Nail Tumors and Their Removal

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Conflicts of Interest

Accure Medical, LLC: Tri-Founder, Tri-Owner, Member Board of Directors
Pre-Intra-Post-Op Pearls for Nail Surgery

• **Pre-Op:** Pt education, Target surgery to primary process
• **Intra-Op:** Anesthesia, Hemostasis & Suture choice
• **Peri/Post-Op:** Pain Management
Wound Care After Nail Biopsy

What Should I Do For My Nail Biopsy Site?

- Leave the dressing in place for 48 hours.
- Keep dressings dry (cover with plastic bag if need to get limb wet).
- You should return for a dressing change in 48 hours. Please schedule that appointment today.
- You should return for a follow-up visit in _______. Please schedule that appointment today.

If you choose to perform your own dressing change 48 hours after the procedure, then you should:

- Remove the dressings applied in clinic.
- If the dressing applied in clinic sticks to the wound, then soak the entire bandage in an equal mixture of hydrogen peroxide and warm water for 10-15 minutes to loosen.
- Cleanse the wound with gentle soap and water.
- Gently pat the wound and surrounding skin until dry.
- Apply petroleum jelly to wound.
- Reapply a wound dressing. Generally, a band aid is all that is required.
- Continue daily dressing changes by cleansing the skin, patting dry and reapplying petroleum jelly and bandage.
- Schedule and return for a follow-up visit with Dr. Hirshaw in two weeks.

What to Expect After Nail Biopsy

Most patients report throbbing pain in the first one to two days after biopsy that will decrease over a week. The wound will probably still be tender to the touch. The numbing medicine used will wear off in four to six hours. Many people report the finger or toe is numb until the day after surgery and sometimes even weeks after surgery, the biopsy site will still have numbness and/or tingling.

The skin under your nail will be pink with a little blood and it will be tender since it is used to having the nail adhered to it for protection.

If we put your nail back on after surgery, it will gradually fall off as it is not truly reattached but rather was replaced as a natural bandage. A new nail will grow in and replace the one that will fall off.

Call clinic if:

- You have a question or comment of any kind. We are always happy to help.
- Bleeding seems excessive. Moderate amount of bleeding or oozing will soak through gauze and this is normal.
- If the wound becomes warm to the touch or oozes pus.
- You have pain that cannot be controlled with measures listed below.

Making Your Recovery from Nail Biopsy as Comfortable as Possible

- Keep the digit elevated at least at waist height whenever possible.
- Sleep with a pillow under the hand or foot that was treated today to decrease pain.
- Keep pressure off the biopsy site for at least the first two days.
- If your procedure was performed on a toe, then wear loose fitting shoes. If the dressing that we applied today is too tight, then unwrap the outer layer of stretchy gauze and rewrap to comfort.
- Keep the wound covered with thin layer of petroleum jelly. This keeps air, water, and other irritants off of it and helps it heal faster. It is okay to stop using petroleum jelly once the wound is healed.
- We generally recommend that you take a non-steroidal anti-inflammatory or acetaminophen while your digit is still numb and then as needed unless your primary care physician has instructed you not to use these types of medications for some reason.
- You may fill the Vicodin® prescription that you were given today and take it as directed.
Pre-Op: Pt Education

- Pays dividends in time, ↓complications
- Explain entire surgery and post-op course
- Discuss risks, benefits
- Allow time to answer all questions
- Do not use epinephrine in pts with Raynaud’s
- Do not stop anticoagulants
- Verbal & written post-op care instructions before surgery
Pre-Op: Pt Education

• Reassure them that you will control their pain
• Discuss pain minimization strategies
• Analgesic choice(s)
• Offer appointment for first dressing change
• Discuss activity restrictions
Pre-Op Must-Haves

• Ensure patient questions have been answered
• Ensure patient is comfortable
• Take photographs before (and prn during)
• Distraction: music, “buzzy bee”, talkesthesia…
Your Physical Exam Guides Your Surgical Approach

Physical Exam Finding

- Longitudinal Melanonychia-with unusual features
- Onychodystrophy-single nail
- (Onychodystrophy-multiple nails, rapidly evolving)
- Erythronychia-single nail

Surgical Approaches

- Tangential shave biopsy/excision
- Lateral longitudinal excision
- Excision: matrix, bed
- (Punch biopsy: matrix, bed)
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**Physical Exam Finding**
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**Surgical Approaches**
- Tangential shave biopsy/excision
- Lateral longitudinal excision
- Excision: matrix, bed
- Punch biopsy: matrix, bed
Longitudinal Melanonychia

Reasonable Surgical Options Include

• Tangential Shave of Matrix
• Lateral Longitudinal Excision
• (partial avulsion & punch of distal matrix)

• High Risk of Inappropriate Sampling or Complication=
• punch biopsy of proximal matrix
• punch biopsy of distal matrix through plate
• nail clipping
Pearls for Tangential Shave

- Score 2mm around the lesion
- Hold scalpel horizontal to matrix surface
- Shave remove thinly the entire lesion, see blade through matrix
- Replace the nail plate for pain control and wound healing
- Suture plate in place, sutures should be snug but not tight
General Principles of Nail Surgery

- Partial avulsions
- Do not force avulsion
- Replace plate

Inspect Nail Plate and Consider Submitting the Portion over the Lesion
Nail Templates Help Keep the Specimen Flat for Processing & Interpretation
Melanoma: Surgical Updates
Retrospective cohort study
Consecutive pts undergoing bx for LM at one cancer ctr from 2000-14
42 pts, 43 biopsies reviewed
3/43 were melanoma, mean Breslow depth 2.1mm
Mean width of all lesions=4.2mm (10.7mm for malignant; 3.4 benign)
One lesion of MMIS dx and it was clinically 2mm broad (RD1 in a 47y/o F)
Mean age for malignant lesions=60; mean age for benign=58.1
Thumb, great toe most commonly involved for malignant and benign
Conclusion: “Most nail bx reveal benign histology. Although clinical and dermoscopic guidelines help guide biopsies, they should not replace clinical judgement as malignant lesions can deviate from these guidelines”
Use of Functional Surgery for Stage II NAM


- Limitations: Few patients for evaluation, limited follow-up
MMIS & Stage I MM: Functional Surgery

- Skin Cancer Unit, Dept of Dermatology (Univ. Bologna)
- NAM accounted for 2.93% of all cases of melanoma dx 1992-2012
- 66% women; mean age at dx 57.3y; 43.6% thumb, 23% great toe
- Prognosis affected by Breslow thickness ≥/<2mm (p=0.02%), ulceration (p=0.04%), & regression (p<0.0001)
- Prognosis not affected by functional surgery vs disarticulation
- Functional surgery=en bloc excision of PNF, matrix, bed, hyponychium with 6mm lateral margin and down to bone

2 pt who underwent functional surgery had recurrence
3 pts in each surgical group (6/39 pts, 15%) died of metastatic disease (median Breslow thickness=3.96mm)
Conclusion: type of surgery does not correlate to prognosis even in pts presenting with NAM Breslow 1-2mm
Breslow thickness, mitoses do correlate with prognosis

<table>
<thead>
<tr>
<th>Breslow Thickness</th>
<th>Functional Surgery</th>
<th>Amputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>≤1mm (T1)</td>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>&gt;1mm to ≤2mm (T2)</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>&gt;2 to ≤4mm (T3)</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>&gt;4mm (T4)</td>
<td>2</td>
<td>5</td>
</tr>
</tbody>
</table>

Melanoma Management 2017

- Retrospective study of 46 pts (all Caucasian) dx NAM from 1992-2014
- Aim 1: Evaluate for any initial misdiagnosis & diagnostic delay
- Aim 2: Correlate initial bx type with achievement of correct dx
Results

• Diagnostic delay occurred in 35/41 pts
• Median delay=48 months (range 16-72mo)
• Biopsy types performed inc. punch, longitudinal, tangential shave
• 1/5 punch bx were dx; 29/29 longitudinal bx dx; 3/3 tangential dx MM but Breslow “difficult and imprecise” by histopathologists
• Longitudinal biopsy recommended regardless of location of pigment
• Prognosis not altered by type of definitive surgery (functional vs amputation)

| TABLE I.—Anamnestic data on initial diagnoses and estimated diagnostic delay. |
|---------------------------------|-----------------|-----------------|
| Profession/diagnosis            | Non-dermatologist initial diagnosis | Dermatologist initial diagnosis |
| Inflammatory disease            | 75%             | 23%             |
| Benign neoplasms                | 14%             | 37%             |
| Malignant neoplasm              | 11%             | 40%             |
| Delay on diagnosis (months)     | 34-72           | 16-24           |
Retrospective study of 21 pts w/nail melanoma diagnosed 2003-13
At least 2y follow-up
13/21 were MMIS
1/21 were 0.31mm
7/21 were 1.9-12mm
Histologic parameters of ulceration, mistoses, etc. were evaluated
9/21 underwent amputation
12/21 local excision & phalangeal preservation (“functional surgery”)

Montagner S, Belfort FA, Belda Junior N, Di Chiaccio N. JAAD 2017  Epub ahead of print
### Table 1 – Characteristics of nail melanoma patients and their respective outcomes

<table>
<thead>
<tr>
<th>Patient</th>
<th>Gender</th>
<th>Age (y)</th>
<th>Site</th>
<th>Tumor Invasion</th>
<th>Surgery Performed</th>
<th>Post-surgery follow-up Time (months)</th>
<th>Outcome (NED/relapse/metastasis/death)</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>F</td>
<td>56</td>
<td>Hallux</td>
<td>MIS</td>
<td>Functional</td>
<td>28</td>
<td>NED</td>
</tr>
<tr>
<td>2</td>
<td>M</td>
<td>29</td>
<td>Hallux</td>
<td>MIS</td>
<td>Functional</td>
<td>39</td>
<td>NED</td>
</tr>
<tr>
<td>3</td>
<td>F</td>
<td>25</td>
<td>4th finger</td>
<td>MIS</td>
<td>Functional</td>
<td>114</td>
<td>NED</td>
</tr>
<tr>
<td>4</td>
<td>M</td>
<td>5</td>
<td>Hallux</td>
<td>MIS</td>
<td>Functional</td>
<td>142</td>
<td>NED</td>
</tr>
<tr>
<td>5</td>
<td>F</td>
<td>69</td>
<td>1st finger</td>
<td>MIS</td>
<td>Functional</td>
<td>175</td>
<td>NED</td>
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<tr>
<td>6</td>
<td>F</td>
<td>42</td>
<td>3rd finger</td>
<td>MIS</td>
<td>Functional</td>
<td>101</td>
<td>Relapse</td>
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<tr>
<td>7</td>
<td>M</td>
<td>59</td>
<td>Hallux</td>
<td>2.5 mm</td>
<td>Functional</td>
<td>32</td>
<td>Metastasis</td>
</tr>
<tr>
<td>8</td>
<td>F</td>
<td>49</td>
<td>1st finger</td>
<td>3.5 mm</td>
<td>Functional</td>
<td>127</td>
<td>NED</td>
</tr>
<tr>
<td>9</td>
<td>F</td>
<td>32</td>
<td>4th finger</td>
<td>MIS</td>
<td>Functional</td>
<td>42</td>
<td>NED</td>
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<td>F</td>
<td>81</td>
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<td>MIS</td>
<td>Functional</td>
<td>38</td>
<td>Relapse</td>
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<tr>
<td>11</td>
<td>F</td>
<td>47</td>
<td>Hallux</td>
<td>12 mm</td>
<td>Amputation</td>
<td>20</td>
<td>NED</td>
</tr>
<tr>
<td>12</td>
<td>F</td>
<td>68</td>
<td>4th PD</td>
<td>5 mm</td>
<td>Amputation</td>
<td>52</td>
<td>NED</td>
</tr>
<tr>
<td>13</td>
<td>M</td>
<td>49</td>
<td>Hallux</td>
<td>MIS</td>
<td>Amputation</td>
<td>118</td>
<td>NED</td>
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<tr>
<td>14</td>
<td>M</td>
<td>77</td>
<td>Hallux</td>
<td>4.35 mm</td>
<td>Amputation</td>
<td>102</td>
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<tr>
<td>15</td>
<td>M</td>
<td>39</td>
<td>Hallux</td>
<td>0.31 mm</td>
<td>Functional</td>
<td>38</td>
<td>NED</td>
</tr>
<tr>
<td>16</td>
<td>M</td>
<td>49</td>
<td>Hallux</td>
<td>MIS</td>
<td>Amputation</td>
<td>116</td>
<td>NED</td>
</tr>
<tr>
<td>17</td>
<td>M</td>
<td>62</td>
<td>Hallux</td>
<td>MIS</td>
<td>Amputation</td>
<td>26</td>
<td>NED</td>
</tr>
<tr>
<td>18</td>
<td>F</td>
<td>56</td>
<td>1st finger</td>
<td>MIS</td>
<td>Functional</td>
<td>28</td>
<td>NED</td>
</tr>
<tr>
<td>19</td>
<td>F</td>
<td>65</td>
<td>Hallux</td>
<td>2.65 mm</td>
<td>Amputation</td>
<td>28</td>
<td>Death</td>
</tr>
<tr>
<td>20</td>
<td>F</td>
<td>69</td>
<td>4th finger</td>
<td>MIS</td>
<td>Functional</td>
<td>103</td>
<td>NED</td>
</tr>
<tr>
<td>21</td>
<td>F</td>
<td>67</td>
<td>5th finger</td>
<td>MIS</td>
<td>Functional</td>
<td>63</td>
<td>Metastasis</td>
</tr>
</tbody>
</table>

NOTA: F: female; M: male; T: toe; F: finger; R: right; IST: melanoma *in-situ*; NED: no evidence of disease.
Descriptive survival study of nail melanoma patients treated with functional surgery versus distal amputation

- 2/12 that underwent functional surgery relapsed
- One at 11 mo & one at 77 mo one as MMIS and had repeat functional surgery and one as invasive and underwent amputation both are free of disease at 4 and 5y post-op
- Another pt who underwent functional surgery has metastatic disease at 18 mo to inguinal nodes and is undergoing treatment
- 2 that underwent amputation had metastasis one to mediastinal nodes at 24 mo & is being treated; 1 had lung mets 26 mo post op and DOD 2 mo later
- Conclusion: This study confirms other reports that the surgical approach and histologic features do not affect prognosis in nail unit melanoma.
2017 Melanoma Surgical Update

- Retrospective study, 2000-2013, 151 Japanese pts, 83M:68F
- Aims: Determine prognosis of NAM
- Determine rates of local control & overall survival according to the extent of resection of 1° tumor

Clinical report

Nail apparatus melanoma in a Japanese population: a comparative study of surgical procedures and prognoses in a large series of 151 cases

*Background:* Nail apparatus melanoma (NAM) is a rare subtype of
Results

• Hallux 36.4%, Thumb 33.1%
• No local recurrences after any of the surgical approaches
• Surgical procedure type does not influence survival as long as total primary tumor resected
• Prognosis similar to other types of MM

<table>
<thead>
<tr>
<th>Tumour thickness</th>
<th>Count (%)</th>
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<tr>
<td>in situ</td>
<td>30 (19.9%)</td>
</tr>
<tr>
<td>≤1.0 mm</td>
<td>21 (14.0%)</td>
</tr>
<tr>
<td>1.01-2.0 mm</td>
<td>15 (10.0%)</td>
</tr>
<tr>
<td>2.01-4.0 mm</td>
<td>30 (19.9%)</td>
</tr>
<tr>
<td>≥4.01 mm</td>
<td>52 (34.4%)</td>
</tr>
<tr>
<td>NA</td>
<td>3</td>
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</table>

<table>
<thead>
<tr>
<th>Bone invasion</th>
<th>Count (%)</th>
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<tbody>
<tr>
<td>Present</td>
<td>22 (15.0%)</td>
</tr>
<tr>
<td>Absent</td>
<td>127 (84.1%)</td>
</tr>
<tr>
<td>NA</td>
<td>2</td>
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<table>
<thead>
<tr>
<th>Stage</th>
<th>Count (%)</th>
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</thead>
<tbody>
<tr>
<td>0</td>
<td>30 (19.9%)</td>
</tr>
<tr>
<td>I A</td>
<td>16 (11.0%)</td>
</tr>
<tr>
<td>I B</td>
<td>9 (6.0%)</td>
</tr>
<tr>
<td>II A</td>
<td>14 (9.3%)</td>
</tr>
<tr>
<td>II B</td>
<td>17 (11.3%)</td>
</tr>
<tr>
<td>II C</td>
<td>20 (13.2%)</td>
</tr>
<tr>
<td>III A</td>
<td>4 (2.6%)</td>
</tr>
<tr>
<td>III B</td>
<td>15 (10.0%)</td>
</tr>
<tr>
<td>III C</td>
<td>19 (12.6%)</td>
</tr>
<tr>
<td>IV</td>
<td>7 (4.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>151 (100%)</td>
</tr>
</tbody>
</table>

*In situ cases were excluded. PFS: progression-free survival; OS: overall survival; WLE: wide local excision; NA: not available.*
Your Physical Exam Guides Your Surgical Approach

Physical Exam Finding
- Longitudinal Melanonychia-with unusual features
- Onychodystrophy-single nail
- Onychodystrophy-multiple nails, rapidly evolving
- Erythronychia-single nail

Surgical Approaches
- Tangential shave biopsy/excision
- Lateral longitudinal excision
- Excision: matrix, bed
- Punch biopsy: matrix, bed
Onychodystrophy: Single Nail

Reasonable Surgical Options Include

- Partial avulsion of plate with either shave, punch, or incisional bx
- Partial avulsion of plate with excision
- High Risk of Inappropriate Sampling or Complication=
- Punch through plate
Single Nail Dystrophy: Nail Tumors
67 y/o R Handed Guitar Player
What Is Your Preferred Surgical Approach?

A. Excision
B. Tangential shave of matrix
C. Punch biopsy of bed
D. Nail matrix/bed excision
E. None of the above
Single Nail Dystrophy

- 63y/o otherwise healthy male
- Asymptomatic lesion of R 2\textsuperscript{nd} finger nail unit
- Present approximately 1.5 years
- Presenting now because lesion catching on clothing, etc.
Digital Fibromyxoma

- 80% poorly margined
- 86% with alternating fibrous and myxoid areas, 11% predominantly fibrous, 3% pred. myxoid
- IHC=CD99+ in 84% (11/13), CD34+ in 69% (42/61), EMA+ in 7.5% (3/40)
- IHC=S100- (0/66), MUC4- (0/11), AE1/3-(0/4)
- Risk of recurrence after incomplete excision=24%
- Pain, deformity may induce complete excision
- Mean follow-up 34 months, no metastases

Single Nail Dystrophy

- 23y/o o/w healthy F
- 1.5 year history of right toe onychodystrophy and painful callus
- Started as ingrown nail s/p phenolization
- Since then part of nail has regrown, catches on things
- Callus refractory to urea, pumice
Subungual Exostosis

- Benign bony tumor, painful
- Etiology unknown-trauma
- Toes (hallux 75%, distal, dorsal) > fingers, F > M
- May be associated with onychomycosis, onycholysis that distract from the dx
Non-Surgical Removal: Pyogenic Granuloma

- Reactive neoplasia of small caliber vascular channels
- Post-traumatic, peripartum, EGFR inhibitors, iatrogenic
- May be difficult to clear
- Besides removal for diagnosis, silver nitrate (risk of tattoo), cautery or laser (risk of scar particular in matrix), consider timolol
Evidence

- Topical beta blocker for PG first described 2016 by Piraccini
- Case series 10 pts on EGFR inhibitors or capecitabine Rx with timolol 0.5% gel BID x 1 month, graded 1-3 for resolution of lesion, pain, bleeding. 9/10 had complete resolution.

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- **Pre-Op:** Pt education, Target surgery to primary process
- **Intra-Op:** Anesthesia, Hemostasis & Suture choice
- **Peri/Post-Op:** Pain Management
Intraoperative: Anesthesia
Anesthesia

- Digital blocks (traditional vs wing (distal; infiltrative) vs palmar (D2-4))
- Some evidence that the subcutaneous variation of palmar block (3mL into subq not tendon sheath) has less post-op pain than transthecal, less theoretical risk tendon inflammation/infection/trigger finger

<table>
<thead>
<tr>
<th>Anesthetic</th>
<th>Onset</th>
<th>Duration without Epinepherine</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Lidocaine</td>
<td>&lt;1 min</td>
<td>30-120 min</td>
<td>Vasodilating</td>
</tr>
<tr>
<td>Bupivacaine</td>
<td>2-5 min</td>
<td>120-240 min</td>
<td>Longer duration</td>
</tr>
<tr>
<td>Ropivacaine</td>
<td>1-15 min</td>
<td>120-360 min</td>
<td>Vasoconstricting, less cardiotoxic than bupivicaine</td>
</tr>
</tbody>
</table>

Nail Surgery Hemostasis Pearls

- Do not stop anticoagulants
- Generally do not need chemical nor cautery
- Use pressure
- Use volumetric anesthesia
- OK to use aluminum chloride
- Cautery carries significant risk of scar
Intraoperative: Suture Choice

- “Controversy remains around treatment of pediatric nail bed injuries”
- Online survey of plastic and orthopedic surgeons in UK + retrospect audit of nail bed surgeries at 4 plastic surgery units in UK + survey of parents of children s/p nail bed injury
- 73 plastic surgeons + 43 ortho surgeons responded
- 84% routinely repair nail bed, 16% do not
- Most common repair = simple interrupted (85%) w/vicryl Rapid (83%)
- 96% replace nail plate, 4% generally discard it

Pre-Intra-Post-Op Pearls for Nail Surgery

• **Pre-Op**: Pt education, Target surgery to primary process
• **Intra-Op**: Anesthesia, Hemostasis & Suture choice
• **Peri/Post-Op**: Pain Management
Post-Surgical Pain Medication by Surgery

**Surgery**
- Avulsion *
- Phenolization *
- Biopsy *
- Shave excision **
- Fusiform longit. excision **
- Lat longitudinal excision***
- Flaps ***
- Nail Unit Graft ***

**Pain Medication**
- *=APAP or NSAIDS
- **=T3 or other mild opioid
- ***=morphine and its derivatives

Post-Surgical Pain Management

- Keep limb elevated
- No unnecessary activity with the limb while digit anesthetized
- Once anesthesia begins to wane then take po pain medication
- And take pain medication before bed
- Plan for a restful 24 hours after surgery
- If digit throbbing it could be the bandage is too tight, loosen it
- Activity thereafter: “let pain be your guide”
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Thank you!
Molly Hinshaw, MD
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