AN APPROACH TO PEDIATRIC NEVI

Melinda Jen, MD

Director, Dermatologic Surgery and Laser
Director, Pigmented Lesion Clinic
Associate Professor of Pediatrics and Dermatology
Perelman School of Medicine at the University of Pennsylvania
Children's Hospital of Philadelphia
APPROACHING PEDIATRIC NEVI

• Pediatric nevi in context
• Clinical scenarios
  • Longitudinal melanonychia
  • Spitz nevi
  • Atypical Spitz tumors
  • Management of dysplastic nevi
NATURAL HISTORY OF NEVI IN CHILDREN

• More nevi to develop over time
  • Influenced by skin type, amount of sun exposure, sunscreen use, parental nevus count
NATURAL HISTORY OF NEVI IN CHILDREN

• More nevi to develop over time
  • Influenced by skin type, amount of sun exposure, sunscreen use, parental nevus count

• Existing nevi evolve over time
  • Increase in size
  • Change dermatoscopic patterns
  • Can disappear (without a halo)
**MELANOMA IS UNCOMMON IN CHILDREN**

- <20 yo account for <0.5% melanomas
- In Olmsted county, Minnesota: 0.53/100,000 person years
  - Vs adults: 21.6/100,000 per year
- Incidence decreasing
  - Most significant in adolescents

---

SEER review 1975-2015
Campbell et al. J Pediatr 2015
MELANOMA IS UNCOMMON IN CHILDREN

• # melanoma in >20,000 pediatric nevi biopsied:
  • 0 in <10 yo
  • 5 in 10-14 yo
  • 33 in 15-19 yo
  • 594 nevi were needed to be biopsied to find 1 melanoma (20x higher than in adults).

Moscarella et al. BJD 2012
MELANOMA IS UNCOMMON IN CHILDREN

• Melanoma in >150,000 pediatric nevi biopsied:
  • 12 in 0-9 yo
  • 23 in 10-14 yo
  • 117 in 15-19 yo

• Number needed to biopsy:
  • 1896 in <10 yo
  • 2011 in 10-14 yo
  • 664 in 15-19 yo
APPROACHING PEDIATRIC NEVI

• Pediatric nevi in context

• Clinical scenarios
  • Longitudinal melanonychia
  • Spitz nevi
  • Atypical Spitz tumors
  • Management of dysplastic nevi
LONGITUDINAL MELANONYCHIA
LONGITUDINAL MELANONYCHIA

• Causes
  • Melanocyte activation
    • Trauma
    • Ethnic pigmentation
    • Medications (minocycline, hydroxyurea, AZT, 5FU)
    • Peutz-Jeger syndrome, Laugier-Hunziker syndrome
  • Lentigo
  • Melanocytic nevus
  • Melanoma - UNCOMMON
CLINICAL CLUES?

- Age (5-7\textsuperscript{th} decade), AA/Asian/native Americans
- Brown/Black, Breadth (>3mm), variegated Borders
- Change in color or width
- Digit (thumb, big toe)
- Extension to the proximal or lateral nail fold (Hutchinson sign)
- Family or personal history of melanoma or DN
CLINICAL CLUES?

• Age (5-7\textsuperscript{th} decade), AA/Asian/native Americans
• Brown/Black, Breadth (>3mm), variegated Borders
• Change in color or width
• Digit (thumb, big toe)
• Extension to the proximal or lateral nail fold (Hutchinson sign)
• Family or personal history of melanoma or DN

Levit et al. JAAD 2000
CLINICAL CLUES IN PEDIATRICS?

What to do?
- Clinical signs of melanoma in adults are often seen in benign conditions in pediatrics
- Conservative management in pediatrics

<table>
<thead>
<tr>
<th>Category</th>
<th>n</th>
<th>Pigmented band ≥5% sum or ≥50% of nail plate</th>
<th>Hutchinson sign</th>
<th>Multiple colors or shades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lentigo</td>
<td>20</td>
<td>10</td>
<td>Yes</td>
<td>3</td>
</tr>
<tr>
<td>Nevus</td>
<td>5</td>
<td>2</td>
<td>Yes</td>
<td>1</td>
</tr>
<tr>
<td>Atypical melanocytic hyperplasia</td>
<td>5</td>
<td>1</td>
<td>Yes</td>
<td>2</td>
</tr>
</tbody>
</table>
SPITZ NEVI
**SPITZ NEVI**

- Benign
  - Not pre-melanoma
  - No increased risk for future melanoma
- Less concerning:
  - <10 years of age
  - Symmetric, dome-shaped, well circumscribed
  - Common dermatoscopic patterns
    - Starburst
    - Regular dotted vessels
    - Globular pigment
STARBURST (>50%)
REGULAR DOTTED VESSELS

(a) 

(b) 

(c) 

(d)
GLOBULAR PATTERN
SPITZ NEVI

- Benign
  - Not pre-melanoma
  - No increased risk for future melanoma
- Less concerning:
  - <10 years of age
  - Symmetric, dome-shaped, well circumscribed
  - Common dermatoscopic patterns: starburst, regular dotted vessels, globular pigment
- Biopsy for any concerning features
  - Avoid partial biopsies
  - Re-excision controversial
    - If positive margins and residual pigmentation clinically → re-excision
    - If positive margins and no residual pigmentation clinically → re-excision vs observation
ATYPICAL SPITZOIDS TUMORS

- Challenging and controversial
- Immunohistochemistry
  - Loss of HMB-45 maturation
  - Ki-67 expression in deep dermal melanocytes
  - Loss of p16 staining
  - Loss of p15 staining
- Comparative Genomic Hybridization (CGH)/Fluorescence in situ Hybridization (FISH)
  - Spitz: gain 11p (HRAS)
  - Multiple abnormalities = more atypical
  - Lower risk: isolated loss 6q23, heterozygous 9p21/p16 deletion, negative FISH
  - Intermediate risk: isolated gain 6p25 or gain 11q13
  - Higher risk: homozygous 9p21/p16 deletion, TERT
- SLN
  - Not to distinguish between benign/malignant
  - Doesn’t predict prognosis
- When in doubt, consult an experience dermatopathologist
SUSPECTED SPITZOID TUMOR

Excisional Biopsy

Histopathologic evaluation

Features worrisome for melanoma
- Ulceration
- Lack of maturation
- Cellular atypia
- Many mitoses
- Heterogeneity of organization
- Asymmetry
- Loss of p16
- Loss of HMB-45 maturation
- Deep expression of Ki-67

Consult with experienced (pediatric) dermatopathologist

Uncertainty persists or favor atypical Spitzoid tumor: Perform FISH or CGH

Favor benign diagnosis

Manage as for diagnosis

Low or intermediate risk:
- Complete re-excision with close clinical follow up

High risk:
- Excise with adequate margins
- Evaluation with oncology
- Consider SLN biopsy

No chromosomal abnormalities or isolated gain 11p:
- Favor benign diagnosis
WHAT TO DO?

1mo ago

A. Skin, left parietal scalp above ear, biopsy:
- Compound dysplastic nevus with moderate atypia and inflammation

Microscopic Description:
The biopsy shows a compound nevus with architectural disorder and random moderate cytologic atypia. Areas of lymphohistiocytic inflammation are seen associated with the atypical nevus. The process extends to all margins of the sections. This case has been reviewed at the Dermatopathology Consensus Conference at the Hospital of the University of Pennsylvania.
HOW ABOUT MILD OR MODERATELY DYSPLASTIC NEVI?

- Do they need re-excision?
- 756 mild or moderately atypical nevi → 495 re-excised
- 81.8% only scar, 18.2% some residual nevus
- 90 with residual melanocytic proliferation:
  - 90% no change in diagnosis
  - 8% no residual atypical melanocytic proliferation
  - 2% upgrade to severely DN

Strazzula et al. JAAD 2014
HOW ABOUT MODERATELY DYSPLASTIC NEVI?

• Do they need re-excision?
• 756 mild or moderately atypical nevi → 495 re-excised
• 81.8% only scar, 18.2% some residual nevus
• 90 with residual melanocytic proliferation:
  • 90% no change in diagnosis
  • 8% no residual atypical melanocytic proliferation
  • 2% upgrade to severely DN

• **Conclusion**: re-excision of mild and moderate DN probably not needed since it rarely changes the diagnosis

Strazzula et al. JAAD 2014
Reddy et al. JAMA Dermatol 2013
MANAGEMENT RECOMMENDATIONS

Pigmented Lesion Subcommittee of the Melanoma Prevention Working Group

• Mild-moderate DN, clear margins: no re-excision
• Mildly DN with positive margins without residual pigmentation: observe
• Moderately DN with positive margins without residual pigmentation: reasonable to observe

Hocker et al. JAAD 2013
Kim et al. JAMA Derm 2014
Hiscox et al. JAAD 2017
CHALLENGING PEDIATRIC NEVI

• Pediatric nevi in context
  • New and changing nevi are common in children
  • Melanoma uncommon

• Clinical scenarios
  • Longitudinal melanonychia
    • Conservative treatment in children
    • Clinical signs of melanoma in adults often seen in benign conditions in children
  • Spitz nevi
    • Benign
    • Nevi with classic dermatoscopic patterns could be followed clinically
    • Avoid partial biopsy
  • Atypical Spitzoid tumors
    • Needs thorough pathologic examination (immunohistochemistry) +/- molecular profiling and expert consultation
  • Management of dysplastic nevi
    • Mild-moderate DN, clear margins: no re-excision
    • Mildly DN with positive margins without residual pigmentation: observe
    • Moderately DN with positive margins without residual pigmentation: reasonable to observe
THANK YOU