Impact of partial biopsies on the need for complete excisional surgery in the management of cutaneous melanomas: A multi-centre review

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CUTANEOUS MELANOMA:

- **Australia:**
  - Melanoma is the 3rd most common cancer in Australia.\(^1\)
  - ~14,000 new diagnoses of melanoma in 2017.
  - MALES = 1 in 14  -  FEMALES = 1 in 24

- **United States:**
  - ~87,000 new melanoma cases diagnosed in 2017.\(^2\)
  - MALES = 1 in 28  -  FEMALES = 1 in 44

Effective diagnosis is essential for treatment and efficient use of medical resources.

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CURRENT LITERATURE:

GUIDELINES:

Gold standard for accurate histological assessment of a suspected cutaneous melanoma is **excisional biopsy** with a 2mm margin or 1-3mm margin.

CURRENT LITERATURE:

When to consider partial biopsies?¹,²

- Lesions too large to primarily excise
- Concerns of cosmesis
- Impractical areas: palms/soles/ear/digit
- Tissue laxity / Time constraints

- SHAVE
- PUNCH
- INCISIONAL

². Microstaging accuracy after subtotal incisional biopsy of cutaneous melanoma. JAAD
CURRENT LITERATURE:

Australian Cancer Guidelines:¹
• Following melanoma diagnosis from partial biopsy, narrow excisional biopsy is recommended to plan definitive melanoma management.

Revised U.K. BAD guidelines:²
• Recommend an incisional or punch biopsy may be acceptable for facial lentigo maligna and acral melanoma.
• In general, shave biopsy should not be performed due to pathology inaccuracy.

American Academy of Dermatology guidelines:³
• If inadequate partial biopsy to make a histological diagnosis or accurately microstage, then a repeat biopsy should be performed.

2. Revised U.K. guidelines for the management of cutaneous melanoma. BJD
3. Guidelines of care for the management of primary cutaneous melanoma. JAAD
OBJECTIVE:

- Retrospective review of melanoma cases from two tertiary melanoma referral centres to assess the accuracy of partial biopsies for diagnosis and microstaging.

- To determine if partial biopsies could provide adequate information to proceed directly to definitive Wide Local Excision (WLE).
METHODS:

- Consecutive data collected from:
  - January 2013 - December 2015

- Collected from referrals from:
  - General Practitioners
  - Dermatologists
  - Surgical oncologists
  - Hospital
METHODS:

Figure 1: Cases excluded from study
RESULTS:

Table 1: Demographics and location by biopsy technique for cutaneous melanoma

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total n = 2304</th>
<th>Shave n = 455</th>
<th>Punch n = 308</th>
<th>Incisional n = 14</th>
<th>Excisional n = 1527</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>1261</td>
<td>236 (52%)</td>
<td>145 (47%)</td>
<td>10 (71%)</td>
<td>870 (57%)</td>
</tr>
<tr>
<td>Female</td>
<td>1043</td>
<td>219 (48%)</td>
<td>163 (53%)</td>
<td>4 (29%)</td>
<td>657 (43%)</td>
</tr>
<tr>
<td><strong>Age (years)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean ±SD</td>
<td>60.6±15.8</td>
<td>63.8±16.3</td>
<td>61.9±16.6</td>
<td>70.9±14.4</td>
<td>59.3±15.4</td>
</tr>
<tr>
<td><strong>Primary site</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head and neck</td>
<td>616 (27%)</td>
<td>204 (45%)</td>
<td>111 (36%)</td>
<td>9 (64%)</td>
<td>292 (19%)</td>
</tr>
<tr>
<td>Upper Extremity</td>
<td>548 (24%)</td>
<td>84 (18%)</td>
<td>52 (17%)</td>
<td>2 (14%)</td>
<td>410 (27%)</td>
</tr>
<tr>
<td>Chest / Abdomen</td>
<td>152 (7%)</td>
<td>22 (5%)</td>
<td>19 (6%)</td>
<td>0 (0%)</td>
<td>111 (7%)</td>
</tr>
<tr>
<td>Back</td>
<td>518 (22%)</td>
<td>68 (15%)</td>
<td>48 (16%)</td>
<td>0 (0%)</td>
<td>402 (26%)</td>
</tr>
<tr>
<td>Lower Extremity</td>
<td>458 (20%)</td>
<td>75 (17%)</td>
<td>75 (24%)</td>
<td>3 (21%)</td>
<td>305 (20%)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (1%)</td>
<td>2 (&lt;1%)</td>
<td>3 (1%)</td>
<td>0 (0%)</td>
<td>7 (&lt;1%)</td>
</tr>
</tbody>
</table>
**RESULTS:**

**Table 2:** Operator and biopsy T-stage by biopsy technique for cutaneous melanoma

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Total (n = 2304)</th>
<th>Shave (n = 455)</th>
<th>Punch (n = 308)</th>
<th>Incisional (n = 14)</th>
<th>Excisional (n = 1527)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinician performing biopsy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General Practitioner</td>
<td>1542 (67%)</td>
<td>216 (47%)</td>
<td>225 (73%)</td>
<td>10 (71%)</td>
<td>1091 (71%)</td>
</tr>
<tr>
<td>Dermatologist</td>
<td>400 (17%)</td>
<td>173 (38%)</td>
<td>47 (15%)</td>
<td>1 (7%)</td>
<td>179 (12%)</td>
</tr>
<tr>
<td>Surgeon</td>
<td>229 (10%)</td>
<td>24 (5%)</td>
<td>23 (8%)</td>
<td>1 (7%)</td>
<td>181 (12%)</td>
</tr>
<tr>
<td>Hospital</td>
<td>133 (6%)</td>
<td>42 (9%)</td>
<td>13 (4%)</td>
<td>2 (14%)</td>
<td>76 (5%)</td>
</tr>
<tr>
<td><strong>Biopsy T stage (mm)</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tis (<em>in situ</em>)</td>
<td>663 (29%)</td>
<td>215 (47%)</td>
<td>95 (31%)</td>
<td>4 (29%)</td>
<td>349 (23%)</td>
</tr>
<tr>
<td>T1 (≤1.0)</td>
<td>721 (31%)</td>
<td>135 (29%)</td>
<td>89 (28%)</td>
<td>2 (14%)</td>
<td>495 (32%)</td>
</tr>
<tr>
<td>T2 (&gt;1.0 - 2.0)</td>
<td>438 (19%)</td>
<td>61 (13%)</td>
<td>60 (19%)</td>
<td>5 (36%)</td>
<td>312 (20%)</td>
</tr>
<tr>
<td>T3 (&gt;2.0 - 4.0)</td>
<td>315 (14%)</td>
<td>34 (7%)</td>
<td>44 (14%)</td>
<td>1 (7%)</td>
<td>236 (15%)</td>
</tr>
<tr>
<td>T4 (&gt;4.0)</td>
<td>167 (7%)</td>
<td>10 (2%)</td>
<td>20 (6%)</td>
<td>2 (14%)</td>
<td>135 (9%)</td>
</tr>
</tbody>
</table>
Table 3: Biopsy thickness and Breslow thickness by biopsy type

<table>
<thead>
<tr>
<th>Biopsy Type</th>
<th>Biopsy thickness Median (IQR)</th>
<th>Breslow thickness Median (IQR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shave</td>
<td>2.0 (2.0)mm</td>
<td>0.8 (1.1)mm</td>
</tr>
<tr>
<td>Punch</td>
<td>3.0 (2.0)mm</td>
<td>1.2 (1.7)mm</td>
</tr>
<tr>
<td>Incisional</td>
<td>3.0 (3.0)mm</td>
<td>1.4 (3.2)mm</td>
</tr>
<tr>
<td>Excisional</td>
<td>5.0 (3.7)mm</td>
<td>1.2 (1.8)mm</td>
</tr>
</tbody>
</table>

Significant difference in initial punch and shave biopsy thickness compared to excisional biopsy (P<0.001).
RESULTS:

Figure 2: Column graph depicting proportion of initial biopsies that were upstaged post-surgical wide local excision based on biopsy type.

Odds of histopathologic upstaging were increased with punch biopsy (OR, 52.1; 95% CI, 20.5-132.4. P<0.001) and shave biopsy (OR, 20.0; 95% CI, 7.7-52.0. P<0.001) compared with excisional biopsy.
RESULTS:

- **9.4%** upstaging for desmoplastic melanomas:
  - OR 6.9 (CI 2.4-19.7. P<0.001).

- **21.9%** upstaging for acral lentiginous:
  - OR 18.4 (CI 6.9-49.2. P<0.001).

- Increased upstaging for shave biopsy with base transection compared to non-transected:
  - OR 4.2 (CI 1.5-11.5. P=0.006).
RESULTS:

Partial Biopsy

- 10/341 (3%) shave biopsies
- 12/167 (7%) punch biopsies

Excisional Biopsy

- 0/10 (0%) shave biopsies
- 4/18 (22%) punch biopsies

UPSTAGED ≤1.0mm to >1.0mm
STUDY UPSTAGING: Shave = 6%, Punch = 15%

- Supported by other studies:
  - Mills et al.\(^1\) (n=709) - 8% Shave biopsies upstaged.
    - 23% Punch biopsies upstaged.
  - Ng et al.\(^2\) (n=2470) - punch biopsy = OR 5.1 upstaging.
    - shave biopsy = OR 2.3 upstaging.

- Our upstage OR’s were much higher than Ng et al:
  - Partly related to low excisional biopsy upstage rate of 0.33% compared to a two-fold upstaging for excisional biopsy 0.70%.

2. The Impact of Partial Biopsy on Histopathologic Diagnosis of Cutaneous Melanoma. *Arch. Dermatol*
DISCUSSION:

PUNCH BIOPSY UPSTAGING > SHAVE BIOPSY UPSTAGING:

- Punch biopsy can be prone to error:
  - Superficial punch biopsies
  - Selection bias towards pigmented areas that may not reflect more deeply invasive areas of regression.
DISCUSSION:

• Performing a further biopsy post-partial biopsy allows consideration and discussion of sentinel lymph node biopsy (SLNB) in appropriate patients.

• Our data suggest that in many cases, adequate information can be provided by partial biopsies to justify proceeding directly to WLE and in some cases SLNB, potentially avoiding a further excision prior to definitive WLE.
LIMITATIONS:

- Representative population, however bias data in that thin melanomas may have only community intervention.

- Unable to determine the extent to which shave biopsies were attempted to completely remove tumour versus purely for diagnosis
  - Shave for diagnosis vs. shave excision

- Under-reporting of shave biopsy thickness due to transection of the melanoma at biopsy, potentially causing inflammation to remaining tumour.
CONCLUSIONS:

- Suggest **avoiding** punch biopsies for pigmented lesions given a high rate of upstaging.

- **Caution** for desmoplastic melanomas and acral lentiginous melanomas given their high upstage rate.

- Partial biopsy may be adequate in many cases to plan definitive surgical management, avoiding excisional biopsy but a **PROSPECTIVE STUDY** is needed to investigate these findings.
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