Introduction

- Subungual melanoma is a relatively rare disease that carries a poor prognosis\(^1-3\)

- Several retrospective studies have been conducted, but incidence, recurrence, and survival rates vary greatly depending on the investigation\(^1-20\)

- Current NCCN guidelines also offer little insight as to the specific surgical management of subungual melanoma\(^21\)

- We aim to utilize a systematic review to better appraise this pathology and to examine applicable surgical interventions
Subungual Melanoma: A Systematic Review
Jacques A. Machol IV, MD, William W. Dzwierzynski, MD
Department of Plastic Surgery
Medical College of Wisconsin, Milwaukee, WI, USA

Methods

- A **Meta-Analysis** provides comparison of similar, randomized controlled studies to increase sample size

- Unfortunately, no such prospective trials exist specifically for treatment of subungual melanoma

- A **Systematic Review** is elected as this allows the compilation of study data from case series that are non-randomized or controlled

Methods

- A systematic lit. review using MEDLINE was performed

- “Subungual Melanoma” or “Subungual Melanosis”

- 1965 to 2012

- English language, Human citations

Fig. 2. Clinical presentation of subungual melanoma as a nail streak
Methods

Inclusion:
- F/u adequate to determine 5 year survival
- >5 cases (to exclude case reports)
- Surgical treatment data
- Hand +/- foot
- Pathology data or clinical presentation or trauma data

Exclusion:
- <5 cases
- Lower extremity only
- Treatment specific (ex. specific surgical technique, ILP only)
- Histologic, pathologic, or basic science studies with no treatment (i.e. Acral or in-situ only)
- No surgical data

Fig. 3. Attrition Search
Subungual Melanoma: A Systematic Review
Jacques A. Machol IV, MD, William W. Dzwierzynski, MD
Department of Plastic Surgery
Medical College of Wisconsin, Milwaukee, WI, USA

• Results

  • 117 sources were reviewed
  • 16 met the established review criteria\(^1,2,4,5,7-18\)

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>PMID#</th>
<th>Study Dates</th>
<th># of Patients</th>
<th>Study Design</th>
<th>Sex Male</th>
<th>Sex Female</th>
<th>Caucasian</th>
<th>Black</th>
<th>Other or Unknown</th>
<th>Population</th>
<th>Age Mean (Years)</th>
<th>Age Range</th>
<th>Follow Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cohen et al(^8)</td>
<td>2000</td>
<td>15005406</td>
<td>1992-2004</td>
<td>49</td>
<td>RR</td>
<td>18</td>
<td>31</td>
<td>59</td>
<td>1</td>
<td>6</td>
<td>NYC, NY</td>
<td>06</td>
<td>24-53</td>
<td>36 months</td>
</tr>
<tr>
<td>O'Leary et al(^4)</td>
<td>2000</td>
<td>10956699</td>
<td>1970-1998</td>
<td>33</td>
<td>RR</td>
<td>53</td>
<td>40</td>
<td>62</td>
<td>11</td>
<td>0</td>
<td>Duke, NC</td>
<td>55.4</td>
<td>10-84</td>
<td>5.2 years</td>
</tr>
<tr>
<td>Guinan et al(^3)</td>
<td>1996</td>
<td>5724488</td>
<td>1950-1994</td>
<td>38</td>
<td>RR</td>
<td>24</td>
<td>14</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>Sydney, Australia</td>
<td>59</td>
<td>33-52</td>
<td>53 months</td>
</tr>
<tr>
<td>Bridge et al(^3)</td>
<td>1996</td>
<td>7621246</td>
<td>1970-1996</td>
<td>20</td>
<td>RR</td>
<td>0</td>
<td>12</td>
<td>7</td>
<td>13</td>
<td>0</td>
<td>Cape Town, South Africa</td>
<td>51.3</td>
<td>22-79</td>
<td></td>
</tr>
<tr>
<td>Flood et al(^2)</td>
<td>1994</td>
<td>8022226</td>
<td>1971-1989</td>
<td>22</td>
<td>RR</td>
<td>12</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Buffalo, NY</td>
<td>59</td>
<td>×</td>
<td>33 months median</td>
</tr>
<tr>
<td>Knell et al(^11)</td>
<td>1994</td>
<td>5129491</td>
<td>1956-1988</td>
<td>46</td>
<td>RR</td>
<td>46</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Houston, TX</td>
<td>59.5</td>
<td>22-83</td>
<td>9.5 years median</td>
</tr>
<tr>
<td>Part et al(^6)</td>
<td>1992</td>
<td>1405623</td>
<td>1979-1989</td>
<td>100</td>
<td>RR</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Aberdeen, Scotland</td>
<td>07</td>
<td>55-93</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Bury and Briggs(^7)</td>
<td>1992</td>
<td>1623541</td>
<td>1987-1991</td>
<td>24</td>
<td>RR</td>
<td>11</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Bristol, UK</td>
<td>61.6</td>
<td>16-86</td>
<td>3 months-18 years</td>
</tr>
<tr>
<td>Hudson et al(^12)</td>
<td>1990</td>
<td>2235409</td>
<td>1970-1987</td>
<td>13</td>
<td>RR</td>
<td>7</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>Cape Town, South Africa</td>
<td>47.5</td>
<td>22-79</td>
<td>Up to 26 months</td>
</tr>
<tr>
<td>Davel et al(^9)</td>
<td>1987</td>
<td>3556557</td>
<td>1950-1975</td>
<td>33</td>
<td>RR</td>
<td>11</td>
<td>22</td>
<td>26</td>
<td>3</td>
<td>2</td>
<td>NYC, NY</td>
<td>56</td>
<td>28-59</td>
<td>8 years</td>
</tr>
<tr>
<td>Telmesten et al(^13)</td>
<td>1985</td>
<td>3995432</td>
<td>1969-1992</td>
<td>16</td>
<td>RR</td>
<td>12</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Sendai, Japan</td>
<td>56</td>
<td>30-84</td>
<td>Up to 110 months</td>
</tr>
<tr>
<td>Papadimitriou and Forre(^14)</td>
<td>1982</td>
<td>7144195</td>
<td>1956-1976</td>
<td>52</td>
<td>RR</td>
<td>25</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NYC, NY</td>
<td>65</td>
<td>28-88</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Patterson and Helwig(^15)</td>
<td>1980</td>
<td>7427913</td>
<td>Not Mentioned</td>
<td>56</td>
<td>RR</td>
<td>44</td>
<td>22</td>
<td>56</td>
<td>3</td>
<td>7</td>
<td>Washington, D.C.</td>
<td>01</td>
<td>23-95</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Webster and Scherf(^16)</td>
<td>1975</td>
<td>3654509</td>
<td>1966-1976</td>
<td>25</td>
<td>RR</td>
<td>12.50</td>
<td>12.50</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>The Netherlands</td>
<td>04</td>
<td>×</td>
<td>9 mo-10 years</td>
</tr>
<tr>
<td>Pink and O'Leary(^2)</td>
<td>1967</td>
<td>6010191</td>
<td>1932-1967</td>
<td>72</td>
<td>RR</td>
<td>32</td>
<td>40</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NYC, NY</td>
<td>57</td>
<td>27-79</td>
<td>Not mentioned</td>
</tr>
<tr>
<td>Das Gupta and Bradley(^2)</td>
<td>1965</td>
<td>PHO14089</td>
<td>1929-1964</td>
<td>54</td>
<td>RR</td>
<td>14</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NYC, NY</td>
<td>26/34 over 50 (2 below 20)</td>
<td>×</td>
<td>Not mentioned</td>
</tr>
</tbody>
</table>
Subungual Melanoma: A Systematic Review
Jacques A. Machol IV, MD, William W. Dzwierzynski, MD
Department of Plastic Surgery
Medical College of Wisconsin, Milwaukee, WI, USA

Results

• Mean age of **47.2 years** (range 10 to 96)

• M to F ratio - 1.09 to 1.00

• Caucasians were affected more than the other races (82%)

• **Incidence**: 3.03% of cutaneous melanomas (range 0.31-16%)

Fig. 4. Incidence of subungual melanoma presenting for treatment
Results

- Thumb 60% of hand cases
- Hallux 78% of lower extremity cases
- 55% presented with discoloration or nail bed lesion as their primary symptom
- 34% reported a history of digit trauma
- Average delay to diagnosis was a staggering 18.7 months (range 12-30 months)

Fig. 4. Percentage of Thumb and Hallux cases
Subungual Melanoma: A Systematic Review
Jacques A. Machol IV, MD, William W. Dzwierzynski, MD
Department of Plastic Surgery
Medical College of Wisconsin, Milwaukee, WI, USA

Results

- **4.22 mm** mean Breslow depth (range 2.1-6.1 mm)
- Clark’s level IV or V was by far the most common
- 100 of the 213 reported patients were Stage I
- 72, 33 and 8, were Stages II, III, and IV respectively
- Mitotic figures were reported in only one study
- **59%** of lesions were with ulceration
- Acral lentiginous - most common clinicopathologic variant (**57%**)

Fig. 5. Stages of Subungual Melanoma
Results

- Surgical details for 645/669 total cases found
- Amputation was the most common treatment occurring 95% of the time
- The proper level of amputation was a controversial topic among the reviewed manuscripts
- Newer studies recommended more distal amputation - IP or PIP level of amputation were most common
- Utilized 63% of the time in the hand
- MTP joint or more proximal amputation was performed most often in lower extremities (99%)

Fig. 6. Location of Digit Amputation
### Results

- The majority of studies did not specify if an upper or lower extremity was treated with a specific procedure.
- These were categorized into:
  - Amputation at or distal to the DIP/IP or
  - Amputation proximal to the DIP/IP
- After data merger, proximal amputation predominated 67% of the time.

### Results

- 30 sentinel lymph node biopsies (SLNB) were recorded.
  - 5/30 were positive.
  - All five positive biopsies underwent lymph node dissection and one was positive.
  - 241 patients had therapeutic or elective node dissections.
  - Of these, 45% had positive nodes.

---

Fig. 2. Clinical presentation of subungual melanoma as a nail streak.
Results

• No study reported surgical complications

• Local or distant recurrence was noted in 27% of cases

• Unable to elucidate the exact number of overall local versus distant recurrences from the data available

• Overall mean 5-year survival was 46% across the studies

• 5-year survival for stage I disease was 55%

• 5-year survival for stage II or greater disease was a dismal 35%
Conclusions

- Mean age across the studies 47.2 years
- Younger versus mean age of cutaneous melanoma diagnosis (61 years)\(^{22}\)
- Marked delay in diagnosis (18.7 months)
- Earlier recognition of this disease may improve survival
- Suspicious subungual lesions should be biopsied to rule out neoplastic disease (<4wks)\(^{23}\)

Conclusions

- Trauma was noted in only 1/3 of the cases
- Likely not causative of malignant changes. May increase attention to changes in the nail bed
- Exceedingly invasive disease (4.2mm), yet does not correlate with low mean stage (I or II)
- Demonstrates how obtaining a true depth is difficult
- Overall, majority of studies conclude stage as the most indicative factor of patient prognosis
Conclusions

- Continue to stage per guidelines until further studies available\textsuperscript{21}
- The current evidence \textit{does not} demonstrate improved survival with a more proximal amputation\textsuperscript{9,13}
- Recommend DIP or IP amputation for primary lesions

Conclusions

- Node dissection should be reserved for clinically positive nodes and for positive lymph node biopsy until additional data is available\textsuperscript{21}
- Future studies are required to modify the staging system for this insidious pathology
References