An Update on Skin Cancer

Michael Sorace, MD
Epidemiology
NMSC

• Nonmelanoma skin cancer
  – Basal cell carcinoma
  – Squamous cell carcinoma
  – Bowens disease (squamous cell carcinoma in-situ)
  – Basosquamous carcinoma
Epidemiology of NMSC

- Nearly 4 million new cases in the US per year
- Estimated 3170 deaths from NMSC per year
- Most common form of cancer in the US
- 1/5 Americans will have NMSC in their lifetime
- 40-50% of Americans over 65 will have at least 1 NMSC
Skin Cancer on the Rise

• Last 30 years
  – Incidence of BCC in women <40 yo has doubled
  – Incidence of squamous cell carcinoma among women under age 40 has increased almost 700%

• Number of NMSC in the Medicare population increased an average of 4.2% per year from 1992 - 2006
NMSC vs Other Cancers

• Higher incidence of skin cancer per year than combined incidence of:
  – Breast Ca
  – Prostate Ca
  – Lung Ca
  – Colon Ca

• In last 30 years, more people have had skin cancer than all other cancers combined.
Melanoma on the Rise

• From 1970-2009 the incidence of melanoma increased
  – 800% among young women
  – 400% among young men

• Incidence of melanoma has increased 1.9% annually over last 10 years

• Caucasian men over age 65
  – 5.1% annual increase in melanoma incidence since 1975
Actinic Keratosis

• Precursor to squamous cell carcinoma
• Affects more than 58 million Americans.
• Approximately 65% of all SCCs and 36% of all BCCs arise in lesions that clinically diagnosed as actinic keratoses.
AK to SCC

• About 1% per Ak per year become SCC
• For every 10 Aks
  – SCC would develop at a rate of about 10% over 10 years
• Other estimates up to 13-20% over a 10-year period
BCC Clinical

- “Pearly Papule”
- “Rodent Ulcer”
- “Rolled border”
SCC clinical

- Many of the same signs as bcc
- Often bleed or hurt
- Often described as “warty” or “crusty”
- Less “pearly” than BCC
Warning Signs for NMSC

- Persists for several weeks
- Persists after cryotherapy
- Bleeds
- Painful
- Surrounding Induration
- Questionable scars
MELANOMA
National cancer Institute

• **Estimated new cases and deaths** from melanoma in the United States in 2013:
  – New cases: 76,690
  – Deaths: 9,480

• One person dies of melanoma every hour
ABCDE’s of Melanoma

<table>
<thead>
<tr>
<th>A</th>
<th>Asymmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Border</td>
</tr>
<tr>
<td>C</td>
<td>Color variation</td>
</tr>
<tr>
<td>D</td>
<td>Diameter (&gt;6mm)</td>
</tr>
</tbody>
</table>

E = Evolution
Breslow Depth

• Strongest predictor of survival
• Thickness of the tumor
• Measured in millimeters
• Top of the granular cell layer of the epidermis to the deepest point of the tumor
• \( \geq 1 \text{ mm} \) poor prognosis
Common Skin Growths
Seborrheic keratosis
Sebaceous Hyperplasia
Syringoma
Psoriasis
Verruca
Skin Cancer Prevention

(Sun Protection)
SPF

• Measure of how much longer a person can stay in the sun
• Multiple of the amount of time
• SPF of 10 would allow 10 times longer in the sun with the same resultant level of redness
• SPF 20 similarly would allow 20 times as much exposure
SPF

• A person who can stay 10 mins in the sun before turning red
  – SPF 10 --- Can stay in the sun 10 times longer
  – SPF 30 --- Can stay in the sun 30 times longer
<table>
<thead>
<tr>
<th>SPF</th>
<th>Blockage of UV exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>90%</td>
</tr>
<tr>
<td>15</td>
<td>92.5%</td>
</tr>
<tr>
<td>20</td>
<td>95%</td>
</tr>
<tr>
<td>40</td>
<td>97.5%</td>
</tr>
</tbody>
</table>
Limitations of SPF

- SPF 10
  - 10 times longer exposure
  - Normal 20 mins ---- 200 mins --- about 3 hours

- SPF 100
  - 100 times longer exposure
  - Normal 20 mins ---- 2000 mins ---- about 33 hours
Types of Sunscreen

• Physical Blockers
  – Wide spectrum
  – Reflect UV rays
  – Zinc oxide
  – Titanium dioxide

• Chemical blockers
  – Narrower spectrum
  – Absorb UV rays
My Sunscreen recommendations

- Use SPF 30 or better
- Zinc oxide or Titanium dioxide
- Apply 30 mins prior to exposure
- Use enough to turn the skin white
- Reapply every 2-3 hours
# UV Protection Factor (UPF)

Rating system of the UV protection provided by fabric

<table>
<thead>
<tr>
<th>UPF Rating</th>
<th>Protection Category</th>
<th>% UV radiation Blocked</th>
</tr>
</thead>
<tbody>
<tr>
<td>UPF 15 - 24</td>
<td>Good</td>
<td>93.3 - 95.9</td>
</tr>
<tr>
<td>UPF 25 - 39</td>
<td>Very Good</td>
<td>96.0 - 97.4</td>
</tr>
<tr>
<td>UPF 40 - 50+</td>
<td>Excellent</td>
<td>97.5 - 99+</td>
</tr>
</tbody>
</table>
Treatment NMSC
Treatment NMSC

• Electrodessication and Curettage (ED&C)
• Topical treatments (imiquomod or 5-FU)
• Excision
• Mohs surgery
• Radiation treatment
• Vismodegib
Electrodessication and Curettage

• 3 cycles of curettage alternating with 3 cycles of electrodessication
ED&C Indications

• When:
  – Small basal cell carcinomas
  – No aggressive features
  – Trunk and extremeties

• Caution:
  – Squamous cell carcinomas
  – Head and neck
ED&C

• Advantages
  • Around a 90-95% cure rate in properly selected scenarios
  • Quick procedure with little down time

• Disadvantages
  • Relatively low cure rate
  • Tumors tend to be more aggressive if recur
  • Poor scarring
Imiquomod

• Immune response modifier
• Binds to Toll-Like receptor 7 (TLR7)
• Stimulates innate immunity and favors a TH1 type immune response
Imiquomod FDA Approval

• Aks in immunocompetent adults
• Primary superficial BCC
  – immunocompetent adults
  – Maximum tumor diameter of 2.0 cm
  – Trunk, neck, or extremities (excluding hands and feet)
• External genital and perianal warts
Imiquomod

- **Aks**
  - 2 days per week for 16 weeks

- **Superficial BCCs**
  - 5 - 7 days per week for 6-12 weeks
  - 70-75% cure rate
5% 5-Fluorouracil

- **Aks**
  - Apply BID for 2-4 weeks
- **Superficial BCC**
  - Apply bid for 3-6 weeks
Vismodegib

• First FDA-approved Hedgehog pathway inhibitor for advanced BCC

• Treatment of:
  – metastatic BCC
  – locally advanced BCC
  – Recurrent BCC
Adverse Reactions

- Muscle spasms
- Aopecia
- Dysgeusia
- Weight loss
- Fatigue
- GI complaints
Mohs Surgery
What is Mohs surgery?

• Technique invented by Fredrick Mohs
• Mainly a treatment for difficult skin cancers
• Method for precisely evaluating tumor margins
Specifics of Mohs Surgery

• The surgeon and pathologist must be the same person

• Technical differences in the way tissue is processed
  – En face embedding
  – Color coded mapping
Advantages of Mohs Surgery

• Highest cure rate
  – 98-99% for primary NMSC
  – 95-97% for recurrent NMSC

• Smaller Scar
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<th>Treatment Modality</th>
<th>BCC</th>
<th>SCC</th>
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<tr>
<td>Excision</td>
<td>90%</td>
<td>92%</td>
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<tr>
<td>ED &amp; C</td>
<td>92%</td>
<td>96%</td>
</tr>
<tr>
<td>Radiation</td>
<td>91%</td>
<td>90%</td>
</tr>
<tr>
<td>Mohs Surgery</td>
<td>99%</td>
<td>97%</td>
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Recurrence Rate

• 4 million NMSC in the US/year
• Lets say 500,000 of those are troublesome tumors
  – @90% = 50,000 recurrences
    • 10 recurrences per 100 pts
  – @95% = 25,000 recurrences
    • 5 recurrences per 100 pts
  – @99% = 5,000 recurrences
    • 1 recurrence per 100 pts
How is it done?
Stage 2

Map residual tumor

Continue until sections are negative

Map sections

Examine tissue under microscope

4-25
Jones 5
A. Visible tumor excised

B. Skin sample is flattened and frozen.

Skin sample is sliced into sections.

Microscopic analysis may reveal positive tumor margins.

C. Tumor-positive area is sampled.
When to Use Mohs Surgery?
Simple Indications

- Aggressive histology
- Head and Neck tumors
- Large tumors (>2 cm)
- Recurrent tumors
- Unusual tumor types
- Immunocompromised patients