspergillosis

Caused by *Aspergillus* species.
Usually immunocompromised.
Can be direct inoculation (localized) or disseminated.

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Septated hyaline hyphae.

Dichotomous **45° branching**. 2-4 μm .
Frequently **angioinvasive** $\rightarrow$ ischemic necrosis.
Spores/yeast forms absent.
Fruiting bodies are rare, but confirm Dx.



Chromoblastomycosis

Chronic cutaneous/subcutaneous infection by dematiaceous (pigmented) fungi.

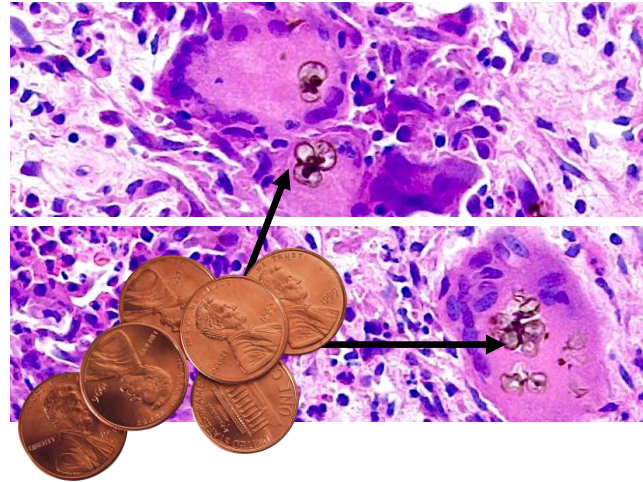
Mostly **tropical/subtropical** in outdoor workers.

Pigmented fungi ("Medlar bodies") resemble copper pennies, pigmented yeast singly, or in groups.

Dermal acute and chronic inflammation with granulomas.

Can induce epithelial hyperplasia.

[Virtual slide 2](#) [3](#)



Phaeohyphomycosis

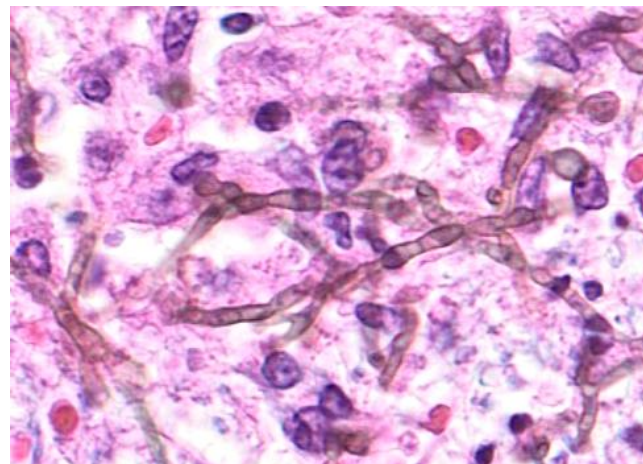
Term for infections caused by dematiaceous (pigmented) **filamentous fungi containing melanin in their cell walls**.

Often associated with trauma.

Brown pigmented hyphae with acute, chronic, and granulomatous inflammation.

Aggressive!

[Virtual slide 2](#)



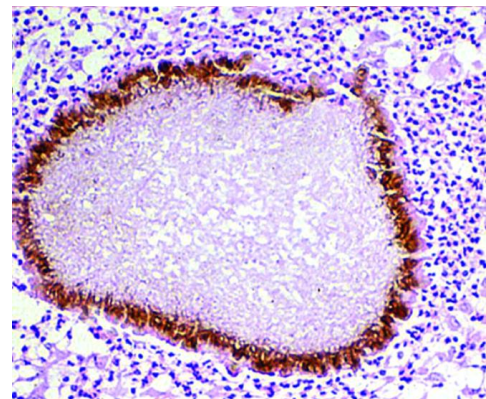
Eumycetoma

Localized chronic granulomatous infection.
Most common organisms from *Eumycetes* class.
Tropical/subtropical. Caused by soil contact.

"Black grains"—mass of brown filaments wider than 1 μm .

Most common site of infection = foot ("Madura foot")
Draining sinus from foot with visible black granules.

[Virtual slide 2](#)



Zygomycosis

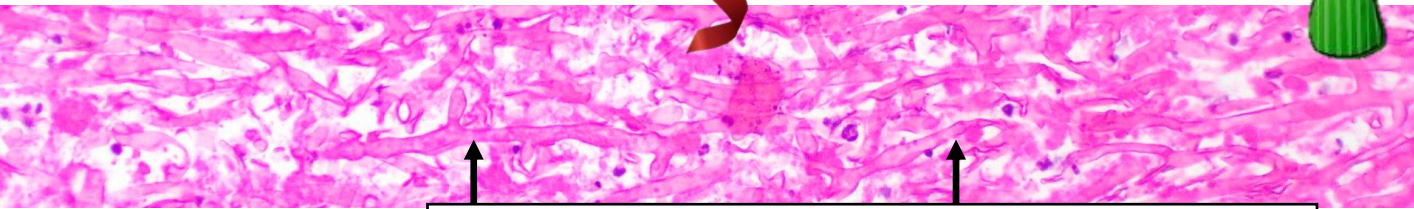
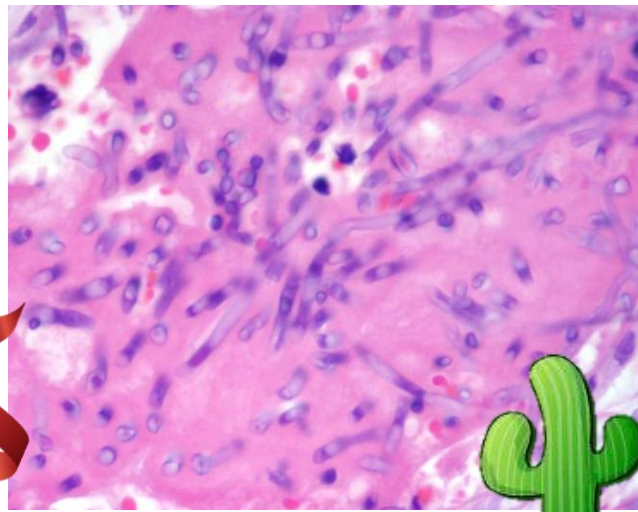
Deep fungal infections, often caused by *Mucormycosis*. Often immunocompromised.

“Ribbon-like,” predominantly aseptate large, broad, hyphae with right angle branching. (> 5 μm width)
Variable associated inflammation: Sparse, neutrophilic, or granulomatous.

Frequent **angioinvasion** → thrombosis → necrosis

Very serious and **deadly**!

Can be skin/soft tissue, Sinonasal, or disseminated. Often need surgical debridement.



[Virtual slide 2](#)

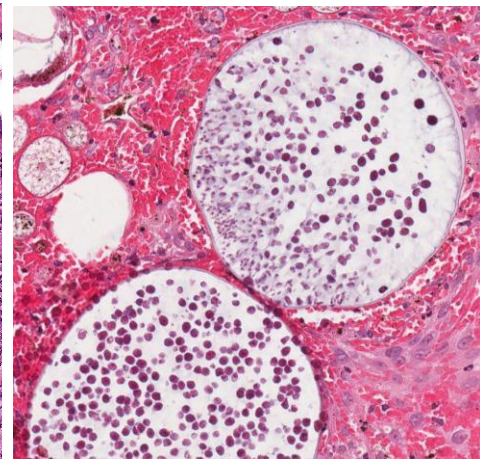
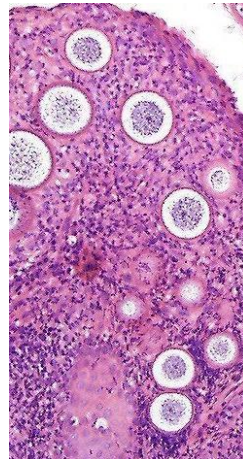
Once you see one.... Then you often realize they're EVERYWHERE! :-)

Rhinosporidiosis

Caused by *Rhinosporidium seeberi*
Tropical mucocutaneous water mold infection. Actually a protozoa (not fungus).
Most commonly presents as **painless nasal polyps**.
Can also infect skin, eye, upper aerodigestive tract.

Huge spherical sporangia (up to 300 μm) with numerous endospores. Can be intact or ruptured.
Thick PAS-positive walls.

[Virtual slide 2](#)



Fusariosis

Caused by *Fusarium* species.

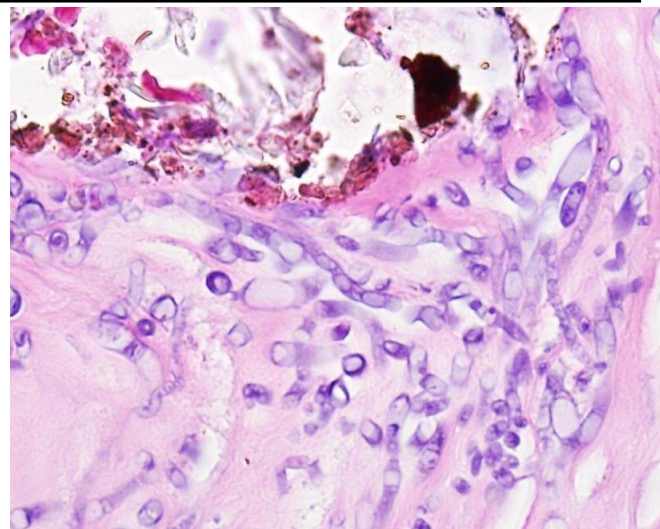
Opportunistic mold, requires a breach in barrier and/or immune compromise to infect.

Morphologically very similar/identical to aspergillus. Uniquely, show sporulation — formation of yeast-like (canoe-shaped) conidia

Eyes and soft tissue after trauma.

Can have disseminated infection with severe immune compromise.

[Virtual slide 2](#) [3](#)



Arthropods & Parasites

Arthropod bite reaction

“ABR”



Variable appearance, but often pruritic, excoriated papules, and vesicles.

Can be in a line as insect stopped to have “breakfast, lunch, and dinner.”

Various degrees of:

Brisk wedge-shaped perivascular lymphocytic infiltrate with **eosinophils**

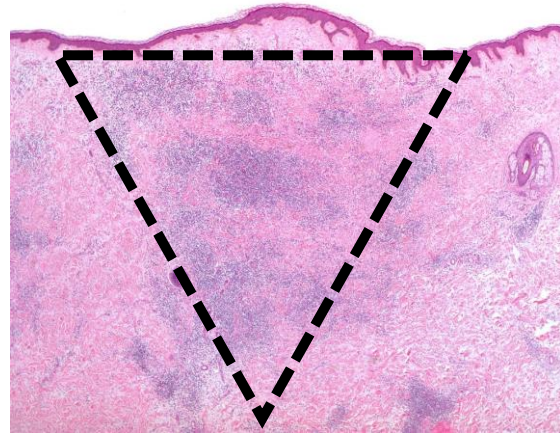
Spongiosis, Ulceration, blister formation

Dermal edema, necrosis

Insect tissue fragments may be present

Can have epidermal changes (often spongiosis ± vesicle), especially at site of entry

Spiders → more neutrophils and necrosis



[Virtual slide 2](#)

Pro Tip: ABR often has much more severe inflammation than a drug reaction, hives, or viral exanthem.

Common finding: Superficial perivascular dermatitis with eosinophils (“SPD with Eos”)

Dx: - Superficial perivascular infiltrate with numerous eosinophils, see comment.

Comment: The epidermis shows minimal changes. There is a mild superficial perivascular mixed inflammatory infiltrate composed of lymphocytes and eosinophils. The histologic features are relatively nonspecific. The differential diagnosis includes dermal hypersensitivity reactions such as a drug eruption or urticaria. An arthropod bite reaction is less likely given the mild nature of the infiltrate. Clinical correlation is recommended. [Edit as necessary]

Leishmaniasis

Protozoa intracellular parasite of *Leishmania* genera.
Transmitted to humans from animal reservoir by sandfly.

Endemic to Middle East, Asia, Africa, Southern Europe, Central and South America.

Can infect skin, nasal cavity, viscera, or be diffuse.

Amastigote = non-flagellated form seen in human tissue.

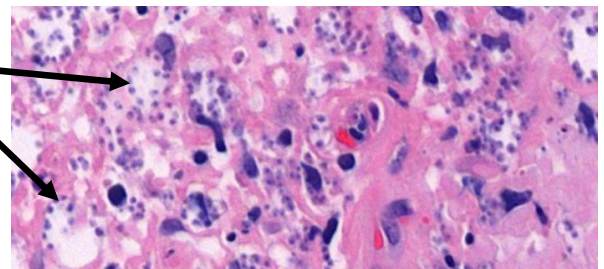
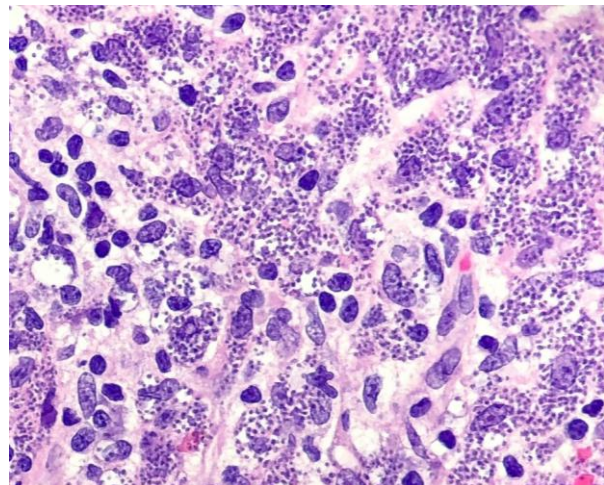
Oval-shaped 2-5 µm.

Eccentric nucleus with a separate rod-like kinetoplast (unique form of mitochondrial DNA) at other end (dot-dash sign) → realistically, hard to actually see in practice! ;-)

In histiocytes in clear spaces, often at periphery (“Marquee sign”).

IHC: **(+) CD1a**. Can do Giemsa stain on touch preparations from lesions. Specific IHC can highlight and confirm.

Negative GMS (Histoplasmosis can look similar and is +)



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Scabies

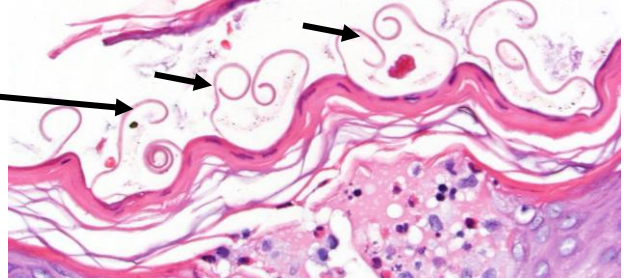
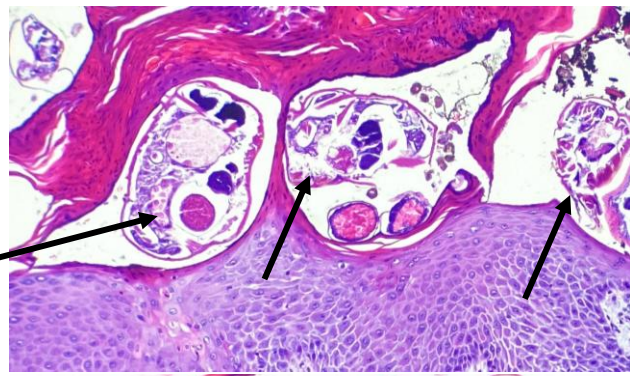
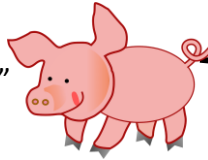
Caused by *Sarcoptes scabiei* mite.
Most common in interdigital, flexural, waist, ankle areas.
Common. Due to skin-to-skin contact.
Linear burrows.

Mites, feces, or eggs in stratum corneum.
Can be very focal, requiring levels to identify!

Skin shows Arthropod bite reaction (ABR) findings (SPD with Eos). Polarizeable.

Egg case remnants look like "pig tails."

[Virtual slide 2](#) [3](#)

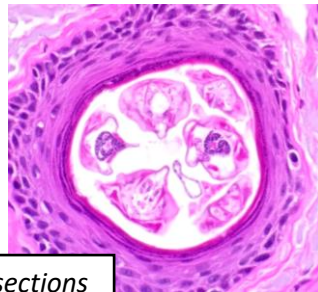
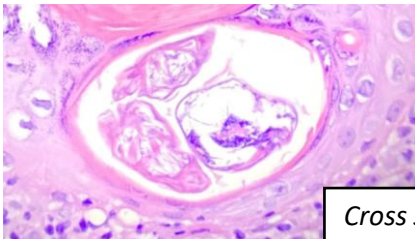


Demodex Mites

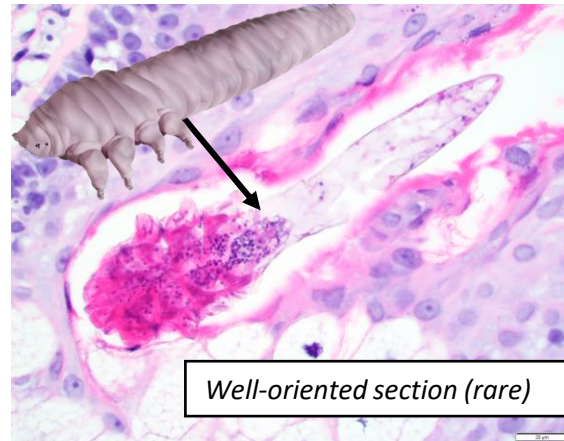
Small mites that live in hair follicles and sebaceous glands.

Common in **face/head biopsies**, esp. around eyes.
Often incidental finding, but can cause dry eyes, chalazia, folliculitis etc.. and associated with rosacea.

Can produce inflammatory reactions, epithelial hyperplasia, and follicular plugging.
Have a chitin exoskeleton.



Cross sections



[Virtual slide](#)

Ticks

Vector for many diseases in the U.S., including Lyme disease, Babesiosis, Ehrlichiosis, etc...
Identified grossly. Embed head only in skin to suck blood → engorged = full of blood.

Ixodes

Deer tick



Solid dark brown

Dermacentor

Dog tick



Ornate patterned surface.

Amblyomma

Lonestar tick



Female bears a single conspicuous **white dot** ("lone star")

Schistosomiasis

[Virtual slide 2](#)

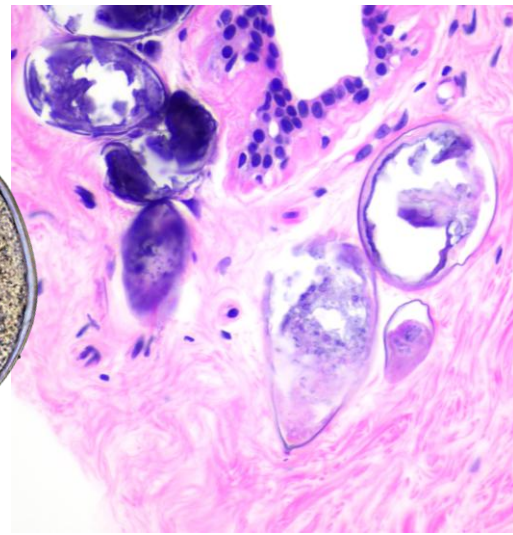
Caused by Schistosome trematode/flatworms.
From feces-contaminated water in tropics.

Adult worms live in liver/intestines/bladder → release eggs into feces/urine. Often see eggs in tissue, frequently calcified.
Egg spine/knob location can help determine species.
Can involve skin. Variable inflammation.

Schistosoma haematobium: primarily infects urinary bladder; terminal spine.

Schistosoma japonicum: primarily infects liver; lateral knob.

Schistosoma mansoni: primarily infects intestines; lateral spine.

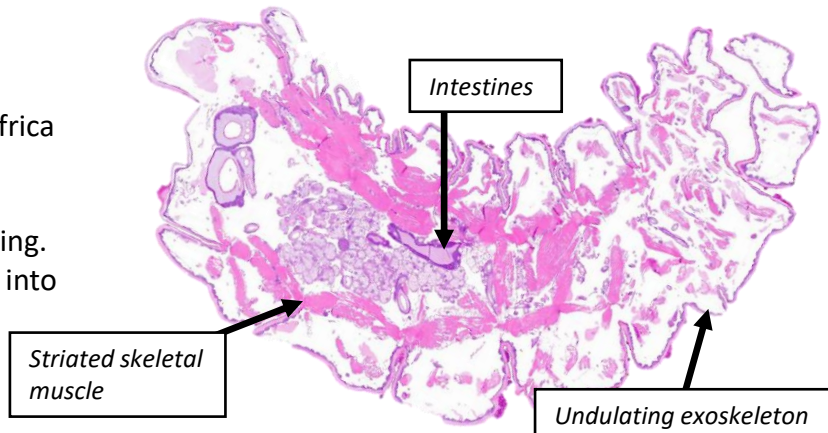


Myiasis

Infestation by **larvae** of **flies** (maggots!)
Various flies in South America (Botfly) and Africa (Blowfly)

Fly eggs transferred by mosquito or on clothing.
Grows into macroscopic insect that burrows into dermis, feeding on tissue! Yikes!
Red, painful nodule.

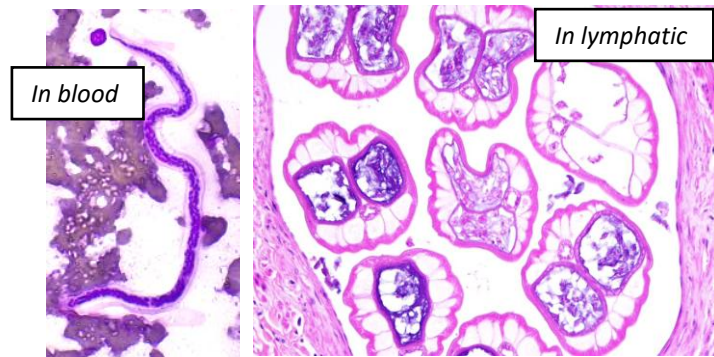
[Virtual slide](#)



Filariasis

Round worms (mostly *Wuchereria bancrofti*)
Transferred by mosquito in tropics
See worms in lymphatics, skin nodules, blood.
Can cause granulomas.
Clog lymphatics → lymphedema ("elephantiasis")

[Virtual slide](#)



Pediculosis

Lice infestation. 3 types: Head, pubic, body
Usually diagnosed clinically.
Must see lice = 3-4 mm long **insects** with 6 legs
Nits (eggs) = small white/translucent structures strongly adherent to hair shaft.



Size relative to a US penny

"If God had amused himself inventing the lilies of the field, he surely knocked His own socks off with the African parasites."

- The Poisonwood Bible by Barbara Kingsolver

