Mohs surgery for the nail unit

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Dermatologic surgery, Mohs surgery and lasers unit

CHU Bordeaux, France
• Squamous cell carcinoma +++
• Acral lentiginous melanoma
  

• Glomus tumor
Nail unit is a rare target for SCC

Misdiagnosis is common

But SCC is the most frequent primary malignant tumor of the nail apparatus

Bowen’s disease

Wart
A retrospective study of squamous cell carcinoma of the nail unit diagnosed in a Belgian general hospital over a 15-year period

Pauline Lecerf, MD, Bertrand Richert, MD, PhD, Anne Theunis, MD, and Josette André, MD
Brussels, Belgium

- 58 cases between 1995 to 2011
- Mean age of diagnosis: 60 yo
- Male predominance (72.5% of cases)
- Hand > Foot

Table I. Clinical and pathological data

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>No. of patients</td>
<td>51</td>
</tr>
<tr>
<td>No. of SCCnu</td>
<td>54</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male: 37 (72.5%)</td>
<td></td>
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<tr>
<td>Female: 14 (27.5%)</td>
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<tr>
<td>Age</td>
<td>60.8 y (21-83 y)</td>
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<tr>
<td>Location</td>
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<tr>
<td>Foot: 1</td>
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<tr>
<td>Hand: 53</td>
<td></td>
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<tr>
<td>Right hand: 33 (62.3%)</td>
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<tr>
<td>Left hand: 20 (37.7%)</td>
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<tr>
<td>Pathological findings</td>
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<td>Location within nail apparatus</td>
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<tr>
<td>Nail bed: 31 (57.4%)</td>
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<tr>
<td>Periungual area</td>
<td></td>
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<td>(folds and grooves): 17 (31.5%)</td>
<td></td>
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<tr>
<td>Both (nail bed and periungual area): 6 (11.1%)</td>
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<tr>
<td>Degree of invasion</td>
<td></td>
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<tr>
<td>In situ: 34 (63%)</td>
<td></td>
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<tr>
<td>Microinvasive: 3 (5.5%)</td>
<td></td>
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<tr>
<td>Invasive: 17 (31.5%)</td>
<td></td>
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<tr>
<td>Depth of invasion</td>
<td></td>
</tr>
<tr>
<td>1.5-8 mm</td>
<td></td>
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<tr>
<td>Osteolysis on x-ray</td>
<td>1/14 cases (7%)</td>
</tr>
</tbody>
</table>

SCCnu, Squamous cell carcinoma of nail unit.
Tumors are located usually on the dominant hand and the middle fingers are at highest risk.

Functional issue +++
• Tobacco represents a significant risk factor, particularly when compared to a control adult population (p < .01).

Tobacco smoking is cofactor of HPV +++ (cervical neoplasia)
Nail unit SCC: a distinctive type that differs from other variants?

- Very slowly growing tumor
- In situ +++ (Bowen’s disease)
- But BD behaves more aggressively in the nail tissues and displays focally features of invasive SCC
- Invasive SCC is less likely to metastasize than other sites
• Currently, no standardized approach to therapy for SCC has been established.

Mohs micrographic surgery: a gold standard?
- Achieve high cure rates
- Spare uninvolved skin
- But no comparative trial has been published

Several features must be pointed out to propose optimal treatment.
1- Extent and location of the SCC  (median or lateral part)

- SCC develops usually from the epithelium of the lateral nail fold with a progressive periungual involvement

Typical erythematous scaly or verrucous plaque
1- Extent and localization of the SCC
( median or lateral part)

Then extension to the nail bed and matrix and when matrix is involved there is frequently a pigmented nail streak before nail plate dysrophy
1- Extent and localization of the SCC (median or lateral part)
1- Extent and localization of the SCC (median or lateral part)

- Erythronychia is a manifestation of BD and suggests a localized medial involvement from the matrix to the hyponychium
1- Extent and localization of the SCC

( median or lateral part)

Subungual involvement presents with onycholysis and when clipping away the nail plate there is frequently an oozing tumor
2- Depth of the SCC

Ulceration, bleeding, nodule formation or pain

Invasive SCC

X ray or MRI if possible
2- Depth of the SCC

- Evaluation of the depth of the tumor in the biopsy specimen
- In the study of Dalle et coll, the depth of the initial tumor was > 1 mm in all the recurrent cases

Biopsy: amelanotic ALM 10 mm
3- Presence of Papillomavirus

- HPV are implicated in induction of subungual SCC especially in immunocompromised patients
- Clinical and histological continuum between warts and SCC in these patients
- Careful evaluation is required
- In the study of Alam, 26% of recurrence rate in 21 patients treated by MMS (vs 13%)

*Human papillomavirus-associated digital SCC.*
*Alam et al J Am Acad Dermatol 2003*
Is there any place for distal phalanx amputation?

Owing to its frequent superficial spreading and finger nail location, conservative and functional treatment should always be considered even in microinvasive or invasive SCC.
Digital amputation

- In case of preoperative evidence of bone infiltration (X-Ray, MRI)
- If deep margin after wide surgical excision is invaded
- And sometimes in case of exophytic or extensive soft tissue involvement
Can non surgical procedures be proposed?

Only for limited and superficial tumor
Dont provide histological control +++

For those who hate surgery !!! At their own risks…
• BD have been treated by curettage or electrodesiccation in a very few selected cases

Coskey et al Arch Dermatol 1972; 106:79-80

• The use of 5 FU + keratolytic agent has been effective in one case of BD of the nail bed

(although follow up was only one year)

Carbon dioxide laser ablation


• 5 patients with BD of the distal digit 2 of whom had involvement of the nail unit

• One of these patients developed recurrence after 5 months, the other was clinically clear of BD (only one year of follow up)
Photodynamic therapy

• May have an additional role as it has been shown to be an effective treatment for common viral warts and could reduce any remaining high-risk HPV infected tissue


• 66 year old man treated with 2 cycles of topical ALA-PDT 1 month apart.

• Nail plate was avulsed under ring block local anesthesia 2 days before PDT to allow access to nail bed and matrix tissue

• 20 % ALA emulsion was applied on nail bed for 4 hours then irradiation was performed with a red light under local anesthesia
The nail regrew normally and 30 months after treatment there was no clinical evidence of recurrence.
Imiquimod

• Acts as an immunomodulator due to its capacity to induce cytokine production, effectiveness in periungual warts has been showned in one open trial

  *Micali G et al J Dermatol Treat 2003*

• But in only 2 cases of Bowen’s disease of the nail: 1 case with HPV 73 and on a recurent case (1/day

  *Weisenseel P et al Hautarzt 2006*

  *Lafitte et al Ann Dermato Venereol 2003*

• Should be considered as un adjuvant treatment in case of HPV associated SCC
What is the place for Mohs Micrographic surgery?
Mohs Micrographic surgery

- MMS has been evaluated for subungual BD and SCC and provides a high cure rate (96% in 80 cases in *Zaiac Dermatol surg 2001*)

**CASE SERIES**

Mohs’ micrographic surgery as treatment for squamous dysplasia of the nail unit

Lauren Cordella Young, Alana Jane Tuxen and Greg Goodman

*Skin and Cancer Foundation, Melbourne, Victoria, Australia*

- 14 patients traités
- 13 cicatrisation dirigée
- 78% de rémission complète
• Review the long-term outcome of patients affected by SCC who underwent MMS
• 63 cases/ 43 MMS (2005-2012, in Bologna):
  – Micro-invasive SCC: 5 cases
  – In-situ SCC: 7 cases
  – Invasive SCC: 45 cases
• 43 patients underwent MMS
  – 36 patients: no bone involvement; clear of tumor after 1 to 4 sessions
  – 5 patients: tumor cells seen at the periostium level > curetage and careful follow-up
  – Bone involvement: disarticulation
  – Healing by secondary intention in the majority of cases
  – Recurrence rate: 3.5%
• MMS allows the evaluation of periostal invasion
• MMS does reduce the number of unnecessary amputation
• A decision to amputate should be performed after failure of MMS to clear the tumor
• 35/42 treated by MMS
• Recurrence rate: 9%
• 2 main growth pattern:
  – in the lateral sulcus, SCC tend to invade deeply and proximally requiring extensive and soft tissue excision. Extension follows the lateral phalanx intimately associated with the bone but usually without direct invasion
  – Over the midline, tumors (invasive or in situ) grows downward toward the dorsal phalanx and required removal of the periostum to clear the tumor
Mohs Micrographic surgery: limits

- The nail is a very challenging location for Mohs surgery because of its unique anatomical and histological characteristics.
- Difficult to obtain a good horizontal section.
- Those horizontal sections don’t provide a good evaluation of the depth of the tumor.
Mohs Micrographic surgery: limits

• Moreover, complete extirpation of the SCC cannot ensure the elimination of HPV for the area of the tumor or its surroundings.
• At last, conservation of a small part of nail is often found to be a poor benefit to the patient.
Squamous cell carcinoma biopsy X-Ray +/- MRI

Bone invasion

Deeply Invasive SCC
Digital amputation

No bone invasion

Micro- invasive or in situ SCC
Functionnal TTT

Limited excision
Tr lateral and < 50% nail
Recurrence 56%
but No control of the margin

Complete avulsion of the nail apparatus
Tr median or > lateral 50%
Recurrence 5%

Delay of recurrence ranging from 6 to 36 months

In situ SCC, micro invasive or invasive SCC without bone alterations

- Mohs frozen sections or 3 dimensional histology
Do we need to perform nail plate avulsion before mohs micrographic surgery for malignant tumors of the nail unit?

Frozen sections for nail surgery: avulsion is unnecessary
Jellinek NJ, Cordova KB

“En bloc” excision as it is done for lateral longitudinal nail biopsy. Nail plate is previously softened by soaking the digit for at least 15 minutes. The tissue is laid flush so that the plate and attached bed and matrix epithelium are mounted en face.

Yes for limited lateral in situ SCC
Preserve superficial epithelial layers of the nail bed ans allows an entire surgical margin examination
TAKE HOME MESSAGE

1. SCC is one of the most frequent malignant tumor of the nail (in situ ++)
2. Functionnal Surgery is the gold standard even for invasive SCC
3. Distal amputation for advanced SCC or with bone invasion
4. Complete ablation of the whole nail apparatus is better in case of medial or large tumor with good cosmetics results
5. Limited excision with histological control of the margin in case of limited tumor
6. Imiquimod should be evaluated in case of HPV associated SCC
Thank you for your attention

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