A Practical Approach to the Unknown Rash

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Objectives

- Employ a systematic, algorithmic approach to assess skin rashes
- Identify medical conditions by the morphology, distribution, and appearance of their associated rash
- Review differential diagnoses, treatment, and disposition for patients with medical conditions that present with rashes

I have no conflicts and have nothing to disclose
Skin: A Common Complaint


History

- Age
- Duration of Rash
- Assoc Sx
- Travel
- Sick Contacts
- PMH
- Meds
- Menstrual Hx
- Sexual Hx
- Immunizations

Physical Exam

- Vitals
- Sick or not Sick
- Mental Status
- Morphology
  - Erythematous
  - Maculopapular
  - Vesiculo-Bullous
  - Petechial/Purpuric
Distribution

- Central
- Peripheral
- Flexor
- Extensor
- Palms & Soles
- Intertriginous
- Dermatomal
- Mucosal Involvement

Palms & Soles

- Dyshidrosis
- Endocarditis
- Erythema Multiforme
- Disseminated GC
- HFM Dz
- Herpes Simplex
- Kawasaki Dz
- RMSF
- Scabies
- Secondary Syphilis
- Toxic Shock Syndrome

Appearance

- Color
- Palpable
- Moist
- Desquamating
- Honey-crusted
- Umbilicated
- Blanching
- Hyper / Hypo-pigmented
Definitions

- **Erythema**: superficial reddening
- **Nikolsky’s Sign**: denuding/sloughing of epidermis by light lateral pressure

Erythematous: Case 1

- 7 mo/old M infant brought in by Mother
- Fever, irritability, decreased appetite, rash
- Immuniz: UTD
- VS: 102°F-132-22
- + Nikolsky
- Febrile
- SSSS
Staph Scalded Skin Syndrome (1)

- SSSS  *S. aureus*
- Peds < 6 y/o (no antibodies)
- Sunburn-like rash → flaccid bullae
- Spares mucous membranes
- IV Penicillinase-resistant PCN
- IV Flds
- Local wound care

Erythematous: Case 2

- 21 y/o F presents w/ red skin & fever
- Meds & Allergies: none
- PMH: none
- LMP: current
- VS: 101.8-124-20  92/62
- neg Nikolsky
- Febrile
- + muc membr

TOXIC SHOCK SYNDROME

Toxic Shock Syndrome (2)

- TSS  *S. aureus or S. pyogenes* toxin
- CDC Criteria
  - Fever, hypotension, rash, + 3 organ systems
- Erythroderma palms & soles → desquamates
- Look for source & remove
- IV PCN-ase PCN
- IV Fluids
- Admit
Erythematous: Case 3
- 42 y/o M presents w/ abrupt rash onset
- Diffuse rash (very pruritic), abd cramps
- Denies EtOH, ate fish 1 h ago
- PMH: neg. NKA
- 98°-108-20-108/66
- neg Nikolsky
- Afebrile*

SCROMBOID

Scromboid Poisoning (3)
- Hx eating fish high in histidine
  - Mackerel family (Scrombridae), mahi-mahi, marlin, tuna
- Histadine \(\rightarrow\) Histamine
- Antihistamines

Kawasaki Disease
- Mucocutaneous Lymph Node Syndrome
- Fever + 4 of 5:
  - Bilat conjunctival inject, Oral mucosa,
  - Erythematous rash, Desquam Hands & Feet,
  - Cervical nodes
- Admit, IVIG, ASA, Steroids
Allergic Reaction

- Urticaria
- Epinephrine
- Antihistamines
- Steroids

Scarlet Fever

- Scarlatina
- Sandpaper-like rash
- Strawberry tongue
- Pharyngitis/Tonsillitis
- PCN

Alcohol Flushing

- Hx EtOH ingestion, common in Asians
  - Genetic mutation of Acetaldehyde Dehydrogenase
  - Acetaldehyde accumulates
- Hx prior episodes
- Face, neck; no pruritus
- HA, N/V, Tachycardia?
- Vitals normal, afebrile
- Support, self-limited
Alcohol Flushing

Normally:
- Alcohol $\rightarrow$ Acetaldehyde by Alcohol Dehydrogenase (ADH)
- ADH $\rightarrow$ Acetic Acid by Acetaldehyde Dehydrogenase (ALDH)
- Acetic Acid $\rightarrow$ $\text{H}_2\text{O} + \text{CO}_2$
- Mutated ALDH2 inhibits conversion
- Therefore Acetaldehyde accumulates
  (Similar to Disulfuram)

Redman Syndrome

• IV Vancocinycin
• Flushing & Erythema
• Histamine release
• Face most common
• Tachycardia
• Hypotension
• Stop/Slow infusion
• Antihistamines

Definitions

• **Macule**: non-palpable, varied shapes, sizes, & colors
• **Papule**: solid, elevated < 5 mm
Maculopapular: Case 1

- 6 y/o M w/ rash brought in by Mother; Started on face & spread to trunk & extremities
- Prior to rash: fever, cough, rhinorrhea
- Mother does not believe in Immunizations
- + Cervical nodes
- Central
- Fever

VIRAL EXANTHUM
RUBELLA

Viral Exanthem (1)

- Rubella (3-Day, German Measles)
  - Rash day 1 Face → spreads centrally
  - Low-grade fever, URI Sx
  - Lymphadenopathy
- Rubeola (Hard Measles)
  - Cough, Conjunctivitis

Complications: Pneumonia, Encephalitis
Viral Exanthem

- Fifth Dz (Erythema Infectiosum)
  - Slapped Cheek
  - Mild viral Sx
  - Parvovirus B 19
- Roseola (Infantum)
  - Sudden high fever → defervescence + rash: trunk, arms, neck
  - Well-appearing child
  - HHV-6

Numbered Skin Rashes 1-6

- First Rubeola
- Second Scarlatina
- Third Rubella
- Fourth Dukes’ Dx (SSSS?)
- Fifth Erythema Infectiosum
- Sixth Roseola

Maculopapular: Case 2

- 33 y/o F c/o rash
- Began on hands
- Spread all over incl muc membranes
- Appears quite ill
- VS: 102-128-24 90/62
- PMH: TMP/Sulfa for UTI
- Peripheral, Fever
- Target Lesions
  - TEN
Toxic Epidermal Necrolysis (2)
- SJS $\rightarrow$ TEN continuum
  - TEN: > 30% BSA
- Target lesions
- Mucous membranes
- Drug Rxn: Viral
- D/C offending source
- Wound Care, IV fids, Steroids
- Admit to Burn Center
- (also Erythematous)

Stevens-Johnson Syndrome
- SJS $\rightarrow$ TEN continuum
  - SJS: < 10% BSA
- Immune disorder
- Target lesions
- Mucous membranes
- Drugs, Infection, Malig
- Tx underlying cause
- Supportive care, Admit

Maculopapular:
Case 3
- 19 y/o student w/ rash
- He c/o HA & fever
- Appears generally ill
- PMH: neg, no meds, Immuniz UTD
- Soc Hx: Recently returned from a NC camping trip
- VS: 102-112-20 110/64
- Peripheral, Fever, no Target Lesions
- RMSF
Rocky Mountain Spotted Fever (3)
- Black Measles
- R. rickettsii
- D. andersoni, variabilis
- Endemic area
- HA, arthralgias
- 3-5 days later rash appears
  - Flexor wrists, ankles, palms, soles
  - (Macules → Petechiae / Purpura)
- Doxycycline

Pityriasis Rosea
- Herald Patch
- Christmas Tree pattern on trunk
- +/- pruritus
- Young adults, lasts months, not contagious
- Etiology: HHV 6 or 7?
- UV light
- Sx care, antihistamines

Syphilis
- Secondary Syphilis
- T. pallidum
- “Great Masquerader”
- 3-6 wks after primary lesion
- Trunk → Flexor extremities (palms & soles)
- Painless, no itching
- Fever, adenopathy, HA, malaise
- VDRL, RPR (screening)
- FTA-ABS, EIA (confirmatory)
- Tx same as Primary
Lyme Disease
- *Borrelia burgdorferi*
- *Ixodes scapularis*
- 3 Stages
  1. Localized: Flu Sx, Rash (Erythema Migrans)
  2. Early Dissem: Neuro Sx (Bells)
  3. Late Dissem: Arthritis
- Doxycycline

Drug Reaction
- History
  - Not very sick
  - ID Drug & DC
  - Amoxicillin common
  - Allergic Rxn Tx

Erythema Multiforme
- EM Minor
  - Skin: Target lesions peripheral body < 10% BSA
- EM Major
  - Skin + muc membr
- Distinct from SJS / TEN
- IgM Hypersensitivity
- D/C drug
- Tx underlying illness
- Topical steroids
- Supportive care
Scabies
- *Sarcoptes scabiei* < 0.5 mm
- Excoriated Flexor surfaces, Web spaces
- Female burrows to live & deposit eggs
- Allergic Rxn, Pruritus worse at night
- Sx 10-30 days post exposure
- Skin scraping
- Permethrin, Ivermectin
- Steroids, Antihistamines

Eczema
- Thickened lichenified skin
- Atopic Dermatitis, other atopic Sx
- Asthma, Hay Fever
- Flexor surfaces
- Moisturizing cream
- Steroids for flares

Psoriasis
- Genetic autoimmune disorder
- Extensor surfaces
- Koebner phenomenon
- Steroids, MTX, UV Light
- Immunotherapy (MABs)
Definitions

- **Vesicle**: elevated fluid-filled, < 5 mm
- **Bulla**: > 5 mm

Vesiculo-Bullous: Case 1

- 4 y/o M flu-like Sx for a couple of days, now breaking out all over, started on his trunk
- VS: 101.4-110.22 98/68
- Behind on immunizations
- Febrile
- Diffuse
- Different stages*

VARICELLA
Varicella (1)

- Chicken Pox: VZV
- Contagious 1-2 days before rash
- Lesions begin face & trunk → extr
- Excoriated lesions in multiple stages
  - Macules → papules → vesicles → pustules → umbilication → scabs
- Isolate, Acyclovir?
- Symptomatic Tx
- Antipyretics (No ASA)

Vesicular-Bullous: Case 2

- 24 y/o M c/o w/ itchy rash on abdomen
- No other complaints
- Noticed a few days after getting new belt
- NKA
- Vitals normal
- Afebrile
- Localized
- Location:
  CONTACT DERMATITIS

Contact Dermatitis (2)

- Jewelry (Nickel), cosmetics, plants
- Pattern, Location
- D/C offending item
- Symptomatic Tx, Antihistamines
- Steroids
Vesiculo-Bullous: Case 3
- 55 y/o F presents again w/ blistering rash
- Diffuse lesions also involving muc membr
- VS: 98°-100-20 110/70
- Afebrile*
PEMPHIGUS

Pemphigus Vulgaris (3)
- Involves mucous membranes
- Chronic Dz
- Females 2:1 Males
- + Nikolsky
- Wound care, support
- Steroids, IVIG
- Admit?

Pemphigoid
- AKA Bullous Pemphigus
- Autoimmune Type II IgG hypersensitivity
- Less aggressive form
- neg Nikolsky
- Flexor surfaces
- Geriatric Pts
- Steroids, MTX
**Disseminated Gonococcemia**
- Arthritis-dermatitis Syndrome
- When GC not Tx
- Sparse painless pustules & purple vesicles
- Peripheral
- Septic Arthritis, Tenosynovitis, Dermatitis, Urethritis, Cervicitis
- Ceftriaxone + Azithromycin
  - (also Petechial / Purpuric)

**Purpura Fulminans / DIC**
- DIC / Thrombotic disorder
- Defect in protein C anticoag pathway
- Hemorrhagic necrotic lesions
  - (Also Petechial / Purpuric)
- Tx underlying cause, FFP, Platelet packs
- Admit

**Necrotizing Fasciitis**
- “Flesh-eating Bacteria”
- Pain Out Of Proportion
- May resemble cellulitis early
- Surgical Emergency
- Debridement
- Polymicrobial, MRSA
  - C.diff, Strep, Bacteroides, Vibrio
- Broad spectrum Abx
- IV Flds, support
- HBO?
Hand, Foot and Mouth Disease
- Coxsackie Virus A-16
- Peds, fever before rash
- Vesicles on palms, soles, then mouth (2/3)
- Self-limited
- Symptomatic Tx
- Good hand hygiene

Herpes Zoster
- Shingles
- Hx Varicella
- VZV Reactivated
- Dorsal root ganglion
- Prodrome Sx 2-3 days
- Acyclovir, Steroids?
- Symptomatic Tx
- Vaccines

Dyshidrosis
- Dyshidrotic Eczema
- Palms & Soles
- Small clusters
- Atopic Sx
- Stress, Seasonal allergies
- Topical Steroids
Definitions

- **Petechiae**: pinpoint flat hemorrhagic circular lesions < 3 mm; don’t blanche w/ pressure
- **Purpura**: hemorrhagic patches > 3 mm, may be palpable
- **Ecchymosis**: > 10 mm

**Algorithm Petechial/Purpuric Rash**

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<thead>
<tr>
<th>FEBRILE &amp; TOXIC</th>
<th>AFEBRILE &amp; NON-TOXIC</th>
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<tbody>
<tr>
<td>PALPABLE</td>
<td>NOT PALPABLE</td>
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<tr>
<td>Meningococccemia</td>
<td>Purpura/Furunculosis</td>
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<td>Disseminated DC</td>
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<td>Endocarditis</td>
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**Petechial / Purpuric: Case 1**

- 20 y/o college student brought in by her boyfriend w/ 2 day Hx of HA, fever, & gradually worsening confusion.
- VS: 104-120-28 98/60
- While waiting in the clinic, she develops this rash
- Lives in dorm w/ roommates
- Fever
- Palpable lesions
- (Maculopapular)

MENINGOCOCCEMIA
Meningococcemia (1)
- N. meningitidis
- Ill-appearing: fever, HA, stiff neck
- Petechial rash starts 2-4 days post exposure: chest & extr
- Meningitis, Sepsis
- Isolation, LP
- Ceftriaxone, Tx contacts
- Admit

Petechial / Purpuric: Case 2
- 30 y/o F c/o rash on legs
- PMH: neg; no meds; NKA
- No sick contacts
- 101²-120-24  98/50
- Febrile
- Lesions non-palpable
- Platelet count = 900*
  TTP

Thrombotic Thrombocytopenic Purpura (2)
- TTP  Acute onset
- Pentad of Clinical Features
  - Fever, Low Platelets, Hemolytic Anemia, Neuro Sx, AKI
- Platelets aggregate/consumed
- Tx underlying cause
- Plasmapheresis, Transfusions
- Do not give Platelets!
- Splenectomy?
Petechial / Purpuric: Case 3

- 37 y/o F presents w/ rash to lower extr
- Started 2 days ago
- PMH: Lupus; no meds
- Soc Hx: no recent travel or contacts
- VS: 98°, 88-16
- 128/80
- Afebrile
- Palpable*

VASCULITIS

Cutaneous Vasculitis (3)

- Many types, often immune mediated
  - Kawasaki’s, Behcet’s, Buerger’s, Giant Cell, Polyarteritis Nodosa, Takayasu’s Arteritis
- Tx underlying disease process
- Steroids
- Anti-inflam agents

Endocarditis

- SBE
- Osler’s Nodes
  - Tender purpuric palpable nodules on fingers & toes
  - Janeway Lesions
  - Painless flat papules on palms & soles
- New or changing Murmur
- Fever
- Echo
- + Blood Cultures
- IV Vanc + Gent
Henoch-Schonlein Purpura

- IgA vasculitis
- Sm vessels bleed
- Lower extremities
- Peds ages 2-6
- Arthralgias
- Abd pain, GI Bleed
- ASx hematuria
- Supportive Tx, Steroids

Immune Thrombocytopenic Purpura

- ITP (prev Idiopathic)
- Lower extremities
- Low platelet count
- Normal bone marrow
- Peds: acute; Adults: chronic
- Platelet transfusion if count < 5000/mm$^3$
  or active bleeding
- Steroids, IVIG
- Splenectomy?

Summary

- Pertinent info to ID a rash:
  - VS; Sick or Not Sick
  - Morphology
  - Distribution
  - Appearance
- With this information, the diff Dx can usually be narrowed down to just a few choices!
- Minimal additional Hx and a few more specific details should give the final Dx!!