<table>
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<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker</th>
<th>Moderator</th>
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<tr>
<td>09:00-09:25</td>
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<tr>
<td>09:20-09:30</td>
<td>Opening</td>
<td>林揚志 醫師</td>
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<tr>
<td>09:30-10:20</td>
<td>如何用排除法來提高甲癣臨床診斷率</td>
<td>王銘燦 醫師</td>
<td>劉漢南 醫師</td>
</tr>
<tr>
<td>10:20-11:10</td>
<td>The Nail Surgery</td>
<td>林揚志 醫師</td>
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<td>11:10-11:30</td>
<td>Break</td>
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<td>11:30-12:00</td>
<td>What’s new in Nail Disorders - from 2014 AAD Meeting</td>
<td>葉呈廷 醫師</td>
<td>林揚志 醫師</td>
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<td>12:00-13:00</td>
<td>Lunch</td>
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<td>13:00-13:50</td>
<td>The Interesting or Difficult Cases for Nail Disease</td>
<td>廖怡華 醫師</td>
<td>楊志勳 醫師</td>
</tr>
<tr>
<td>13:50-14:40</td>
<td>皮膚鏡在指甲疾病上的應用</td>
<td>邱成澤 醫師</td>
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<td>14:40-15:00</td>
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<td>15:00-15:50</td>
<td>Pincer Nail Deformity: Cause, feature and therapeutic response to elastic wire (鏘狀甲: 成因及治療經驗分享)</td>
<td>曾德朋 醫師</td>
<td>廖怡華 醫師</td>
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## Curriculum vitae

<table>
<thead>
<tr>
<th>Name</th>
<th>MING-TSAN WANG</th>
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<tbody>
<tr>
<td>Date of Birth</td>
<td>October 3, 1958</td>
</tr>
<tr>
<td>Place of Birth</td>
<td>Tainan, Taiwan</td>
</tr>
<tr>
<td>Gender</td>
<td>Male</td>
</tr>
<tr>
<td>Nationality</td>
<td>Taiwan R.O.C.</td>
</tr>
<tr>
<td>Contact Address</td>
<td>129, Min-Sheng 2nd Road, Kaohsiung 807, Taiwan, R.O.C.</td>
</tr>
<tr>
<td>Telephone</td>
<td>886-7-2618500</td>
</tr>
<tr>
<td>E-mail</td>
<td><a href="mailto:mtswang@seed.net.tw">mtswang@seed.net.tw</a></td>
</tr>
</tbody>
</table>

### Education & Appointments
1. M.D., Kaohsiung Medical College, Kaohsiung, Taiwan. [1977-1984].
2. M.S., Graduate Institute of Medicine, Kaohsiung Medical College, Kaohsiung, Taiwan. 1988-1991
4. Resident, Department of Dermatology, Kaohsiung Medical College Hospital, Kaohsiung, Taiwan. 1986-1990
5. Chief, Department of Dermatology, Kaohsiung Municipal Ta-Tung Hospital, Kaohsiung, Taiwan. 1990-1999
6. Adjunct Lecturer, Department of Dermatology, Kaohsiung Medical College, Kaohsiung, Taiwan. 1991-2001
7. Fellowship, Department of Dermatology, School of Medicine, University of California, San Francisco, USA. 1997
8. President, Wang Ming-Tsan Dermatological Clinic, Kaohsiung, Taiwan. [1999-present]
9. Member of Council, The Chinese/Taiwanese Dermatological Society, Taipei, Taiwan. [1999-present]

### Honors

### Professional activities

### Publications
甲癣的診斷是靠

1. 典型的臨床症狀
2. KOH(+) 或 fungal culture

KOH陽性率低，加上基層醫師幾乎都不做KOH檢查，fungal culture更不必說，連醫學中心都少做。所以甲癣的診斷，幾乎都靠「臨床症狀」來下診斷。
Fungal Culture 採樣

指甲有一「半透明的片狀物」如半透明壓克力板，呈現顏色是緊貼其下物質的顏色。

壓克力板受外力會霧掉，變色。若夾雜其他物質會呈現不同顏色。

皮膚長期摩擦會增厚，指甲經常奇摩擦同樣會角化。

所以今天嘗試以另一個角度來提高甲癬的診斷率。

雖然無法確定誰是敵人，但可把「是朋友」的排除掉。可提高診斷率。

那就是把邏輯上不合理、發生機率低的症狀排除，篩選後剩下的趾(指)甲病變，當然就有較高的比率是甲癬。

但何謂「典型的臨床症狀」，卻是一個更棘手的問題。

大多數醫師以趾(指)甲變厚 (hyperkeratosis) 及變色來做診斷依據。

颱風會刮風下雨，但刮風下雨不一定是颱風。亦即有許多疾病，趾(指)甲會變厚 (hyperkeratosis) 及變色。
甲癣是皮肤被黴菌感染一段時間後，才進而侵犯趾(指)甲。故一般來說先罹患一段時間的足癬後才會得到「趾甲癬」，罹患一段時間的手癬後才會得到「指甲癬」。
Standard microscopy of a normal nail

**DLSO**

- Standard microscopy of a normal nail showing two major different structures, namely, the outer and inner portions.
Proximal subungal onychomycosis (PSO)

即使 is white superficial onychomycosis (WSO) 毛菌易是從表面侵入趾(指)甲板，在趾(指)甲板上層繁殖，同様並不破壞 nail surface.
屬於nail surface 的趾(指)甲疾病。
包括：

- longitudinal lines
- herringbone nails
- transverse lines
- pitting and rippling
- trachyonychia (rough nails)
- onychoschizia (lamellar splitting)

*longitudinal lines* 妥善利用光源

![Figure 8.9](image)

*Schematic drawing of nail invasion in PSO.*
Longitudinal lines – old age
“sausage link’ appearance

herringbone nails

Transverse lines
1st趾 特長  Transverse lines

Trachyonychia (rough nails)

Onychoschizia (lamellar splitting)

重點：
當趾(指)甲 表面 看起來或摸起來有問題時，宜排除甲癬的診斷。
Subungual hyperkeratosis

Subungual hyperkeratosis is one of the symptoms of nail disease, but it is not to diagnose nail disease. The infection can cause the nail to become thick and weak and the structure is also damaged, leading to splitting (onycholysis), which is different from the tightly packed Subungual hyperkeratosis.
締實緊密趾(指)甲末端變厚

- 締實緊密趾(指)甲末端變厚，要考慮的疾病是：
  - pincer nail (末端變窄變高)
  - repeated minor trauma caused by footwear
    - 第2趾較長
    - 喜歡打網球、籃球學生左足第2趾甲

Pincer Nail
第2趾 較長

第2趾甲 角化増厚
重點：

・紮實緊密的Subungual hyperkeratosis，宜排除甲癬的診斷。

・用指甲摳一摳增厚的趾甲，級可區分病灶是紮實緊密，還是鬆、脆。

Onycholysis

・Onycholysis是甲癬症狀之一，但不是看到Onycholysis就要診斷甲癬。

・尤其手指甲呈現潔白、乾淨的Onycholysis，常是潔癬，self-inflicted、prolonged immersion in water with detergents，不宜診斷甲癬。
Onycholysis
重點：

- 潔白、乾淨的Onycholysis，宜排除甲癬的診斷

趾甲末端的寬度

- 趾甲末端的寬度不宜有改變，當趾甲末端的寬度變窄，弧度過彎，有時合併中間hyperkeratosis，或兩邊緣陷入趾頭，應考慮pincer nail。
重點：

- 趾甲末端的寬度變窄，弧度過彎，宜排除甲癬的診斷

快速簡報：

- 甲癬黴菌雖會侵犯趾(指)甲及皮膚，一般趾(指)甲周邊皮膚應無明顯變化

- cuticle 消失，出現 potential space，趾(指)甲有橫溝 → paronychia

- post. nail fold 增厚、坡度變陡，合併趾(指)甲變形 → onychotillomania

- 趾頭末端皮膚角化，合併 subungual hyperkeratosis → repeated minor trauma

- (皮膚會 tylosis，趾甲也會 hyperkeratosis)
Paronychia

Onychotillomania

post. nail fold增厚、坡度變陡，合併趾(指)甲變形

Onychotillomania

Central longitudinal grooved dystrophy – self induced
*2nd toe* 特長（趾頭末端皮膚角化）

Brachyonychia – Nail biting

*2nd toe* 外力

Onychomadesis – Nail shedding
Local inflammation – acute paronychia

Table 4.2 Causes and associations of nail shedding

Local inflammation, e.g. acute paronychia (Figures 4.7-4.12)
Kawasaki syndrome
Fever/systemic upsets
Syphilis
Bullous dermatoses, e.g. pemphigus
Stevens-Johnson syndrome
Lyell’s syndrome (Figures 4.7-4.9)
Drugs
Cytotoxics
Antibiotics
Retinoids
Keratosis punctata
Local trauma
X-irradiation
Acrodermatitis enteropathica
Hyopoparathyroidism with amelogenesis imperfecta
Yellow nail syndrome

Local trauma – 被踩到
Onychomadesis

Onychomadesis

Onychomadesis $\Rightarrow$ Pterygium
Discoloration

Nail shedding

Hyperkeratosis

- 鞋子太緊
- 趾頭太長
- 爬山
- 長時間行走、逛街
- 出國旅遊
- 運動時特殊姿勢
  - 籃球
  - 網球
爬山穿很寬鬆的鞋，左足在前

爬柴山，下山時，趾頭很痛

學生喜歡打網球、籃球
左足第2趾甲

日本求學
學校在山上 上下學 上坡下坡
打籃球 右足在前 跳投

長時間摩擦 撞擊：趾甲 角化增厚 橫紋

籃球 左足在前

提高甲癬診斷

✦ 病史
✦ 詳細檢查趾(指)甲病灶周圍皮膚的變化
✦ 整體評估雙足雙手的變化
用數位相機記錄投藥後反應

 Berm 由數位相機的紀錄，前後一個月照片的對照比較，可明顯看出病灶是否有改善。若沒改善
→ 換藥。

 Berm 若換藥後仍沒改善 → 那您的武功就更上一層，自我學習成長，了解這種 picture 不是甲癬，
以後不需投與口服抗黴菌，雖不知正確答案，
但至少病人不必白吃三個月口服藥，節省健保
資源，也是功德一件。

只有認真觀察，認真記錄，才能
精進醫術，共勉之

沒把握的個案拍照或劃線

謝謝您的聆聽
# CURRICULUM VITAE

**Name**: Chih Lin, M.D. 林揚志

**Address**: Office 92, Sec.2. Chungshan North Road, Taipei 104, Taiwan

**Personal Position**: Attending doctor, Department of Dermatology, Mackay Memorial Hospital, Taipei. Associate Professor, Lee Ming Technological College

**Education**: 1978-1985, Chung San Medical University, Taipei, Taiwan. M.D.

## Post graduate training

- **1985-1989** Resident and Chief Resident, Dermatology.
- **1988** Observer in College of Physicians and Surgeons of Columbia University, New York

## Hospital Appointment

- **1989-1990** Chief, section of Dermatology, Mackay Memorial Hospital, Taiton Branch
- **1990**- present Attending Doctor, Dermatology, Mackay Memorial Hospital, Taipei
- **2003-2007** Chief, section of Dermatology, Mackay Memorial Hospital,

## Professional Membership

- **1988 - present** Chinese Dermatological Society, Taipei
- **1999 - present** American Academy of Dermatology
- **2000 - 2011** Director of Taiwan Dermatology Society
- **2002 – present** Lecturer board
- **2010 – present** Assistant professor board

## Special Field of Interest

1. Nail disorder
2. Cosmetic and Laser dermatology
3. Cosmeceuticals
Nail Surgery

Preoperatives examination:
- History
- Clinical examination
  - All 20 nails
  - mucous membranes
  - skin and hair
- Laboratory
  - X-ray
  - mycology, microbiology

Preoperatives examination II:
- Explanation:
  - possibility of permanent dystrophy
  - possibility of no diagnosis
  - Length of time for nail to regrow
  - Bleeding, infection as with any surgery
- Photographs

Prerequisites for Nail Biopsy
- Understanding of anatomy and physiology
- Proper patient selection and preparation
- adequate anesthesia
- Hemostasis
- A nail condition that has eluded diagnosis by routine clinical inspection, history, radiologic and microbiologic techniques
- A dermatopathologist familiar with nail unit
Anatomy of the Nail Unit:

- Damage to matrix has potential to permanently scar the nail.
- A biopsy of the distal matrix less likely to result in scar.
- There is no subcutaneous tissue in the nail unit and the periostrium lies beneath the nail unit.

Blood supply and Hemostasis

- The tourniquet not be left in place for more than 15 minutes.
Anesthesia

1. Digital block: 2cc lateral base of digit.

2. Wing block: small volume, more rapid, cause blanching, facilitates hemostasis
Anesthesia II

Use of medications: coumadin, sacilylate

- Medical history: DM, peripheral vascular disease.
- Connective tissue disease,
- Prosthetic valves and joints.

Instrument

- Spatula
- Double action nail nipper (bone rongeur)
- The English nail splitter
- Free septum nail elevator
Dental spatula

Free septum elevator

Types of Nail Biopsy

By Sites
- nail bed biopsy
- nail fold biopsy
- nail matrix biopsy

1. excision biopsy
2. punch biopsy
3. longitudinal nail biopsy
Nail fold biopsies are similar to elsewhere on skin, a free elevator inserted under the nail fold to protect the underlying matrix. The nail fold heals by secondary intention.

Nail bed disorder and clinical feature I

Malignant, pre-, transitional tumors
- SCC, Bowen’s disease
- BCC
- melanoma
- kaposi’s sarcoma
- metastatic sarcoma
- keraoacanthoma

Clinical nail findings
- hyperkeratosis, dyschromia, onycholysis, destruction of nail
- rare, variable appearance
- pigmentation, erosion, destruction of nail plate, 25% amelanotic
- pigmentation, elevation, destruction of nail plate.
- Mass, pseudo-clubbing, dystrophy, dusky red color, with or without pain.
- Multiple or solitary, nail plate destruction. Mass erosion, granulation tissue, with or without pain.

Nail bed disorder and clinical feature II

Benign tumors
- enchondroma
- glomus tumor
- exostosis
- osteochondroma
- Pyogenic granuloma
- epidermal cyst
- fibroma

Clinical nail findings
- mass, alteration of nail plate, pain
- spontaneous pain, blue red mass
- mass, elevation of plate, tender, may see secondary infection
- enlargement of digit, elevation or destruction of the nail plate
- exuberant friable mass, needs to be DD from amelanotic melanoma
- mass, nail plate deformity
- mass, elevation, distortion of the nail
Nail bed disorder and clinical feature III

Infection
- onychomycosis
- warts
- subungual scabies
- inflammatory dermatosis
- psoriasis
- lichen planus
- other nail bed conditions
- hemorrhage trauma.

Nail Bed Biopsy
- Usually avulsed prior to remove specimen
- a larger punch for the nail plate and a smaller punch for nail bed specimen.
- Elliptical excision oriented in a longitudinal axis
- defects larger than 3 mm are usually sutured, nail bed heals without scarring, occasionally some onycholysis.
Nail Matrix Biopsy I

- Nail plate avulsed
- punch biopsy through the nail plate
- Elliptical excision oriented in a horizontally(transverse) suture for more cosmetic result.
Usually avulsed prior to remove specimen

Fig. 10.18. Crescent or fusiform matrix biopsy: only the proximal part of the nail plate is cut to permit biopsy.

Fig. 10.29. Sites of biopsy for lesions less than 3 mm wide, taken through intact nail plate.
Nail Matirx Biopsy II

- Longitudinal nail biopsy (larger lesions in lateral one third)
- Punch biopsy through the nail plate
- Elliptical excision oriented in a horizontally (transverse) suture for more cosmetic result.

Fig. 10.19. Longitudinal biopsy on the lateral aspect.
Biopsy methods

Patient must be fully apprised of risk of permanent post op dystrophy

- Periungual pigmentation: en bloc down to bone, 1 mm normal tissue included,
- Lateral third: Lateral longitudinal biopsy.
- Mid portion of nail plate.
  - 2 mm in width: 3mm punch
  - 3 to 6 mm: distal 2/3, transverse elliptic excision, proximal 1/3, releasing flap
  - wider than 6mm

Fig. 10.21. Nail matrix—nail bed biopsy. (a) The nail plate on either side of the area to be biopsied is removed. (b) Excision of a rectangular block down to bone.
Digital myxoid cyst

Treatment
- Repeated puncture
- Intralesional steroid injection
- Cryotherapy
- Uses of sclerosants (polydecanol 0.25%) after evacuation
- Topical steroid tapes

Digital myxoid cyst
- Treatment
- Photocoagulation of the cyst
- Surgical removal
- Laser treatment

Myxomatous type, superficial type
Ganglion type, Deep type
Glomus tumor

- X-ray
- Ultrasonography
- MRI

Digital glomus tumor

CONCLUSION: Types of Nail Apparatus Biopsy by Location
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<td><strong>Name</strong></td>
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<td><strong>現任職務</strong></td>
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What’s new in nail disorder from 2014 AAD meeting

Yu-Ting Yeh
Department of Dermatology, CGMH
2014-06-15

Outlines

- Laser for onychomycosis
- Dermoscopy for nail disorder
- Surgical tips in nail surgery
- Diagnosis from nail clipping
- Nail phenolization
- Subungual melanoma: new research
- Indigo naturalis and nail psoriasis

Laser for onychomycosis

- Currently approved lasers by FDA
- Temporary increase of the clear nail growth in patient with onychomycosis
- 532 nm, 630-680 nm, 1064 nm, and 1320 nm Nd:YAG lasers
- 870/930 nm combination and 980 nm diode lasers
- UV light, photodynamic therapy (PDT), the femtosecond infrared titanium sapphire 800 nm laser, and ablation with CO2 laser

The clinical and mycological clearance of toenails treated with 1064-nm Nd:YAG laser versus no treatment

![Graph showing clinical and mycological results](image-url)

**Table I. Baseline characteristics**

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<th>Control</th>
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<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
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<tr>
<td>Age (y)</td>
<td>33 (14)</td>
</tr>
<tr>
<td>Sex</td>
<td>60%</td>
</tr>
<tr>
<td>Initial for laser treatment, % (SD)</td>
<td>101 (0)</td>
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<tr>
<td>Clinical improvement per affected nail at baseline, %</td>
<td>60 (31)</td>
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<tr>
<td>Negative mycological culture at 3-mo follow-up</td>
<td>67%</td>
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**Table II. Clinical and mycological results**

<table>
<thead>
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<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Proximal nail plate clearance per affected nail, mm</td>
<td>0.44 (1.1)</td>
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<tr>
<td>Nails with complete clinical clearancea</td>
<td>1 Nail</td>
</tr>
<tr>
<td>Proximal nail plate clearance per affected nail, mm</td>
<td>0.24 (0.6)</td>
</tr>
<tr>
<td>Nails with complete clinical clearancea</td>
<td>1 Nail</td>
</tr>
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</table>

*For nail measurements, 6 control subjects (N = 39) and 10 laser patients (N = 30) were available.

1 Measures the proximal nail plate clearance as compared with baseline values.

2 Compared with proximal nail plate clearance at 3 mo in control group.

Toenail onychomycosis treated with a fractional CO2 laser and topical antifungal cream

Laser for onychomycosis

- Limited data supporting the use of laser therapies for onychomycosis
- More RCT are needed
- 1064-nm Nd:YAG laser does not appear to be an effective treatment for onychomycosis
- Fractional CO2 laser therapy combined with a topical cream was efficacious in the treatment of onychomycosis
Dermoscopy

- Onychomycosis
- Nail psoriasis
- Onychopapilloma
- Onychomatricoma

SHORT REPORT

Nail digital dermoscopy (Onychoscopy) in the diagnosis of onychomycosis

S.M. Piraghi, F. Balian, M. Charos, C. Roux

Department of Dermatology, University of Geneva, Geneva, Switzerland

Correspondence: F. Balian, F-mart.beauties.com

Abstract

Background: Onychomycoses and traumatic onychopapillomas are the most common causes of nail abnormalities, and differential diagnosis is often impossible without mycological examination. The aim of the present study was to develop a dermoscopic classification in onychomycoses that facilitate the diagnosis and differentiate between traumatic and mycological lesions and to determine the sensitivity and specificity of these dermoscopic features.

Methods: We performed a retrospective study at the outpatient dermatology clinics of the University of Geneva. Digital dermoscopic images of 21 consecutive patients were used for evaluation. Videodermoscopy was used to distinguish different structures. Digital dermoscopic images of onychomycoses were compared with those of traumatic onychopapillomas.

Results: Digital dermoscopic imaging allowed us to identify three recurring dermoscopic features: linear longitudinal striations, dots, and spicules. A scoring model was developed, and the sensitivity and specificity were calculated.

Conclusion: The findings show that dermoscopy and videodermoscopy in onychomycosis and traumatic onychopapilloma provide additional diagnostic criteria. Sensitivity and specificity were calculated as 95.5% and 94.1%, respectively.

Table 2: Statistical analysis

<table>
<thead>
<tr>
<th>Linear edge (%)</th>
<th>Spicules (%)</th>
<th>Striae (%)</th>
<th>Dots (%)</th>
<th>Colour (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>W</td>
<td>Y</td>
<td>O</td>
<td>Br</td>
<td>R</td>
</tr>
<tr>
<td>DSO (50)</td>
<td>29 (68)</td>
<td>21 (48)</td>
<td>22 (45)</td>
<td>22 (45)</td>
</tr>
<tr>
<td>P-value</td>
<td>&lt;0.001</td>
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<td>&lt;0.001</td>
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<td>Drastic change</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
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<tr>
<td>Statistical significance</td>
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DFO, digital videodermoscopy; DSO, dermatoscopy; TD, traumatic dermoscopy; CD, clinical diagnosis; TN, traumatic nails; OLE, onycholysis; E, erosion; B, basement membrane; R, retraction; W, white; Y, yellow; O, orange; Br, brown; R, grey; K, keratin.

Nail digital dermoscopy (Onychoscopy) in the diagnosis of onychomycosis

Figure 1: Dermoscopy of DSO: ‘Spikes’ of the proximal margin of the onycholytic area, which acquires a jagged edge (20x).

(To facilitate the recognition of the structures, the edges were highlighted using the "Magnetic Laser" tool of Photoshop® CS3. It creates a selection, automatically adhering to edges of contrast objects.)

Figure 2: Dermoscopy of DSO: ‘Linear striae’ of different colours in the onycholytic nail plate (10x). (Edges highlighted using the "Magnetic Laser" tool of Photoshop® CS3.)

Figure 3: Traumatic onycholysis: ‘linear edge’ of the proximal margin of the onycholytic area (20x).

Videodermoscopy of the hyponychium in nail psoriasis

Figure 1: Clinical presentation of nailbed psoriasis.

Figure 2: Same patient as shown in Fig. 1. Capillaries of the hyponychium as seen by videodermoscopy. (Magnifications: A, X40; B, X70.)


Onychopapilloma

Onychomatricoma

- Benign and slow-growing tumor derived from the nail matrix
- Thickened nail plate with ridging and yellow discoloration
- Proximal splinter hemorrhages
- Longitudinal overcurvature of the nail plate
- V-shaped tumor originating in the nail matrix with longitudinal filamentous projections into the nail plate

Onychomatricoma

- Fibroepithelial tumor with fibrillary collagen bundles and epithelial invaginations into the dermis proximally and longitudinally-oriented fibroepithelial projections with matrix epithelium lined cavities distally
- Tumor derived from the nail matrix with a distinct superficial and deep layer
- Keratogenous nail plate with cavitations

Dermoscopy in the diagnosis of onychomatricoma

- Holes in the distal margin
- A gray pigmented band of the fingernail with distal splitting
- Longitudinal white lines corresponding to the channels that contain the tumor projections
- Proximal and/or distal splinter hemorrhages
Surgical Tips

• Spare the nail plate
• Promote healing
• Decrease pain
• Better cosmetic result

Surgical tips

• Evaluate patient and design plan
• Identify location of the lesion
  • Matrix?
  • Nail bed?
  • Nail unit?

Submarine Hatch Technique
Nail clippings

- Painless
- Help guide patient care
- Current clinical application
  - Onychomycosis
  - Nail psoriasis
  - Onychomatricoma
  - Subungual hematoma
  - Melanonychia
- Surgical planning

Onychomycosis

Subungual hematoma

Diaminobenzadine

Nail psoriasis

Parakeratosis, parakeratotic abscess (with neutrophils), and serum crusting
**Summary**

**Diagnosis from a nail clipping**
- Nail clipping histologic features of onychomycosis and psoriasis
- Subungual hematoma
- Onychomatricoma
- Melanonychia / Surgical planning
- Foreign material

**Nail phenolization**
- Important surgical procedure used to narrow the nail matrix
- Ingrowing nail (onychocriptosis), transverse overcurvature of the nail (pincer nail, tile nail, and plicated nail), and also for permanent total nail avulsion
- Prior training is necessary
- Comorbidity, phenol toxicity, time of application of phenol, and post operative oozing
Advantage of nail phenolization

- Simple and cheap
- Electrocautery vs phenol application in partial matrixectomy after partial nail extraction
  - Matrix phenolization is connected with shortened healing time vs the matrix electrocoagulation
  - Less morbidity and lower recurrence rates
- Little postoperative discomfort and quick return to normal activities

How to apply

- Small cotton bud soaked in 88% phenol was applied to the germinal matrix
- Wound must be bloodless (tourniquet use)
- Once is enough
- Neutralize any residual phenol with alcohol or alcohol and chlorhexidine
  - Not necessary
  - Phenol is inactivated with blood after removal of the tourniquet

---

Author, year (reference) | Phenolization (recurrence rate) | Other procedure: recurrence rate
--- | --- | ---
Van Der Ham, 1990 (17) | 9.6% | Nail wedge excision: 16 %
Grieg, 1991 (18) | 9% | Nail wedge excision: 73 %
Fulton, 1994 (19) | 4.4% | Nail wedge excision: 17.5 %
Légaré*, 1999 (20) | 66.6% | Onychectomy: 16.6 %
Caronin, 2001 (21) | 1.1% | Surgical matrixectomy: 18.3 %
Herold, 2001 (22) | 0% | Surgical matrixectomy: 5.5 %
Islam, 2005 (23) | 4% | Nail wedge excision: 42 %
Lau, 2005 (24) | 5.7%§ | Surgical matrixectomy: 4.3%
Bostanci, 2007 (25) | 4.9% | NaOH matrixectomy: 4.2 %


Toxicity of phenol

- Lethal dose: 3-30g
- 3 cotton swabs with phenol solution with 88% → 0.35g
- Systemic effects (ingestion or contact)
  - Lung edema
  - N&V, lethargy, and coma
  - Hypotension, bradycardia or tachycardia, and arrhythmia
  - Hemolysis and methemoglobiemia

Evolution and complication after nail phenolization

- Oozing appears on the 3rd day and may continue for 6 weeks
- Infection, although rare, is the most common complication
- Slight edema in the LNF and PNF may remain for 1 week due to phenol
  - Topical steroid may improve the edema

Other adverse reaction

- Narrow nail
- Spicule
- Onycholysis
- Perionychium burn
- Osteitis

Postoperative care

- Limb should be elevated for 1 day
- Dressing is removed after 24 hrs
- Wound is cleaned with 3% H₂O₂
- Patient is asked to wash the wound twice a day until oozing disappears
- Wound is covered with simple bandage
- Patient should return the next day and in 10, 30, and 60 days
Subungual Melanoma: New Research

- Histopathological analysis of the progression pattern of subungual melanoma
- Subungual melanoma usually originates from the nail matrix and may spread to the surrounding nail bed, hyponychium, and proximal nail fold

Histopathological findings of invasive subungual melanoma (case 7). (a) Longitudinal section of the nail unit. (b) Stacking of atypical melanocytes in the nail matrix. (c) Dermal invasion of atypical melanocytes in nests and solitary units in the hyponychium; note the striking variation in size and shape of the nests.

<table>
<thead>
<tr>
<th>Case no</th>
<th>Proximal nail fold (depth, mm)</th>
<th>Nail matrix (depth, mm)</th>
<th>Nail bed (depth, mm)</th>
<th>Hyponychium (depth, mm)</th>
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</table>

Abbreviations: AWW, alive and well; NA, not available.
In conclusion

- Dermal invasion of subungual melanoma in the nail matrix area tends to occur later than other areas of the nail unit
- Longitudinal incisional biopsy is necessary to accurately evaluate melanoma invasion

Indigo Naturalis and Nail Psoraisis

- Indigo naturalis has been used for centuries in traditional Chinese medicine because of its antipyretic, anti-inflammatory, antiviral, antimicrobial, and detoxifying effects
- Its active component, indirubin, have been used for decades in China to treat systemic psoriasis

Fig. 2. Clinical improvement on the appearance of skin lesions after indigo naturalis ointment treatment. Photos of the right leg (a) and left leg (b) were taken at the baseline visit. Eight weeks after the treatment, photos of the right leg (c) treated with indigo naturalis ointment and left leg (d) treated with vehicle only were taken.

Changes in mean clinical score and area coverage in indigo naturalis ointment- and vehicle-treated plaques. The score of scaling (A), erythema (B), induration (C), and total of these scores (D); clearing percentage of target plaque (E); and improvement related to baseline (F) are given. Mean data are shown for the 12-week treatment period. Error bars indicate SD.
Indigo naturalis

- Inhibit proliferation
- Reduce inflammation
- Promote differentiation
- Induce apoptosis
- Inhibit production of interferon-γ, interleukin-6 and RANTES chemokine


Fig. 3. Effect of topically applied indigo naturalis ointment on the expression of Ki-67, filaggrin and CD3 in target lesions. Skin biopsies were taken after 8 weeks of treatment and processed for paraffin sectioning and immunohistochemical analysis. a, c, e Vehicle-treated lesion. b, d, f Indigo naturalis-treated lesion. Results of the immunohistochemical analysis using three different antibodies: anti-Ki-67 (a, b), antifilaggrin (c, d) and anti-CD3 (e, f) are shown (original magnification: x100).

Dermatology 2007;214:155–161

Indigo naturalis in nail psoriasis?

- Thirty-one outpatients with symmetrically comparable psoriatic nails were enrolled
- Outcomes were measured using Nail Psoriasis Severity Index (NAPSI) for five nails on one hand and for the single most severely affected nail from either hand.
- The results show a reduction of NAPSI scores for the 12-week treatment for the Lindioil group (49.8% for one hand and 59.3% for single nail) was superior to the reduction in the scores for the control group (22.9%, 16.3%, respectively).

http://dx.doi.org/10.1016/j.phymed.2014.02.013
In conclusion

- **Lindioil** was an effective and safe treatment for nail psoriasis and was acceptable to the subjects, indicating that it has great potential to become a safe and effective alternative therapy for treating nail psoriasis.
### Curriculum Vitae

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### Education, postgraduate training and occupational history

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<th>Year</th>
<th>Degree</th>
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<tr>
<td>1989-1996</td>
<td>M.D.</td>
<td>Department of Medicine, College of Medicine</td>
<td>National Taiwan University, Taipei, Taiwan</td>
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<tr>
<td>2001-2007</td>
<td>Ph.D. Graduate Institute of Pathology, College of Medicine</td>
<td>National Taiwan University, Taipei, Taiwan</td>
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<tr>
<td>1996-2000</td>
<td>Resident, Department of Dermatology</td>
<td>National Taiwan University Hospital, Taipei, Taiwan</td>
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<td>2000-2008</td>
<td>Visiting Staff, Department of Dermatology</td>
<td>National Taiwan University Hospital, Taipei, Taiwan</td>
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<td>2006-2008</td>
<td>Lecturer, Department of Dermatology</td>
<td>National Taiwan University, Taipei, Taiwan</td>
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<tr>
<td>2008-2012</td>
<td>Assistant Professor, Department of Dermatology, College of Medicine</td>
<td>National Taiwan University, Taipei, Taiwan</td>
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<tr>
<td>2012-2013</td>
<td>Visiting Scholar, Institute of Molecular and Cellular Biology</td>
<td>Baylor College of Medicine, Houston, TX, USA</td>
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### License and Board Certification

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<td>2000</td>
<td>Board of Dermatology, Taiwan, Republic of China</td>
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### Academic Appointment

- **Dermatologica Sinica**
  - Associate Editor: September 2004 - June 2007; January 2013 - present
  - Editorial Board: July 2007; January 2013
- Laser and Photonics Medicine Society of the Republic of China
  - The Council Member: December 2012 -

### Fields of Interest
- Melanoma, cutaneous carcinogenesis, dermatologic surgery
**The interesting and difficult nail cases**

A 2-year-old girl
An enlarging pigmented lesion on the left 5th fingernail for ½ year

Diagnosis:
Junctional nevus presenting as longitudinal melanonychia

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<table>
<thead>
<tr>
<th>Relation Between Resultant Clinical Manifestations and Location of Pathologic Change</th>
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<tr>
<td><strong>Proximal matrix</strong></td>
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<tr>
<td><strong>Distal matrix</strong></td>
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<tr>
<td><strong>Proximal and distal matrix</strong></td>
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<tr>
<td><strong>Nail bed</strong></td>
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<td><strong>Nail bed and hyponychium</strong></td>
</tr>
<tr>
<td><strong>Proximal nail fold</strong></td>
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**Melanonychia (brown/black nail)**

- Activation or proliferation (benign or malignant) of nail matrix melanocytes
- Total, banded, transverse (rare), longitudinal (the most common)
- Polydactylous longitudinal bands are generally a benign finding.
Causes of melanonychia

Melanocytic hyperplasia
- Lentigo
- Melanocytic nevus
- Malignant melanoma (Subungual melanoma)

Melanocytic activation
- Racial/ethnic melanonychia
- Pregnancy
- Trauma: friction, nail biting
- Drug-induced hyperpigmentation
- Phototherapy (PUVA)

Syndrome/systemic:
  - Laugier-Hunziker: lip, genital
  - Addison’s disease
  - Acquired immunodeficiency syndrome

Inflammatory nail disease: psoriasis, lichen planus

Pigmented Bowen’s disease

Pigmented onychomycosis: T. rubrum

Subungual hematoma

Exogenous drugs and dye: potassium permanganate

Melanocytic activation

Racial/ethnic melanonychia

Pregnancy

Trauma: friction, nail biting

Drug-induced hyperpigmentation

Phototherapy (PUVA)

Syndrome/systemic:
  - Laugier-Hunziker: lip, genital
  - Addison’s disease
  - Acquired immunodeficiency syndrome

Inflammatory nail disease: psoriasis, lichen planus

Pigmented Bowen’s disease

Clinical Signs That Require Histologic Evaluation of Longitudinal Melanonychia

- Periungual pigmentation (Hutchinson’s sign)
- Adult age > 40 years old
- Change in color/width of the band
- Hyperpigmented lines within the band
- Proximal portion of the band wider than distal
- Thumb, index finger, or toe involvement
- Blurred margins
- History of trauma (negative prognostic factor)\(^6\)\(^5\)

Histopathology is still the gold standard for diagnosis of nail apparatus melanoma

Dermoscopic feature of early nail apparatus melanoma

- currently controversial
- The most suspicious dermoscopic feature of early nail apparatus melanoma is irregular lines (per color, spacing, thickness, and parallelism) on a brown (not grayish) background.
- Micro-Hutchinson’s sign
- A wide pigmented band (> 3 mm)
- Triangular pigmentation on the nail plate

Hutchinson’s sign

- Originally reported by Sir Jonathon Hutchinson in 1886, is macroscopic pigmentation on the periungual skin and is characteristic of nail apparatus melanoma
- Micro-Hutchinson’s sign is defined by pigmentation of the cuticle seen on dermoscopy but not with the naked eye. Micro-Hutchinson’s sign is a highly characteristic dermoscopic feature of early nail apparatus melanoma.
Melanonychia in children

- In terms of the morphological characteristics of melanocytic nevus involving the nail apparatus of infants, the nevus occasionally shows broad of the nail plate with some variegation of the brown color and periungual pigmentation (33%), mimicking nail apparatus melanoma.

- Nail apparatus melanoma is extremely rare in infants, and interestingly, although such pigmentation first shows a rather rapid increase in width and color density, after a variable period, the pigmentation stabilizes and typically regresses by adolescence. Even complete regression is possible.

Journal of Dermatology 2011; 38: 45–52

Subungual melnaoma

- Finger : toe in the Japanese population = 1.6 : 1 (vs. sole : palm = 3.5:1).

- The thumb followed by the great toe, 90% in total.

- Mechanical trauma could be an important etiological factor as patients often report a history of trauma.

- Delay in diagnosis → poor prognosis

A 65-year-old man

Acral lentiginous melanoma
Tumor thickness 1.3 mm
Stage IB: T2a N0 M0

A 35-year-old man

Diagnosis: Melanotic macule
Like ephelide: Melanocytes are not increased in numbers.
Hyperpigmentation of the matrix keratinocytes.
Histopathology of longitudinal melanonychia (I)

- From a histologic point of view, LM results either from simple activation (hyperfunction) of nail matrix melanocytes or melanocyte hyperplasia.
- Lentigo type, consists of a slight to moderate increase in the number of matrical melanocytes superior to 10 cells per 1 mm stretch of nail matrix epithelium. Lack of nesting (DDx nevi) or cytological atypia (DDx melanoma).
- Melanocytic nevus: nests
- The melanotic macule is characterized by the basal localization of both pigmentation and dendritic melanocytes, without true melanocyte hyperplasia.

Histopathology of longitudinal melanonychia (II)

- Melanocyte activation differs from lentigo by the suprabasal location of the melanocytes, at times with a florid pagetoid-like features, and pigmented dendrites, without true melanocyte hyperplasia.
- The normal MC is in fact higher between 8 and 17, keeping in mind that MC can reach 20 in the proximal matrix and can be limited to 4 in the distal matrix.

A 49-year-old man
Onychomycosis caused by *T. rubrum*

A 30-year-old man
Sportsman’s toes, subungual hemorrhage

A 30-year-old man playing basketball frequently
Tennis toe: 1, 2
Jogger’s toe: 3, 4, 5
Frictional melanonychia

If melanonychia is symmetric and affects the lateral and external part of the 4th or 5th toenail and great toe, repeated trauma from ill-fitting shoes or overriding toes is a likely cause.


A 21-year-old woman
Frictional trauma-induced melanonychia
Onychomycosis

A 35-year-old man
Nail hypertrophy

A 18-year-old man
Onychomycosis

Chronic paronychia and candida onychomycosis

A 61-year-old man
A 77-year-old woman
Exogenous cause of dyschromia, discoloration tends to follow the contour of the proximal nail fold.

Endogenous cause of dyschromia, discoloration tends to follow the contour of the lunula.

Melanonychia and mucocutaneous hyperpigmentation from hydroxyurea use

Drug-induced melanonychia

- Electron beam therapy
- Psoralen with ultraviolet A (PUVA)
- Zidovudine
- Prolonged antimalarial therapy with amodiaquine, chloroquine, mepacrine, or quinacrine
- Chemotherapy with agents such as doxorubicin, bleomycin, cyclophosphamide, daunorubicin, dacarbazine, 5-fluorouracil, methotrexate, and hydroxyurea

Drug-induced melanonychia

It typically fades slowly following drug withdrawal
### Racial/ethnic melanonychia

- Blacks, Asians, Hispanics, and Middle Easterners. Nearly 100% of blacks develop 1 or more pigmented bands by the age of 50 years.
- The number and width of the bands increases with age.
- Digits used for grasping such as the thumb, index finger, and middle finger, or in those digits prone to trauma such as the great toe.

### Koenen’s tumor / Periungual fibroma

- Ungual fibromas that occur in the general population in response to trauma are usually solitary.
- Later onset: typically in the second decade or later.

### Nail tumor

- At the nail fold/plate junction
- Within the nail fold
- On the nail folds and nail walls
- Within the nail bed with or without nail plate destruction

### Updated Clinical diagnostic criteria for tuberous sclerosis complex 2012

#### Major features
1. Hypomelanotic macules (3, at least 5-mm diameter)
2. Angiofibromas (3) or fibrous cephalic plaque
3. Ungual fibromas (2)
4. Shagreen patch
5. Multiple retinal hamartomas
6. Cortical dysplasias*
7. Subependymal nodules
8. Subependymal giant cell astrocytoma
9. Cardiac rhabdomyoma
10. Lymphangioleiomyomatosis (LAM) y
11. Angiomyolipomas (2) y

#### Minor features
1. “Confetti” skin lesions
2. Dental enamel pits (>3)
3. Intraoral fibromas (2)
4. Retinal achromic patch
5. Multiple renal cysts
6. Nonrenal hamartomas

Definite diagnosis: Two major features or one major feature with 2 minor features
Possible diagnosis: Either one major feature or 2 minor features
Acquired digital fibrokeratoma

- Majorly caused by trauma
- Mostly originate from the proximal nail fold → Nail plate furrows or grooves
- Subungual

A 59-year-old man

Glomus tumor

Intense, pulsating pain: spontaneous or triggered by mild trauma or temperature change (warm to cold). Hand: finger tips or subungual space

A 47-year-old woman

Myxoid pseudocyst of the digits

- Proximal nail fold of the fingers, rarely on toes.
- Transillumination
- Longitudinal grooving
- Distal interphalangeal joint, arising from the joint capsule or tendon sheath synovia.
- Rarely occur without wear and tear osteoarthritis

A 85-year-old man

Digital mucinous pseudocyst

- Proximal nail fold of the fingers, rarely on toes.
- Transillumination
- Longitudinal grooving
- Distal interphalangeal joint, arising from the joint capsule or tendon sheath synovia.
- Rarely occur without wear and tear osteoarthritis

Nail psoriasis

- Nail psoriasis occurs in as many as 50% of psoriatic patients, up to 83% in those with psoriatic arthritis.
- Isolated nail psoriasis is not rare.
- Participated and worsened by trauma
- A negative impact on patient’s compliance, motivation, and quality of life
Nail Psoriasis Severity Index (NAPSI)

The nail is divided with imaginary horizontal and longitudinal lines into quadrants. Each nail is given a score for nail bed psoriasis (0-4) and nail matrix psoriasis (6-4) depending on the presence of any of the features of nail psoriasis in that quadrant.

1. Evaluation 1: Nail matrix. In each quadrant of the nail, nail matrix psoriasis is evaluated by presence of any of the nail matrix features: pitting, leukonychia, red spots in the lunula, crumbling: 0 for none, 1 if present in 1 quadrant of the nail, 2 if present in 2 quadrants of the nail, 3 if present in 3 quadrants of the nail, and 4 if present in 4 quadrants of the nail.

2. Evaluation 2: Nail bed. Nail bed psoriasis is evaluated by the presence of any of the nail bed features: onycholysis, splinter hemorrhages, subungual hyperkeratosis, "oil drop" (salmon patch dyschromia): 0 for none, 1 for 1 quadrant, 2 for 2 quadrants, 3 for 3 quadrants, and 4 for 4 quadrants.

3. Each nail gets a matrix score and a nail bed score, the total of which is the score for that nail (0-8).

4. Each nail is evaluated, and the sum of all the nails is the total NAPSI score. The sum of the scores from all nails is 0-160, or 0-160 if toenails are included. At any time the matrix or nail bed score can be assessed independently if desired.

If a target nail scale is desired, the same technique can be used to evaluate all 8 parameters (pitting, leukonychia, red spots in lunula, crumbling, oil drop, onycholysis, hyperkeratosis, and splinter hemorrhages) in each quadrant of the nail, giving the nail a score of 0-32.

Nail Psoriasis Severity Index (NAPSI)
Psoriasis vulgaris for 7-8 years
Nail changes for 5-6 years

Salmon patches (oil drop sign)
- Diagnostic
- Fingernails
- Yellow-red areas of discoloration in the center of the nail or bordering an onycholytic area

Pitting
typical symptom, fingernails
large, deep and irregular

Abnormal keratinization of the proximal nail matrix

Acrodermatitis continua of Hallopeau
- Single digit involvement is common, more common on the finger tips
- Periungual and subungual pustules with onycholysis
- Nail destruction, atrophy of distal pharynx

A 39-year-old woman
General Nail Care

- Koebner, or isomorphic response
- Avoid manicure, biting the nails, picking or trimming the cuticle, clearing subungual debris, or wearing tight-fitting shoes.
- The nails must be kept short

Psoriatic nail: treatment

- The management of nail psoriasis has been challenging particularly when the nail involvement is the only manifestation of the disease.
- Low penetration of the topical medications and slow growth rate of the nails are the main factors for this difficulty.
- Moreover, most of the therapies require prolonged treatment and continuity, sometimes with side effects and/or disappointing results.

Psoriatic nail: Intralesional therapy

- Triamcinolone acetonide: the most widely used agent in doses of 2.5–10 mg/mL at up to four injection sites (two into the proximal nail fold and two in the lateral nail fold), used bimonthly for 5-6 months.
- Injections to the proximal nail fold with 28- and 29-gauge needle syringes or with needle-less injectors are very effective in treating nail matrix disease such as pitting or ridging.
- Up to 70–90% of psoriatic patients with both nail matrix and nail bed lesions respond to intralesional steroids, except for onycholysis, which shows a less pronounced response.
- Corticosteroid injections can cause considerable pain, atrophy, despigmentation, secondary infection, inclusion cysts, subungual hemorrhage, and tendon rupture.
Dye laser

- 595 nm PDL
  - 7 mm spot size, 1.5 ms pulse duration, 8–10 j/cm² energy
  - once monthly for 3 months, with significant improvement particularly of nail bed lesions.
  - Mean NAPSI scores declined from 21.2 at baseline to 3 at 1 month after 3 sessions.

Topical therapies for treatment of nail psoriasis

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Treatment protocol</th>
<th>Significant improvement in NAPSI scores</th>
<th>Baseline NAPSI score</th>
<th>Follow-up NAPSI score</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sánchez-Bregant</td>
<td>2008</td>
<td>0.05% calcipotriol + 0.005% betamethasone dipropionate</td>
<td>Calcipotriol twice daily for 3 months</td>
<td>Similar efficacy in both groups, significant reduction of NAPSI scores</td>
<td>B</td>
<td>21.2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Bigemini et al.</td>
<td>2008</td>
<td>8% clobetasol in nail lacquer and tacsiloxol</td>
<td>Clobetasol once daily at weekends and tacsiloxol at weekdays under occlusion, for 6 mos</td>
<td>70% reduction in NAPSI at 6 mos</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rigopoulos et al.</td>
<td>2007</td>
<td>0.1% tacrolimus cream + 0.05% clobetasol propionate</td>
<td>Once daily under occlusion, for 3 mos</td>
<td>Similar efficacy in both groups, significant reduction of NAPSI scores</td>
<td>A2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rega et al.</td>
<td>2005</td>
<td>8% clobetasol in nail lacquer</td>
<td>Once daily for 3 weeks and twice weekly, for 9 mos</td>
<td>Reduction of all nail alterations within 1 mos</td>
<td>N/A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Camarca et al.</td>
<td>2005</td>
<td>70% CaA oral solution in maize oil</td>
<td>Maize oil</td>
<td>Complete resolution or substantial improvement in CaA group</td>
<td>A2</td>
<td></td>
<td></td>
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</tbody>
</table>

Systemic therapies for treatment of nail psoriasis

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Intervention</th>
<th>Comparison</th>
<th>Treatment protocol</th>
<th>Significant improvement in NAPSI scores</th>
<th>Baseline NAPSI score</th>
<th>Follow-up NAPSI score</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scher et al.</td>
<td>2008</td>
<td>0.1% tacrolimus gel</td>
<td>Vehicle gel</td>
<td>Once daily for 6 mos</td>
<td>A2/B</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>de Jong et al.</td>
<td>1999</td>
<td>5% 5-Fluorouracil (Fluorax)</td>
<td>Belafax (urea and propylene glycol)</td>
<td>Once daily for 3 mos</td>
<td>Significant improvement with both preparations</td>
<td>A2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hran and Tosti</td>
<td>1999</td>
<td>8% clobetasol nail lacquer</td>
<td>Placebo</td>
<td>Once daily in the first week, from 2nd week onwards 2–3 times weekly, for up to 9 mos</td>
<td>Clear improvement in 90%, complete resolution in 22% of patients in the treatment arm</td>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tosti et al.</td>
<td>1998</td>
<td>Calcipotriol ointment + Betamethasone propionate + salicylic acid</td>
<td>Twice daily, for up to 5 months</td>
<td>Calcipotriol as effective as the combination of topical steroids and salicylic acid (49% versus 56% reduction of subungual hyperkeratinization at 6 mos)</td>
<td>B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Biologic therapies for treatment of nail psoriasis

<table>
<thead>
<tr>
<th>Study</th>
<th>Year</th>
<th>Treatment</th>
<th>Placebo</th>
<th>Treatment 1</th>
<th>Treatment 2</th>
<th>Improvement in NAPSI score</th>
<th>A2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igarashi et al. [60]</td>
<td>2012</td>
<td>Ustekinumab</td>
<td>Placebo</td>
<td>45 or 90 mg, sc, at weeks 0, 4, and every 12 weeks through week 72</td>
<td>Placebo</td>
<td>Improvement in NAPSI score 27% in 45 mg group, 68% in 90 mg group at week 64</td>
<td></td>
</tr>
<tr>
<td>Van den Bosch et al. [58]</td>
<td>2010</td>
<td>Adalimumab</td>
<td>Placebo</td>
<td>40 mg, sc at every other week through week 12</td>
<td>Placebo</td>
<td>Mean NAPSI scores reduced by 44% at week 12</td>
<td></td>
</tr>
<tr>
<td>Rigopoulos et al. [69]</td>
<td>2010</td>
<td>Adalimumab</td>
<td>Placebo</td>
<td>80 mg, sc at week 0, 60 mg every other week starting at week 1, through week 24</td>
<td>Placebo</td>
<td>Significant improvement in all patients after 8th injection; fingernail NAPSI decreased from 4 at baseline to 4 at week 24 in patients with just cutaneous psoriasis and from 24 to 10 in patients with psoriatic arthritis</td>
<td></td>
</tr>
<tr>
<td>Ormazza et al. [60]</td>
<td>2012</td>
<td>Etanercept</td>
<td>Placebo</td>
<td>1st group: 50 mg weekly for 24 weeks and 2nd group: 50 mg twice weekly for the first 12 weeks, 50 mg weekly for the other 12 weeks, sc</td>
<td>Placebo</td>
<td>Both dose regimens were effective for nail psoriasis and significant improvement in NAPSI scores in both groups at week 24</td>
<td></td>
</tr>
</tbody>
</table>

Thank you for your attention!
Nail Dermoscopy

Melanonychia

- Melanin-derived brown-to-black nail pigmentation.
- A “clinical” term, not dermoscopic or pathologic!
- Commonly presents as band arranged lengthwise along the nail unit - longitudinal melanonychia or melanonychia striata.

Progression of Melanonychia
Regression of Melanonychia

ABC Rule of Subungual Melanoma

A. Age Range: 20-50 y, peak 5th-7th decades
   Race: African American, Native American, Asian
B. Band (nail band): Pigment (Brown-Black)
   Breadth (≥3 mm)
   Border (irregular/blurred)
C. Change: Rapid increase in size/growth rate of nail band
   Lack of change: Failure of nail dystrophy to improve despite adequate treatment
D. Digit involved: Thumb > hallux > index finger
   Single digit > multiple digits
   Dominant hand
E. Extension: Extension of pigment to involve proximal or lateral nail fold (Hutchinson's sign) or free edge of nail plate
F. Family or personal history: Of previous melanoma or dysplastic nevus syndrome

When to biopsy?

1. Isolated pigmented band on a single digit that develops during the fourth to sixth decade of life.
2. Nail pigmentation that develops abruptly.
3. Pigmentation suddenly becomes darker or larger or blurred.
4. Acquired pigmentation of the thumb, index finger, or large toe.
5. Pigment that develops after a history of digital trauma.
6. Any acquired lesion in patients with history of melanoma.
7. If the pigmentation is associated with nail dystrophy.
8. If pigmentation of the periungual skin is found to be present (Hutchinson's sign).

Histologic Distinction Between Subungual Lentigo and Melanoma

Brijal Amin, MB,BS; Kishwer S. Nehal, MD; Achim A. Jungbluth, MD; Aisha Zaidi, BS; Mary S. Brady, MD; Daniel C. Cox, MD; Thin Zhou, MA; and Klaus J. Buxom, MD*

- Confluency of cells, described as a focal row of melanocytes directly opposed to each other: this feature was seen in melanoma, but not in benign lentigo;
- Multinucleation and inflammation are not found in benign lentigo and nevus, but rather they are seen in melanoma;
- Florid pagetoid cell spreading, not found in benign lentigo and diagnostic for in situ melanoma;
- Severe atypia, which was only seen in melanoma, but was uncommon.

Subungual melanoma: Histological examination of 50 cases from early stage to bone invasion

Miki IZUMI,1 Kenmi OHARA,2 Toshihiko HOASHI,2 Hiroko NAKAYAMA,1 Cheng-Sheng CHIU,1,2,4 Taikichi NAGAI,1 Jun MATSUBAYASHI,1 Kenichi IWAYA,1 Kiyoshi MUKAI1

1Department of Diagnostic Pathology, Tokyo Medical University, Department of Dermatology and Pathology, Tsuchiura Hospital, Tokyo, Japan, and 2Department of Dermatology, Chang Gung Memorial Hospital, Chang Gung University College of Medicine, Taoyuan, Taiwan

Subungual Melanoma

A Study of 124 Cases Highlighting Features of Early Lesions, Potential Pitfalls in Diagnosis, and Guidelines for Histologic Reporting

<table>
<thead>
<tr>
<th>Features</th>
<th>MUS (28 Cases)</th>
<th>Acral Nev (28 Cases)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pagetoid spread</td>
<td>-</td>
<td>3 (29%)</td>
<td>0.0656</td>
</tr>
<tr>
<td>Mild</td>
<td>1 (4%)</td>
<td>1 (17%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>7 (25%)</td>
<td>3 (11%)</td>
<td></td>
</tr>
<tr>
<td>Marked</td>
<td>2 (7%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Cellular atypia</td>
<td>-</td>
<td>14 (50%)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Mild</td>
<td>1 (4%)</td>
<td>3 (11%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>8 (30%)</td>
<td>10 (36%)</td>
<td></td>
</tr>
<tr>
<td>Marked</td>
<td>5 (18%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Lentiginous growth</td>
<td>-</td>
<td>10 (36%)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Mild</td>
<td>3 (10%)</td>
<td>10 (36%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>2 (7%)</td>
<td>1 (4%)</td>
<td></td>
</tr>
<tr>
<td>Marked</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Junctional growth</td>
<td>-</td>
<td>10 (36%)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Mild</td>
<td>0</td>
<td>10 (36%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>10 (50%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Marked</td>
<td>6 (21%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Junctional atypia</td>
<td>-</td>
<td>25 (89%)</td>
<td>&lt; 0.0001</td>
</tr>
<tr>
<td>Mild</td>
<td>16 (57%)</td>
<td>1 (4%)</td>
<td></td>
</tr>
<tr>
<td>Moderate</td>
<td>13 (47%)</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Marked</td>
<td>1 (4%)</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>
Dermoscopy in Nail Disease

First step
Criteria for melanocytic onychopathy
- Parallel lines (longitudinal/transverse)
- Longitudinal bands (matrix to edge)
- Black dots/globules
- Diffuse grayish/brownish background

Second step
Criteria for benign/malignancy
- Parallel lines (Color evaluation
- Pattern analysis
- Micro-Hutchinson’s sign
- Microscopic groove
Color evaluation

- **Gray** pigmented band composed of multiple homogeneous grayish lines:
  - a result of epithelial hyperpigmentation without melanocytic hyperplasia such as is seen in drug-induced pigmentation and ethnic pigmentation (melanocytic activation)
- **Brown** pigmented band is usually composed of multiple brown lines:
  - often caused by melanocytic hyperplasia as seen in a nevus or melanoma

Melanocytic activation

- Drug- and radiation-induced LM
- Endocrine LM
- Ethnic (racial) LM
- Traumatic LM
- Laugier Hunziker syndrome
- LM associated with HIV infection
- LM associated with inflammatory nail disorders
- Nonmelanocytic nail tumors (Bowen’s disease)
- Nutritional LM (Vit.B12 or folate deficiency)
- Systemic lupus erythematosus
- Scleroderma

Endocrine melanonychia

- LM may be seen Addison’s disease (diffuse pigmentation and/or LM), Cushing’s syndrome, after adrenalectomy, hyperthyroidism, acromegaly, and during pregnancy.
- Endocrine longitudinal melanonychia may affect multiple digits.
- Dermoscopy findings are very similar to drug- and radiation-induced longitudinal melanonychia.

DRUG-INDUCED NAIL PIGMENTATION

- In most cases the pigmentation was observed on several fingernails or toenails.
- More commonly seen in phototypes IV, V, and VI skin.
- It usually appears 1 to 2 months after the beginning of the offending agent.
- Dermoscopic features:
  Grayish coloration of the background and of thin longitudinal gray lines with regular thickness, spacing, coloration.

(J Am Acad Dermatol 2007;56:835-47.)
Ethnic-type melanonychia

- Ethnic or racial nail pigmentations are physiological longitudinal pigmentations of the nail or nails observed in dark-skinned individuals with skin type V and VI.
- They can present as single or more often multiple bands involving one or more digits.

Traumatic melanonychia

- Repeated trauma such as nail biting may induce nail pigmentation.
- Repeated minor trauma such as picking, chewing, breaking, or rubbing of the proximal nailfold may cause LM.
- Frictional LM is mainly seen on the toes and is often associated with foot deformities or unsatisfactory footwear.
- May associated with visible abnormalities of the surface of the nail plate.

Laugier-Hunziker syndrome

- An acquired disorder of the pigment system.
- Longitudinal melanonychia, and macular pigmentation of the lips, mouth, and anogenital area.
- The nail pigmentation may appear either as a single or double band with a diameter between 1 to 2 mm.
- The entire nail can become hyperpigmented, this is rather rare.
- Can be associated with a pseudo-Hutchinson’s sign.

Melanocytic hyperplasia

- Lentigines of the nail matrix
- Nevi of the nail matrix
- Melanoma of the nail matrix
Pattern analysis

- **Regular pattern:**
  Brown longitudinal parallel lines with regular spacing and thickness.

- **Irregular pattern:**
  Longitudinal brown to black lines with irregular spacing and thickness and disruption of parallelism.

Regular pattern

- *Brown longitudinal parallel lines with regular spacing and thickness.*
- A brown homogenous color of the background band. The color of the individual lines within the band can vary from light brown to black. However, within any given band, the lines will be composed of similar shades of brown throughout the lesion.
- The spacing between the lines is regular and the thickness of the lines is relatively uniform throughout the band.
- The lines comprising the band are oriented parallel to each other.

Irregular pattern

- *The band comprises multiple longitudinal brown to black lines with irregular spacing and thickness and disruption of parallelism.*
- Associated with a homogeneous brown pigmentation of the background nail bands. However, the color of the individual lines varies from light brown to black. In fact it is common to observe many different colored lines within the nail band.
- The lines vary in their thickness and spacing. These lines, normally arranged parallel to each other, can lose their parallelism and cross into each other.
Local features

- Micro-Hutchinson’s sign
- Microscopic grooves
- Blood spots
- Triangular band
- Dermoscopy of the free edge
- Nail plate abnormality

Hutchinson’s sign

- Reported by Jonathon Hutchinson in 1886, is macroscopic pigmentation on the periungual skin, characteristic of nail apparatus melanoma.
- Periungual pigmentation must be checked not only in the proximal and lateral nail folds but also in hyponychial skin.

Micro–Hutchinson’s sign was defined by the visibility on dermoscopy of a pigmentation of the periungual tissues that could not be seen with the naked eye.
Pseudo-Hutchinson’s sign

- Addison’s disease
- AIDS
- Bowen’s disease
- Drug-induced pigmentation
- Laugier-Hunziker syndrome
- Malnutrition
- Peutz-Jeghers syndrome
- Racial pigmentation (phototypes V and VI)
- Radiation therapy
- Trauma
- Nail matrix nevi (heavily pigmented)

Blood spots

- Irregular pattern of the longitudinal lines associated with subungual hemorrhage in an acral lentiginous melanoma of the nail apparatus (Breslow thickness 0.15 mm, Clark level II).

Microscopic grooves

- *Microscopic grooves* were observed in many cases, not always superimposed on the pigmented area.
- These grooves were either whitish or grayish and had a linear longitudinal disposition.

Triangular appearance of bands

- Acral lentiginous melanoma of the nail apparatus (Breslow thickness 0.4 mm, Clark level III)
Nail plate abnormality

Melanoma in childhood?

- Nuclear atypias are present in some pediatric forms of nevus, including Spitz nevus (so-called juvenile melanoma).
- A mild degree of transepidermal melanocyte migration can be seen in benign nevi, especially those that are acral in location.
- The epithelium of the nail matrix differs from that of the epidermis in that it normally contains melanocytes not only in the basal layers but also in the suprabasal layers.

Melanoma in childhood!


Non-melanocytic onychopathy
**Subungual Hematoma**

- Homogenous brownish to reddish pigmentation
- Purple-black to reddish black spots and globules
- Streaks of pigments

*J Am Acad Dermatol 2007;56:835-47*

**Dermoscopy of Subungual hematoma**

- Proximally well circumscribed dots or blotches.
- Distal edge was distorted with a linear pattern, especially in older lesions.
- Purple-blue in recent lesions; brown in older lesions.

**Exogenous pigmentation**

- Tobacco
- Dirt
- Potassium permanganate
- Tar
- Iodine
- Silver nitrate

*Not show up on histopathology!*

**Onychomycosis**

- Nail plate (dorsum)
  (i) Chromonychia: yellow/brown/green/related to trauma (hematoma)
  (ii) Melanonychia
  (iii) Onycholysis: distal/lateral/distal-lateral
  (iv) Opacity
  (v) Longitudinal whitish streaks

*International Journal of Dermatology 2012, 51, 483–496*
Onychomycosis

- Free edge
  (i) Subungual keratosis: “ruinous aspect”/no “ruinous aspect”
  (ii) Chromonychia: ventral/dorsal
  (iii) Dermatophytoma

- Adjacent skin
  (i) Dryness
  (ii) Scaling

Psoriatic nail

- Nail matrix
  (i) Pitting
  (ii) Trachyonychia
  (iii) Beau’s line
  (iv) Leuconychia
  (v) Mottled lunula

- Nail bed
  (i) Onycholysis
  (ii) Salmon spot/oil spot
  (iii) Splinter hemorrhages
  (iv) Subungual hyperkeratosis

Onychomycosis vs. Onycholysis

- Jagged edge with spikes: the proximal margin of the onycholytic area has a jagged edge.
- Longitudinal striae of different colors of the onycholytic nail plate. Their color ranges from white to yellow, orange and brown.
- Linear edge (without spikes): the proximal margin of the onycholytic area is regular, without indentations.

Ungual lichen planus

- Nail matrix
  (i) Onychochrosis
  (ii) Longitudinal splitting
  (iii) Pterygium

- Nail bed
  (i) Onycholysis
  (ii) Splinter hemorrhages
  (iii) Subungual hyperkeratosis
  (iv) Melanonychia
  (v) Fragmented dorsum nail plate
  (vi) Convergent longitudinal grooves
Nail bacterial infection

Pigmented nail/Onychopathy
Dermoscopic evaluation

First Step Algorithm
Criteria for melanocytic onychopathy

Melanocytic onychopathy
Non-melanocytic onychopathy
Unclassified

Second Step Algorithm
Color evaluation
Pattern analysis
Micro-Hutchinson's sign
Microscopic groove

Benign
Subungual melanoma

Subungual hematoma
Exogenous pigmentation
Onychomycosis
Psoriatic nail
Ungual lichen planus
Others
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**台灣皮膚科醫學會會員**
Taiwan Dermatologic Association, Member

**Fields of Interest**
- International Society of Hair Restoration Surgery; Orlando Hair restoration training (Bosley) (2012)
- International Society of Hair Restoration Surgery; Alaska Hair restoration training (2011)
- JP plastic surgery; Hair restoration training (Korea: 2012)
- Japan: NHT hair transplantation center (Japan; 2012)
- Department of Dermatology, Keio University, Japan (November 2008): visiting research fellowship
- Department of Dermatology, Toranomon Hospital, Japan (December 2008): visiting research fellowship
- Traumatic prevention research center, Taipei Medical University (2002-2003); research student
- Department of Anesthesiology, Wanfang Medical Center; Research student (summer of 2002)
- Canadian National Transplantation Research Institute; Research Student (1998)
  Assisted in basic liver transplantation research
Publications


Pincer nail

- Excessive transverse curvature of the nail plate increases along the longitudinal axis of the nail (incurved nail, unguis constringes, transverse over curvature, trumpet nail, convoluted nail, omega nail)

- Curvature increases proximally to distally, giving the nail a trumpet-like appearance. Impingement of the distal nail bed between the free lateral edges of the nail plate.

- Incidence of pincer nail was reported to be 0.9% in randomized population.

Pincer nail deformity

- Pinching of the lateral nail plate into soft tissue
  - Severe pain and secondary infections
  - Hindering normal walking and markedly decrease the quality of life.

Hereditary:
  - Symmetrical
  - Family members
  - Usually great toes > small toes
  - Epidermolysis bullosa simplex (Dowling-Meara type)

Acquired:
  - Not symmetrical
  - Psoriasis, tumors (exostosis, implantation cyst), Tinea unguim
  - Placement of arteriovenous fistula in the forearm
  - B-blockers: practolol, acebutolol
  - Metastasing adenocarcinoma of sigmoid colon (marker of gastrointestinal malignancy)
  - Infant: Kawasaki’s disease
  - Deformity in the foot with deviation of the phalanges: ill-fitting shoes
  - Osteoarthritis
Therapeutics

- Large number of successful conservative and surgical treatment modalities have been described for the correction of PND, but no consensus exists as to the most common and accepted form of treatment.

- Surgical therapies: recurrence is less common but with some disadvantages.
  - pain, time consumption, secondary infection, and need for local anesthesia, cosmetic deformity, resulting in disfigurement.

- Nonsurgical treatment: nail matrix is destroyed with various chemical or physical agents such as 40% urea paste, electrocoagulation, or a stainless steel brace inserted on the nail plate and fixed under the lateral edges temporarily resolve the pain but often recur.


Evolution of the treatment

A Splint for Pincer Nail Surgery: A Convenient Splinting Device Made of an Aspiration Tube

Treatment of transverse overcurvature of the nail with a plastic device: Measurement of response
A Case of Pincer Nail Treated Using a Shape-Memory Alloy

Bo Hee Yang, MD, Chan Yl Bang, MD, Ji Won Byun, MD, Song Hyub Han, MD, Hye Jin Song, MD, Jeong Hyeun Shin, MD, PhD, Gwang Soong Cho, MD, PhD, and Seung Gyun In, MD*

Figure 1. Application techniques. (A) A distal block was applied to both great toes with 2% lidocaine, and then the oblong-shaped pedicle of the nail was pulled out using a mosquito clamp. (B) The width of the nail was measured using a paper ruler. (C) The side-angled shape-memory alloy was selected and dipped into cold ethyl alcohol. (D) Involved shape-memory alloy was bent six times to allow the hooks on both sides of the edge to catch onto the pedicle. (E) and (F) One side hook was applied to each side of the edge of the pedicle. (G) One more shape-memory alloy was applied to the pedicle side of the toenail, and each hook was pinched using a mosquito clamp to fix the pedicle. (H) Excess skin and subcutaneous fat was removed using an elliptical incision.

Surgical Pearl: Nail plate separation and splint fixation—a new noninvasive treatment for pincer nails

Figure 1. Nonsurgical nail of left great nail.

Figure 2. Alkaline splint bar was glued under nail plate’s white free edge using cyanacrylate adhesive after nail plate separation.

Figure 3. Marked cosmetic improvement 12 months after treatment.

Regarding Assisting Pincer Nail Deformity by Haneke’s Procedure

Figure 1. (A) After the nail bed is exposed, the normal nail bed (black arrow) is seen with the surrounding fibrous tissue (white arrow). (B) Surface irregularities such as traction osteophytes (white dot) are easily removed using a bone burr. (C) The original nail was trimmed thin using the bone burr for final coverage of the nail bed. (D) Satisfactory results were obtained using this simple, effective, nail matrix-sparing technique without any complications.
Trichloroacetic Acid Matricectomy and Aluminum Splint Fixation for the Treatment of Pincer Nails

Table 1. Summary of the Clinical Profiles of the Patients

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Location</th>
<th>Duration (Years)</th>
<th>Outcome</th>
<th>Complications</th>
<th>Follow-Up (Months)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>35</td>
<td>Both great toes</td>
<td>1</td>
<td>Excellent</td>
<td>None</td>
<td>32</td>
</tr>
<tr>
<td>Male</td>
<td>36</td>
<td>Both great toes</td>
<td>4</td>
<td>Excellent</td>
<td>None</td>
<td>27</td>
</tr>
<tr>
<td>Male</td>
<td>25</td>
<td>Both great toes</td>
<td>7</td>
<td>Excellent</td>
<td>None</td>
<td>21</td>
</tr>
<tr>
<td>Male</td>
<td>11</td>
<td>Both great toes</td>
<td>6</td>
<td>Excellent</td>
<td>None</td>
<td>10</td>
</tr>
<tr>
<td>Female</td>
<td>32</td>
<td>Right great toe</td>
<td>10</td>
<td>Excellent</td>
<td>None</td>
<td>5</td>
</tr>
<tr>
<td>Male</td>
<td>16</td>
<td>Left great toe</td>
<td>5</td>
<td>Excellent</td>
<td>None</td>
<td>4</td>
</tr>
<tr>
<td>Male</td>
<td>43</td>
<td>Both great toes</td>
<td>1</td>
<td>Excellent</td>
<td>None</td>
<td>3</td>
</tr>
</tbody>
</table>

Dermatol Surg 2010;36:1493–1498

Gutter splint treatment

Figure 1. (A) Separation of nail precursor from epidermal layer. (B) Aluminum splint bar. (C, D) Twenty-eight months after treatment. (continued next page)

Figure 2. Patient 1. (A, B) Preoperative condition. The inside of the nail plate was ingrown, and pyogenic granuloma-like change, swelling, and erythema were observed around the nail fold. (C, D) After 9 days of super elastic wire treatment, the free end of the nail plate became flattened, and pyogenic granuloma-like change became maturated. Erythema and swelling of the toenail vanished.

Dermatol Surg 2008;34:1729–1732

・ マチワイヤ (Machiwire)
合金特許
T本(2-4指に使えます)（治療の料金は含みません）
太さは7種類・0.3mm、0.35mm、0.4mm、0.45mm、0.5mm(標準)、0.55mm、0.6mmが有ります。
成人の母趾では多くの場合0.45mm・0.5mm(標準)、0.55mmが適応です。
SE NiTi wire is composed of shape-memory NiTi alloy and has strong elasticity. Machida and colleagues first introduced the material and methodology in the treatment of ingrown and curved nails in 1999, with promising results. Moriue and colleagues applied a similar therapeutic strategy for treating ingrown nails with successful outcomes.
Clinical Assessment

- Nail height (A) and nail width (B) at the distal end of the nail: measured directly using a caliper.
- Ratio of A to B was calculated.
  - ratio approaches 0 → indicates a flatter nail plate,
  - higher values → marked dorsal protrusion.
- Subjective pain relief scale: no relief, partial relief, and total relief.
- Clinical photographs of the nail were also taken to assist in the evaluation.

Results

Three patients had the hereditary type of PND in that they had a positive family history revealing the same deformity in parents or siblings.

Patients with onychomycosis outnumbered those without onychomycosis, no significant difference in the severity of PND.

The degree of transverse overcurvature seen in PND patients with a medical history of ingrown nail was more severe than in those without.

*Table 1: Baseline Demographic Data and Disease Characteristics of All Patients with Pincer Nail Deformity*

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (digits), n</td>
<td>43 (73)</td>
</tr>
<tr>
<td>Age, mean (range)</td>
<td>43 (26-101)</td>
</tr>
<tr>
<td>Sex, patient; digit, n (%)</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>15 (35); 26 (39)</td>
</tr>
<tr>
<td>Female</td>
<td>28 (65); 47 (64)</td>
</tr>
<tr>
<td>Duration of disease, years, range</td>
<td>0.4-20</td>
</tr>
<tr>
<td>Onychomycosis, patient; digit, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>34 (79); 52 (71)</td>
</tr>
<tr>
<td>No</td>
<td>9 (21); 21 (29)</td>
</tr>
<tr>
<td>Medical history of ingrown nail; digit, n (%)</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>23 (53); 39 (59)</td>
</tr>
<tr>
<td>No</td>
<td>20 (47); 34 (47)</td>
</tr>
</tbody>
</table>
Figure 3. Pincer nail deformity. Photographs demonstrating the treatment response of some patients with pincer nail deformity. (A) Pre-treatment condition, (B) Post-treatment condition at 2 months. The curvature of the nail plate has been improved.

Figure 5. (A) view from anterior aspect, (B) view from dorsum aspect. Pincer nail deformity. Pincer nail deformity patient with thick nail plates (0 months). Minimal response was observed at the 1-month mark, so a second wire was implanted. One month after implantation of two wires the curvature of the nail plate had improved (2 months). One wire was later removed as the nail grew longer (4 months).