Intro to Dermatopathology

OPTH 727

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Note: you will receive extensive lectures in skin pathology in your oral pathology courses. As you are aware, lesions/diseases of the lips and peri-oral skin are within the scope of practice in dentistry. The following slides are to touch on the basic concepts that are most relevant to dentistry.

Skin lesions – organized by basic disease processes.

- Trauma
  - Cuts, bruises, scrapes
- Hypoxic
  - Gangrenous necrosis
- Infectious
  - Numerous infectious processes
    - Will cover later in course and in microbiology courses
  - Immune suppression leads to even more skin infectious processes
- Vascular
  - Vasculitis
    - Often due to drug eruptions
  - Hemorrhage
- Allergic reactions

- Genetic- genodermatoses
  - **Xeroderma pigmentosum**
  - Incontinentia pigmenti
  - Pachyonychia congenita
  - Epidermolysis bullosa

- Autoimmune/inflammatory
  - **Pemphigus vulgaris**
  - **Pemphigoid**
  - **Lichen planus**
  - **Erythema multiforme**
    - **EM Minor**
    - **EM Major … Stevens – Johnsons , Toxic Epidermal Necrolysis**
- Cancer
  - **Basal cell carcinoma**
  - **Squamous cell carcinoma**
  - **Melanoma**
- Benign or premalignant lesions
  - **Nevus**
  - **Actinic keratosis**
  - **Actinic cheilosis**

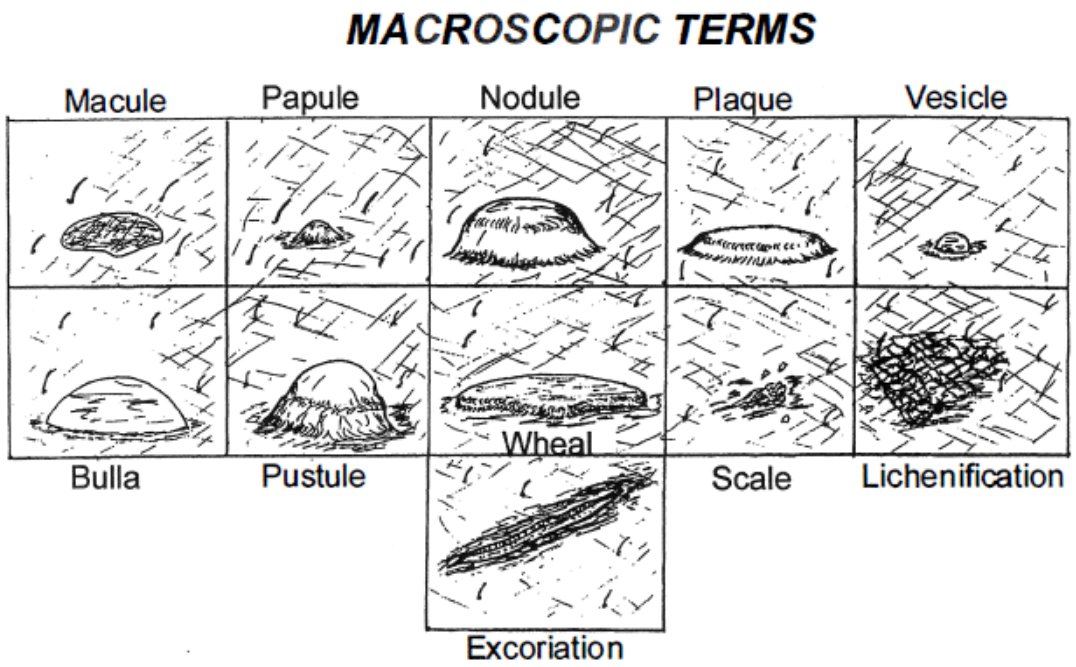
  - **Lipoma**
  - **Epidermal cyst**

Information from this slide is not on exam

Dermatopathology

- Who treats skin diseases/lesions
  - Dermatologists
  - General Practitioners
  - Allergists
  - Infectious disease specialists
  - Rheumatologists
  - Emergency medicine
  - Plastic surgeons
- Diagnostic Tools of the trade?
  - Visual examination/ clinical history
    - What do the lesions look like?
    - Symptoms
    - How long have they been there
  - Laboratory testing
    - Histopathology
      - Very commonly used
    - Microbiology
    - Blood testing? – used to evaluate multisystem disease
  - Imaging? – Not really. Only to rule out multisystem disease

Various clinical and histological terminologies



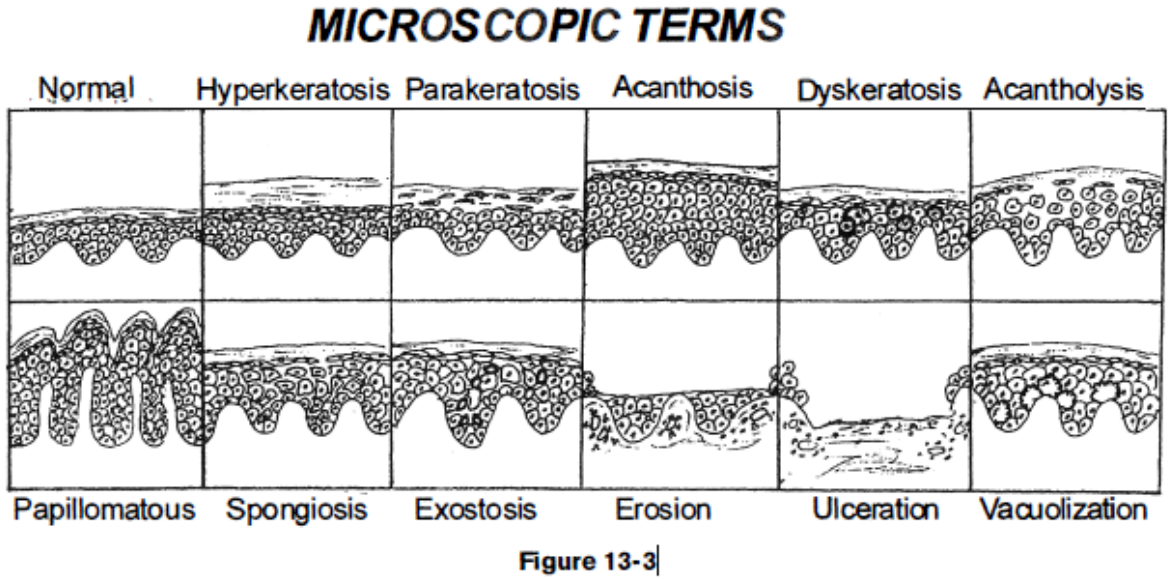


Figure 13-3

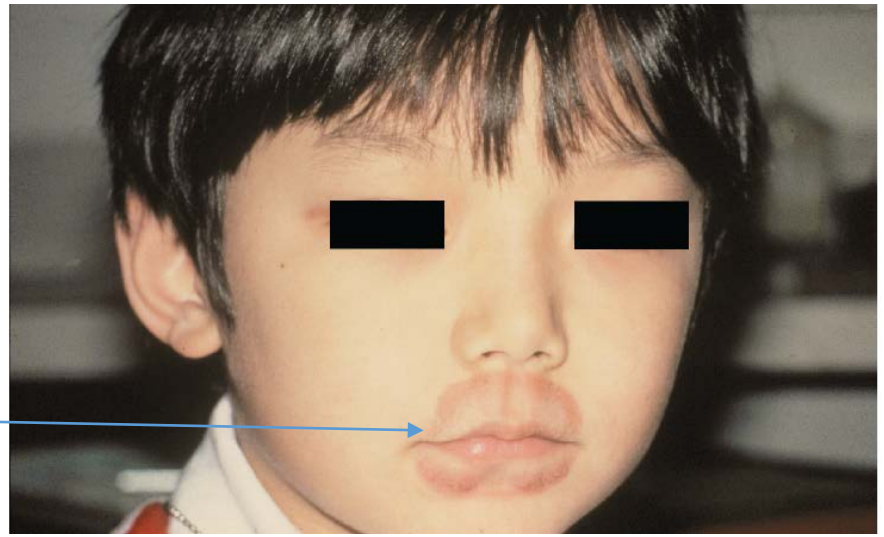
Do not need to know for exam

Macule – flat
Nodule – raised (can be grabbed)
Vesicle, bullae, – raised, fluid filled lesions

Definitions

- Dermatitis: Inflammation of the skin - “rash”
  - Could be due to many, many reasons; infection, repeated trauma, hypersensitivity

- Pruritus: symptom “Itchy”



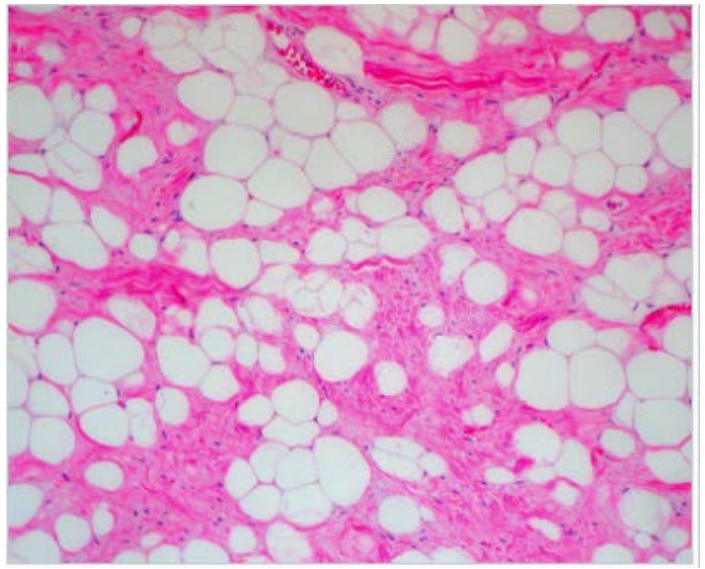
Two common skin lesions; epidermal cyst and lipoma

- Clinical:
  - Both commonly found in head and neck area
  - Both usually present as soft, movable lumps just beneath the skin

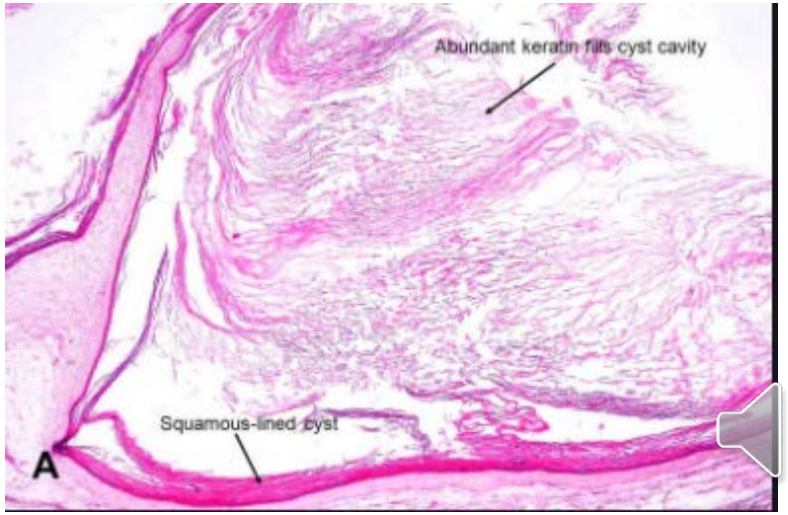
- Histopathology:
  - Lipoma: benign proliferation of fat
  - Epidermal cyst: keratin filled lumen lined by stratified squamous epithelium

Not on exam, but there are several terminologies for epidermal cyst… epidermoid cyst, infundibular cyst, sebaceous cyst, inclusion cyst

Lipoma

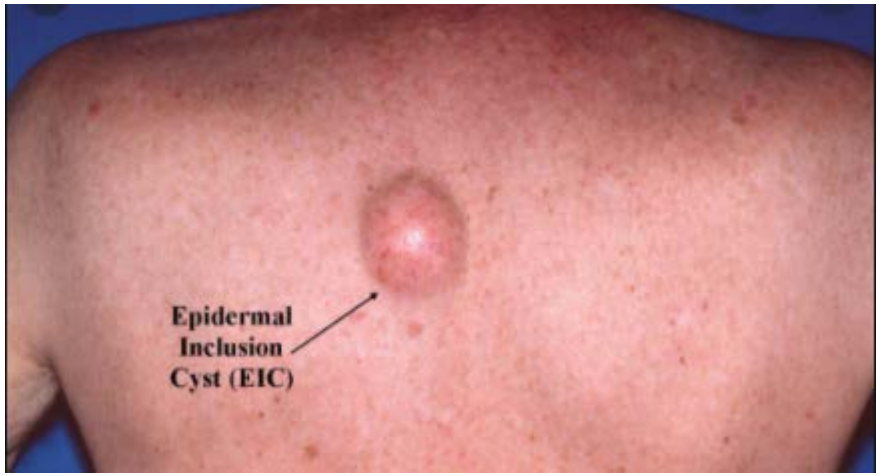


Epidermal cyst



Lipoma

Epidermal cyst



Skin Cancer

- Many skin cancers exist. We are only covering most commonly encountered skin cancers.
- Skin cancers can be divided in two categories.
  - Non-melanoma skin cancers – FAR MORE COMMON THAN MELANOMA
    - **Basal cell carcinoma (BCC)**
    - **Squamous cell carcinoma (SCC)** of skin
    - Excellent prognosis. Rare metastasis.
  - **Melanoma**
    - Far more dangerous tumor than BCC or SCC of skin. Highly infiltrative. High metastatic potential.
    - 5 year survival rate is 90% - good prognosis but need early detection.
    - Melanoma is far less common than BCC or SCC.
  - **Merkel Cell Carcinoma**
    - Rare
    - High grade malignancy

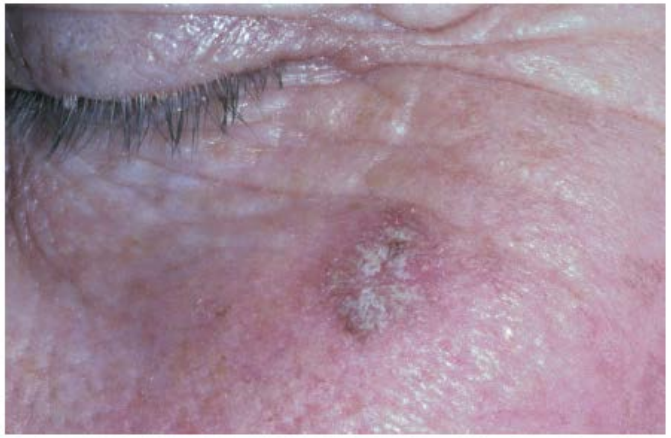
- Fair skin and UV exposure are by far the most important risk factors for all skin cancers.
  - For this reason, head and neck are a common location for skin cancers!!
- Prognosis of skin cancers, as with all other cancers, dependent on many factors
  - Size of tumor, histologic type, histologic grading, depth of invasion
  - Age, health of patient

Non melanoma skin cancers (BCC and SCC) and associated precancerous lesions

- A **very** gross generalization. BCC more likely on upper lip, SCC more likely on lower lip.

- **Actinic keratosis** (skin) or **actinic cheilosis** (lip) are precancerous lesions.
  - Very common. Incidence increases with age.
- **Seborrheic keratosis** is a very common non-cancerous lesion found on the face

Basal Cell Carcinoma



• **Fig. 10-87 Actinic Keratosis.** A plaque of the skin of the face with a rough, sandpaper-like surface.

• **Fig. 10-90 Actinic Cheilosis.** Crusted and ulcerated lesions of the lower lip vermilion.

SCC

Melanoma

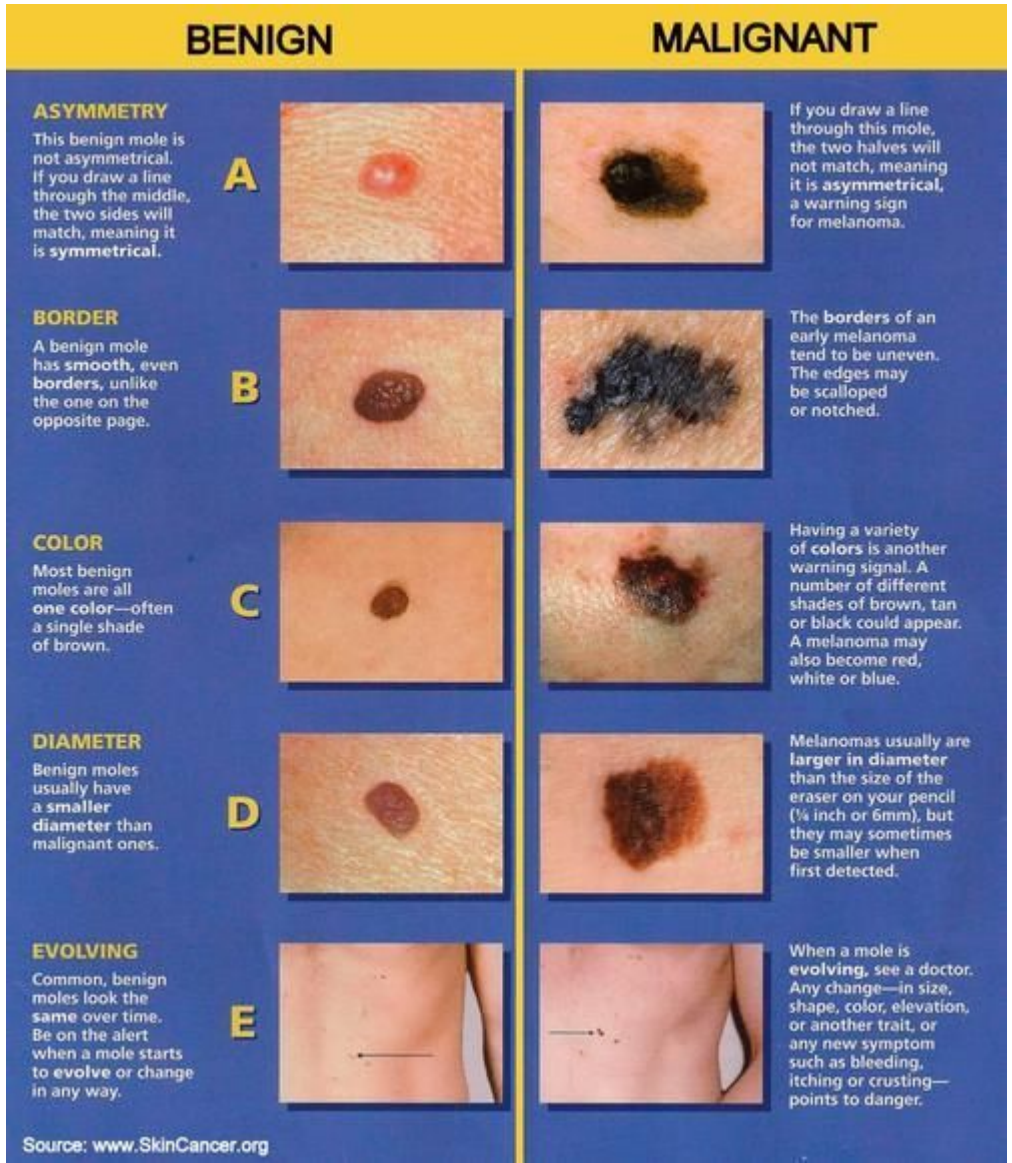
- "Melanoma" is sometimes called "malignant melanoma"
  - There is no benign melanoma. Melanoma is a cancer.
- Melanoma is a dangerous, invasive malignant tumor of skin.
- Cell of origin- melanocytes
- A benign proliferation of melanocytes is a **nevus** or mole.
  - Dysplastic nevus is considered premalignant for melanoma.
  - Seborrheic keratosis is NOT premalignant but can look like a nevus or melanoma.
- ~30% of melanomas originate from a nevus
- Melanoma may present in oral cavity
  - ~300 oral cases per year
  - 90,000 skin cases per year

• **Fig. 10-44 Melanocytic (Intradermal) Nevus.** A brown nodule on the facial skin with a papillomatous surface and protruding hairs.

• **Fig. 10-137 Superficial Spreading Melanoma.** This lesion on the neck demonstrates the ABCDE warning signs of melanoma: **A**symmetry, **B**order irregularity, **C**olor variegation, **D**iameter larger than a pencil eraser, and **E**volving larger size. (Courtesy of Dr. Mark Bowden.)

Seborrheic Keratosis

Benign mole (nevus) vs. Melanoma - clinical



- Histopathology is the only way to definitively distinguish benign moles from melanoma.

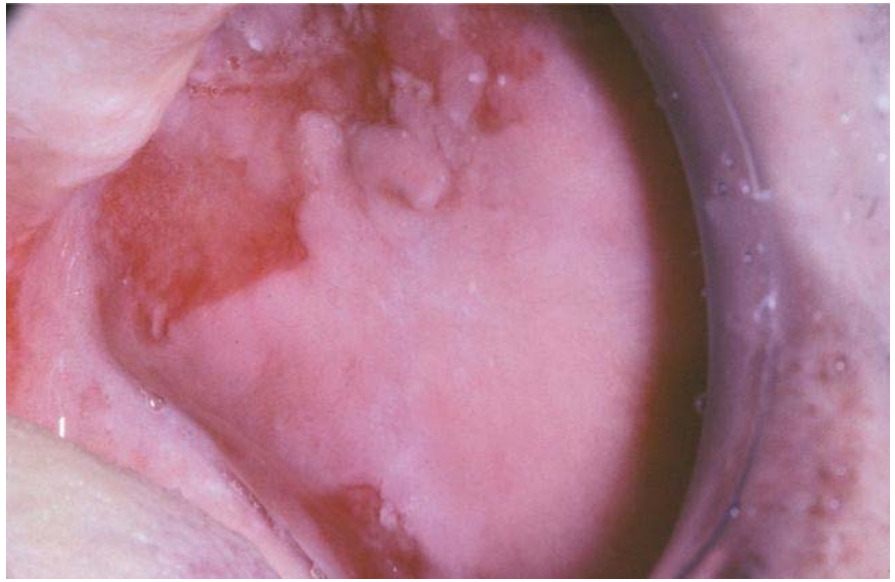
Genodermatoses – GENETIC diseases of skin

- **Xeroderma pigmentosum**
  - Very rare genetic disease.
  - Defect in DNA repair mechanisms.
    - Highly susceptible to UV radiation
  - 10,000 times higher chance for skin cancers to develop
    - Skin cancers develop in childhood
  - Atrophied skin
  - MUST stay indoors most of the time

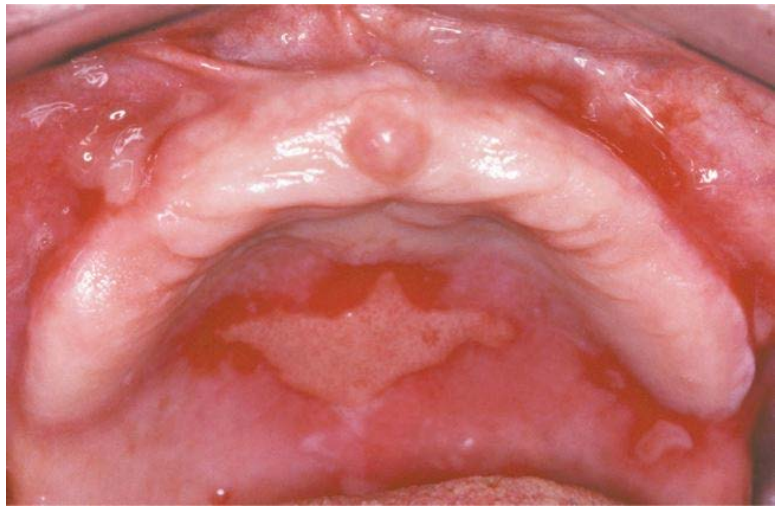
Blistering diseases of skin (and oral mucosa)

- In general… blistering diseases may be infectious or immune mediated
- Two important immune mediated skin diseases are:
- **Pemphigus vulgaris**- an autoimmune disease
  - Blisters/bullae/ulcers on skin and mucous membranes (i.e. oral cavity)
  - Autoantibodies against desmosomes (what are desmosomes? Desmosomes are proteins that anchor epithelial cells to each other)
    - Autoimmune attack on skin/mucosa – breaks skin apart and leads to blisters/ulcers on skin and mucous membranes
- **Pemphigoid**- an autoimmune disease
  - Similar in clinical presentation to pemphigus
  - Autoantibodies against hemidesmosomes (what are hemidesmosomes? Hemidesmosomes are proteins that anchor epithelial cells to the basement membrane)

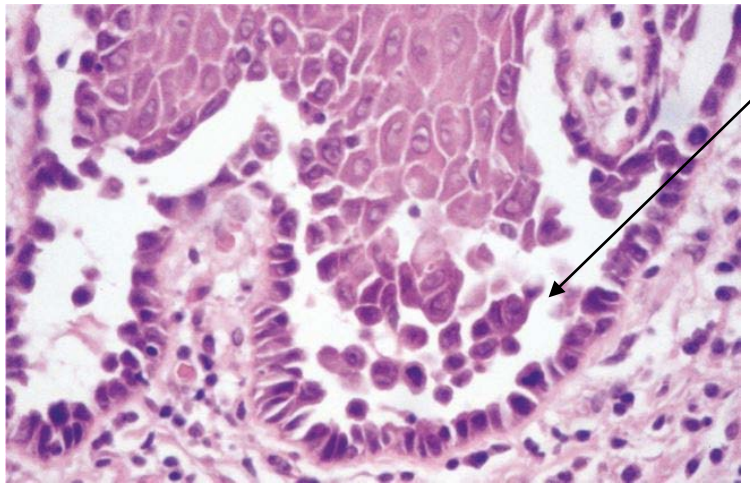
Pemphigus Vulgaris - Clinical



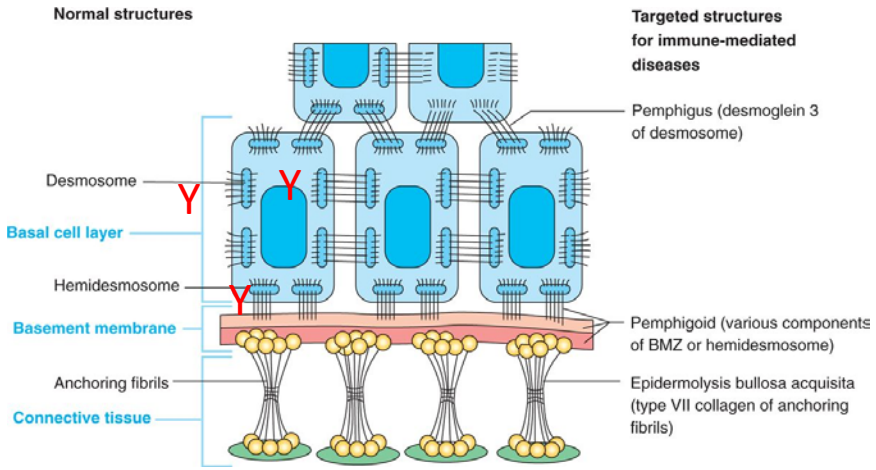
Pemphigoid



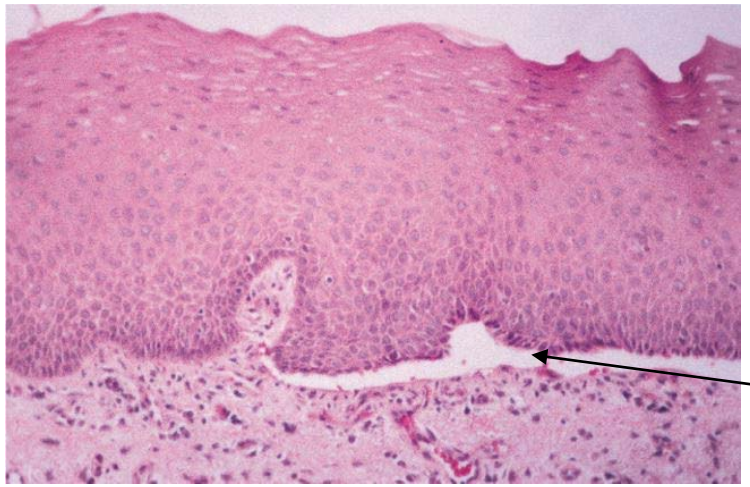
Pemphigus



Intraepithelial splitting (acantholysis)



Pemphigoid



Sub-basilar splitting - epithelium splits from basement membrane

Erythema Multiforme (EM)

- Spectrum of Diseases (Multiforme = many forms)
  - EM Minor- usually triggered by a herpes infection
  - EM Major – usually triggered by a drug reaction
    - Stevens-Johnsons
    - Toxic epidermal necrolysis- Most serious
- Sudden onset
  - Oral lesions, dermal lesions
  - Fever, malaise, headache, sore throat
  - Dehydration

Erythema Multiforme (EM) Minor.

1. Hemorrhagic crusting of lips

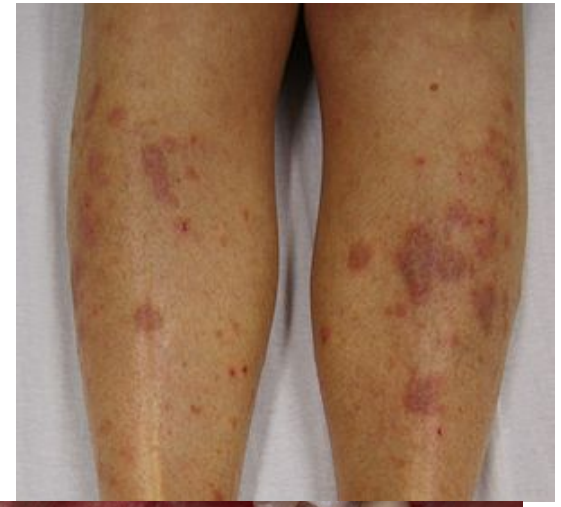
2. Intraoral ulcerations

3. Targetoid lesions on hands

Stevens Johnson Disease

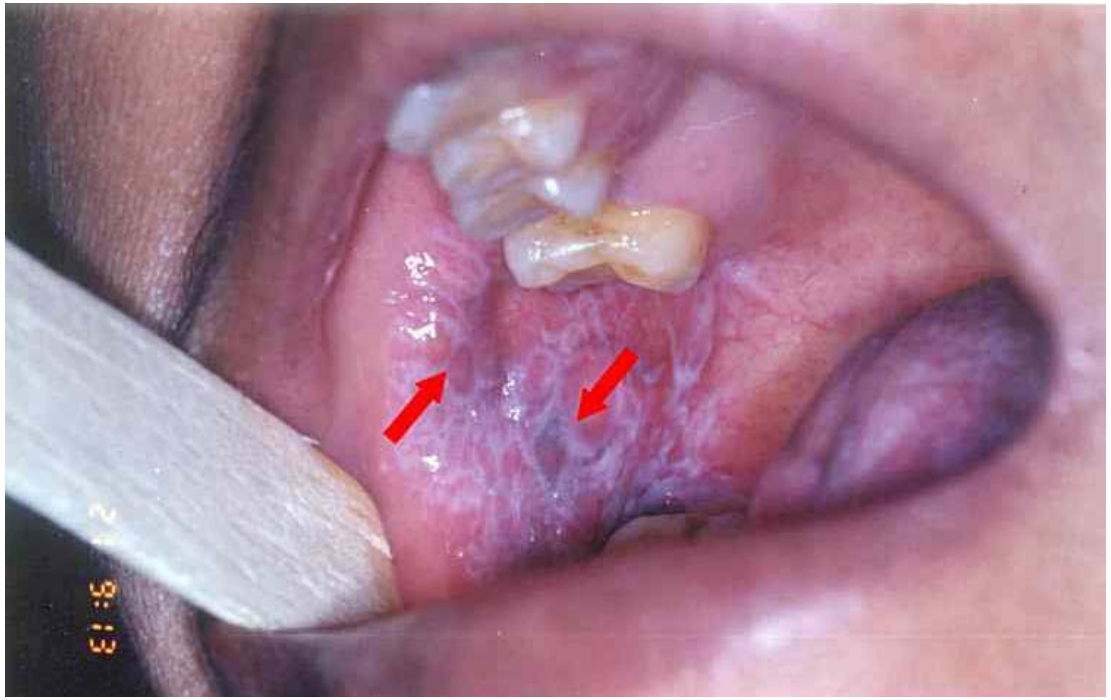
Lichen Planus

- Inflammatory condition of skin and mucous membranes
  - Exact etiology of LP is unknown. In contrast to pemphigus and pemphigoid.
  - May cause burning sensation inside mouth (especially upon eating spicy foods).
- Intraoral: (see next slide)
  - Lacy-white-striae with surrounding erythema (reticular)
    - Buccal mucosa, gingiva, tongue most common
  - Erythematous and ulcerative (erosive)
- Dermal:
  - Purple/brown bumps that may be itchy



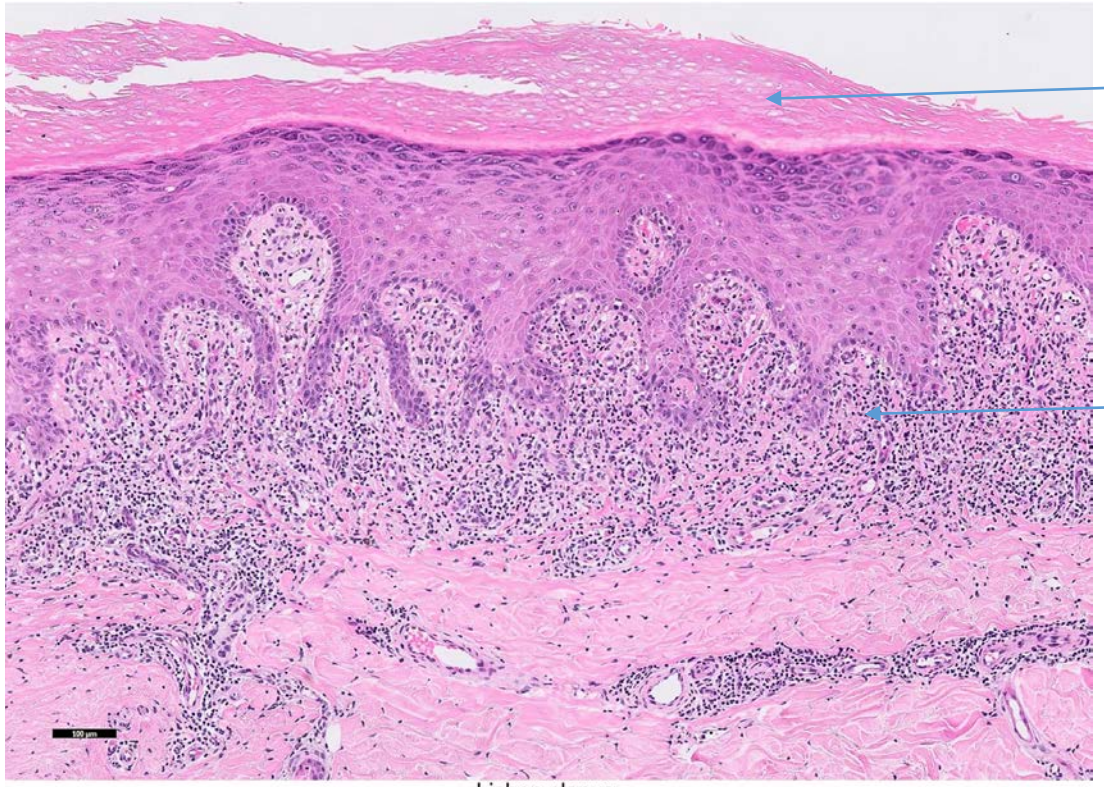
Lichen Planus

- Reticular Lichen Planus
- White striae with erythema



- Erosive lichen planus
- (mostly erythematous/ulcerating)

Lichen planus histopathology



Lichen planus:
mild hyperkeratosis, acanthosis, bandlike chronic inflammatory infiltrate (H&E, ×10)

Hyperkeratosis

Mostly lymphocytic inflammatory infiltrate in the lamina propria