Nail Disorders

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Some slides courtesy E.J. Mayeaux, Jr., M.D.

Disclosure Statement:
• Co-Author,

Objectives
• Recognize normal nail anatomy
• Evaluate the chief complaint of abnormal appearing nails
• Utilize medical and physical modalities in the management of nail disorders, as feasible

Normal Nail Anatomy
• Nail plate
  – Hard, flexible
  – Keratinized sq. cells
  – Borders proximal and lateral nail folds
  – Longitudinal grooves on ventral surface
  – Onychodermal band = Hyponychium

Normal Nail Anatomy
• Nail bed
  – Highly vascular
  – Germinial tissue
  – Longitudinal ridges interdigitates with nail
  – Borders lunula, lateral nail folds, and hyponychium

Courtesy of Dr. E.J. Mayeaux, Jr., M.D.
Leukonychia

- No clinical significance
- Possibly due to minor trauma to proximal nailbed

Splinter Hemorrhage

- Most commonly a benign finding due to local trauma – up to 20% of normal people
- Can be a sign of Bacterial Endocarditis with septic emboli

- Janeway lesions
- Tender Osler’s nodes
Longitudinal Ridges

- Normal variant
- More common in elderly

Transverse Nail Ridges / Habit Tic Deformity

- Repetitive trauma to cuticle
- Most common childhood nail condition
- Reassurance - No Tx is necessary
- Behavior modification helpful

Subungual Hematoma

- Treatment
- Loss of nail and regrowth

Nail Streaking / Longitudinal Bands / Longitudinal Melanonychia
- Up to 90% of Black people have streaking usually multiple nails
  - Habif - Clinical Dermatology

Factors Leaning Toward Melanoma
- New longitudinal band in light skinned individual
- Sudden change in width or color
- Single nail involvement
- Pigmentation of nail fold or prox. nail margin – Hutchinson’s sign
- More than 3 mm wide
- Family or personal history of melanoma or dysplastic nevi
- Destruction or disruption of nail plate

Subungual Melanoma
- Small number of patients with LM have subungual melanoma
- Benign vs. malignant - often difficult
  - Bx if cause not apparent

Subungual Melanoma
- 45% to 60% arise on hand
  - Most in the thumb
- On foot, occurs on great toe
- Median age = 60s - 70s
- Males = females
Subungual Melanoma

- Biopsy if etiology uncertain
- Provide adequate tissue
- No single bx method best
  - Dystrophy less with distal matrix bx
  - Appearance less crucial in the toes
  - Bx more aggressively in older patients

Local Deformation

- Digital mucous cyst deforming nail

Koilonychia - Spooning

- Normal variant
- See commonly in infants/toddlers
- Iron deficiency anemia
- Hemochromatosis
- Raynaud's
- SLE
- Trauma
Ingrown Toenail

- Poor fitting shoes
- Trauma
- Improper nail care
- Chronic irritation and hypertrophy
- Nail removal
- Excision of hypertrophic skin

2 Disorders

Wart

- Secondary onycholysis and disruption
- Treatment options
**Onychomycosis**

- Fungal infection of the nails
- Dermatophytes
  - *Trychophyton rubrum* 70%
  - *Trychophyton mentagrophytes* 20%
  - Tosti, A E-Medicine 2/2016
  - Less common – *Candida*
    - Immune compromise / diffuse infection
- Single digit or multiple digits
- Very common in adults
  - May also occur in children

**Risk Factors**

- Male > Female
- Age
- Genetic predisposition
- Decreased immune system
- Diabetes
- Poor circulation
- Trauma

**Onychomycosis**

- Distal subungual onychomycosis
  - Most common
  - Invades hyponychium/onychodermal band
  - Distal nail turns yellow or white

**Onychomycosis Diagnosis**

- Tendency to label any process involving nail as a fungal infection
  - Diff Dx – Leukonychia, psoriasis, eczema, habit tic, dystrophic nails
- Confirm before treatment?
  - Microscopy
  - Sabouraud’s medium etc.
  - Nail clippings to lab
  - Dermoscopy – streaking aurora borealis pattern
  - PCR

**Onychomycosis Treatment Highlights**

- Terbinafine (Lamisil) - Drug of Choice 6 wks fingernails 12 weeks toenails 250 mg daily
- Itraconazole - drug interactions, CYP3A4 inhibitor
  - More effective if due to *Candida*
- Ciclopirox (Penlac) – Lacking in effect
  - ? Prevent recurrence
Onychomycosis Treatment Difficulties

- Liver damage
  - Avoid Ketoconazole
  - Griseofulvin
  - Terbinafine 1/50,000 – 1/100,000
  - Q 6wks LFTs/CBC
  - Avoid if ANC<1000, renal or hepatic disease
- Treatment failure
- Reinfection


Onychomycosis Tx

<table>
<thead>
<tr>
<th>Drug</th>
<th>Dose</th>
<th>Course</th>
</tr>
</thead>
<tbody>
<tr>
<td>Griseofulvin (Grifulvin V)</td>
<td>500mg PO qday or 15-20mg/day</td>
<td>6-12 months (f)</td>
</tr>
<tr>
<td>Terbinafine (Lamisil)</td>
<td>250mg PO qday or 400mg/20kg qday</td>
<td>6-12 weeks (f)</td>
</tr>
<tr>
<td>Terbinafine (Lamisil) pulse (not FDA indicated)</td>
<td>100mg twice weekly (not thoroughly studied)</td>
<td>6 weeks (f), 12 weeks (t)</td>
</tr>
<tr>
<td>Itraconazole (Sporanox)</td>
<td>200mg PO daily</td>
<td>3 months (t)</td>
</tr>
<tr>
<td>Itraconazole (Sporanox) pulse</td>
<td>680 mg or 128mg/daily capsules for 1 week/pulse</td>
<td>3 months (t), 6 months (f)</td>
</tr>
<tr>
<td>Fluconazole (Diflucan) (not FDA indicated)</td>
<td>150mg or 3-5mg/kg once weekly</td>
<td>12-26 weeks (f), 16-26 weeks (t)</td>
</tr>
<tr>
<td>Ciclopirox 8% nail lacquer (Penlac)</td>
<td>Apply daily to nail and surrounding skin</td>
<td>Up to 48 weeks</td>
</tr>
<tr>
<td>Efinaconazole 10% soln (Jublia)</td>
<td>Apply to affected toenail(s) qDay</td>
<td>Up to 48 weeks</td>
</tr>
<tr>
<td>Tafoxorone (Kerydin)</td>
<td>Apply to affected toenail(s) qDay</td>
<td>Up to 48 weeks</td>
</tr>
</tbody>
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Efficacy Meta-Analysis

- Terbinafine (76 ±3 percent)
- Itraconazole pulse therapy (63 ±7 percent)
- Griseofulvin (60 ±6 percent)
- Itraconazole continuous therapy (59 ±5 percent)
- Fluconazole (48 ±5 percent) and Posaconazole off label
- Ciclopirox (Penlac) (7 percent)*


Treatment Adjuncts

- Nail avulsion
  - Decrease the adverse effects
  - Decrease duration of oral therapy
  - Decrease pain from onychogryphosis

Complementary Medicine

- Laser
- Photodynamic therapy
- Vicks VapoRub
- 40 to 50% urea compound
  - 3-7 days under occlusion
- Banana peels
- Tea Tree oil 2-3 times/day

VapoRub for Onychomycosis??

- Vicks VapoRub has been advocated in the lay literature as an effective tx
  - 5/18 (27.8%) mycological cure @ 48 wks
  - 10/18 (55.6%) had partial clearance
  - 3/18 (16.7%) showed no change

Reducing Recurrence 2014 BAD Guidelines

- Discard shoes
- Alternate shoes
- Keep feet dry
- Antifungal powder in shoes
  - Miconazole
  - Clotrimazole
  - Tolnaftate
- Naphthalene moth balls in bag x 3 days
- Treat family members
- British Academy of Dermatology - The British Journal of

Pincer Nails

- Unknown etiology
- Widening of distal phalanx, onycho
- Hereditary or acquired
- Result of inward folding of the lateral edges of the nail
  
  - Treatment
  - Shorten nails
  - Lateral matricectomy

Hypertrophic Nail

- Trauma
- Chronic inflammation
- Poor fitting shoes
- Trim nails or surgical removal with ablation
Paronychia

• Acute inflammation of the lateral and/or proximal nail folds
• Red, tender, throbbing, intensely painful
• Usually caused by infection
  — Staph aureus, Strep pyogenes, and Pseudomonas most common
• Small abscess forms

Paronychia

• Predisposing factors
  — Overzealous manicuring
  — Nail biting
  — Thumbsucking
  — Diabetes mellitus
  — Frequently immersed in water

Paronychia

• Chronic paronychia - Candida vs inflammation

Paronychia

• Milder cases
  — Warm soaks 15 minutes 2-4 times daily, with or without systemic antibiotics
• More severe cases require I&D
• For chronic paronychia, trauma and irritants must be eliminated
  — Broad spectrum antifungals

Courtesy of Dr. E.J. Mayeaux, Jr.
Changes Associated with Systemic Diseases

Eczema

- Onycholysis and deformity
- Poor attachment of cuticle and damage to proximal nailbed
Clubbing
- Spongy nail bed with loss of angle
- Pulmonary disease - often more inflammatory or cancer instead of just COPD
- Inflammatory bowel disease
- Cirrhosis
- Congenital heart disease

Pitting Disorders
- Psoriasis
- Alopecia Areata
- Sarcoid
- Connective tissue dz
- Pemphigus vulgaris
- Incontinentia pigmenti

Color Changes of Nail/Lunula
- Blue (Azure Lunula) - Wilson's disease (hepatolenticular degeneration)
- Red – CHF
- Yellow – Tetracycline
- Yellow – Yellow nail syndrome in respiratory diseases or lymphedema
- Slow growth of nails often thickened
- Blue Grey – Argyria (Silver poisoning)
- Brown or Black – Excessive Fluoride ingestion
- Green – Pseudomonas infection
- White – Terry’s nails of CHF, cirrhosis DM or aging

Onychogryphosis
- Trauma
- Elderly
- Onychomycosis
Psoriasis

- Pitting
- Oil staining
- Mechanism
Psoriasis

- Nail involvement - 10% to 50%
- Usually coexists with skin psoriasis
- Nail involvement = higher incidence of arthritis
- Nail plate pitting
  - Proximal matrix forms superficial plate
  - Pinpoints to punched out lesions
  - Not specific for psoriasis

Psoriasis Treatment

- Distal onycholysis enhances microbial colonization
  - Greenish-blue discoloration suggests Candida or pseudomonas

Psoriasis Treatment

- Topical high-potency corticosteroid solution or ointment QHS under occlusion with cellophane wrap
  - Occlusion <2 wks
- Corticosteroid and calcipotriol
- Oral and topical PUVA for cutaneous and nail psoriasis
- Narrow-band UVB
- Systemic MTX, retinoids, cyclosporine, biologicals

Psoriasis

- Longitudinal matrix involvement produces ridging or splitting
- Transverse produces Beau’s lines
- Intermediate produces leukonychia and diminished integrity

Psoriasis

- Nail disease often refractory
- Intralesional corticosteroid injection into the proximal nail fold
  - Pain minimized by precooling or block
  - Nail bed dz = proximal injection
  - Matrix disease = fold injection

Lichen Planus

- Uncertain etiology
Lichen Planus

- Lichen Planus is often a scarring disease when it affects the nail bed and mucosa especially the vagina

Nail involvement in 10% to 20% of patients
– Brittle, ridged nails most common
– Onychorrhexis or splitting

Lichen Planus - Pterygium

- Diffuse matrix atrophy produces thinning of the plate
- Tends to predominate centrally, producing “angel wing” deformity
- Pterygium from matrix scarring
  – Specific for lichen planus
  – Total matrix scarring - anonychia

Lichen Planus Diagnosis

- Straightforward when the disorder coexists with cutaneous signs
- Mycologic studies to exclude onychomycosis
- If negative, a nail biopsy will likely be needed to confirm the diagnosis
  – Examination should include H&E and PAS staining

Lichen Planus Treatment

- Unless matrix scarring has occurred, the disease is treatable
- Intraleisonal corticosteroid therapy
  – Triamcinolone acetonide 2.5 to 5.0 mg/mL injected into the proximal and lateral nail folds at monthly intervals
  – Diffuse to the underlying matrix
- Systemic or topical corticosteroids
- Acitretin at a dose of 0.35 mg/kg per day may be a treatment option in recalcitrant cases

**Poly-ureaurethane 16% for Nails**  
- FDA approved nail solution for the treatment of nail dystrophy  
- For brittle nail syndrome  
- Mechanically supports the damaged nail plate using a polymer blend that creates strong adhesion  
- Forms a breathable barrier while protecting and strengthening the nail  
- Allows for oxygen transfer while blocking water absorption  

**Beau's lines**  
- Horizontal ridge / depression  
- Disruption in growth due to any severe disease  
- Usually affects most or all nails

**Beau's lines/ridges**

**Mee's Lines**  
- Horizontal white band without ridging/depression  
- Arsenic poisoning  
- Carbon monoxide poisoning  
- Severe systemic insult

**Assoc. with Systemic Disease**  
- Mee's lines  
  - Multiple white transverse lines  
  - Historically arsenic intoxication  
  - Begins in matrix & extends across nail  
  - Usually single, but may be multiple  
  - Move distally as the nail grows  
  - Bx shows plate fragmented  
  - Chemical analysis of nail or hair

**Half and Half Nails**  
- Renal failure  
- Loss of lunula  
- Loss of convexity  
- Distal onycholysis
Dermatomyositis

- Blush
- Dilated arterioles

Review of Dz Affecting Nail Anatomy

Figure by Rob Fawcett, M.D.