AACAII Punch Biopsy
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Disclosures

• No relevant relationships with PHARMA
Why Do a Biopsy in Your Office?

• Patients often present with rashes that need an answer
  – They’ve had it for weeks to months to years
  – No one can give them an answer
• What better time than to perform the procedure rather than have them walk away with the impression that nothing was done?

Consider the Conundrum

• Urticaria that does not act like hives
• Angioedema that persists for months
• Eczematous dermatitis that persists and recurs for months without a pattern
• Vesiculopapular eruptions on extremities
• Excoriated blistering eruptions
Materials Necessary

- 4 mm punch biopsy ideal (sizes 3 – 6 mm)
- 5-O nylon or 4-O nylon non-absorbable monofilament on a cutting needle
- Lidocaine 1% without epinephrine and syringe with 27 g needle (epi prolongs anesthesia and reduces bleeding but concern when dealing with fingers or toes)
- Povidone or Chlorhexidine as antiseptic
- Suture tray – sterile scissors, suture driver (hemostats make lousy suture drivers), forceps, drapes, gauze
- Media – formalin for microscopic (H&E) vs Michel’s or Zeus media for immunofluorescence
- Sterile gloves, non-latex Coverlets, sterile petrolatum or antibiotic ointment

First

- Identify need to perform the biopsy
- Obtain written consent – include procedure description with indication(s), side effects of infection, bleeding, numbness, scarring, pain, reaction to medication, fainting
- Perform “Time Out” – identify patient and DOB, identify area(s) to biopsy with patient
- Patient should be supine or prone
Biopsy Procedure

• Have everything within easy reach – open containers for specimens
• Circle area(s) with surgical marker
• Prep area with preferred antiseptic
• Inject lidocaine into site to be biopsied
• Apply sterile drape(s)
• Spread tissue with fingers at right angles to creases or wrinkles (makes an elliptical hole that is easier to suture)

Biopsy Procedure

• Perform punch biopsy and remove tissue
• Cover wound with sterile gauze to contain bleeding
• Suture wound with single interrupted sutures
  – Start central and work outward to avoid dogears
  – Four knots per suture should hold
• Clean area with sterile saline, dry, and apply sterile petrolatum then Coverlet
• Instructions for wound care to patient
• Submit appropriately labelled sample to lab
Spread skin at right angles to skin crease – will form elliptical wound that is easier to suture

Remove core of tissue and deposit in appropriate media – check inside of punch to be sure sample removed – may need to gently use forceps and cut base of core
Insert cutting needle at equidistant sites for in and out – start in the middle – pull needle out other side but with enough suture left to tie knot.

Wrap suture 2 to 3 times around suture driver, grab other end and pull through.
Knot should lay flat when pulled – using surgeon’s knot allows initial knot to pull ends together for second knot to then secure

Loop suture around suture driver once and then grab opposite (loose) suture line and pull through to tighten knot. Repeat twice for square knot and then cut ends.
Secure initial surgical knot with two square knots

Repeat with simple interrupted sutures for ends if needed for bleeding or appearance

Generally, number of stitches = size of punch (mm) / 2
Caveats to Remember

• Avoid areas of infection, face, bony areas, vascular areas, groin, areas of bruising /ecchymoses, lateral knee (peroneal nerve)
• Choose areas that are new and without lichenification and that have not been treated or scratched
• Biopsy multiple sites for eczematous dermatitis that does not respond as expected to therapy to evaluate for mycosis fungoides

Caveats for Specific Lesions

• Vasculitis – obtain H&E in middle of active lesion / purpura with direct immuno-fluorescence (DIF) best in very young (newer) lesions < 24 hours old
• Blistering disorders – obtain DIF at a distant (<1 cm) from blister (perilesional)
  – For DIF, always choose non-bullous lesions
  – Ideally, truncal > extremities, above waist
• Connective tissue disorders – obtain DIF in lesions – “older is better”
Billing

- **11100**: Biopsy of the skin, subcutaneous tissue &/or mucous membrane (including simple closure); single lesion
  - Medicare reimburses $125.63
- **11101**: each separate/additional lesion (in conjunction with 11100)
  - Medicare reimburses $40.03

Slide courtesy of Marcella Aquino, M.D. Wintrop University Hospital, NY

Direct Immunofluorescent (DIF) in Autoimmune Blistering Disorders

<table>
<thead>
<tr>
<th>Disorder</th>
<th>Antibody Distribution</th>
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<tbody>
<tr>
<td>Pemphigus Vulgaris</td>
<td>IgG &amp; C3 in epidermal cell surface</td>
</tr>
<tr>
<td>Bullous Pemphigoid</td>
<td>IgG &amp; C3 at D-E junction (linear, homogenous, epidermal side)</td>
</tr>
<tr>
<td>Linear IgA Dermatosis</td>
<td>IgA at D-E junction (linear, homogenous, epidermal side)</td>
</tr>
<tr>
<td>Herpes Gestationes</td>
<td>C3 at D-E junction (linear, homogenous)</td>
</tr>
<tr>
<td>Epidermolysis Bullosa Aquisita</td>
<td>IgG &amp; C3 at D-E junction (linear, homogenous, dermal side)</td>
</tr>
<tr>
<td>Dermatitis Herpetiformis</td>
<td>IgA focal granular at papillary tips</td>
</tr>
<tr>
<td>Bullous LE</td>
<td>Multiple Igs, C3 &amp; fibrin at D-E junction (linear homogenous or non homogenous)</td>
</tr>
</tbody>
</table>

Slide courtesy of Marcella Aquino M.D. Wintrop University Hospital, NY
# Interpreting the Dermatopathologist Report

- [https://www.dermnetnz.org/cme/dermatopathology/inflammatory-skin-diseases/](https://www.dermnetnz.org/cme/dermatopathology/inflammatory-skin-diseases/)

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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<tbody>
<tr>
<td>Hyperkeratosis</td>
<td>Thickening of the stratum corneum</td>
</tr>
<tr>
<td>Orthokeratosis</td>
<td>Hyperkeratosis without parakeratosis</td>
</tr>
<tr>
<td>Parakeratosis</td>
<td>Flattened keratinocyte nuclei within the stratum corneum</td>
</tr>
<tr>
<td>Follicular plugging</td>
<td>Hyperkeratosis within hair follicle</td>
</tr>
<tr>
<td>Hypergranulosis</td>
<td>Thickened granular layer (may have associated hyperkeratosis)</td>
</tr>
<tr>
<td>Hypogranulosis</td>
<td>Decreased thickness of granular layer (may have associated parakeratosis)</td>
</tr>
<tr>
<td>Acanthosis</td>
<td>Thickened squamous cell layer</td>
</tr>
<tr>
<td>Epidermal atrophy</td>
<td>Decreased thickness of epidermis</td>
</tr>
<tr>
<td>Cellular vacuolisation</td>
<td>Intracellular clear rounded spaces</td>
</tr>
<tr>
<td>Spongiosis</td>
<td>Intercellular oedema between keratinocytes (sometimes associated with exocytosis)</td>
</tr>
<tr>
<td>Exocytosis</td>
<td>Inflammatory cells within epidermis (usually refers to lymphocytes, and implies a benign process)</td>
</tr>
<tr>
<td>Acantholysis</td>
<td>Separation and rounding up of keratinocytes because of loss of intercellular adhesions</td>
</tr>
<tr>
<td>Dyskeratosis</td>
<td>Abnormally or prematurely keratinised eosinophilic keratinocytes, identified by prominent eosinophilic(red-staining) cytoplasm</td>
</tr>
<tr>
<td>Colloid bodies</td>
<td>Non-nucleated eosinophilic deposits in lower epidermis or upper dermis formed from the intracellular filaments of dead keratinocytes, and may entrap immunoglobulin or fibrin</td>
</tr>
</tbody>
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Interpreting the Dermatopathologist Report

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<tr>
<th>Apoptosis</th>
<th>‘Programmed cell death’ of individual cells. Produces colloid bodies (which initially may contain shrunken dark nuclei).</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuolar degeneration</td>
<td>Damage to the basal layer, with intracellular oedema and vacuoles. May be associated with colloid body formation and clear spaces at the dermal-epidermal junction, sometimes resulting in a subepidermal blister.</td>
</tr>
</tbody>
</table>

Examples

How a Punch Biopsy Can Aide the Allergist in Diagnosis
Urticaria

Perivascular infiltration of lymphocytes with rare eosinophils – should respond to antihistamines

Interstitial edema
Often NOT described

Role of Skin Biopsy in the Treatment of CIU

Polymorphonuclear infiltrates in urticaria typically do not respond easily to antihistamines – composed of mixtures of neutrophils, eosinophils, monocytes, lymphocytes

Urticarial Vasculitis – rarely read as such by pathologists – look for terms such as intravascular, intimal wall destruction, neutrophils, fibrinoid necrosis, nuclear dust
Dermatitis Herpetiformis

Neutrophils in tips of dermal papillae
Microabscesses containing neutrophils & eosinophils

DIF: ~90% (+)
Granular deposition of IgA at dermal papillae & occ along the dermal-epidermal border

Bullous Pemphigoid May Not Present with Bullous Eruptions

Patients may present with urticaria or excoriations suggestive of neurodermatitis or eczematous dermatitis
Case 12:
52 y.o. female with chronic intensely pruritic prurigo nodularis-like eruptions, which blistered after 6 months

Histology & DIF showed

Slide courtesy of Drs. Ernest Charlesworth and Luz Fonacier, Presented at the 2005 AAAAI Meeting, Seminar 2415

Mycosis Fungoides Simulating Eczema – Biopsy Multiple Sites

Formation of nests of atypical lymphocytes suggestive of Pautrier’s abscess
Epidermotropism seen in biopsy of previous patient with mycosis fungoides
Drug Eruptions: Interface Dermatitis

Interface dermatitis: Degenerative change of the dermal-epidermal junction (DEJ)

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<th>Condition</th>
<th>Pathology</th>
</tr>
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<tbody>
<tr>
<td>Erythema Multiforme</td>
<td>Vacuolar change at DEJ with overlying orthokeratosis</td>
</tr>
<tr>
<td>Fixed Drug Eruption</td>
<td>Vacuolar degeneration of basal keratinocytes</td>
</tr>
<tr>
<td>Viral Exanthem</td>
<td>Vacuolar degeneration at the DEJ</td>
</tr>
<tr>
<td>Lupus Erythematosus</td>
<td>Vacuolar degeneration at the DEJ, mucin in the dermis, superficial and deep inflammation</td>
</tr>
</tbody>
</table>

Adapted from Keeling, B.H. et al. Curr Allergy Asthma Rep 2015;15:62. Slide courtesy of Marcella Aquino, M.D. Wintrop University Hospital, NY

• Erythema Multiforme Like

Histology

Interface reaction pattern
Basal layer vacuolar damage
Keratinocyte necrosis both basal and suprabasal
Superficial sparse perivascular infiltrate
Blistered areas may show subepidermal splits
Splits more common in Stevens Johnson variant
Conclusions

• The ability to perform punch biopsies aides the allergist in assessing difficult to manage immune mediated skin disorders
• Performing skin biopsies is easy and can be quickly done in < 30 minutes
• Reimbursement is reasonable but the assistance you provide your patient in making a diagnosis and the time spent with your patients is worth the investment

- Sandra Gawchik, DO, FACAAI
- Anil Nanda, MD, FACAAI

Disclosures

- No financial relationships to disclose
Find Relief for your **ATOPIC DERMATITIS**
A simple guide for stepping up your eczema treatment

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**ECZEMA in Skin of Color**

Introducing a New Eczema Resource: EczemaInSkinofColor.org

Through a mutual commitment to address disparities in treating eczema in people of color, the American College of Allergy, Asthma & Immunology (ACAAI) and Allergy & Asthma Network have partnered to launch EczemaInSkinofColor.org.

The website is designed to help physicians and patients better understand and identify eczema in people with all skin types.
Wet Wrap Therapy in Atopic Dermatitis

**Supplies:**
- Topical medications and moisturizers
- Water (relatively warm) and basin
- Clean dressings

-Face: 2-3 layers of wet gauze bandages, may be held in place with surgical net covering
- Arms/legs/hands/feet: 2-3 layers of wet gauze bandages, may be held in place with wet tube socks or elastic bandages, followed by dry tube socks/dry gauze
- Total body therapy: wet pajamas, covered by dry ones

**Wet Wrap Therapy Procedure:**
- Fill basin with warm water
- Patient should have a 15-20 minute soaking bath followed by dry patting skin
- Apply topical medication to affected (rash) areas and moisturize to nonaffected/dry areas
- Soak dressing in very warm water, as they cool relatively quickly
- Dressings should be wet but not dripping
- Cover affected areas with wet dressing followed immediately by dry dressings (elastic bandage, socks, pajamas)
- May use warm blanket, as needed for patient comfort
- Keep dressings on for 2-4 hours, overnight is ok.

**References:**

## Treatment

### Non-lesional

**BASIC MANAGEMENT**

1. **Skin Care**
   - Moisturize, liberal and frequent (dependent on patient preference)
   - Wash baths or showers using non-soap cleansers, usually once daily and followed by moisturizer (even on clear areas)

### Mild

**BASIC MANAGEMENT**

1. **Skin Care**
   - Moisturize, liberal and frequent (scheme per patient preference)
   - Wash baths or showers using non-soap cleansers, usually once daily and followed by moisturizer (even on clear areas)

2. **Antifungal Measures**
   - Shave affected body parts and wear loose clothing to promote ventilation.
   - Consider antifungal agents.

### Moderate

**BASIC MANAGEMENT + TOPICAL ANTI-INFLAMMATORY MEDICATION**

1. **Skin Care**
   - Moisturize, liberal and frequent (scheme per patient preference)
   - Wash baths or showers using non-soap cleansers, usually once daily and followed by moisturizer (even on clear areas)

2. **Antifungal Measures**
   - Shave affected body parts and wear loose clothing to promote ventilation.
   - Consider antifungal agents.

### Severe

**BASIC MANAGEMENT + REFERRAL to Aid Specialist**

- **Systemic**
  - Immuno-suppressants
  - Corticosteroids
  - Antihistamines
  - Topical only

**Medical Measures**

- **Topical**
  - Antifungal agents
  - Corticosteroids

**Pharmacological**

- **Oral**
  - Systemic antifungal agents
  - Antihistamines

**Referral**

- **Dermatologist**
  - Consider referral to a specialist for severe cases.

**Considerations**

- **Adverse Effects**
  - Monitor for side effects of systemic therapy.

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*Figure 3: Stepwise management of mild dermatitis. (A) Indicated for patients with mild to moderate AD. (B) Indicated for patients without chronic AD. (C) Indicated for patients with chronic AD. (D) Indicated for patients with moderate to severe AD. (E) Indicated for patients with severe AD. (F) Indicated for patients with severe AD and systemic involvement. (G) Indicated for all patients. (H) Indicated for all patients. (I) Indicated for all patients. (J) Indicated for all patients. (K) Indicated for all patients. (L) Indicated for all patients. (M) Indicated for all patients. (N) Indicated for all patients. (O) Indicated for all patients. (P) Indicated for all patients. (Q) Indicated for all patients. (R) Indicated for all patients. (S) Indicated for all patients. (T) Indicated for all patients. (U) Indicated for all patients. (V) Indicated for all patients. (W) Indicated for all patients. (X) Indicated for all patients. (Y) Indicated for all patients. (Z) Indicated for all patients.*