SKIN BIOPSY TECHNIQUE

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CONFLICTS

• No conflicts with the content of this lecture
SKIN BIOPSY

• Helps in cases of dilemma
• Opportunity to find something extraordinary
• Document diagnosis and justify treatment
CHOOSING THE LESION

- Classical, well-formed lesion
- Exception (early lesions in HSP, DH, BP)
- Avoid lesions that are modified
CHOOSING THE SKIN BIOPSY TECHNIQUE

• Size of Lesion
• Anatomic location
• Disease category or clinical diagnosis
• Proficiency or preference of clinician
SKIN BIOPSY TECHNIQUES

• Punch biopsy
• Shave biopsy
• Saucerization biopsy
• Wedge biopsy
• Incisional biopsy
• Excisional biopsy
SPECIAL CIRCUMSTANCES

- Urticaria pigmentosa
- Scalp biopsy trichoglyphics
- Immunofluorescence
- Lupus erythematosus
LOCAL ANESTHESIA

- Lidocaine: Infiltration, ring, or field block
- Topical: EMLA with 2 hours occlusion = 5 mm
- Lidocaine with epinephrine:
  - Use with caution in digital block
  - Use with caution in pregnancy
COMPLICATIONS

- Hypersensitivity to local anesthetic
- Discomfort associated with local anesthetic
- Bleeding
- Scarring
- Infection
PRACTICAL CONSIDERATIONS

• Optimal strength (10%) and volume of formalin solution (10X)

• Minimal handling of tissue to avoid crush artifact from forceps

• Place tissue in bottle (not in the cap)

• Infiltrate with optimal local anesthetic to avoid “artificial edema”

• Avoid electrocautery or cryotherapy artifact

• Avoid secondary or treated lesions
PRACTICAL CONSIDERATIONS

• Non-specific findings or misdiagnosis can result from improper:
  • Biopsy site selection
  • Lesion selection
  • Technique (superficial specimen)
  • Choice of transport media

• Examples include:
  • False-negative DIF and sampling error in NMSC or large pigmented lesions
  • Multiple biopsies in polymorphic lesions and large pigmented lesions
SKIN BIOPSY IN SPECIFIC DISEASES

- Bullous diseases
- Lupus erythematosus
- Vasculitis
- Panniculitis
- Hair disorders
- Epithelial neoplasms
- Malignant melanoma
- Dermatofibrosarcoma Protuberans
- T and B cell lymphomas
SKIN BIOPSY IN SPECIFIC DISEASES
Bullous Diseases

• Early non bullous lesional or perilesional skin within 1 cm of a bulla from the trunk is preferred for pemphigoid

• Brief immersion in formalin produces false negative results in only pemphigus

• Punch biopsy (small vesicle) or scooped shave biopsy

• Light microscopy (H&E) specimen in formalin

• DIF specimen in Michel or Zeus media (or normal saline)
SKIN BIOPSY IN SPECIFIC DISEASES
Bullous Diseases

- Normal saline is superior to Michel or Zeus for DIF specimens delivered to the lab within 48 hours
- Mucosal surfaces: Perilesional within 5 mm from erosion
- Epidermolysis bullosa (EB): Fresh blister (< 12 hours)
- Inducing a blister: Firm downward pressure with traction for 1-2 minutes and biopsy at least 5 minutes after inducing erythema
SKIN BIOPSY IN SPECIFIC DISEASES
Bullous Diseases (DIF)

- BP: Lesional and/or perilesional
- PV/PF: Lesional and/or perilesional
- DH: Non lesional
- Bullous Lupus Erythematosus: Lesional and non lesional
SKIN BIOPSY IN SPECIFIC DISEASES
Lupus Erythematosus

• 4 mm punch biopsy minimum

• Lesional skin only for cutaneous LE and tumid LE

• Chronic cutaneous LE and tumid LE: established lesion (>6 months) highest yield for H&E and DIF
SKIN BIOPSY IN SPECIFIC DISEASES
Lupus Erythematosus (DIF)

- Chronic and subacute cutaneous LE: Lesional
- SLE: Lesional and non lesional
- Drug-induced LE: Lesional and/or non lesional
- Dermatomyositis: Established lesion for H&E and DIF
SKIN BIOPSY IN SPECIFIC DISEASES

Vasculitis

- Deep punch: Post capillary venule and deep plexus
- Highest yield H&E: Established lesions (>72 hours)
- Highest yield DIF: Acute lesion (< 24 hours)
- IgA vasculitis retains positive DIF in established lesions
SKIN BIOPSY IN SPECIFIC DISEASES

Panniculitis

- Deep incisional biopsy (not shave biopsy)
- Double punch technique or electric rotary power punch
- 6 mm punch minimum size divided for culture and H&E
SKIN BIOPSY IN SPECIFIC DISEASES

Hair Disorders

- More than 1 biopsy is helpful
- Established lesion
- 4 mm punch is ideal:
  - Remember trichoglyphics
  - Remember to obtain adequate depth (4-5 mm)
- Normal scalp biopsy is not essential
- Transverse sections, vertical sections, or both
SKIN BIOPSY IN SPECIFIC DISEASES
Hair Disorders

- Tyler Technique - 3 pieces, vertical and transverse
- HoVert Technique - 4 pieces, vertical and transverse
SKIN BIOPSY IN SPECIFIC DISEASES
Epithelial Neoplasms

• Shave biopsy: Epidermal lesions
• Punch biopsy: Dermal lesions
• Curettage: Potential interpretation limitations
• Special considerations: Microcystic adnexal carcinoma
SKIN BIOPSY IN SPECIFIC DISEASES
Malignant Melanoma

• Complete excision

• Saucerization: Macular lesions

• Orientation: Score, ink, or suture

• Partial biopsy specimens are associated lower yield

• Lentigo Maligna: Broad shave or shaves (not punch)

• Multicolor lesions: Multiple shaves
SKIN BIOPSY IN SPECIFIC DISEASES

Dermatofibrosarcoma Protuberans

- DFSP requires a deep biopsy to show the characteristic honeycomb pattern involving the subcutis
- Deep incisional biopsy is recommended
- Superficial biopsies result in a dilemma:
  - Cellular dermatofibroma vs. DFSP
  - Immunostains can be helpful in superficial specimens
SKIN BIOPSY IN SPECIFIC DISEASES

Cutaneous T-cell Lymphoma

• T = T-cell and Top Heavy

• Broad shave biopsies include a wide area of the dermoepidermal junction to help demonstrate epidermotropic lymphoid cells

• Broad shave biopsies are also ideal for immunostains and gene rearrangement studies

• Multiple shave biopsies from different anatomic sites may be needed to establish the diagnosis
Primary Cutaneous B-cell Lymphoma

- **B = B-cell and Bottom Heavy**

- B-cell lymphoma requires a deep biopsy showing the infiltrate’s architecture and zonal immunostaining patterns
  
  - B-cell lymphoid hyperplasia vs. B-cell lymphoma

- Superficial biopsies can result in misinterpretation due to insufficient sampling of the deep dermal infiltrate

- Deep incisional biopsy is recommended
Summary

- Choosing the biopsy site and lesion:
  - Lesional vs. perilesional
  - Early vs. established
  - H&E vs. DIF
- Choosing the skin biopsy technique:
  - Superficial vs. deep
- Practical considerations: Avoid artifacts
- Skin biopsy techniques for specific diseases
- Multiple biopsies especially in polymorphic lesions