Delineating the Perforating Dermatoses

Richard Limbert, DO PGY-4
AOCD Spring Meeting
April 23, 2015
Objectives

• Present case reports of perforating dermatoses
• Review unique clinical and histopathological findings
• Establish a concise classification scheme
• Discuss the workup of a patient with a perforating dermatosis
• Review potential treatment options
Perforating Dermatoses

- Group of papulonodular skin diseases clinically characterized by a central keratotic core.
- Core represents transepidermal elimination of dermal elements.
- 4 primary perforating dermatoses:
  - Reactive perforating collagenosis (RPC)
  - Acquired perforating dermatosis (APD)
  - Elastosis perforans serpiginosa (EPS)
  - Perforating calcific elastosis (PCE)
# Primary Perforating Dermatoses

<table>
<thead>
<tr>
<th>Disease</th>
<th>Perforating Substance</th>
<th>Location</th>
<th>Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reactive Perforating Collagenosis</strong></td>
<td>Collagen</td>
<td>Extremities, overlying sites of trauma</td>
<td>None</td>
</tr>
<tr>
<td><strong>Acquired Perforating Dermatosis</strong></td>
<td>Collagen, elastic fibers, or necrotic material</td>
<td>Lower extremities or generalized</td>
<td>Pruritus, diabetes, renal failure, liver disease, malignancies, endocrinopathies</td>
</tr>
<tr>
<td><strong>Elastosis Perforans Serpiginosa</strong></td>
<td>Elastic fibers</td>
<td>Lateral neck, flexures</td>
<td>Genetic diseases, penicillamine</td>
</tr>
<tr>
<td><strong>Perforating Calcific Elastosis</strong></td>
<td>Calcified elastic fibers</td>
<td>Abdomen, periumbilical, areolar</td>
<td>Multiparity, obesity</td>
</tr>
</tbody>
</table>
Case Report

• 17 year old Hispanic male
• 3 year history of spreading “warts”
• Denies pain, pruritus, or manipulation of lesions
• Cosmetically disturbing
• Past Medical History
  – Asthma, allergic rhinitis, medulloblastoma
• Prior treatments
  – Lactic acid, salicylic acid, OTC cryotherapy
Case Report
Case Report
Right Elbow
Right Elbow
Verhoeff-van Gieson Stain
Reactive Perforating Collagenosis

Case Patient

• Topical tretinoin 0.1% cream
• Mild improvement
• Lesions tend to recur
• Patient admits to non-compliance
  – Lesions no longer bother him
Follow-up after topical tretinoin
Reactive Perforating Collagenosis

- Rare, <50 reported cases
- Familial, typically autosomal recessive
  - Genetic abnormality in collagen
- Begins in childhood
- 5-8mm keratotic papules over areas of trauma
  - + Koebnerization
  - Asymptomatic
  - May spontaneously resolve
<table>
<thead>
<tr>
<th>Primary Perforating Dermatoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reactive Perforating Collagenosis</strong></td>
</tr>
<tr>
<td><strong>Acquired Perforating Dermatosis</strong></td>
</tr>
<tr>
<td><strong>Elastosis Perforans Serpiginosa</strong></td>
</tr>
<tr>
<td><strong>Perforating Calcific Elastosis</strong></td>
</tr>
</tbody>
</table>
Case Report

• 42 year old African American male
• 3 week history of eruption on trunk and limbs
• Extremely pruritic
• History of alcoholic hepatitis
• Similar episode a few years ago that resolved after UV light therapy
Right Lower Leg

10X
Verhoeff-van Gieson Stain

40X
Acquired Perforating Dermatosis

- Includes perforating dermatoses arising in adults previously named:
  - Acquired reactive perforating collagenosis
  - Acquired elastosis perforans serpiginosa
  - Kyrle’s disease
  - Perforating folliculitis

- May represent different stages of development

- Lesions have different morphologies in the same patient
  - Collagen, elastin, amorphous material, +/- follicular structures
Acquired Perforating Dermatosis

• Lower legs or generalized
• Pruritus → chronic scratching → epidermal hyperplasia
• Diabetes mellitus or renal failure (10% of dialysis patients)
  – ↑ fibronectin found in serum and lesional skin
• Other associations
  – Liver: primary sclerosing cholangitis, alcoholic cirrhosis
  – Malignancy: lymphoma, hepatic, thyroid
  – Endocrine: hypothyroid, hyperparathyroid
  – Congestive heart failure
  – Drugs: indinavir, TNFα inhibitors
<table>
<thead>
<tr>
<th>Primary Perforating Dermatoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perforating Substance</strong></td>
</tr>
<tr>
<td>Reactive Perforating Collagenosis</td>
</tr>
<tr>
<td>Acquired Perforating Dermatosis</td>
</tr>
<tr>
<td>Elastosis Perforans Serpiginosa</td>
</tr>
<tr>
<td>Perforating Calcific Elastosis</td>
</tr>
</tbody>
</table>
Elastosis Perforans Serpiginosa
Elastosis Perforans Serpiginosa

• 2-5mm keratotic papules
  – Annular or serpiginous pattern
  – Lateral neck > face, flexures
  – Childhood or 2\textsuperscript{nd} decade
  – Asymptomatic

• 3 general categories
  – Idiopathic (most common)
  – Reactive
  – Drug-induced
Reactive Elastosis Perforans Serpiginosa

- 40% have genetic disease affecting fibrous tissue
  - Down syndrome (most common)
  - Ehlers-Danlos syndrome
  - Osteogenesis imperfecta
  - Marfan syndrome
  - Pseudoxanthoma elasticum
  - Systemic sclerosis
  - Rothmund-Thomson syndrome
  - Acrogeria
Hematoxylin and Eosin vs Acid Orcein-Giemsa Stain
Drug-induced EPS

- Penicillamine – 1% of patients
  - Inhibits lysyl oxidase → elastic tissue damage
  - "bramble brush" elastic fibers with lateral buds
<table>
<thead>
<tr>
<th>Primary Perforating Dermatoses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Perforating Substance</strong></td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Reactive Perforating Collagenosis</td>
</tr>
<tr>
<td>Acquired Perforating Dermatosis</td>
</tr>
<tr>
<td>Elastosis Perforans Serpiginosa</td>
</tr>
<tr>
<td>Perforating Calcific Elastosis</td>
</tr>
</tbody>
</table>
Perforating Calcific Elastosis
Perforating Calcific Elastosis

• Rare
• Most commonly reported in multiparous, obese, middle aged, black women
• Periumbilical and/or periareolar
• Repeated trauma of stretching causes elastic fiber degeneration
• Similar clinical and histological appearance to pseudoxanthoma elasticum (PXE)
  – Lacks systemic symptoms, screen for FHx of PXE
• No effective treatment
Periumbilical Plaque
# Primary Perforating Dermatoses

<table>
<thead>
<tr>
<th>Condition</th>
<th>Perforating Substance</th>
<th>Location</th>
<th>Associations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reactive Perforating Collagenosis</td>
<td>Collagen</td>
<td>Extremities, overlying sites of trauma</td>
<td>None</td>
</tr>
<tr>
<td>Acquired Perforating Dermatosis</td>
<td>Collagen, elastic fibers, or necrotic material</td>
<td>Lower extremities or generalized</td>
<td>Pruritus, diabetes, renal failure, liver disease, malignancies, endocrinopathies</td>
</tr>
<tr>
<td>Elastosis Perforans Serpiginosa</td>
<td>Elastic fibers</td>
<td>Lateral neck, flexures</td>
<td>Genetic diseases, penicillamine</td>
</tr>
<tr>
<td>Perforating Calcific Elastosis</td>
<td>Calcified elastic fibers</td>
<td>Abdomen, periumbilical, areolar</td>
<td>Multiparity, obesity</td>
</tr>
</tbody>
</table>
Differential Diagnosis

**Keratotic papules**
- Flegel’s disease
- Keratoacanthomas
- Darier’s disease
- Keratosis pilaris
- Lichen planus
- Psoriasis
- Molluscum contagiosum
- Verruca vulgaris
- Prurigo nodularis
- Squamous cell carcinoma

**Annular plaques**
- Granuloma annulare
- Tinea
- Sarcoidosis
- Actinic Granuloma
- Porokeratosis
- Discoid lupus
Secondary Perforating Disorders

- **Endogenous substances**
  - Chondrodermatitis nodularis helicis
  - Hematomas
  - Perforating pseudoxanthoma elasticum
  - Perforating calcinosis
  - Lichen nitidus
  - Papular mucinosis
  - Amyloidosis
Secondary Perforating Disorders

- **Granulomas**
  - Perforating granuloma annulare
  - Necrobirosis lipoidica
  - Sarcoidosis
  - Rheumatoid nodule
  - Gout tophi
Secondary Perforating Disorders

- Foreign material
  - Silica
  - Wood
  - Suture

- Infectious disease
  - Chromoblastomycosis
  - Leprosy
  - Shistomiasis
  - Tuberculosis
  - Leishmaniasis
Secondary Perforating Disorders

- **Tumor cells**
  - Melanoma
  - Paget’s disease
  - Mycosis fungoides
  - Pilomatrixoma
  - Nevus sebaceous
  - Keratoacanthoma
• Thorough history and physical
  – Evaluate for underlying disease
  – Screen for family history
• Check labs
  – CBC
  – CMP
  – Ferritin
• Biopsy is essential for diagnosis
• Proper referrals if warranted
Treatment

- Often disappointing. No controlled trials.
- Treat the underlying disease (APD)
- Topical steroids (concomitant LSC, PN)
- Target pruritus
  - Soothing lotions
  - Antihistamines
  - UV light
- Destruction: cryotherapy, CO2 laser
  - Caution dyspigmentation, poor wound healing on lower legs
Treatment

• Allopurinol (APD)
  – Free radical scavenger, inhibits neutrophil activity

• Topical and systemic retinoids

• Few cases show success with:
  – Antibiotics (clindamycin, doxycycline)
  – Keratolytics
  – 5-FU
  – Methotrexate
  – Antimalarials
• Perforating disorders are characterized by keratotic plugs of the perforating material

• There are four distinct primary perforating diseases
  – Reactive perforating collagenosis (RPC)
  – Acquired perforating dermatosis (APD)
  – Elastosis perforans serpiginosa (EPS)
  – Perforating calcific elastosis (PCE)

• Biopsy is key to establishing the diagnosis
Summary

• The diagnosis of a perforating disorder should prompt the evaluation for systemic disease

• Treatment is often difficult
  – Success with:
    • Treating the underlying disease
    • Targeting pruritus
    • UV light
    • Allopurinol
    • Retinoids
References

References

References

Thank You

Dr. Richard Miller
Dr. George Gibbons
Rachel White, OMS IV