Spongiotic (Eczematous) Dermatitis

Catherine Barry, D.O.
Dermatopathologist
Learning Objectives

• Review the clinical findings in patients with eczema or hypersensitivity dermatitis
• Review the histological findings of eczematous (spongiotic) diseases and their diagnostic challenges
• Review the work up and helpful treatments
What information is essential to provide to the pathologist when performing a skin biopsy for a rash?

- A. Clinical description of the rash
- B. Duration of the lesion
- C. Previous therapy
- D. All of the above
Prototype
Atopic (Eczematous) Dermatitis
Histological Pattern

• Acute - microvesical formation
• Subacute – spongiosi where bridging between keratinocytes is conspicuous at low power
• Chronic – mild spongiosis
Stratum Corneum: The Permeability Barrier

- Keeps the water in
- Keeps the world out
What is spongiosis?

Intraepidermal and intracellular edema
What is spongiosis?

Intracellular edema
Acute Spongiotic Dermatitis
Chronic spongiositotic dermatitis
Two Types of Classification

• Pathological – spongiosis under the microscope

• Clinical presentation
  – Endogenous dermatitis - related to major constitutional or hereditary factors
  – Exogenous dermatitis - involving environmental factors.
Important

• Provide clinical history
  – Description of the rash
  – Distribution
  – Associated medications and prior treatment
  – Differential diagnosis helps when possible
Pathological Classification (Spongiotic Dermatitis)

- Atopic Dermatitis (Eczema)
- Seborrheic Dermatitis
- Allergic Contact Dermatitis
- Dyshidrotic Eczema (Pompholyx)
- Stasis Dermatitis
- Drug Eruption
- Arthropod Bite Reaction
- Pityriasis Rosea
- Photosensitive (Phototoxic/Photoallergic) Dermatitis
- Incontinentia Pigmenti (Bloch-Sulzberger Syndrome)
Clinical Classification (Endogenous)

- Atopic dermatitis
- Seborrheic dermatitis
- Discoid dermatitis (nummular eczema)
- Hand eczema (dyshidrotic eczema, palmoplantar eczema, pompholyx)
- Autosensitization (IId reaction)
Clinical Classification (Exogenous)

• Allergic Contact dermatitis – poison ivy
• Irritant dermatitis – topical damage
• Infectious – ie. fungus
• Asteatotic dermatitis - elderly, in winter and in those with minor degrees of ichthyosis, asteatotic dermatitis (eczema craquelé)
Pathological Classification (Spongiotic Dermatitis)

- Atopic Dermatitis (Eczema)
- Seborrheic Dermatitis
- Allergic Contact Dermatitis
- Dyshidrotic Eczema (Pompholyx)
- Stasis Dermatitis
- Drug Eruption
- Arthropod Bite Reaction
- Pityriasis Rosea
- Photosensitive (Phototoxic/Photoallergic) Dermatitis
- Incontinentia Pigmenti (Bloch-Sulzberger Syndrome)
Establish the Diagnosis

- No objective diagnostic lab test
- No specific histopathology
- Numerous clinical presentations
- Complex pathophysiology
- Multiple, often unknown triggers
Definitive diagnosis is difficult

• Pathologists usually cannot render a more specific diagnosis other than
  – Spongiotic dermatitis consistent with eczematous dermatitis etc.

• Can offer a limited differential diagnosis when given some clinical information.
Chronic spongiotic dermatitis
Subacute spongiotic dermatitis
Acute Spongiotic Dermatitis
Pearl – Don’t be tricked

Langhan cells
If we see parakeratosis?
Order a fungal stain
Atopic dermatitis

• Complex inflammatory skin disorder
  – intense pruritus
  – cutaneous hyperreactivity
  – immune dysregulation

• Exacerbations and remissions

• Affects all ages, but more common in kids
Atopic dermatitis

• Pathogenesis: immune mediated
• Epidemiology:
  – 10% of children
  – Most present before age 7
  – Atopic diathesis: 75% have a personal or family history of allergic disease
Atopic dermatitis

• Clinical: “the itch that rashes”
  – Lesions:
    • Acute: erythema and vesiculation
    • Subacute: papular
    • Chronic: brown/red, lichenification
  – Distribution:
    • Infancy: face, extensors of extremities
    • Childhood: neck, antecubital and popliteal fossae
    • Adulthood: fossae, hands/feet
Acute
Subacute / Chronic
Atopic dermatitis

- Clinical:
  - Other findings:
    - Pityriasis alba
    - Dennie-Morgan lines, allergic shiners
    - Keratosis Pilaris
    - Icthyosis Vulgaris
    - Hyperlinear palms
Infantile Distribution

- Face
- Elbows
- Knees
Chronic
Important Features of Atopic Dermatitis

1. Early age at onset:
   - 70-90% by age 5
   - 95% by age 15

2. Atopy
   - personal or family history
   - IgE reactivity

3. Xerosis
Common overlapping features

- Asthma
- Excema
- Hayfever
Atopic Dermatitis

- Immune system
- Infectious agents
- Food
- Aeroallergens
- Stress/anxiety
- Genetics
- Heat/humidity
- Neural mediators
- Irritants
Atopic Dermatitis

- Immune system
- Aeroallergens
- Food
- Infectious agents
- Genetics
- Heat/humidity
- Neural mediators
- Irritants

Barrier function

Stress/anxiety
The bottom line... the diagnosis is clinical
Exclusionary Conditions

- Scabies
- Psoriasis
- Seborrheic dermatitis
- Allergic contact dermatitis
- Cutaneous lymphoma
- Immunodeficiency diseases
Food Allergy

- Food allergens can induce eczema
- 90%: milk, egg, peanut, soy, wheat, fish
- 80% outgrow by age 5
  - except peanut and shellfish

- Food allergy correlates with increased severity and younger age of onset of AD
Scratch testing
Patch testing
Follicular Eczema
Treatment

• **Topical steroids**
  – Class 6-7 topical steroids can be used on the face
  – Safe for eyes (Desonide gel 0.05%, aclovate cream or ointment 0.05%)

• **Oral steroids**

• **Emollients**
  – Lansinoh ointment
  – Eucerin, Aquaphor, vasaline, Cetaphil or Vanicream
Treatment

• Anithistamines
  – Sedating – diphenhydramine, hydroxyzine, cyprohepatine
  – Nonsedating fexofenadine, cetirizine, loratadine - useful, especially when there is an urticarial component (doxepin topical or 10mg QD - tricyclic antidepressant with potent H1 and H2 blocking properties) or concurrent allergic rhinoconjunctivitis
Treatment

- Topical calcineurin inhibitors
  - pimecrolimus 1% cream or tacrolimus 0.03% to 0.1% ointment
- Crisaborole – expensive, helpful in children
- Phototherapy – helpful in dyshidrotic eczema in adults and severe cases
- Cyclosporin – moderate to severe cases
- Methotrexate – once a week dosing, monitor LFTs, CBC
- Mycophenolate mofetil (Cellcept) - immunosuppression
- Dupixent – IL-4 alpha antagonist, expensive, moderate to severe cases
Selected Spongiotic Dermatidites

- Dyshidrotic Eczema (Pompholyx)
- Asteatotic Eczema (Craquele)
- Guttate Parapsoriasis
- Nummular Eczema
- Id reaction (Autoeczematization)
- Pityriasis Alba
- Keratosis pilaris
- Chelitis
- Seborrheic Dermatitis

- Allergic Contact Dermatitis
- Stasis Dermatitis
- Drug Eruption
- Arthropod Bite Reaction
- Pityriasis Rosea
- Photosensitive (Phototoxic/Photoallergic) Dermatitis
- Tinea (fungal) infection
- Incontinentia Pigmenti (Bloch-Sulzberger Syndrome)
Dyshydrotic Eczema (Pompholyx)

- More common in adults in the 3rd to 5th decade of life
- Females > Males
- May be associated with hyperhidrosis
- Usually lasts 2-4 weeks, but recurrent episodes not uncommon
Dyshydrotic Eczema (Pompholyx)
Asteatotic Eczema (Craquelé)

- Elderly, bilateral, winter months
- Can be associated with an underlying malignancy
Guttate Parapsoriasis

- Often follows streptococcal infection
- Drop-like lesions on the trunk and extremities
- Thought to lead to mycosis fungoides
  1% of large plaque parapsoriasis
Nummular Eczema

- Coin shaped tiny papules and papulovesicles that become confluent
- Not related to atopic dermatitis
- Associated with cold dry weather, infection, predisposing medication
Pityriasis Rosea

- Young adults, initial “Herald patch” followed by “Christmas tree” pattern rash on trunk
- More common in spring or autumn
- Can take up to 6mo to clear
Id reaction
(Autoeczematization)

- Dissemination of a previously localized ‘eczematous’ process such as fungal infection or stasis dermatitis
- Commonly seen as a reaction to foods, look at the feet and nails for fungus
An id reaction is an eczematous skin reaction that develops in response to a distant unknown antigen. Which of the following is a known and common cause of “id reaction”?

- A. Tinea pedis
- B. Food allergens
- C. Stasis dermatitis
- D. All of the above
Pityriasis Alba

- Hypopigmented scaly patches with predilection for face, neck and shoulders of darker skinned atopic individuals
- Usually between 6-16 years
- Topical 1% hydrocortisone (or other low-potency steroid cream or ointment) may be used sparingly for 3-7 days to abate any ongoing inflammation.
Keratosis Pilaris

- Bilateral upper arms and thighs, sometimes face
- Usually a childhood onset
- Keratolytics such as lactic acid, salicylic acid, or urea-based lotions (Urealac, Keratol) or creams applied twice daily
- Topical retinoids such as tazarotene cream (0.05%) or tretinoin cream (0.1%) applied daily
Atopic Chelitis

- Inflammation of the lips
- Contact (toothpaste), irritant dermatitis, atopic patients, vitamin deficiency
- AKA - Angular chelitis
- Candidiasis treat with Nystatin, ketoconazole 2% cream covers yeast and dermatophytes, topical mupirocin ointment for bacterial coverage if suspect impetigo
Seborrheic Dermatitis

- Affects sebum rich areas of the skin
- Adult, caucasian, male prediliction, AIDS, neurological disorders
- Scalp, eyebrows, perinasal, beard, presternal
- OTC treatment – alternate over the counter shampoos
  - Demodex mites – selenium sulfide 1% shampoo
  - Yeast-like species – Nizoral 1% shampoo
Seborrheic Dermatitis
Allergic Contact Dermatitis

- Delayed hypersensitivity reaction to exogenous antigen
- Any age
- Nickel, fragrance (Rhus, uroshiol), neomycin/bacitracin
- Short course of topical or oral steroids
Allergic Contact Dermatitis
Stasis Dermatitis

- Associated with venous stasis, chronic CHF, s/p surgery to lower legs
- Bilateral lower legs
- Elderly
- Pruritic, painful, weeping
- Steroids, topical antifungal, compression stockings, elevation, increase diuretic, culture when necessary
Drug Eruption

- Antibiotics
- Exposure to initial presentation of drug or re-exposure to a medication where the patient was previously sensitized
- Can take up to 3 to 6 months to develop after medication onset
- Remove one medication at a time for 3 to 4 weeks
Arthropod Bite Reaction

- Solitary or multiple papules, often clustered
- Punctum centrally may be evident
- Pruritic
- Topical steroids, topical lidocaine 2.5%/prilocaine 2.5%
Photosensitive (Phototoxic/Photoallergic) Dermatitis

- Can begin within minutes of light exposure
- Tender macular erythema and edema in sun exposed areas
- r/o photo drug, dermatomyositis, lupus
Tinea (fungal) infection

- Infectious organisms
  Trichophyton, Microsporum, Epidermophyton species
- Children or adults
- Mimics eczema, psoriasis, gyrate erythemas
- Topical azole creams
  (ketoconazole 2%, econazole 1%)
- Oral for severe reactions
  lamisil 250mg QD x 14 days, oral sporonox 100mg BID x 14 days
Incontinentia Pigmenti (Bloch-Sulzberger Syndrome)

- Genodermatosis noted at birth
- Progressive cutaneous blistering along the lines of Blaschko
- Mutation in the NEMO gene
- X-linked dominant nearly exclusively in females
When spongiosis and parakeratosis are present, what histochemical stain should be ordered”?

- A. AFB
- B. GMS or PAS
- C. Gram
- D. All of the above
If eosinophils are present in the dermis

• A. the diagnosis is eczema.
• B. the diagnosis is a medication reaction.
• C. the diagnosis is arthropod insult.
• D. a hypersensitivity dermatitis cannot be excluded.
When eosinophils are found in association with neutrophils, fibrin thrombi and leukocytoclasia, which of the following should be considered?

- A. mastocytosis
- B. bullous pemphigoid
- C. leukocytoclastic vasculitis
- D. sarcoidosis
Treatment Summary

• Elimination of exacerbating factors
  – Avoid trigger factors such as heat, low humidity
  – Treat skin infections such as *Staphylococcus aureus* and herpes simplex
    Use antihistamines for sedation and control of itching
  – Treat stress and anxiety
• Elimination of aeroallergens and food allergens
• Elimination of contact allergens
• Maintaining skin hydration
  – Emollients and moisturizers
  – Bathing practices
• Controling pruritus
• Topical/Oral steroids
Treatment Summary

- Topical calcineurin inhibitors
  - pimecrolimus 1% cream or tacrolimus 0.03% to 0.1% ointment
- Crisaborole – expensive, helpful in children
- Phototherapy – helpful in dyshidrotic eczema in adults and severe cases
- Cyclosporin – moderate to severe cases
- Methotrexate – once a week dosing, monitor LFTs, CBC
- Mycophenolate mofetil (Cellcept) - immunosuppression
- Dupixent – IL-4 alpha antagonist, expensive, moderate to severe cases
Selected Spongiotic Dermatidites

- Dyshidrotic Eczema (Pompholyx)
- Asteatotic Eczema (Craquele)
- Guttate Parapsoriasis
- Nummular Eczema
- Id reaction (Autoeczematization)
- Pityriasis Alba
- Keratosis pilaris
- Chelitis
- Seborrheic Dermatitis
- Allergic Contact Dermatitis
- Stasis Dermatitis
- Drug Eruption
- Arthropod Bite Reaction
- Pityriasis Rosea
- Photosensitive (Phototoxic/Photoallergic) Dermatitis
- Tinea (fungal) infection
- Incontinentia Pigmenti (Bloch-Sulzberger Syndrome)
Pathology Report

- Chronic/subacute/acute spongiotic dermatitis with eosinophils, see note

**NOTE:**
- Describe histological features from the top down
- The findings are not diagnostic for a specific disease process but can be identified in a variety of forms of eczematous (hypersensitivity) dermatidites.
- Offer a differential if possible
- Answer the clinician's question
Thank you!