Basic Dermatology Procedures for the Non-dermatologist

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Disclosures
• I have no conflicts of interest to disclose

Basic Dermatology Procedures
• Liquid Nitrogen
• Skin Biopsies
• Electrocautery
Liquid Nitrogen Cryosurgery

Principles

- 196°C (−320.8°F)
- Temperatures of −25°C to −50°C (−13°F to −58°F) within 30 seconds with spray or probe
- Benign lesions: −20°C to −30°C (−4°F to −22°F)
- Malignant lesions: −40°C (−40°F) to −50°C.
- Rapid cooling → intracellular ice crystals
- Slow thawing → tissue damage
- Duration of THAW (not freeze) time is most important factor in determining success

Indications
- Benign, premalignant, in situ malignant lesions

Objective
- Selective tissue necrosis

Reactions predictable
- Crust, bulla, exudate, edema, sloughing

Post procedure hypopigmentation
- Melanocytes are more sensitive to freezing than keratinocytes

Am Fam Physician. 2004 May 15;69(10):2365-2372

Liquid Nitrogen Cryosurgery

- Fast freeze, slow thaw cycles
  - Times vary per condition (longer for deeper lesion)
  - One cycle for benign, premalignant
  - Two cycles for warts, malignant (not commonly done)
- Lateral spread of freeze (indicates depth of freeze)
  - Benign lesions 1-2mm beyond margins
  - AKs- 2-3mm beyond margins
  - Malignant- 3-5+mm beyond margins (not commonly done)

Liquid Nitrogen Cryosurgery Technique

- Hold spray gun 1-1.5cm away from target
- Freeze until ice field fills the margin
- Maintain the spray for the appropriate time BEYOND initial time of ice field formation
- If more than one cycle required, allow for complete thawing before beginning next cycle
Cryosurgery for Common Warts

- Freeze time 20-60 seconds
- Margin- 2-3mm
- Thaw 30-45 seconds
- TWO cycles better than one
- Repeat every 3-4 weeks
- Average # of warts cleared= 40%
- Average # of treatments to clear warts = 12
  — ONE YEAR!

Cryosurgery for Planar Warts

- May consider cotton tipped applicator technique

Ring Wart

Bullae

http://www.dermnet.com
Cryosurgery for Actinic Keratoses

- One freeze-thaw cycle
- Margin: 2-3mm
- Freeze time
  - AK: 5-7s
  - Actinic cheilitis: 10-20s

Cryosurgery for Seborrheic Keratoses

- Freeze-thaw cycle depends on thickness
- Thin/flat: freeze 5-10s
- Large/thick: freeze >10s, may need second cycle

Cryosurgery for Lentigines

- Quick 3-4s freeze
- Avoid overfreezing
  - Risk of hypopigmentation

Cryosurgery for SCC in situ*

- One 30 second freeze
- Two 20 second freezes
- Close follow up

*ED+C still preferred treatment option
Skin Biopsies

Skin Biopsy
- Procedure itself is easy
- Knowing when and where to biopsy much more difficult
- Pathologist can only comment on the tissue provided (not what’s left on patient)
- Potential pitfalls in technique

Skin Biopsy Types
- Curettage
- Snip/scissors
- Shave biopsy
- Saucerization
- Punch
- Incisional
- Excisional (in toto)

Curettage with Biopsy
- Samples epidermis only
- Clinically benign lesions involving the epidermis
  - Verrucae (warts), seborrheic keratoses, actinic keratoses
- Send pathology at same time as treating the lesion
- Limitations
  - Limited to the epidermis
  - Fragmented tissue
Snip/Scissors Biopsy

- Pedunculated lesions
- Benign growths
  - Acrochordons (skin tags)
  - Filiform warts
  - Pedunculated nevi

Shave Biopsy

- Samples epidermis and papillary (superficial) dermis
- Ideal for elevated lesions involving the epidermis and superficial dermis
  - Inflammatory dermatoses of epidermis, superficial dermis (psoriasis, eczema, CTCL, lichen planus)
  - Nevi, benign adnexal tumors
  - Diagnosis of basal cell or squamous cell carcinoma
  - Diagnosis of lentigo maligna (MIS)
Saucerization Biopsy

- Deeper biopsy with intentional deeper placement of the blade
- Samples epidermis and superficial and deep dermis
- Advantage
  - Histologic examination of the entire circumference of the lesion with adequate depth to assess invasion
- Ideal for
  - Inflammatory dermatoses with dermal infiltrate
  - Atypical pigmented lesions (to r/o melanoma)
  - Keratoacanthoma/SCC

Punch Biopsy

- Samples epidermis, dermis and superficial subcutaneous fat
- Varying barrel sizes - 2mm- 8mm
- Ideal for
  - Inflammatory dermatoses with deep dermal infiltrate (lupus)
  - Infiltrative diseases (amyloid, sarcoid, lymphoma cutis)
  - Blistering diseases (pemphigus, pemphigoid)
  - Depressed lesions (scleroderma)
- Limitations
  - Only samples portion of larger lesion
  - Requires suture (>3mm)
  - Not ideal for subcutaneous lesions

Incisional Biopsy

- Samples epidermis, dermis, subcutaneous fat
- Removes wedge from center or edge of lesion
- Ideal for
  - Large tumors
  - Subtle diseases of connective tissue
  - Diseases of the fat (panniculitis)
  - Diseases of the fascia
Excisional Biopsy
- Samples epidermis, dermis, subcutaneous fat
- Intended to be definitive treatment
- Ideal for
  - Suspected invasive melanoma

Skin Biopsies- Potential Pitfalls
- Crush artifact
- Leaving part of tissue in punch tool
- Multiple specimens, mislabeling

Crush Artifact

Failure to Deliver
- Leaving part of the biopsy in the punch tool
Multiple Biopsy Specimens

- Critically important to have an established protocol/routine to ensure the correct biopsy goes in the correct bottle

A  B  C

Shave Biopsy Tray

Punch Biopsy Tray

How to biopsy a specific lesion

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Type of biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Papulosquamous (eczema, psoriasis)</td>
<td>Shave or saucerization biopsy</td>
</tr>
<tr>
<td>r/o melanoma</td>
<td>Saucerization or excisional biopsy</td>
</tr>
<tr>
<td>Blister</td>
<td>Punch biopsy at the edge for H+E and DIF</td>
</tr>
<tr>
<td>Wart, seborrheic keratosis, actinic keratosis</td>
<td>Shave biopsy or curettage</td>
</tr>
<tr>
<td>Scalp (alopecia)</td>
<td>Punch biopsy from hair containing region adjacent to alopecia, request transverse sections</td>
</tr>
</tbody>
</table>
### Where to Biopsy

<table>
<thead>
<tr>
<th>Lesion</th>
<th>Location of biopsy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tumor</td>
<td>Thickest portion, avoid necrotic tissue</td>
</tr>
<tr>
<td>Blister</td>
<td>Edge of the lesion, include about 2mm of blister edge; send for H+E and DIF</td>
</tr>
<tr>
<td>Ulceration/necrotic lesion</td>
<td>Edge of ulcer or necrosis plus adjacent skin</td>
</tr>
<tr>
<td>Generalized polymorphic eruption</td>
<td>Characteristic lesion of recent onset (+/- more developed lesion)</td>
</tr>
<tr>
<td>Small vessel vasculitis (palpable purpura)</td>
<td>Characteristic lesion of recent onset (ideally &lt;24 hours old)</td>
</tr>
</tbody>
</table>


### Direct Immunofluorescence

- Location of the biopsy depends on diagnosis
- Vasculitis - lesional skin from an early lesion
- Lupus
  - DLE/SCLE Lesional skin
  - SLE- Lesional, uninvolved can be positive as well
- Blistering
  - Peri-lesional

### DIF in Pemphigoid and Pemphigus

- Eclipsing the edge of new blister
- Being too far from a blister can cause false negative DIF

Slide courtesy of Jeff North, MD
Photo courtesy of Kari Connolly, MD
DIF in Other Immunobullous Disease

- Dermatitis herpetiformis
  - Up to 1 cm away from lesion
  - Don’t overlap the clinical lesion
    - Higher risk for loss of epidermis and destruction of Ig by the neutrophilic inflammatory infiltrate
- Serology: anti-transglutaminase and anti-endomysium antibodies also helpful

Slide courtesy of Jeff North, MD

Electrosurgery

- Electrodesiccation
  - Superficial tissue destruction
- Electrocoagulation
  - Deep tissue destruction
- Electrosection
  - Cutting

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Electrodesiccation

- Damped, high-voltage current
- Causes superficial tissue damage via dehydration

Electrodesiccation and Electrofulguration

Electrodesiccation Indications - Epidermal Lesions

- Acrochordons
- Actinic keratosis
- Angioma (small)
- Hemostasis
- Lentigo
- Seborrheic keratoses/dermatosis papulosa nigra
- Verrucae

Electrodesiccation for Epidermal Lesions - Technique

- Typically doesn’t require anesthesia
- Use lowest setting that produces a very subtle gray char
- May see pinpoint bleeding (indicates you have reached dermis and time to stop)
- Doesn’t require post procedure wound care other than vaseline
- Target lesions “fall off” within 1-2 weeks
- Typically doesn’t scar or lead to pigmentary damage if done correctly
Basic Dermatology Procedures
Summary Points- Liquid Nitrogen

- Duration of thaw determines amount of tissue damage
- Warts require monthly treatments for 12 months
- Avoid over freezing (to avoid hypopigmentation)

Basic Dermatology Procedures
Summary Points- Skin Biopsies

- Pathologists can only comment on the tissue provided
- Curettage is a good way to treat warts, SKs
- Shave/saucerization biopsies are best for inflammatory lesions, BCC, SCC
- Punch biopsies are best to evaluate deep dermis
- Incisional biopsies are the best way to assess the subcutis
- Try to perform excisional biopsies for melanoma, but large saucerization acceptable

Basic Dermatology Procedures
Summary Points- Electrocautery

- Electrodesiccation is a good option to cosmetically treat seborrheic keratoses, dermatosis papulosa nigra
- If shave remove a wart, electrodesiccate the base to decrease risk of recurrence