2018 HANDS ON BIOPSY WORKSHOP

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Faculty Disclosure

- Bako-Consultant
- Ortho Dermatologics—Clinical Research and Speaker's Bureau

What We Will Cover Today

- Punch Biopsy
- Epidermal Nerve Fiber Density Biopsy
- Shave Biopsy
- Curettage Biopsy
- Needle Biopsy
- Nail Fungus Sampling and Punch Nail Biopsy
- We won’t be covering incisional/excisional formally, but if we have time…

Why are we afraid to biopsy?

- **Not sure of technique**
- **Not sure when to or which biopsy type to use**
- **Derm isn't my strong suit**
- **Time-eater in office**
- **Can I cause metastasis?**
- **What do I do with the patient afterwards?**
- **Medico-legal issues**
- **Don't have the equipment in office**

A Skin Biopsy...

- is a “sampling” of tissue to send to a laboratory
- Is a gold standard in dermatology
- Gives a histopathologic diagnosis to a skin disorder (aka a name to a disease)
- Directs your course of treatment
- Potentially can save a patient’s life or make diagnosis better
- is reimbursable
- Most don’t have a 10-day global periods

Why Perform a Skin Biopsy

- Provides objective, independent, and definitive laboratory histopathological “diagnosis” of a condition
- Medical-legal component of Evidence Based Medicine
- Takes some of the guesswork out of patient care
- Reduces differential diagnoses and delays of treatment
- Guides targeted pharmacological therapy (for dermatitis) and plastic surgical treatment options (for neoplasms)
- Increases the variety of treatment options

What should you biopsy?

- **Any suspected neoplastic lesion**
- **Any non-healing lesion that hasn't responded to your standard of care treatments**
- **Any blistering disorder**
- **Any "rash" or dermatoses that isn't responding to your treatment or to refine your differential diagnosis**

When shouldn't you biopsy?

- **Biopsying the site of an infection** (if you are not trying to find out more info about the infection)
- **Ask patient about recent coumadin or aspirin use** (not a contraindication)**, but might require more "tincture of pressure".**
- **Also, ask about any bleeding disorders, adhesive allergies, topical antibiotic allergies**

Thoughts on LE Skin Biopsies

- Lower extremity skin lesions often appear different than other parts of the body and frequently differ from medical textbook descriptions
- Pathology reports are highly dependent on the quality of the biopsy that physicians submit to the lab
  - Tip - be gentle with obtaining specimens
- Poorly or inappropriately performed biopsies can result in misleading or incomplete histological diagnosis

Thoughts on LE Skin Biopsies—cont'd

- Include a clinical description with all specimens
- Take photos for medical records and sent to laboratory
- Use caution around major blood vessels and nerves
- Don't biopsy scabs or eschar
- Do not include normal tissue with biopsy
  - except bullous lesions – include area of attachment
- Chronic ulcers should be biopsied and cultured
- Ablative procedures are contraindicated without a biopsy

Before you even do the procedure...

You NEED to consent. Best written.

- **You need to warn the patient during the consent process:**
  - Need for further surgery *(ie if biopsy comes back as malignant)*
  - Scar painful, pigmented, thickened or even lag in healing especially on plantar foot

Medical Documentation For Biopsy

- Medical necessity audits are increasing
  - laboratories often need to send physician medical records
- Document medical necessity for performing biopsy
  - pain, color change, rapid growing, suspicion of malignancy
- Description of lesion or condition
  - location, size, shape, color
- Procedure note for biopsy
  - document laboratory test ordered, laterality, what you used for local anesthetic, etc.
- Confirm review of laboratory report
  - did diagnosis change, what action is being taken, sutures removed at that visit

Surgical Planning

- **For a "rash" or dermatosis, biopsy the newest lesion (ask, what just came out?)**
- **If 1-4 mm, excise totally if anatomic area allows it; or consider staged procedure**
- **If larger lesion, get thickest portion of area (darkest?)**
- **It's all about the DEPTH of your specimen!! Imagine the skin levels as you do the procedure**
- **TAKE PHOTOS!!!!!**

ALWAYS consider

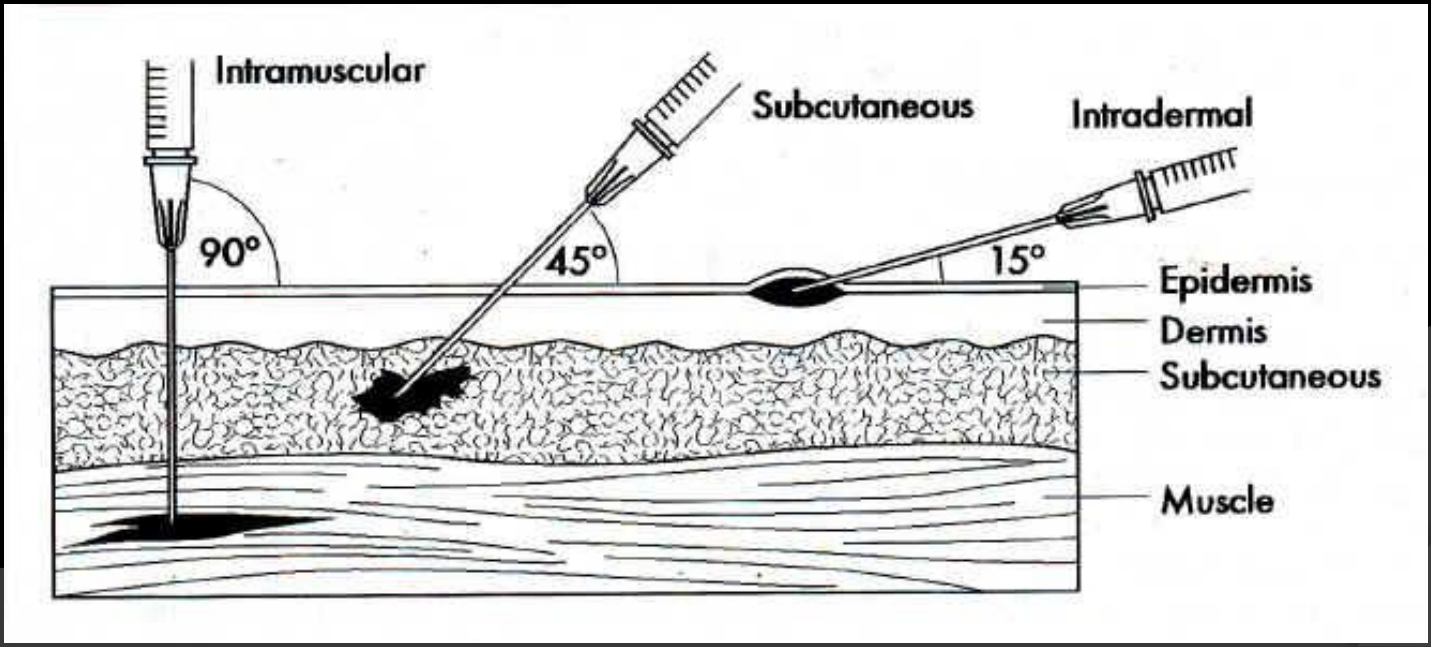
- **Relaxed skin tension lines**
  - If in doubt, pinch skin together to see where lines are
  - Then, realize you want your incision to be in those lines *(aka parallel to those lines)*--- this gives best scar and cosmetic result overall even on plantar foot
  - ALL incisions leave scars!!!

What you need...

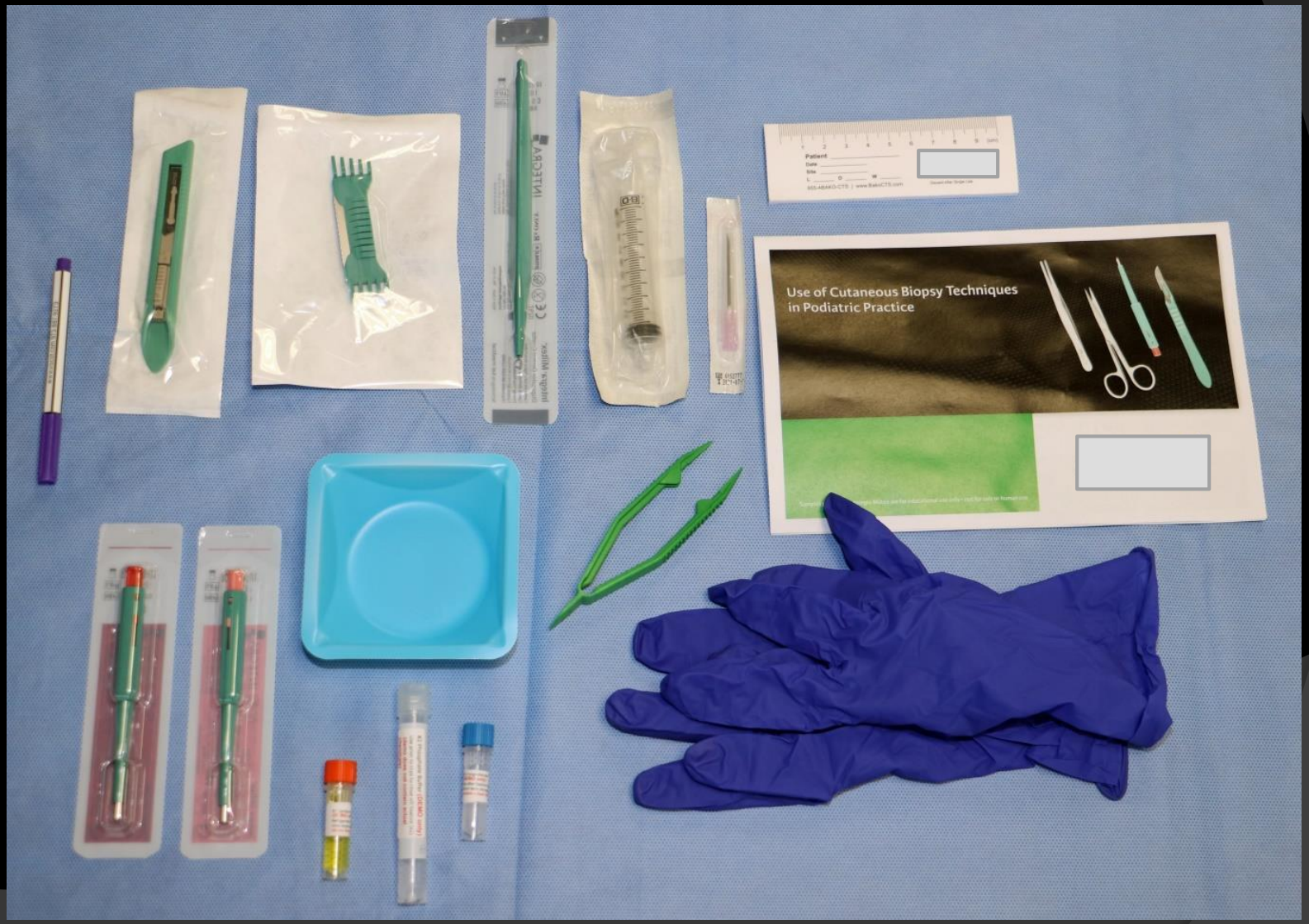
- **An initial biopsy is a clean, NOT sterile procedure**
- **Anesthesia**
  - Lidocaine with epi if you are comfortable using it
- **Syringe, needle**
  - 1cc—3cc syringe with 30 gauge needle
- **Blade**
  - 15 blade for shave, disposable punch 3mm or higher
  - Forceps, small scissors, needle holder
- **Suture**
  - 3-0 or 4-0 nylon for skin closure after punch
  - Steri strips
- **Topical**
  - Hemostasis, antibacterial ointment
- **Dressing**
  - Bandaid to a dry sterile dressing

Inject Intradermally…

- **Place needle <u>almost</u> flat against skin, bevel up. Insert needle**
- **Slowly inject agent; watch for wheal to appear. If it does not, withdraw needle slightly and reinject. Do not aspirate before injecting. Do not massage site after injecting.**
- **Withdraw needle quickly at the same angle as it was inserted.**



Hands On – Open the Biopsy Kit

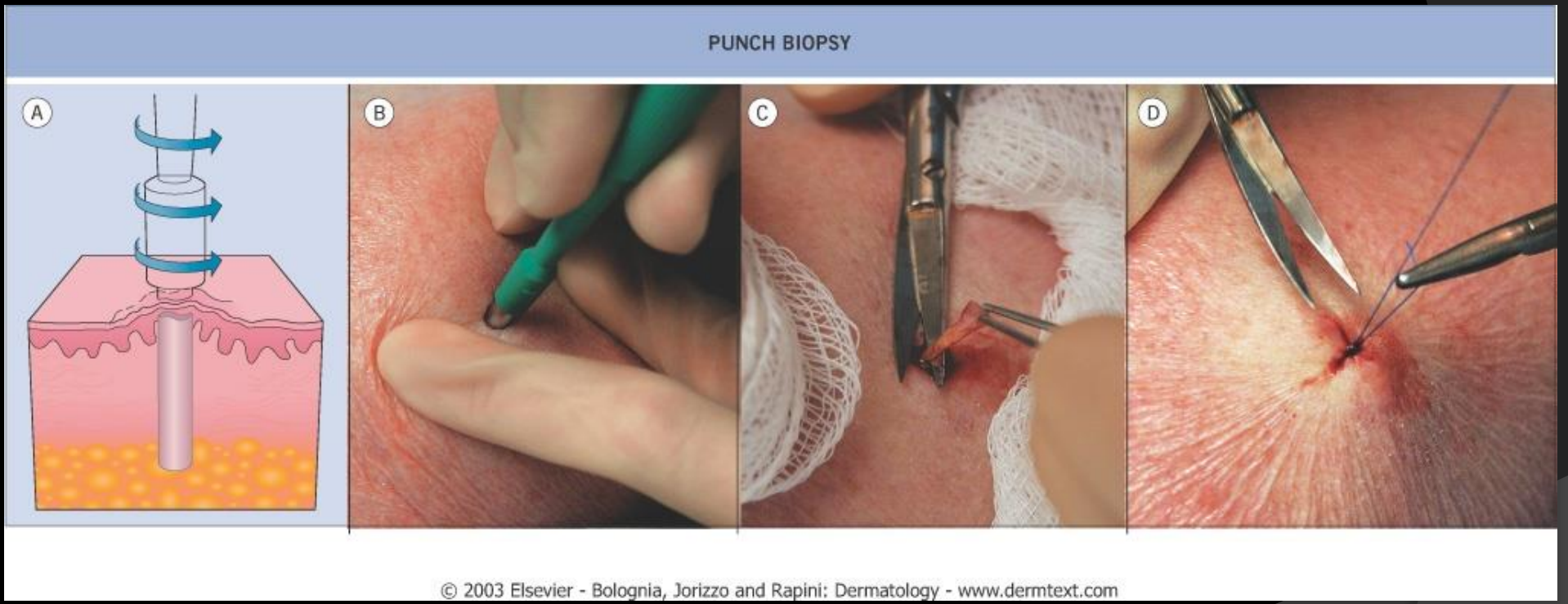


Punch Biopsy Instruments

Punch Biopsy

- Punch Biopsy - obtain a “small part” of a larger condition or excise in toto
  - 2mm punch with or without plunger (x 2 areas are preferred)
  - 3mm punch is recommended for pigmented lesions (may need suture)
- Go deep to sample dermal and subcutaneous tissue
- Gentle motion, do not literally punch hard into skin
- Multiple punch biopsies do not need a modifier

Punch Biopsy



From Bolognia's Dermatology

What's wrong with this picture?

Punch Technique: Intradermal Injection

Punch Technique: Finding RSTL

Punch Technique

When the punch is being drilled in the skin, you should feel the resistance of the dermis give way to the fluffiness in the subcuatneous fat. You should especially be aware of the depth of the subcutaneous fat when on the dorsum of the foot and around the ankle. Also consider the shallowness of the tissue when biopsying a nail.

Don't crush the specimen!!!!

Punch Technique: Suture

Hands On - Punch Biopsy Demo

- 70% isopropyl alcohol wipe to prepare biopsy site for 10 seconds
- Administer local anesthesia
  1cc lidocaine with epinephrine, 1cc syringe, 27g or 30g 1/2” needle
- Gently press punch biopsy into the skin, let the blade do the work
- Rotate punch and press into subcutaneous fat
- Pull biopsy out, connective tissue may need to be cut
- Place skin biopsy into formalin fixative
- Apply hemostatic agent (35% aluminum chloride) to biopsy site or Suture with 4-0 nylon
- Apply topical antibiotic and bandage

Epidermal Nerve Fiber Density Biopsy

Epidermal Nerve Fiber Density Biopsy

- Provides definitive diagnosis of small fiber peripheral neuropathy and degree of severity
- Epidermal Nerve Fiber Density Biopsy Kit
  - 3mm punch biopsy, forceps, scissors, alcohol wipe, gauze, bandage
  - Zamboni's fixative (yellow), rinse solutions, shipping supplies
- The most studied ENFD biopsy location is the lower leg
  - 10cm proximal to the lateral malleolus
  - normative values have been established at this location
- When removing the biopsy specimen, use atraumatic forceps
  - be careful to grasp the biopsy deep to the surface epithelium
  - do NOT crush the surface epithelium (#1 reason for limited reports)

Hands On - ENFD Biopsy Demo

- Prep with alcohol wipe, infiltrate lidocaine with epinephrine proximal (but not directly at) to the biopsy site using a “V” pattern
- Perform 3mm punch biopsy - 10cm proximal to lateral malleolus
  - gently remove biopsy specimen
- Place in Zamboni’s fixative (#1) and refrigerate for 8 hours minimum
  - Zamboni is a weak acid, sample may not remain for more than 24 hours
- Pour out Zamboni’s into blue tray, keep specimen in vial
- Refill with buffer rinse (#2), pour out, repeat buffer rinse, pour out
- Refill with cryoprotectant (#3), screw on blue cap tightly
- Two shipping options (use cool-pack and Styrofoam cooler)
  - place biopsy in Zamboni’s fixation and FedEx to lab on that same day
  - place biopsy in Zamboni’s overnight, rinse the following day, and ship ASAP
- Apply hemostatic agent, topical antibiotic, gauze, bandage

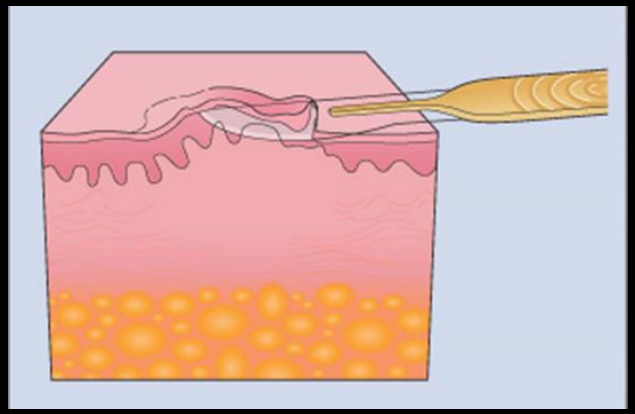
Shave Biopsy

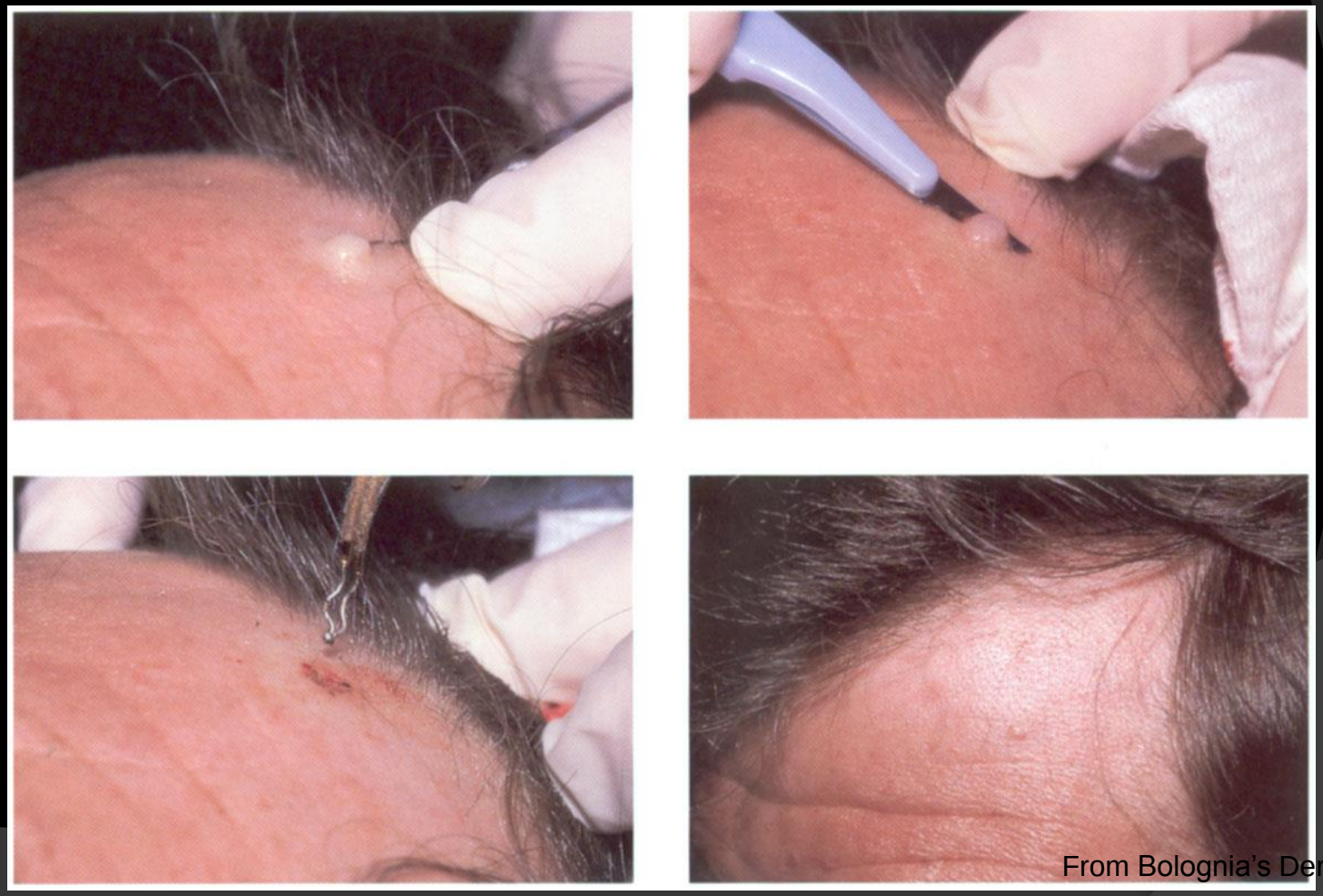
- **Indications: Nevi** (Moles) **flat and papular**
- **Benign, EXOPHYTIC growths**
  - Plantar lesions are ENDOPHYTIC (ie warts)
- **Not helpful or appropriate for skin rashes**
- **#10 Blade Scapel or Miltex Biopblade (saucerization biopsy)**
- **Multiple shave biopsies need a 59 modifier**
- **Unless you have experience in doing a deeper shave** (saucerization)**, it will not give you the depth or level of invasion that an incisional/excisional will give**
  - I personally would not do on a suspected melanoma on the lower extremity

Shave Biopsy: Technique

- **Intradermal technique of local anesthesia**
- **Blade parallel with skin; can use #15 blade or autoclaved disposable shaving blade**
- **Topical hemostatic agent** (Aluminum chloride) **and cauterize**
- **Pigmentation remains if you don’t go deep enough when sampling a nevi**

Shave Biopsy





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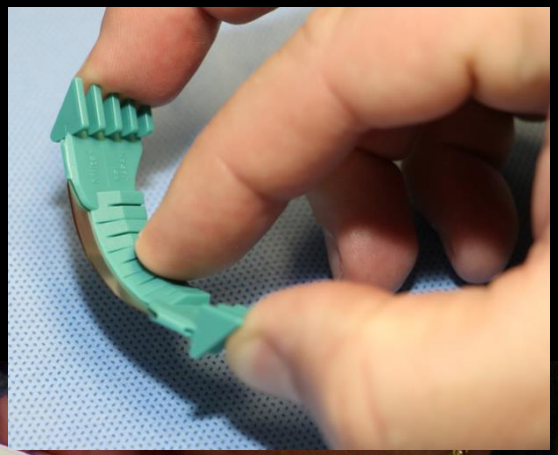
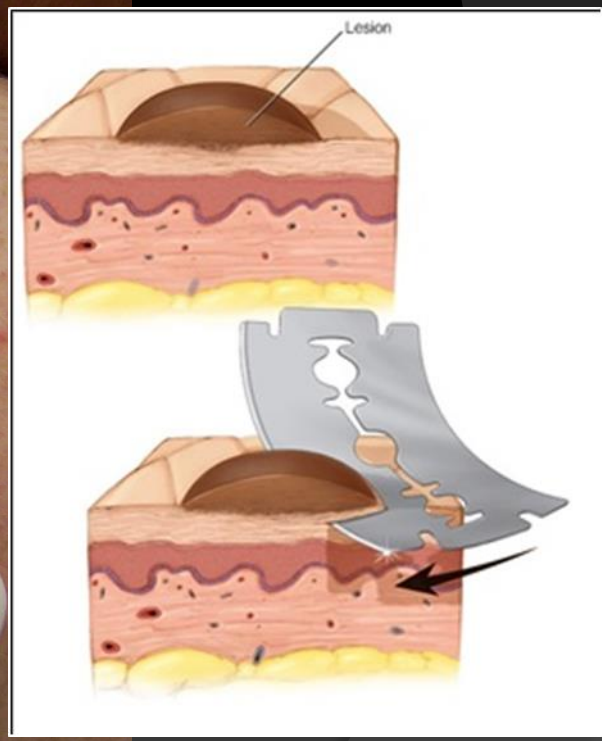


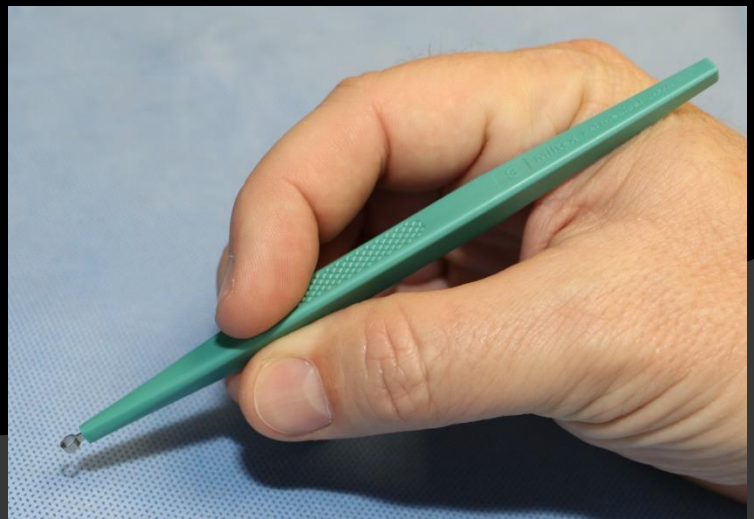

Lesion

Hands On - Shave Biopsy Demo

- Prepare biopsy site – alcohol wipe, local anesthesia
- #10 blade - use flat belly of blade to cut underneath lesion
- Miltex Biopblade - bendable / saucerization to scoop out lesion
- Hold sides of Biopblade with thumb and middle finger, use index finger for stabilization and forward movement
  - light squeeze = shallow transverse cut, hard squeeze = deeper concave cut
- Enter skin at 10-15% angle and create a smooth divot
- Tip – rotate hand 90’ to exit skin without leaving a ledge
- Gently use forceps to remove biopsy and place into formalin fixative
- Apply hemostatic agent, topical antibiotic, and bandage

Curettage Biopsy

- Curettage Biopsy – sample superficial lesions that can be “scraped off” the skin surface (scales) and not into dermis
- Commonly used for macerated interdigital web spaces
- Can also be used to biopsy ulcer bases
- Probably the most “underutilized” instrument by podiatrists
- A version involves both curettage and electrodessication



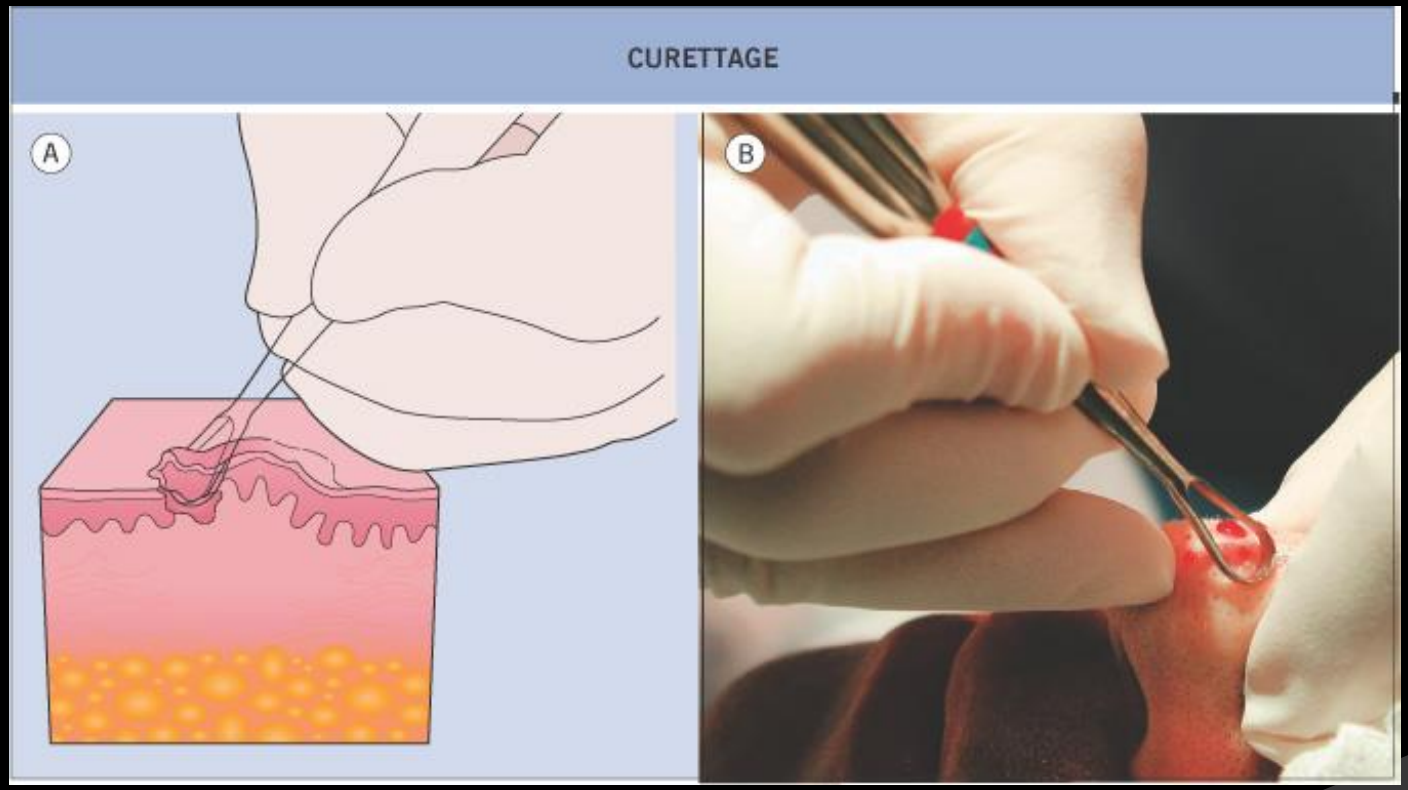
Curettage and Electrodessication: INDICATIONS

- **Viral Warts**
- **Seborrheic Keratoses**
- **Squamous cell carcinomas in situ AKA Bowen's Disease**
- **Basal Cell Carcinoma** (small)
- **Tattoo removal**
- **<u>Not</u> helpful for skin rashes as it may damage the inflamed skin and render it unreadable**

Curettage and Electrodessication: Technique

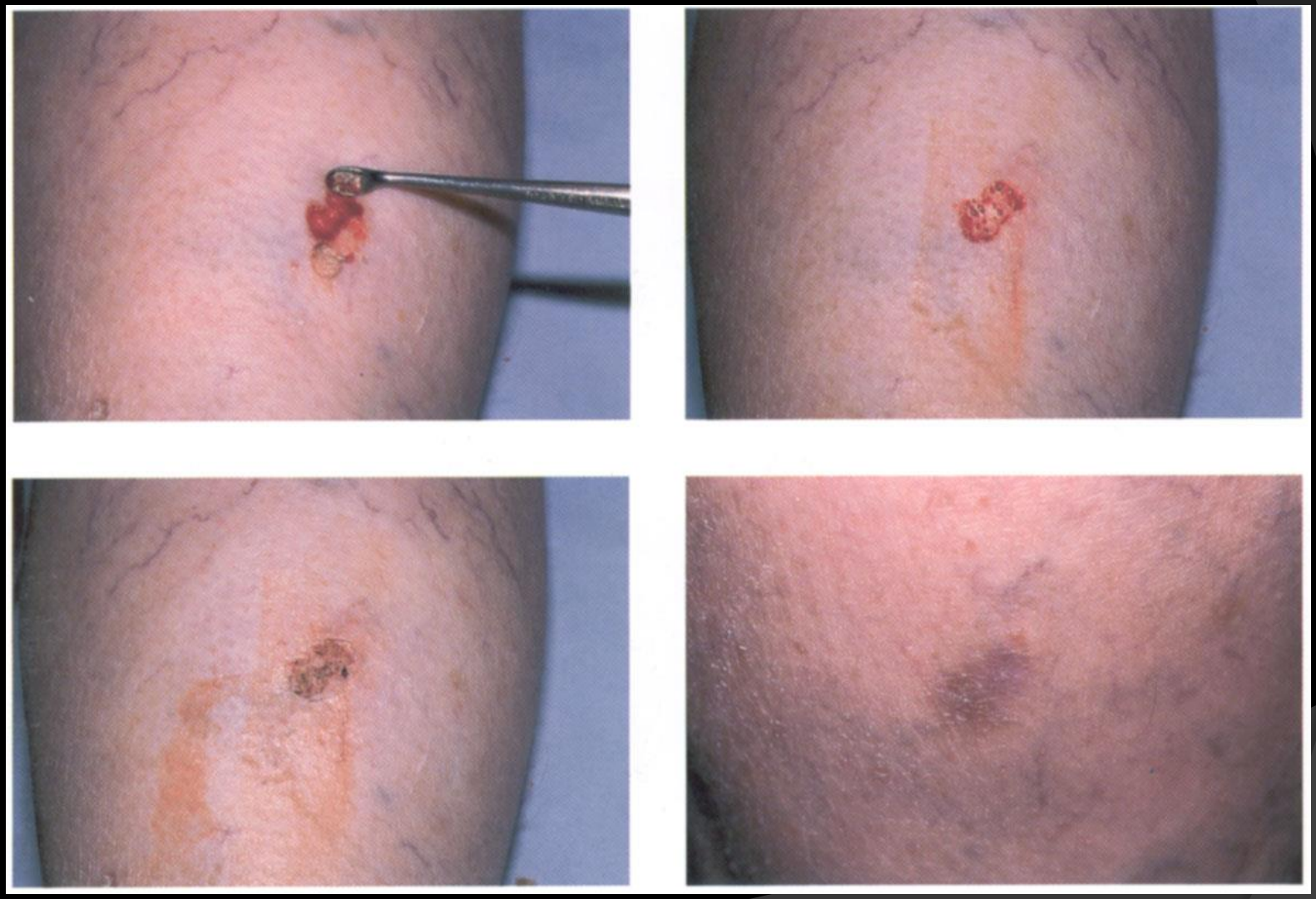
- **Infiltration of local anesthetic**
- **Sharp curettage with sideways scraping movements**
- **Initial curettage send to pathology in formalin**
- **Electrocautery for hemostasis**
- **Repeat 2 more times**

Simple Curettage Technique

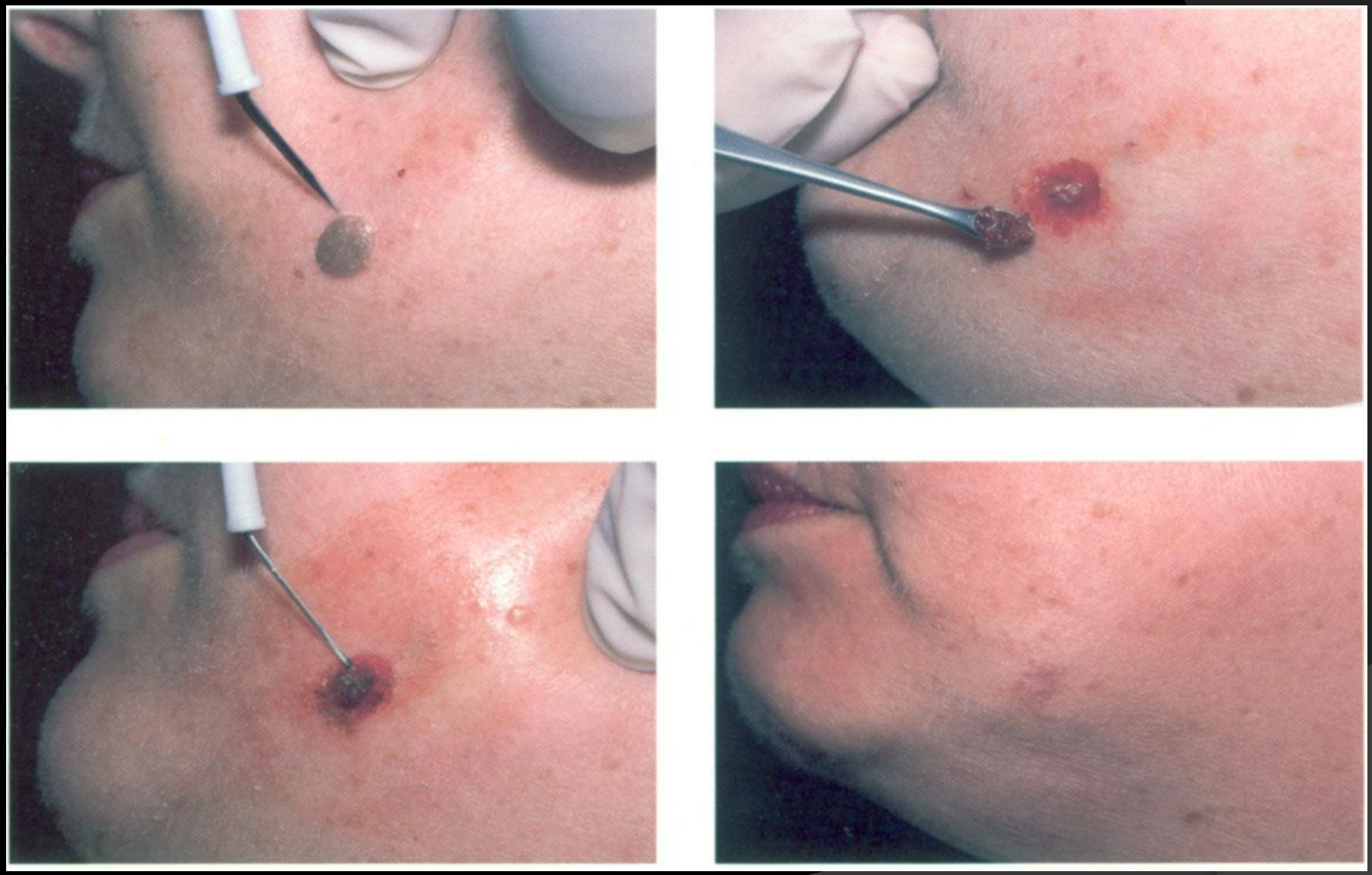


From Bolognia's Dermatology

Curettage and Electrodessication



Bowen’s Disease (Squamous Cell Carcinoma in situ)



Seborrheic Keratosis

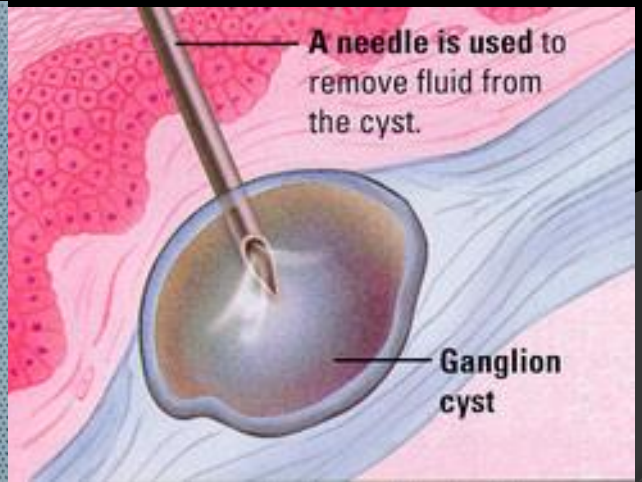
Curettage and Electrodessication for Tattoo Removal

Hands On – Curettage (only) Biopsy Demo

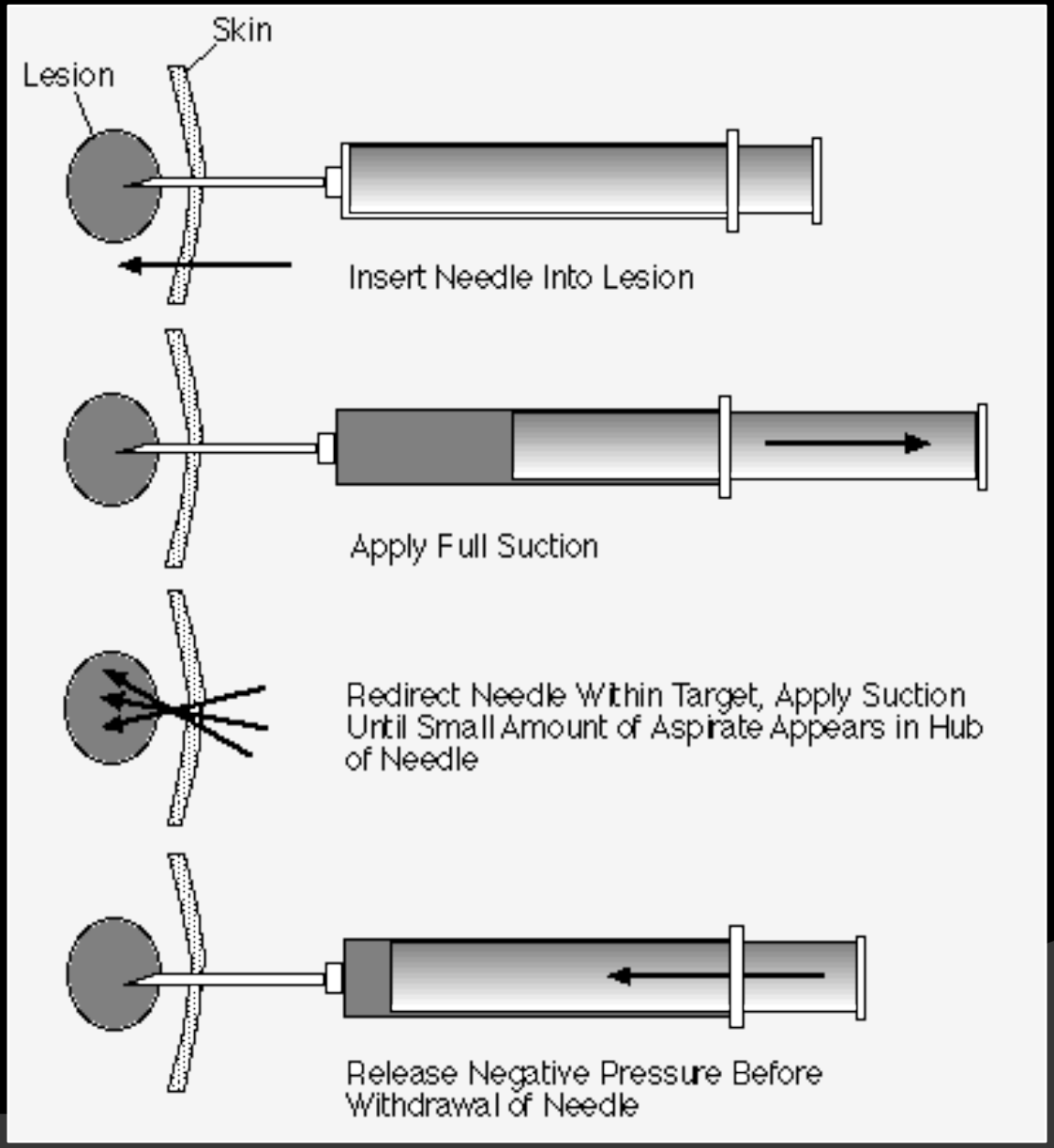
- Biopsy site may or may not need preparation
- Attention directed towards leading edge of condition
- Hold like pencil, index finger on top flat textured area
- Gently scrape curette across biopsy site, collecting tissue within loop
- Warning – too much pressure on curette will gouge patient
- One to four scrapes may be required
- Shake specimen into formalin fixative
- Molecular genetic testing (PCR Assay) must be submitted dry (nails)
- Hemostatic agent, antibiotic, bandage may or may not be required

Needle Biopsy - Soft Tissue Mass

- Needle Aspiration Biopsy – sample fluid and/or cells from deep seeded soft tissue mass (non-epithelial, non-skeletal)
- Ganglion cyst is most common soft tissue tumor in the foot
- Do not surgically remove a soft tissue mass without first knowing what the mass is, otherwise the risk of amputation increases
  - If skin moves over soft tissue mass , then perform needle biopsy
  - If soft tissue mass moves with skin, then perform punch biopsy



Needle Biopsy Technique



Hands On - Needle Biopsy Demo

- Prepare biopsy site – alcohol wipe, raise local anesthetic wheal
- 10cc syringe with 18 gauge needle - inserted into soft tissue mass
- Draw syringe back to create a vacuum
- Maintain vacuum and redirect into 4 quadrants of mass
- Let tension off the plunger and withdraw needle
- If fluid is obtained, flush fluid into fixative container
- In no fluid is obtained, draw fixative into syringe, then flush fixative back into fixative container
- Tip – dry tap can be an indication for open punch biopsy
- Tip – gout crystals should be put into ETOH, not formalin
- Never ever send needle to laboratory

Nail Unit Sampling for Onychomycosis

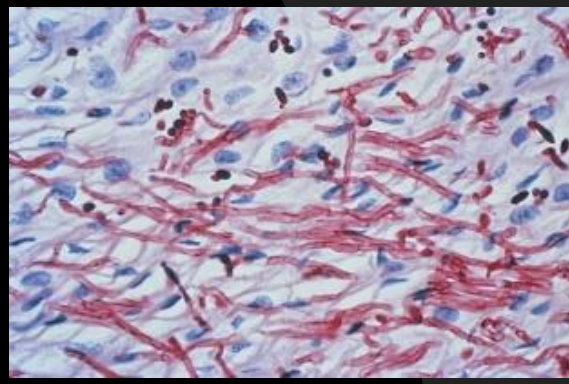
- Nail Unit Sample for Mycotic Nails – subungual debris, nail plate
- Sample is sent to laboratory
- I never send a simple distal clipping of nail plate—dry hyphae
- Intent is to diagnose a disorder or condition

Diagnostic Testing for Onychomycosis

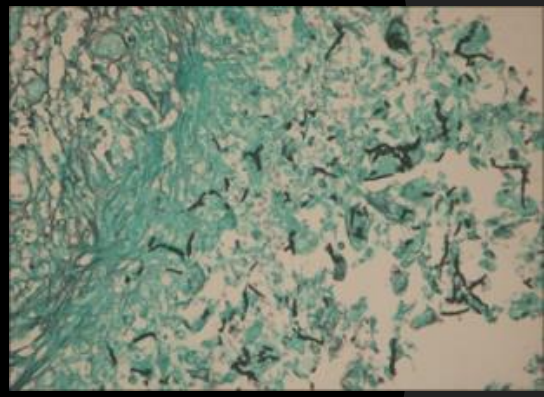
- Detect, diagnose, *confirm*, and determine the presence of disease
- Monitor the condition and determine a course of treatment in an individual suspected of having the disease
- Clinical diagnosis by physical examination alone can be inaccurate
- To avoid misdiagnosis such as nail psoriasis, micro-trauma, lichen planus, or saprophytic mold
- Accurate diagnosis is crucial for successful treatment
- A positive laboratory confirmation of fungal infection is necessary and should precede any therapeutic treatment
- *Independent objective documentation* for defending Medicare audits

PAS and GMS and FM Stains

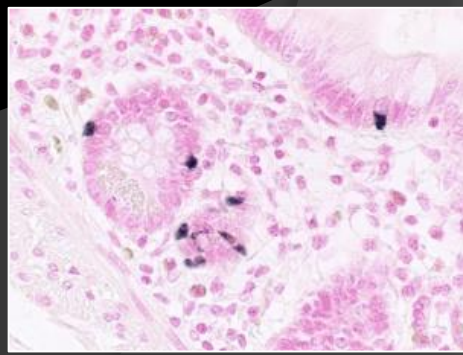
- Periodic Acid–Schiff (PAS)
  - produces a magenta color
  - demonstrates excellent fungal morphology
  - High sensitivity (few false negative tests)



- Gomori Methenamine Silver (GMS)
  - stains carbohydrates (sugars) living and dead
  - excel at staining degenerated organisms
  - High sensitivity but poor morphology
  - in tandem with PAS, offers Highest sensitivity

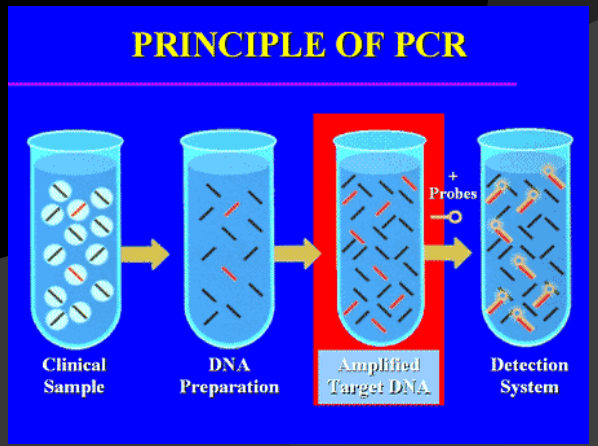


- Fontana Masson (FM)
  - highlights melanin pigment in fungal organisms
  - presence of an underlying melanocytic process



Molecular Genetic Testing – PCR Assay

- Polymerase Chain Reaction assay detects fungal DNA from nails
- Amplify a piece of DNA across several orders of magnitude
  - millions of copies sequenced
- Rapid detection of both dermatophytes and non-dermatophytes
  - detects the genetic material of fungi (dermatophytes, saprophytes, yeasts)
  - if detected, genes specific for the pathogens genus +/- species are sought
- High specificity (organism identification) for targeted patient therapy
  - augments the superior sensitivity of PAS/GMS stains



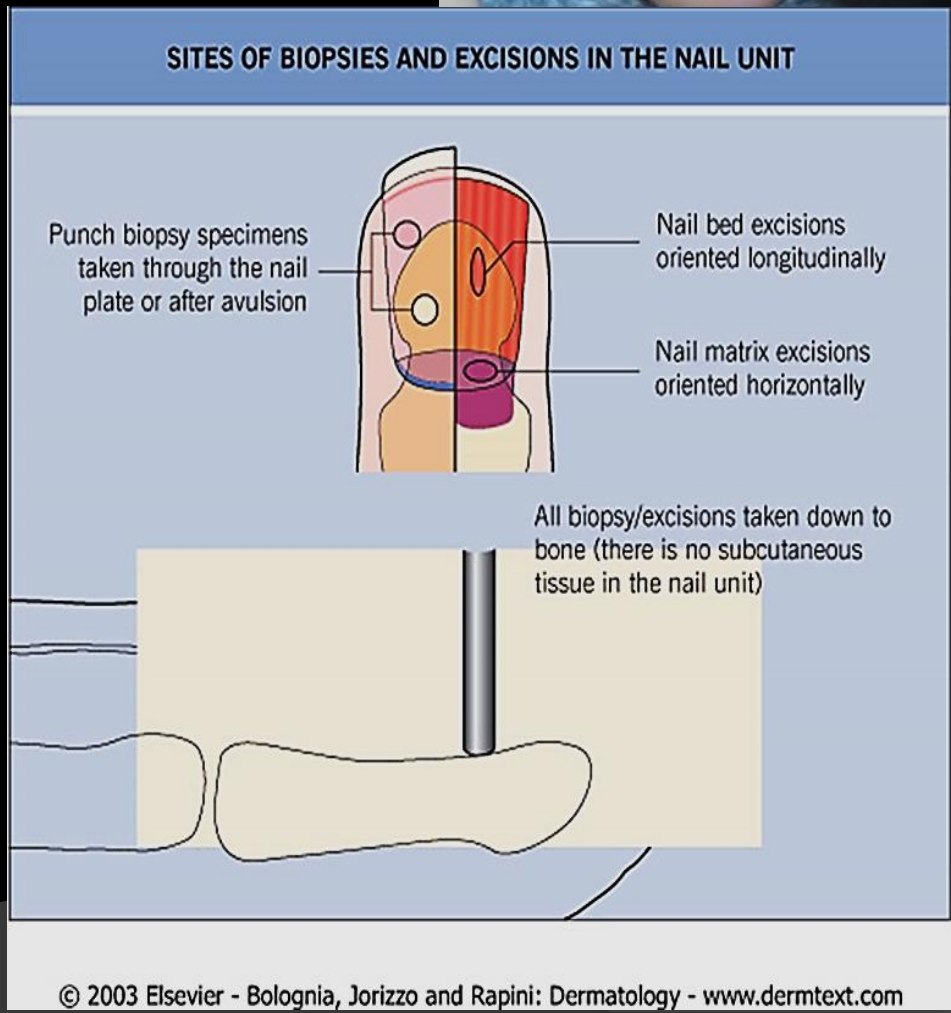
Onychomycosis Laboratory Testing

- Recommended for Insurance/Prior Auth
  - Periodic Acid–Schiff (PAS) - High sensitivity (few false negative tests)
  - KOH Prep
  - Fungal Culture

- Selectively Recommend
  - Polymerase Chain Reaction (PCR) Assay - High specificity (organism identification)

Punch biopsies for the nail

- 3mm punch
- Can remove the nail plate (total or partial) or punch through nail plate
- Nail matrix for melanoma and melanonychia
  - Proximal vs distal matrix
- Nail bed punch good for inflammatory, infectious, neoplastic (ie psoriasis, lichen planus)
- Helpful to diagnose proximal subungual onychomycosis

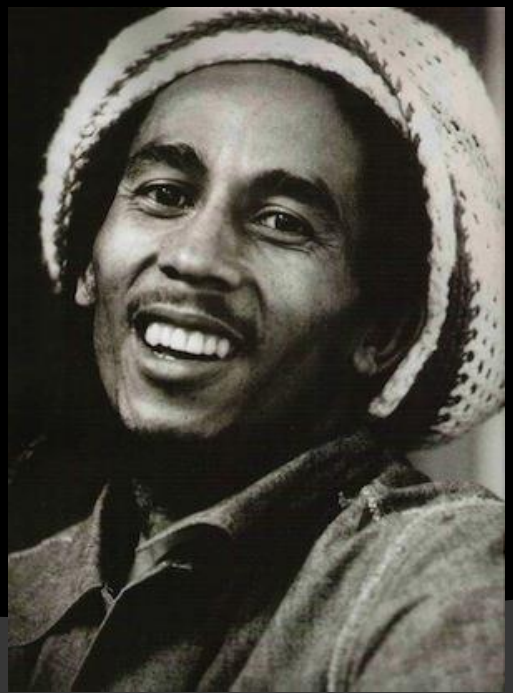


Longitudinal melanonychia (LM)

Clin
Pod Med
Surg
33 (2016)
319-336

Acral Lentiginous Melanoma

- Fewer than 5% of all melanomas
- Most common melanoma in black patients
- Bob Marley
  - developed a discolored toenail dismissed as a soccer injury
  - later diagnosed as late stage Acral Lentiginous Melanoma
  - refused medical advice to have his toe amputated
  - cancer spread to his brain and lungs, he died at 36 years old



What would you do?

What would you do?

Picture courtesy of
Dr Gabrielle G. Gagliardi

What would you do?

Thank you!!!!
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