Skin Block

• Introduction To Diseases Of The Skin
• Acneiform, Alopecias, and Pigmentary Disorders
• **Eczemas, Papulosquamous, and Vesiculobullous Skin Disease**
• Skin Neoplasms
• Drug Eruptions
• Skin Signs of Systemic Disease
Learning Objectives

At the end of this session, the students will be able to:

• Recognize the clinical presentation and describe the pathogenesis of eczematous disorders including atopic dermatitis, dyshidrotic dermatitis, nummular dermatitis, astyototic dermatitis, stasis dermatitis, seborrheic dermatitis, and contact dermatitis

• Recognize the clinical presentation and describe the histological presentation of papulosquamous disorders including psoriasis, pityriasis rosea, and lichen planus

• Recognize the clinical presentation and describe the histological presentation, and pathogenesis of the vesiculobullous (blistering) diseases including bullous pemphigoid and pemphigus vulgaris.
Eczematous, Papulosquamous, and Vesiculobullous Skin Disease

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Eczematous (Spongiotic) Dermatitis

• Eczema (*Greek: to ooze*)
• Defined histopathologically by marked epidermal edema
  – Termed spongiosis
Eczematous (Spongiotic) Dermatitis

- Atopic dermatitis
- Dyshidrotic dermatitis
- Seborrheic Dermatitis
- Contact Dermatitis
- Nummular Dermatitis
- Stasis Dermatitis
- Asteatotic Dermatitis
Atopic Dermatitis

• Common chronic dermatitis
  – Affects 9-12% of children

• Earliest manifestation of atopic triad
  – Atopic dermatitis
  – Asthma
  – Allergic rhinitis

• ~80% of children with atopic dermatitis will develop asthma or allergic rhinitis later in childhood

• Clinical stigmata
  – Hyperlinear palms
  – Dennie Morgan folds
Atopic Dermatitis

- Unknown pathogenesis
  - Barrier defect (profillagrin, fillagrin)
  - Elevated serum IgE levels in >80% of patients
  - Th2 > Th1 immunologic profile
  - “The itch that rashes”

- Children predominantly affected
  - Only 40% of affected children will develop persistent/recurrent disease in adulthood
Atopic Dermatitis: Age-Dependent Distribution

Infants (>2 year):
• Scalp, face, extensor surfaces most affected
Atopic Dermatitis: Age-Dependent Distribution

Children (2-12 years):
- Flexural surfaces most common sites
- Head, neck, wrists, ankles, hands, feet also affected
Atopic Dermatitis: Age-Dependent Distribution

Adults (>12 years):
- Hands, eyelids, flexural surfaces, retroauricular scalp, neck, chest most common sites of involvement
Atopic Dermatitis: Morphology

- Acute lesions characterized by erythematous edematous papules and papulovesicles coalescing into ill-defined plaques with secondary serous exudate and crusting
- Most common clinical presentation in infants
Atopic Dermatitis: Morphology

- Chronic lesions characterized by lichenified hyperpigmented papules and plaques often with thick overlying lamellar scale
- More common in older children and adults
**Atopic Dermatitis: Complications**

**Impetiginized eczema**

- Results from secondary bacterial *infection*
  - Staph carriage more common in atopics
- Staph >> strep
- Treat with oral antibiotics, topical steroids
  - Often also results in improvement in non-impetiginized lesions
Atopic Dermatitis: Complications

Eczema Herpeticum

- Aka Kaposi’s Varicelliform eruption
- Rapid dissemination of herpes simplex virus infection over eczematous lesions
- Classically presents with monomorphlc, punched-out erosions with hemorrhagic crusting
Atopic Dermatitis: Histology

Spongiosis (Widened intercellular spaces)
Dyshidrotic Eczema

• AKA Pompholyx
• Recurrent vesicular eruption
• Primary lesions are deep seated vesicles, resemble tapioca pearls
• Primarily occurs on hands and feet
  – Lateral aspects of fingers
• Extremely pruritic
Nummular dermatitis

- “Coin shaped" scaly pruritic plaques
- Extremities > trunk
- More common in elderly, men
Asteatotic dermatitis/Eczema Craquele

- Extremely dry, rough skin, leading to fine fissuring and pruritus and inflammation
Seborrheic dermatitis

- Common, chronic disease
- Results from cutaneous overgrowth of *Malassezia furfur*
- Bimodal age distribution: early infancy and adulthood
- HIV and Parkinson’s disease associated with more severe disease
- Disproportionately affects men
- No racial predilection
Seborrheic Dermatitis: Clinical Features

- Erythematous patches with overlying greasy, white-yellow scale associated with pruritus, burning
Seborrheic Dermatitis: Distribution

**Adults:**
- Scalp ("dandruff")
- Face
  - Eyebrows
  - Nasolabial folds
  - Beard/mustache
  - Ears
- Central chest
- Perineum
Infants:

- Flexural creases, diaper area
- Skin exposed to saliva
  - Often folds of neck
- Scalp (cradle cap)
Contact Dermatitis

Irritant Contact Dermatitis (80%)
- Non immune mediated
- Direct physical or chemical injury to the epidermis resulting in inflammation

Allergic Contact Dermatitis (20%)
- Immune mediated
  - Delayed hypersensitivity reaction (type IV cell-mediated)
- Greater itch
- Patch testing can help identify/verify allergen
- Clinical presentation often with angular, geometric plaques
Allergic Contact Dermatitis
Allergic Contact Dermatitis
Allergic Contact Dermatitis

• Toxidendron
  – Poison ivy
  – Poison oak
  – Poison sumac
“Leaves of 3, let it be!”
Patch Test: Allergen Identification
Pityriasis Rosea

- Mild inflammatory exanthem
- Highest incidence between 15-40
  - Seasonal
- Herald patch (precedes generalized eruption by hours to days)
- Self-resolves 6-8 weeks
- May be related to viral infection
  - HHV-7
Pityriasis Rosea: Clinical Features

- Smaller scaly thin pink oval papules that follow “Christmas tree” pattern
- Atypical presentations or distributions more common Fitzpatrick types IV-VI
- Cannot clinically distinguish from secondary syphilis
Psoriasis

• Chronic immune mediated polygenic skin disorder
  – Multiple genetic and environmental factors
• Affects 1-3% of the population worldwide
  – Average age at onset in third decade
  – Males = females
• Classified as auto-inflammatory disease
  – T cell mediated
• Results in keratinocyte hyper proliferation with loss of normal differentiation
Psoriasis: Clinical Features

• Extent/severity of disease varies widely
• Dynamic and unpredictable course with exacerbations and remissions
• **Sharply demarcated**, erythematous plaque with overlying thick, adherent, silvery-white “micaceous” scale
• Affects extensor >> flexor surfaces
  – Elbows, knees, buttocks
Psoriasis: Clinical Features

Auspitz sign:
• Pinpoint bleeding foci when scales removed
• Represent exposure of dermal papillae
Psoriasis: Clinical Findings
Psoriatic Nail Disease

- Present in >40% of patients with psoriasis
- Associated with increased risk of developing psoriatic arthritis
- Clinical presentation dependent on portion of nail apparatus involved
Psoriatic Nail Disease

- **Nail matrix**
  - Pitting,
  - Leukonychia
  - Nail fragility
  - Total nail dystrophy
Psoriatic Nail Disease

Nail bed
- Onycholysis
- Salmon patches ("oil spots")
- Subungual hyperkeratosis
Acrodermatitis Continua of Hallopeau

“Nail floats away on a lake of pus”
Psoriasis: Koebnerization

• Elicitation of psoriatic lesions via trauma to the skin
• Occurs in 25% of psoriatics
Psoriatic Arthritis

- Psoriasis associated inflammatory arthritis
  - Occurs in 20% of patients
  - Carries significantly increased risk of cardiovascular disease
- Monoarticular or asymmetric oligoarthritis
  - Most commonly involves the small joints of the hands and feet
- Characteristic “sausage digit/fingers" dactylitis
  - Correlates with “pencil in cup" deformity on xray
Psoriasis - Histology

- Parakeratosis
- Regular (psoriasiform) elongation of bulbous rete ridges
- Suprapapillary thinning
- Hypogranulosis
- Subcorneal neutrophilic pustules
Lichen Planus

• Uncommon inflammatory disease of the skin, nails and mucous membranes
• Average age of onset between 30 to 70 years
  – 10% have a family history
• Prevalence 0.3% - 0.8%
• Pathogenesis is unknown
• Associated with liver disease, particularly hepatitis C
Lichen Planus

- Flat-topped, polygonal, violaceous papules with lacy-white lines on surface (Wickham's striae)
- **5Ps:** purple, planar, polygonal, pruritic, papules
- Distribution: flexor surfaces of wrists, forearms, ankles, genitalia and lumbar region
- Pruritus is variable
Lichen Planus: Mucosal Disease

- Oral, genital mucosa often involved
- Lacy-whitish reticular plaques or erosions
- Erosive lesions predispose to squamous cell carcinoma in 1.2% of cases
Lichen Planus: Koebnerization

- Trauma to skin incites lichen planus lesions
- Similar to psoriasis
Lichen Planus: Nail Involvement

- Occurs in ~10% of cases of lichen planus
- 25% of cases occur in the absence of cutaneous disease
- Cicatricial process
- End stage: dorsal pterygium
Lichen Planus: Histology

- Hyperkeratosis
- Wedge shaped hypergranulosis
- Acanthosis and saw-toothing
- Band-like infiltrate
- Colloid bodies
Vesiculobullous Disease

Bullous Pemphigoid
Pemphigus Vulgaris
Bullous pemphigoid

- Bullous pemphigoid (BP) is the most common autoimmune subepidermal blistering disease
- Most commonly occurs in elderly populations
- Chronic disease course with spontaneous exacerbations and remissions
- Results from tissue-bound and circulating autoantibodies directed against components of hemidesmosomes (BP180 or BP230)
Bullous Pemphigoid – Clinical Features

- Multiple, large, tense bullae arising on normal and erythematous skin
- Predilection for extremities and trunk
- Blisters not easily broken or enlarged by pressure
- Bullae may rupture, leaving circular erosions that heal without scarring
Bullous pemphigoid - Histology

- Subepidermal blister
- Mixed infiltrate with eosinophils within blister cavity
- Blister roof intact
- Mixed superficial perivascular infiltrate
Bullous Pemphigoid: Immunofluorescence

- Linear C3 and IgG along the dermal-epidermal junction
- Nearly 100% of perilesional biopsies are positive on DIF
Pemphigus Vulgaris

- Uncommon, blistering disorder affecting the skin and mucous membranes
- Presents in 5th-6th decade of life
- More common among individuals of Mediterranean, Jewish ancestry
- Results from autoantibody formation against desmogleins (Dsg1 and Dsg3)
Pemphigus Vulgaris: Clinical Features

- Small, fragile, flaccid bullae
- Rupture results in painful erosion
- +Nikolsky Sign
  - Lateral pressure causes shearing of the epidermis
- Classically mucosa first site of involvement
- Chronic course of disease with spontaneous relapses/remissions
Pemphigus Vulgaris: Clinical Features
Pemphigus Vulgaris: Clinical Features
Pemphigus Vulgaris - Histology

- **Acantholysis**: loss of intracellular connections between keratinocytes
- Suprabasilar blister with “tombstoning” of basal keratinocytes
Pemphigus vulgaris - Immunofluorescence

- C3 and IgG show an intercellular staining pattern
- Indirect IF positive in 80 - 90% cases
Take Home Points

- Atopic dermatitis is characterized by elevated levels of IgE and the presence of an eosinophilic infiltrate; it is associated with atopic triad of asthma, atopic dermatitis, and allergic rhinitis.
- Seborrheic dermatitis is a skin lesion often seen on the scalp and face with increased prevalence in patients suffering from HIV and Parkinson’s disease that is associated with pruritus.
- Psoriasis may be associated with monoarticular or asymmetric oligoarthritis and dactylitis, also known as "sausage digit." X-ray shows "pencil in cup" deformity.
- Lichen planus is an inflammatory skin disease manifesting as polygonal, purple, flat-topped papules on the skin that may be associated with hepatitis C infection. Histology shows "sawtoothy" of the epidermal basal layer.
Take Home Points

• Bullous pemphigoid is an autoimmune blistering disease seen in older patients with blisters that are not easily broken or enlarged by pressure which is characterized by a split in the lamina lucida of the basement membrane on electron microscopy and linear staining at the dermal-epidermal border by immunofluorescence.

• Pemphigus vulgaris is an autoimmune chronic blistering disorder of the skin and mucous membranes characterized by bullae that either break or are enlarged by pressure and autoantibodies against desmoglein III, part of the desmosome, leading to an intercellular staining pattern on immunofluorescence.