

# SKIN PATHOLOGY

# Skin pathology

- Skin diseases are common and diverse, ranging from irritating acne to life-threatening melanoma.
- Either intrinsic to skin, or systemic diseases involving many tissues, or genetic syndromes such as neurofibromatosis.

# Terms for Macroscopic Lesions

- **Excoriation:** Trauma breaking the epidermis; a red linear mark (i.e., a deep scratch)
- **Lichenification:** Thickened and rough skin; usually the result of repeated scratching
- **Macule:** Flat, circumscribed area, (<5 mm), distinguished by color. If >5 mm = a **patch**.
- **Papule:** Elevated dome- or flat-topped lesion (< 5 mm). If >5 mm = a **nodule**.
- **Plaque:** Elevated flat-topped lesion, (>5 mm)
- **Pustule:** Discrete, pus-filled raised lesion.
- **Scale:** Dry excrescence
- **Vesicle:** Fluid-filled raised area (<5 mm). If >5 mm = a **bulla**.
- **Blister** is common term for both vesicles and bullae

# Microscopic Terms

- **Acantholysis:** Loss of intercellular adhesion of keratinocytes.
- **Acanthosis:** Diffuse epidermal hyperplasia.
- **Hyperkeratosis:** Hyperplasia of the stratum corneum with abnormal keratin.
- **Papillomatosis:** Surface elevation caused by hyperplasia and enlargement of dermal papillae.
- **Parakeratosis:** Keratinization characterized by retention of the nuclei in the stratum corneum. On squamous mucosal membranes, such as buccal mucosa, parakeratosis is normal.
- **Spongiosis:** Intercellular edema of the epidermis

# INFECTIOUS DERMATOSES

- **Bacterial Infections**
- Numerous; range from superficial (e.g. *impetigo*), to deeper abscesses
- **Impetigo**: characterized by an accumulation of neutrophils under stratum corneum → a subcorneal pustule.
- one of the most common bacterial infections of the skin
- seen primarily in children
- causative organism: m/c *Staph. Aureus*; then *Strept. pyogenes*
- Usu. on the extremities or face near nose or mouth; rapidly evolves into a larger lesion with a honey-colored crust of dried serum.
- Treatment: Microbiologic culture and antibiotics

The characteristic erythematous scab-like lesions crusted with dried serum.



Kumar et al: Robbins Basic Pathology, 9e.  
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# Fungal infections of skin

- simple (e.g. *Tinea* or *Candida* spp); or life-threatening in immunosuppressed persons (e.g. *Aspergillus* spp).
- superficial (e.g. stratum corneum, hair, and nails); deep; or systemic (hematogenous spread in immunocompromised pts)
- **Histologic appearance:**
- Superficial infections → neutrophilic infiltrate in the epidermis.
- Deep infections → greater tissue damage; a granulomatous response
- Periodic acid-Schiff (PAS) and Gomori methenamine silver stains can be helpful in identifying the fungal organisms

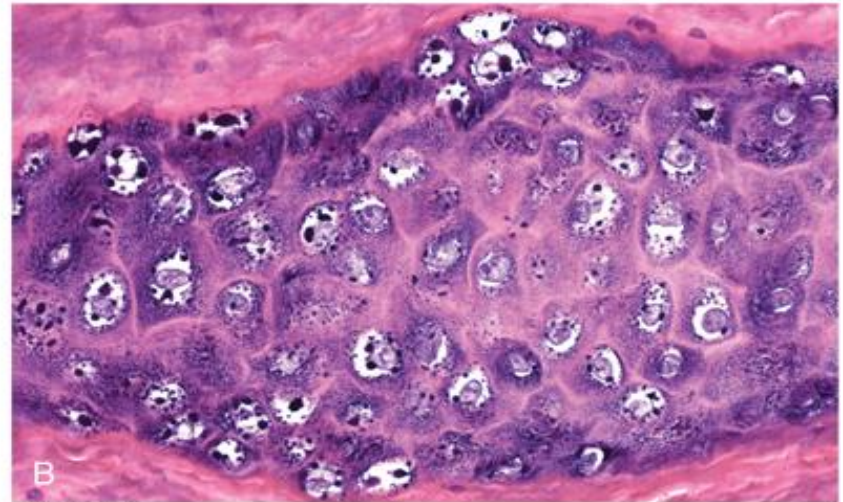
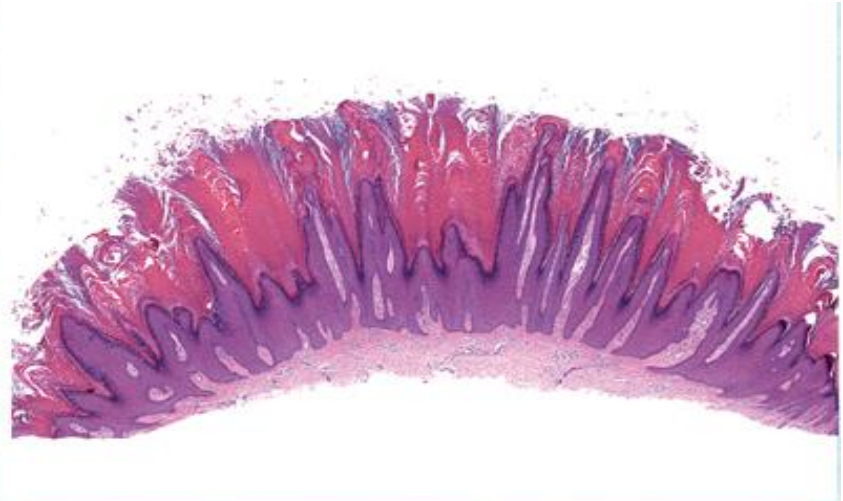
# Verrucae (Warts)

- common lesions of children and adolescents.
- caused by human papillomavirus (HPV)
- self-limited, most often regressing spontaneously within 6 months to 2 years.
- most warts are caused by low-risk HPV subtypes (6 and 11) that lack transforming potential.
- Morphology:
- **Verruca vulgaris**, the most common type of wart, is found most frequently on the hands, particularly on the dorsal surfaces and periungual areas, where it appears as a gray-white to tan, flat to convex, 0.1- to 1-cm papule with a rough, pebble-like surface.



- **Verruca plana, or flat wart**, is common on the face or dorsal surfaces of the hands; are flat, smooth, tan macules.
  
- **Verruca plantaris** and **verruca palmaris** occur on the soles and palms, respectively. These rough, scaly lesions may reach 1 to 2 cm in diameter
  
- **Condyloma acuminatum (venereal wart)** occurs on the male and female genitalia, urethra, and perianal areas
  
- **Histologic features :**
  - **epidermal hyperplasia**
  - cytoplasmic vacuolization (**koilocytosis**), in superficial epidermal layers, producing halos of pallor surrounding infected nuclei.
  - Infected cells also may demonstrate prominent **keratohyaline granules** as a result of impaired maturation

# Verrucae (Warts)



# Malignant Epidermal Tumors

- **Squamous Cell Carcinoma (SCC):**
- *is a common tumor arising on sun-exposed sites in older people.*
- Incidence: men >>women.
- Predisposing factors include: sunlight, industrial carcinogens (tars and oils), chronic ulcers, old burn scars, ingestion of arsenicals, and ionizing radiation.
- may be preceded by carcinoma in-situ lesions

# Pathogenesis of SCC

- *TP53* mutations caused by UV light-induced DNA damage
- UV light (UVB in particular) → a transient immunosuppressive effect on skin by impairing antigen presentation by Langerhans cells
- **Morphology:**
- SCC **in-situ** → sharply defined, red, scaling plaques
- invasive SCC → nodular, show variable scale, and may ulcerate.

- **Microscopically:**
- **in-situ** → highly atypical cells at **all levels** of the epidermis, with nuclear crowding and disorganization.
- **Invasive SCC** → defined by penetration of the basement membrane by neoplastic cells; variable degrees of differentiation (ranging from well-differentiated tumors that exhibit extensive keratinization, to neoplasms consisting of anaplastic cells with necrosis).
- **Clinical features:**
- SCC are often discovered while small and resectable.
- < 5% have metastasized to regional nodes at diagnosis.
- The likelihood of metastasis is related to the thickness of the lesion and degree of invasion into the subcutis.
- Mucosal squamous cell carcinomas (oral, pulmonary, esophageal, etc.) generally are much more aggressive.

# Basal cell carcinoma BCC

- **common *slow-growing cancer that rarely metastasizes.***
- It tends to occur at sites of chronic sun exposure and in lightly pigmented individuals
- PATHOGENESIS:
  - **associated with dysregulation of the Hedgehog pathway** (It controls cell division of adult stem cells and has been implicated in development of some cancers)
  - Mutations in *TP53* are also common in both familial and sporadic tumors.
- **Clinical Features of BCC:**
- usually cured by local excision
- < 40% of patients will develop another BCC within 5 years.
- Advanced lesions may ulcerate, and extensive local invasion of bone or facial sinuses may occur if the lesions are neglected for many years

# Melanocytic Lesions

- Either benign or malignant
- Benign lesions are called nevi (plural of **nevus**)
- Most *melanocytic nevi* have activating mutations in *BRAF* or less often *NRAS*, but the vast majority never undergo malignant transformation.
- *dysplastic nevi* are best regarded as markers of melanoma risk. They are characterized by architectural and cytologic atypia.
- *Melanoma* is a highly aggressive malignancy; tumors only a few millimeters in thickness can give rise to deadly metastases.
- In most cases, it progresses from an (in situ) to an invasive (dermal) form.
- Characteristics of the dermal tumor such as depth of invasion and mitotic activity correlate with survival



Melanoma with irregular contours and pigmentation. Melanoma cells have hyperchromatic nuclei of irregular size and shape with prominent nucleoli. Mitoses, including atypical forms often are encountered.

