Proper Management of Pathology Specimens

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No conflict of interest

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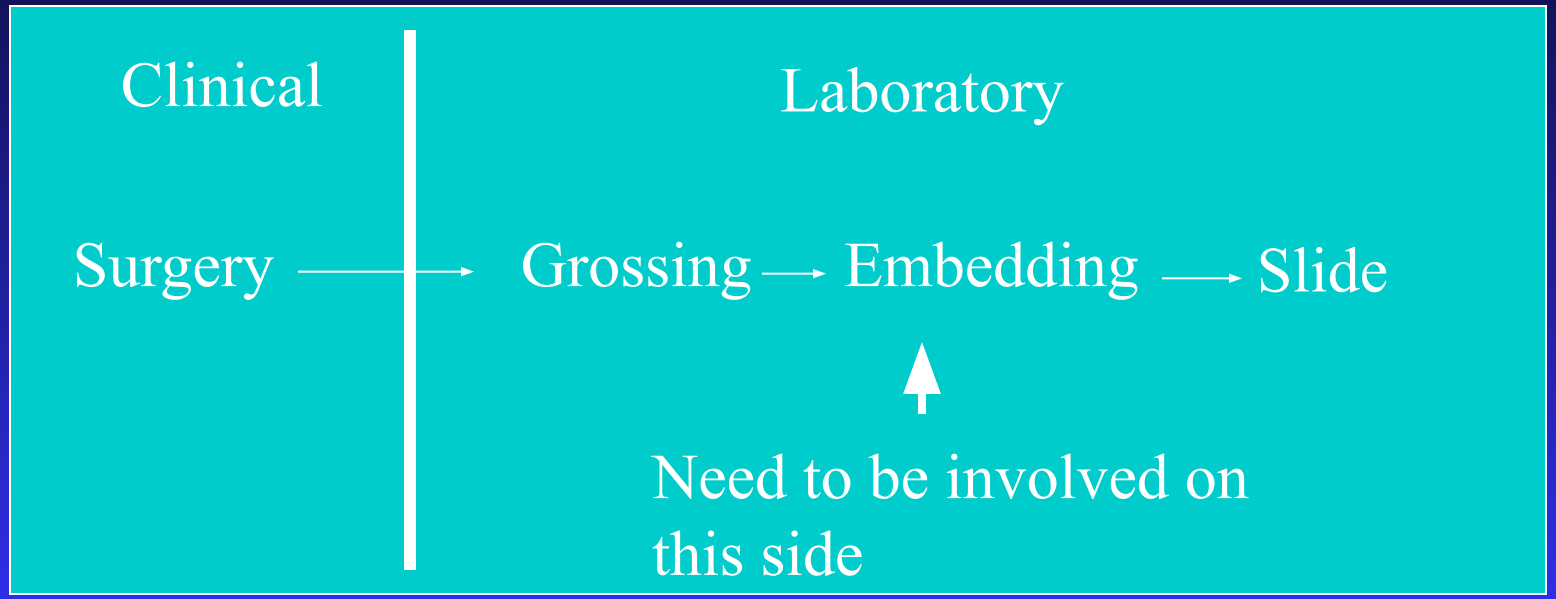
Objectives

- Nail
  - Tissue submission/processing
  - Fungal identification including mold

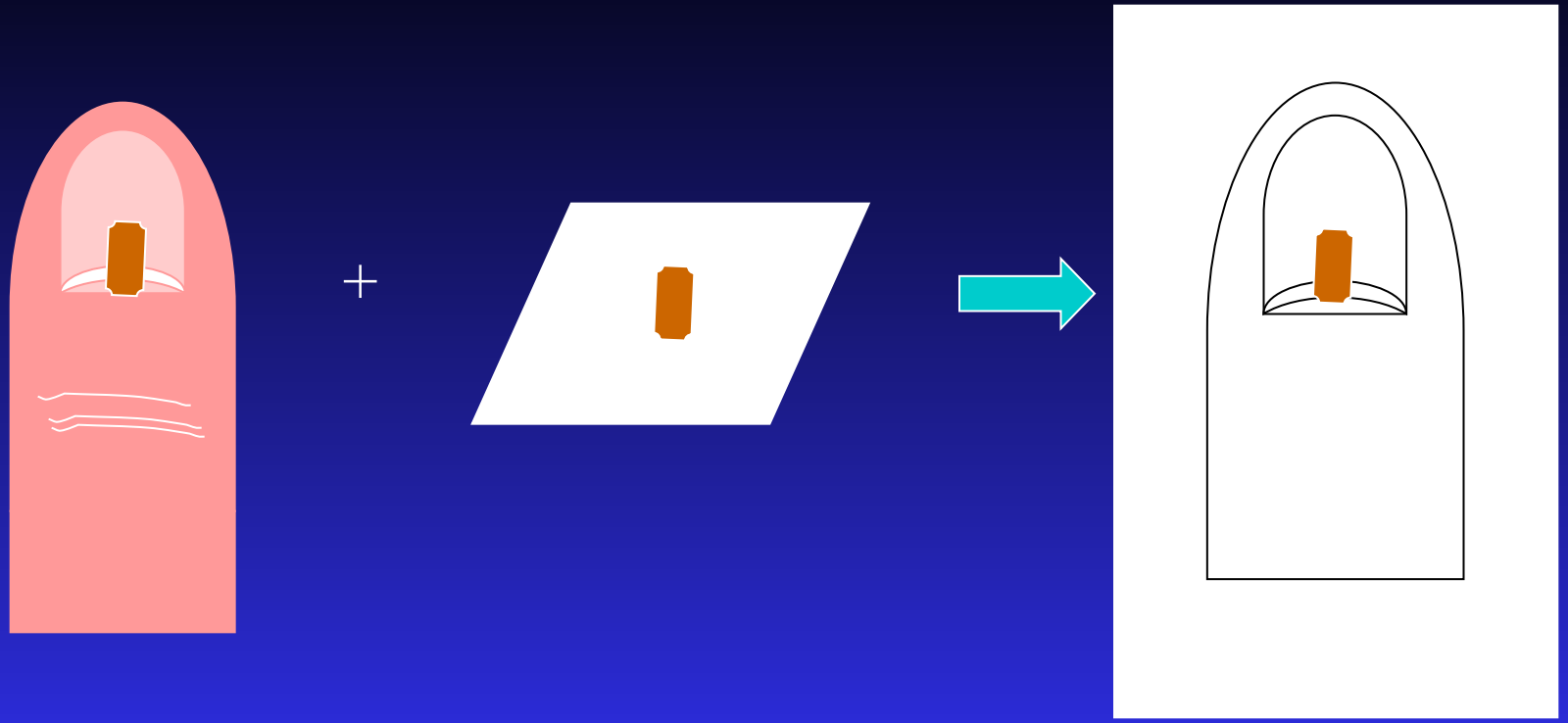
What can the nail surgeon do to submit a bed/matrix specimen for appropriate interpretation?

Need to be involved in lab prep



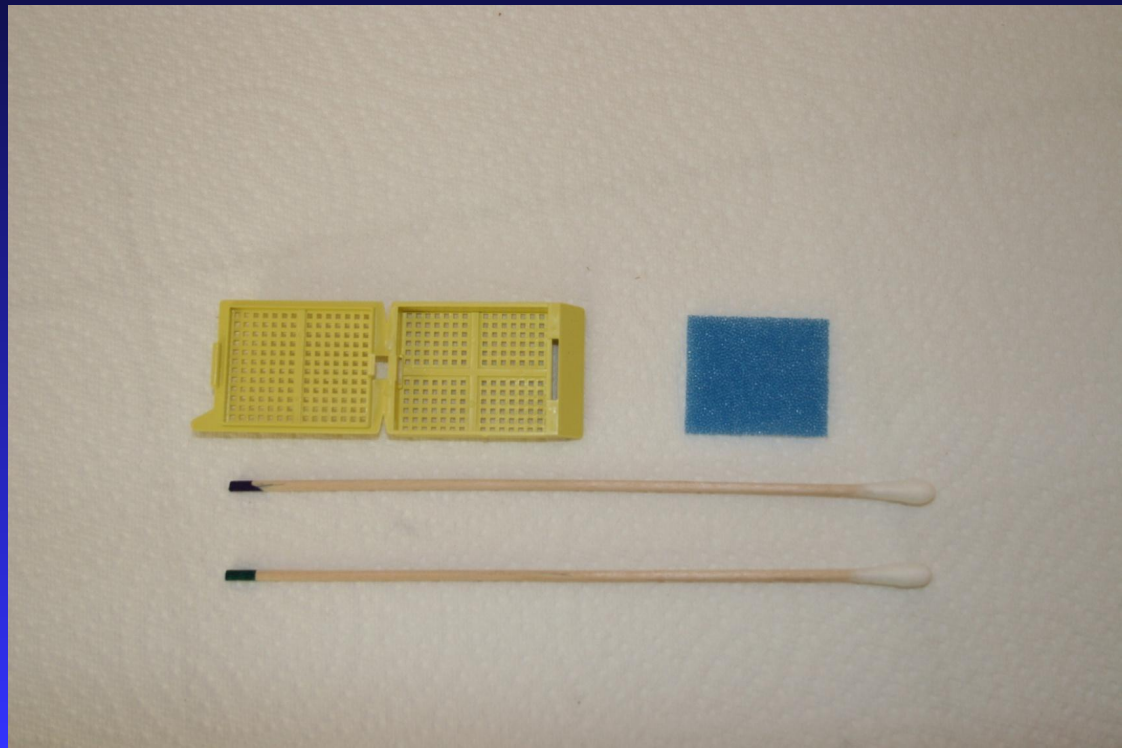
Need concise and clear guidelines for specimen submission:

- Orientation of tissue
- Clear information to histotechnicians
- Reproducible among different laboratories



Print template at www.cta-lab.com

Histology Materials



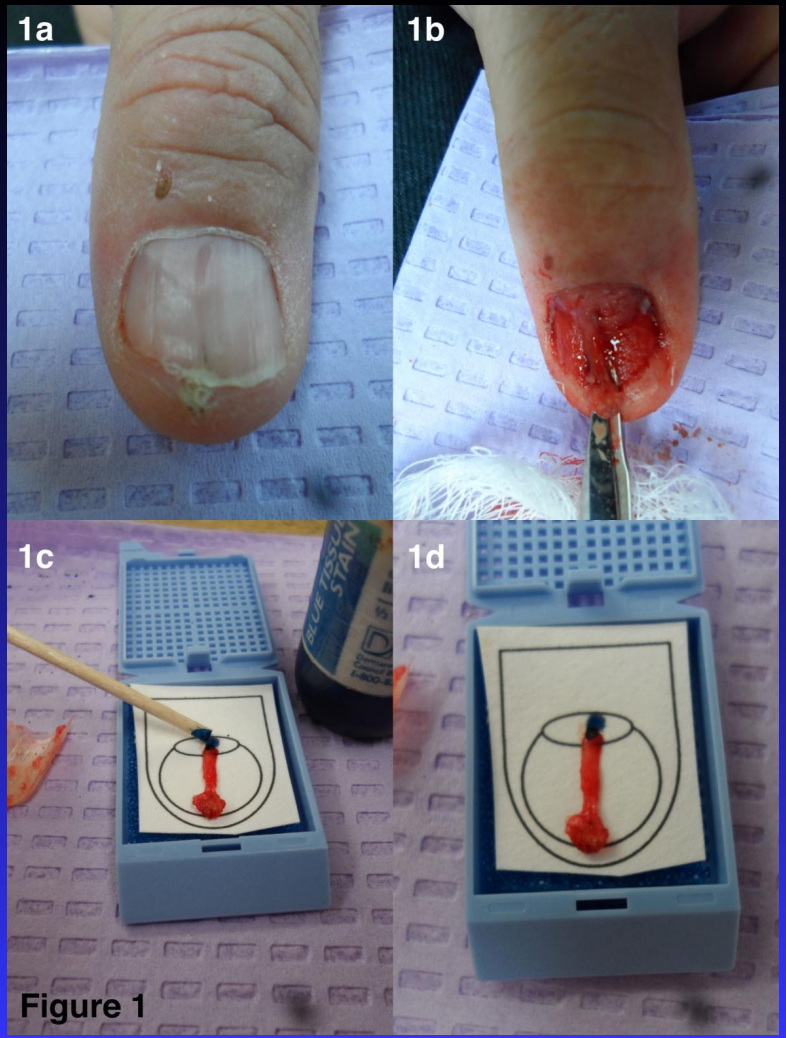


Figure 1

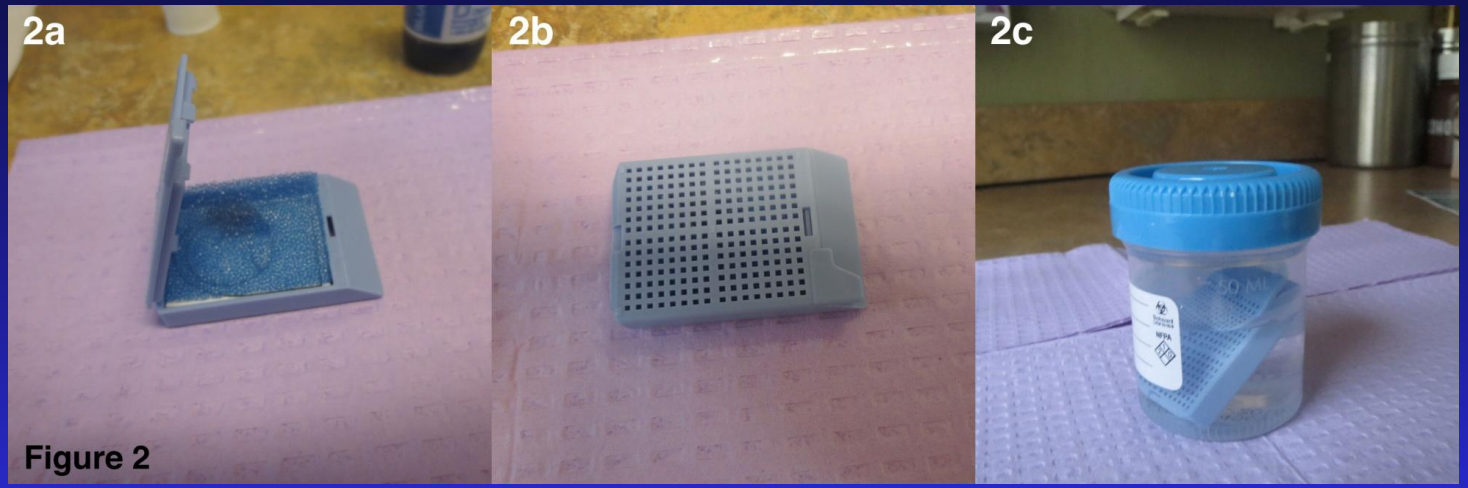
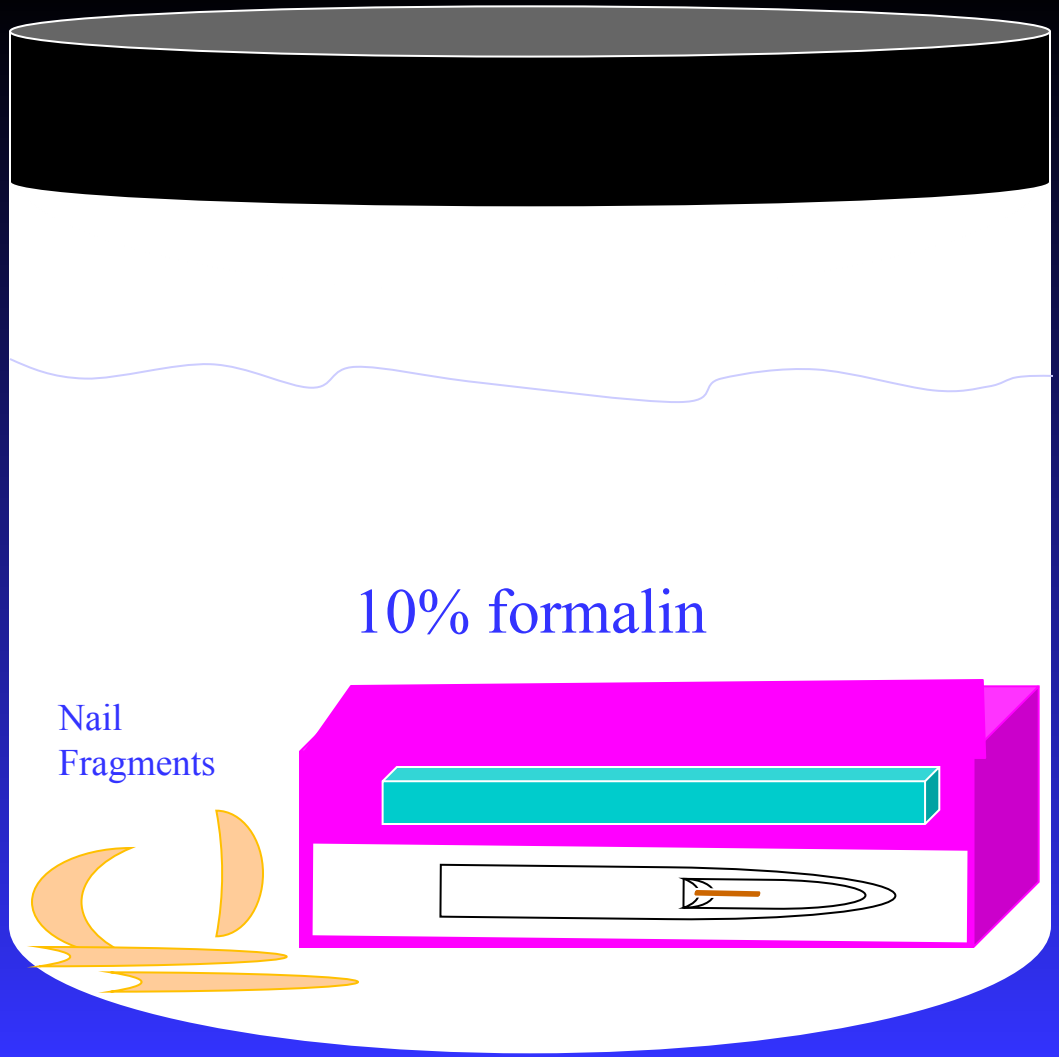


Figure 2


10% formalin
Nail
Fragments

Each specimen is different

Pathologist review before grossing

- Number tissue blocks
- Unstained slides or levels at the start
- Special stains
- Importance of nail
- Reserve nail for culture

Think about the differential diagnosis when grossing

Think about the differential diagnosis when grossing

- Onychopapilloma
- Onychomatricoma
- Digital myxoid/mucous cyst
- Squamous cell carcinoma
- Longintudinal melanonychia

Onychopapilloma

Onychopapilloma

- Clinical
  - Logintudinal erythronychia (redness)
  - Distal nail split

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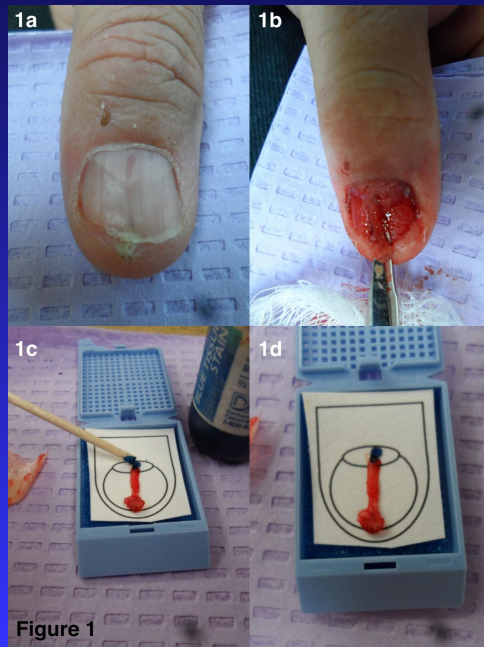
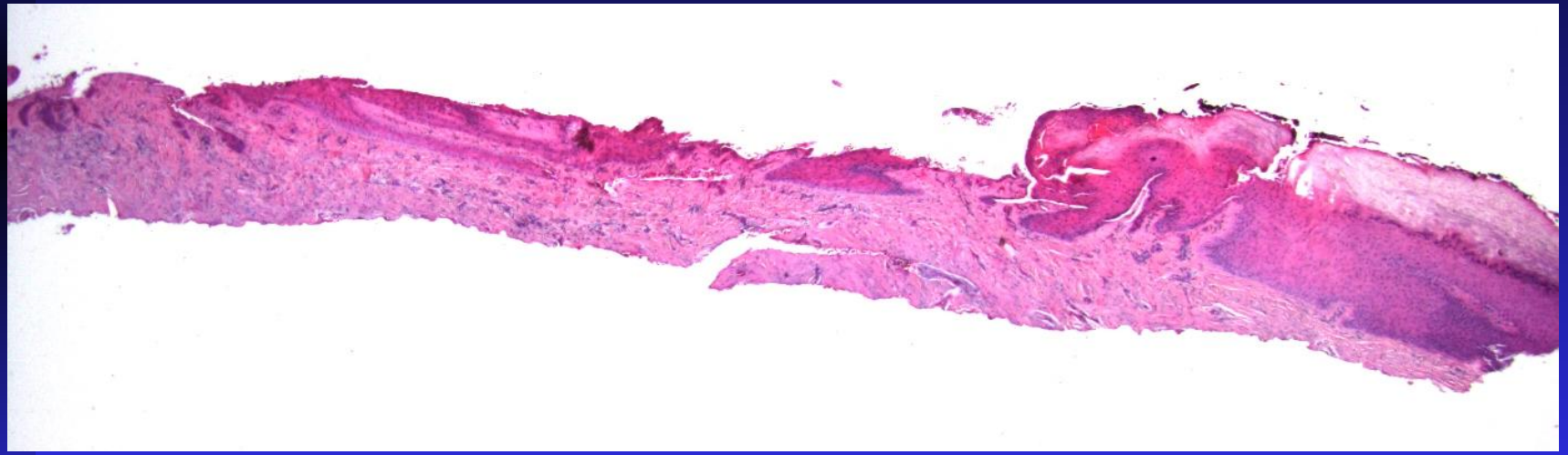
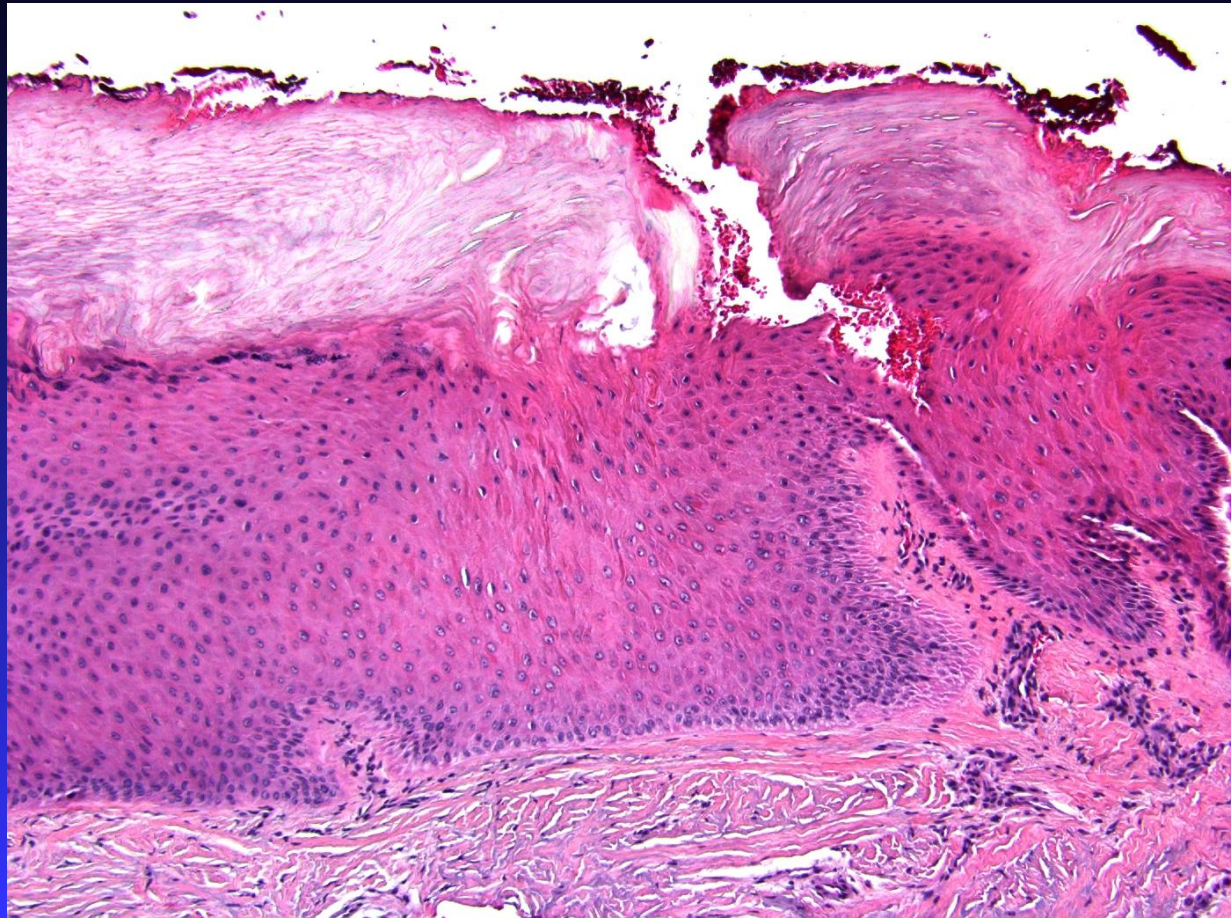
Embed proximal to distal



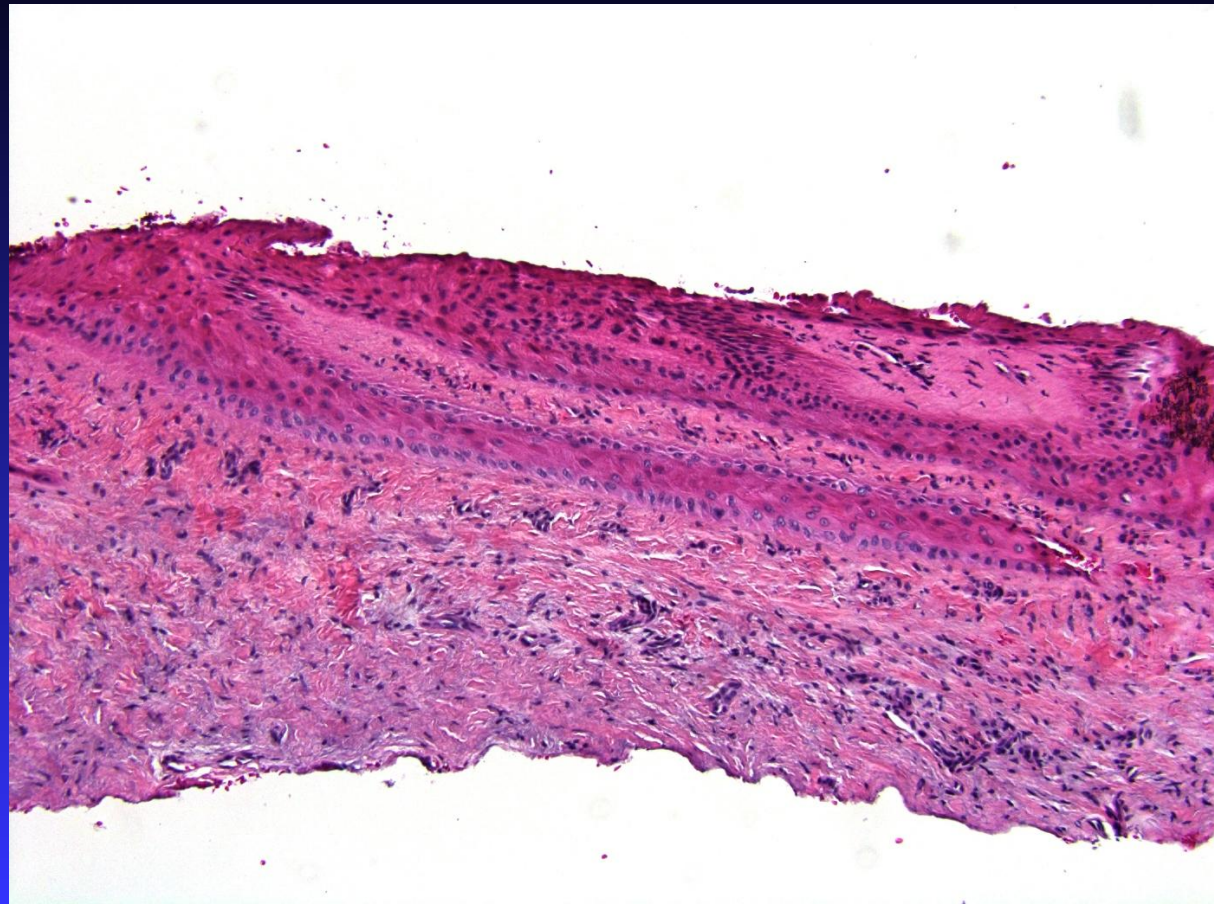
Onychopapilloma—Keratin Producing



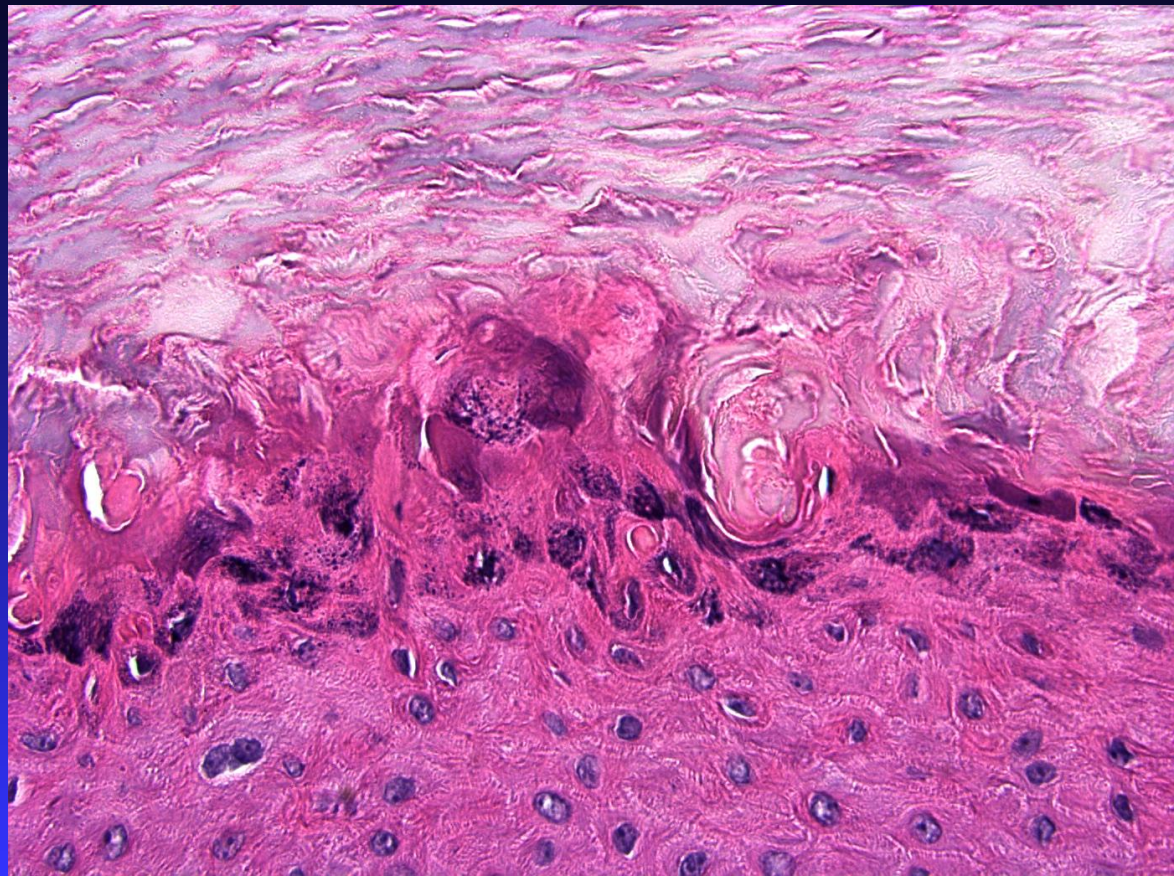
Onychopapilloma—Keratin Producing



Onychopapilloma



Onychopapilloma—Not a wart



Onycomatricoma

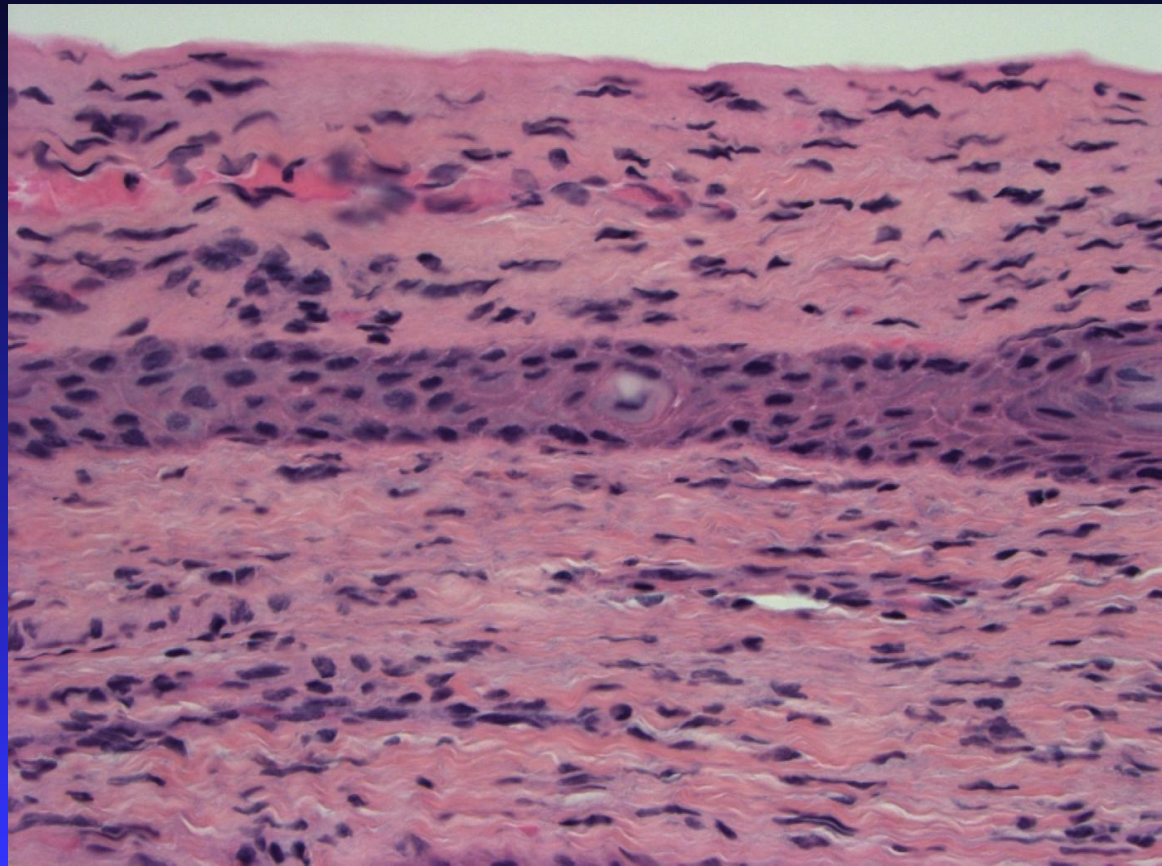
Onycomatricoma

- Examine nail for holes—Transverse sections of dystrophic nail

Onychomatricoma

Epithelial and dermal components

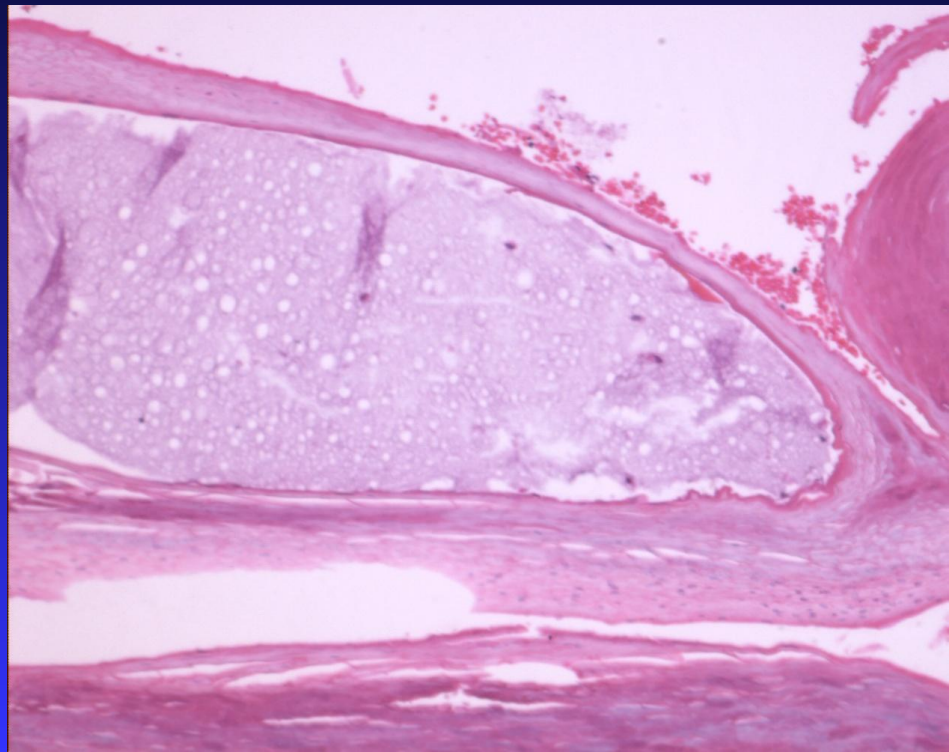
Onychomatricoma



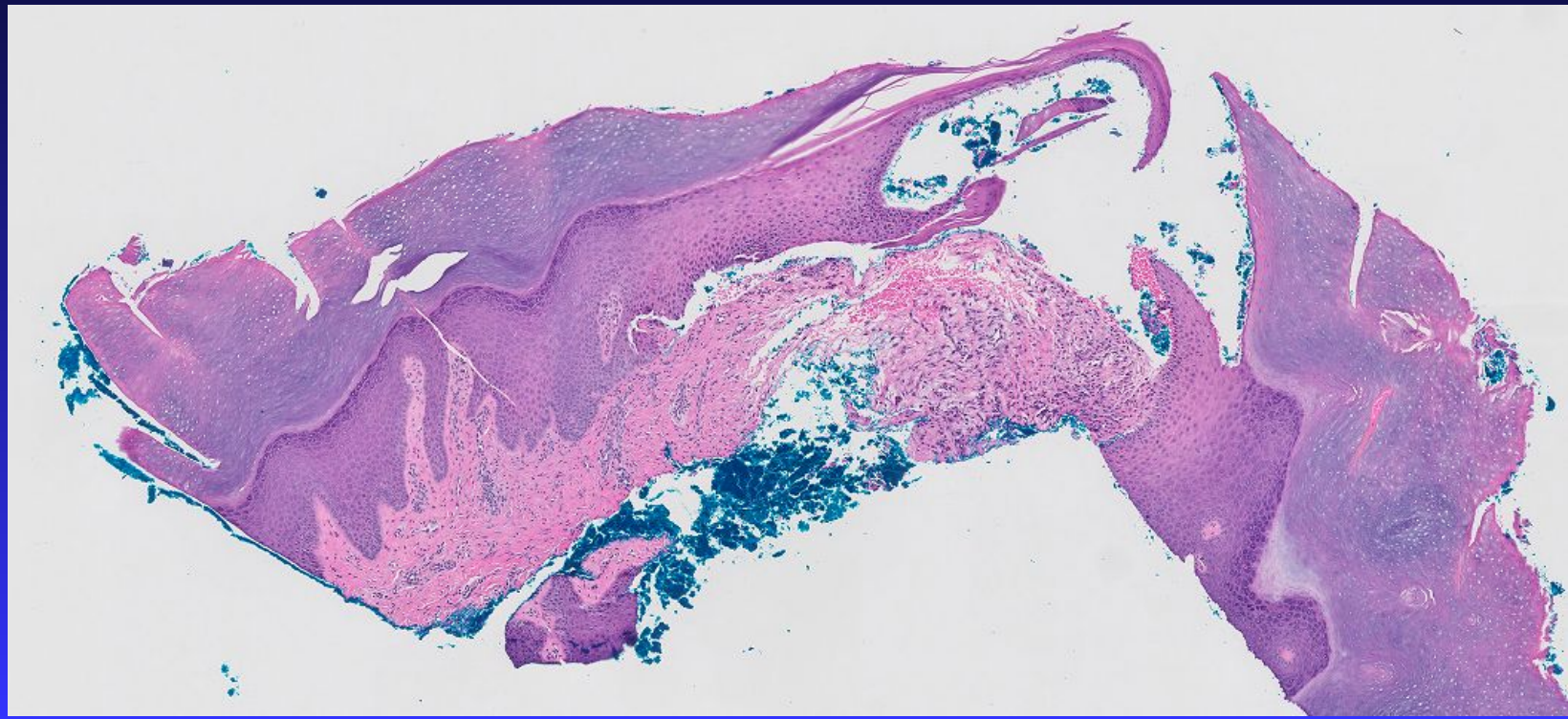
Digital Myxoid/Mucous Cyst

Digital Myxoid/Mucous Cyst

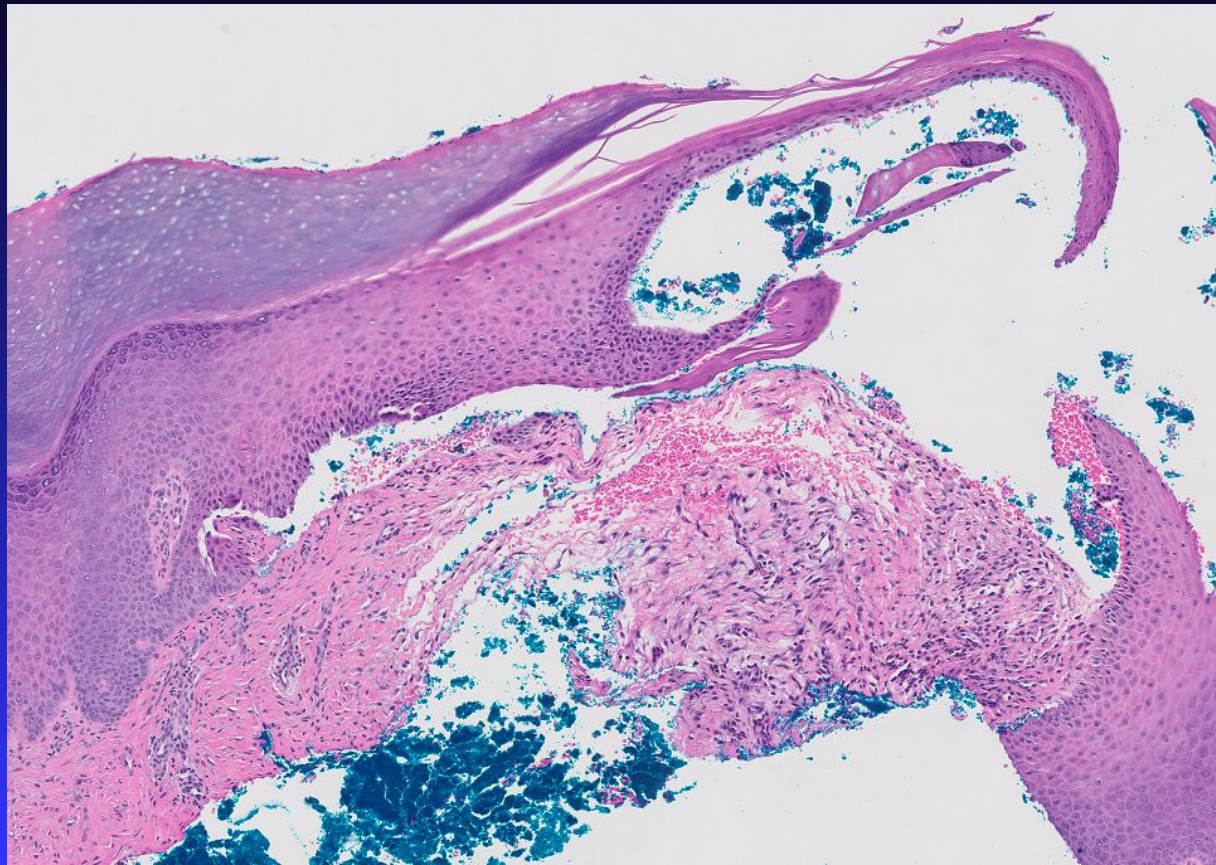
- Mucin may be anywhere



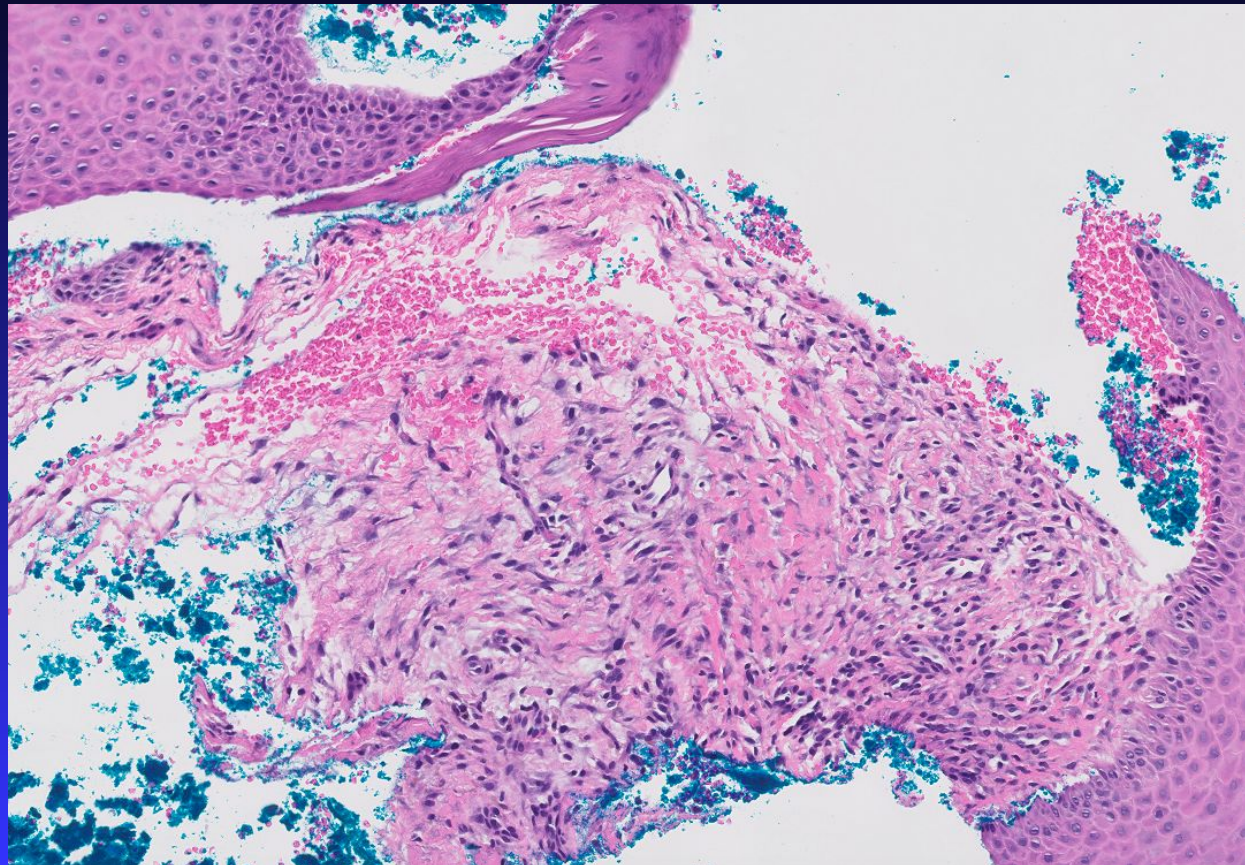
H&E may show only scar and reactive change



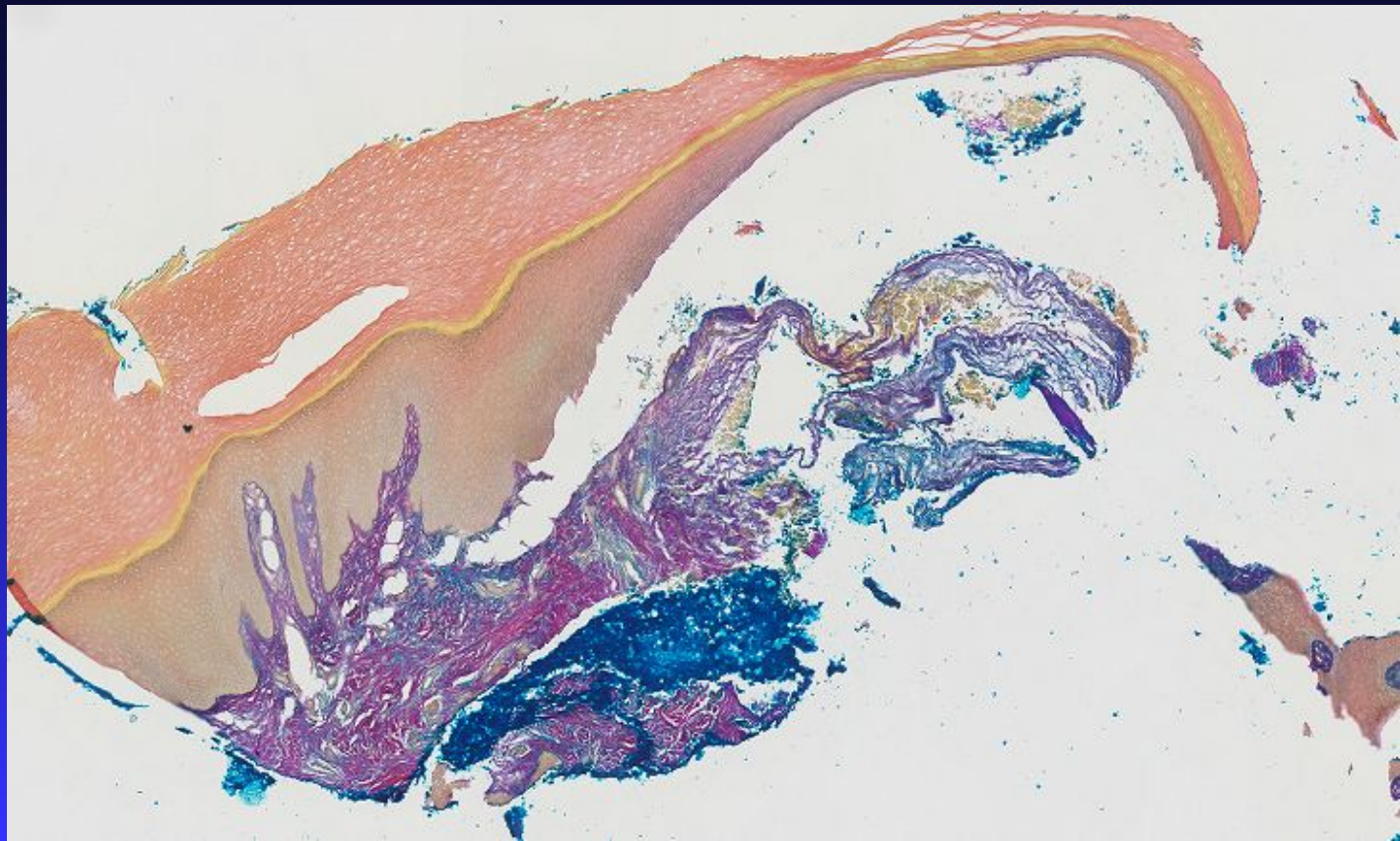
H&E may not show mucin



H&E may not show mucin



Mucin stain often required

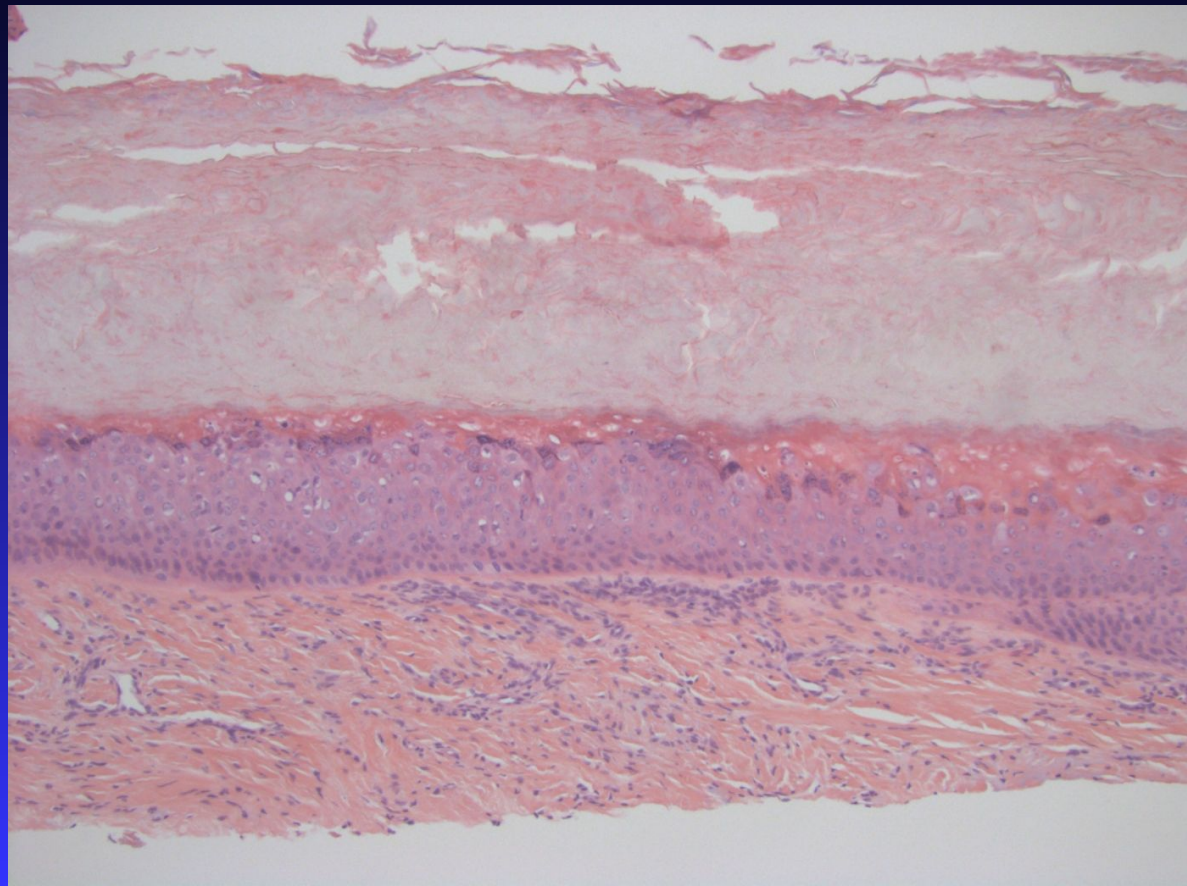


Think about the diagnosis when grossing

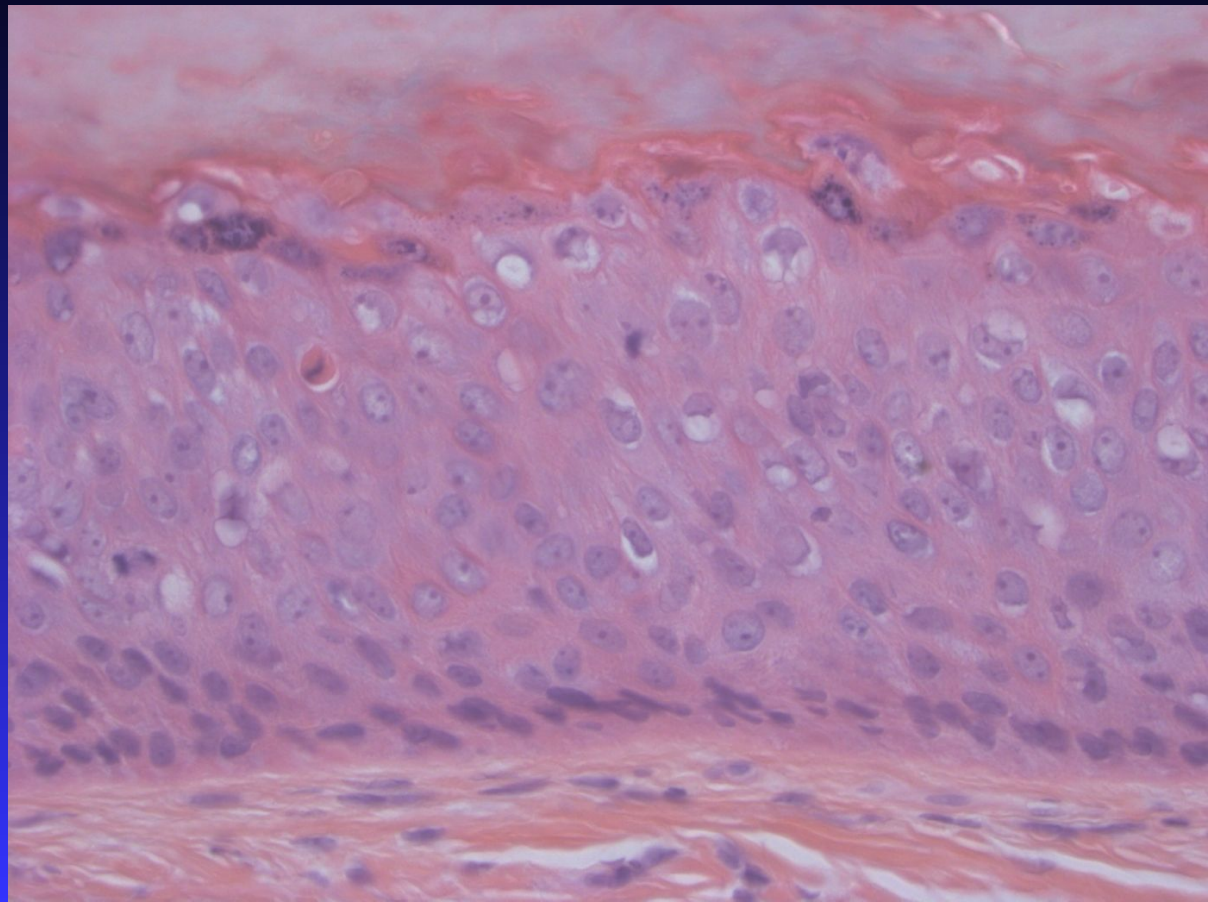
- Squamous cell carcinoma
  - Sampling
  - HPV-Verruca etiology

Squamous cell carcinoma

Squamous cell carcinoma

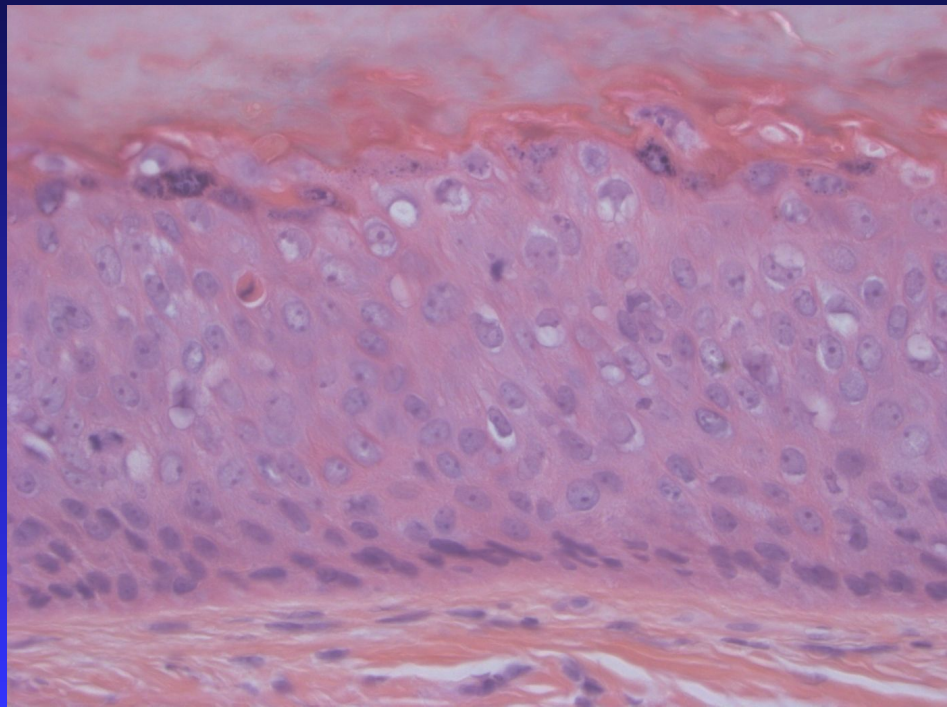


Squamous cell carcinoma in-situ

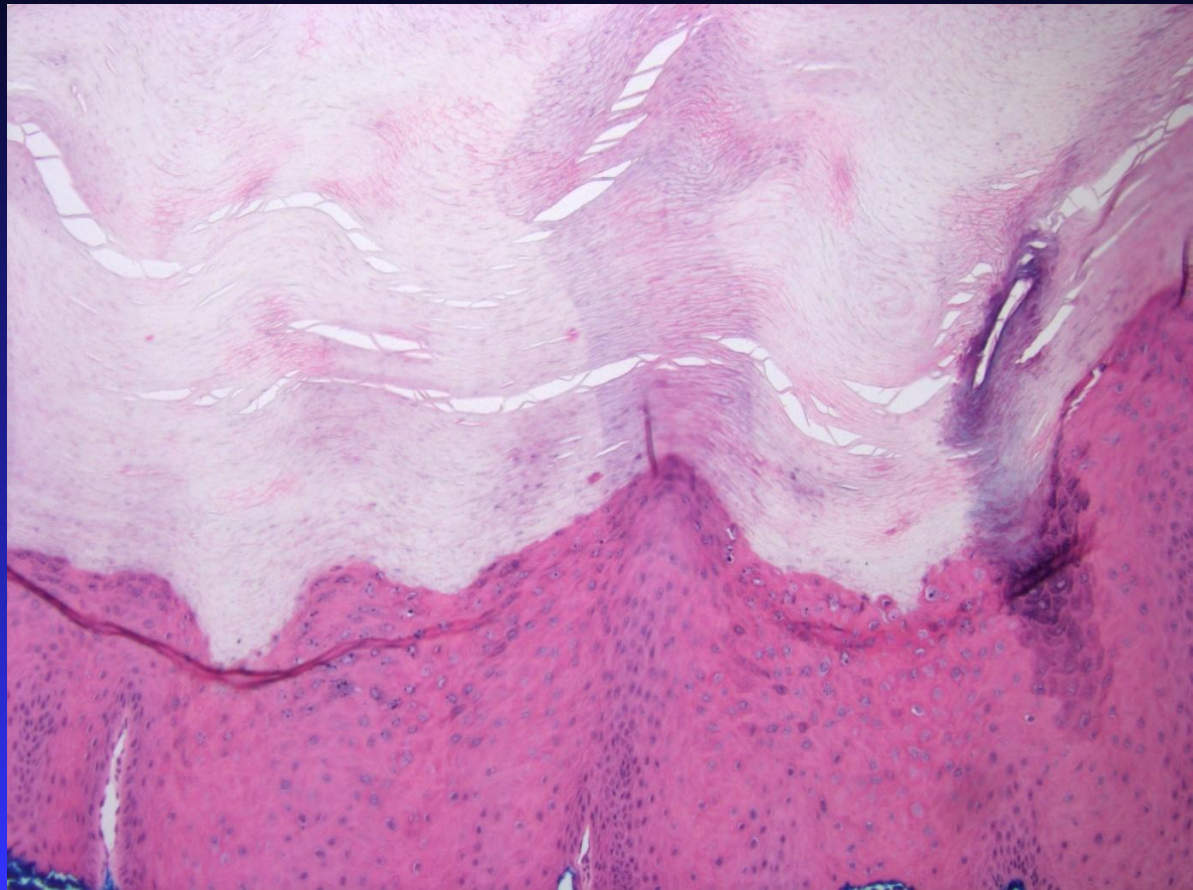


Squamous cell carcinoma in-situ

- Human Papillomavirus (HPV) features



SCC versus Wart/Verruca



SCC versus Wart/Verruca

- Clinical correlation often necessary
  - Immunosuppression (esp HIV)
  - If it is destroying bone, it is not benign!
  - Sample more if suspicious

HPV In-situ Hybridization (ISH)

- HPV Subtypes
  - Low risk--Verruca
  - High risk—Squamous cell carcinoma
  - Pan HPV test—Benign and malignant

Think about the diagnosis when grossing

- Longintudinal melanonychia
  - Identify source of clinical pigmentation

Histopathology of benign activation

- Epithelial pigmentation
- Melanophages
- No or only a slight increase in junctional melanocyte density

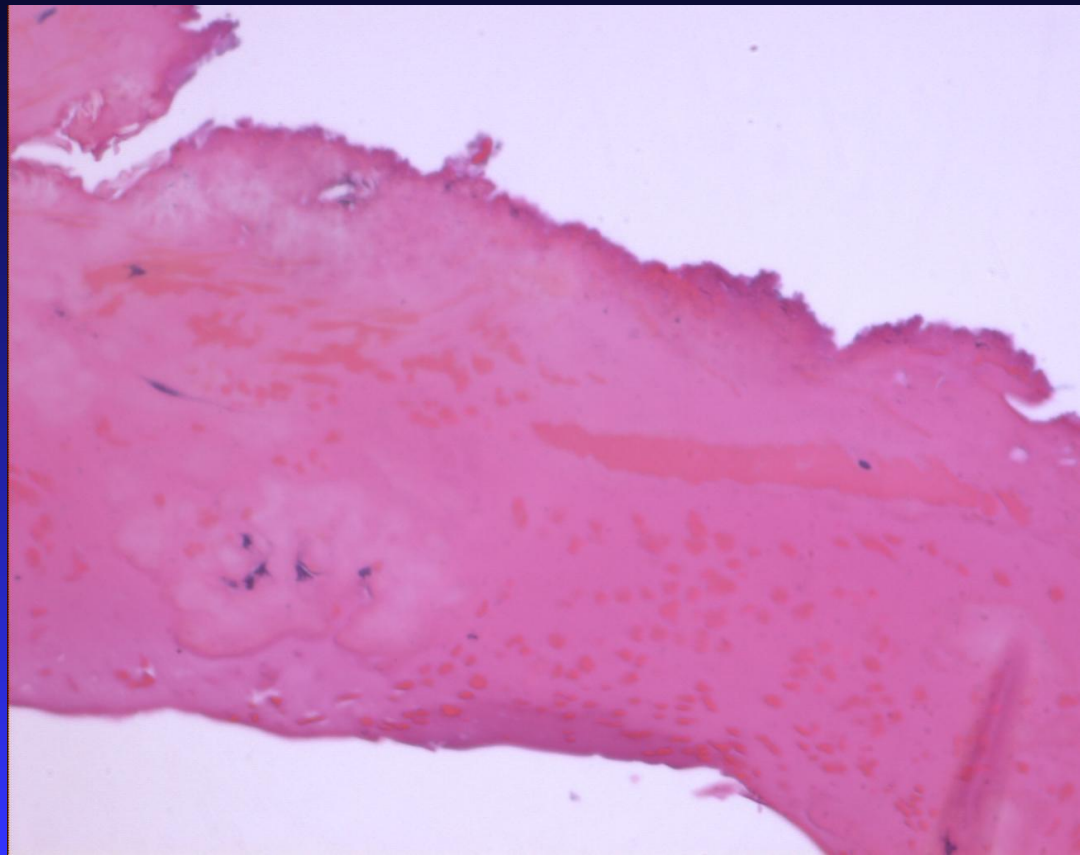
Features of melanotic macule can be subtle.

- H&E with initial levels
- MelanA IHC
- Fontana-Masson
- PAS fungus
- Unstained slides

H&E for melanonychia

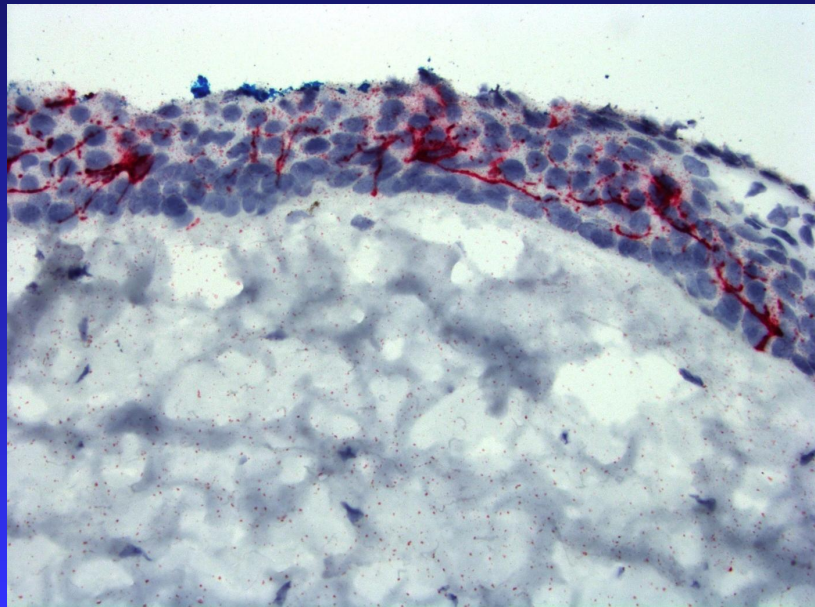
- H&E level sections
  - Blood
  - Exogenous material
  - Medication deposition

Blood in nail plate

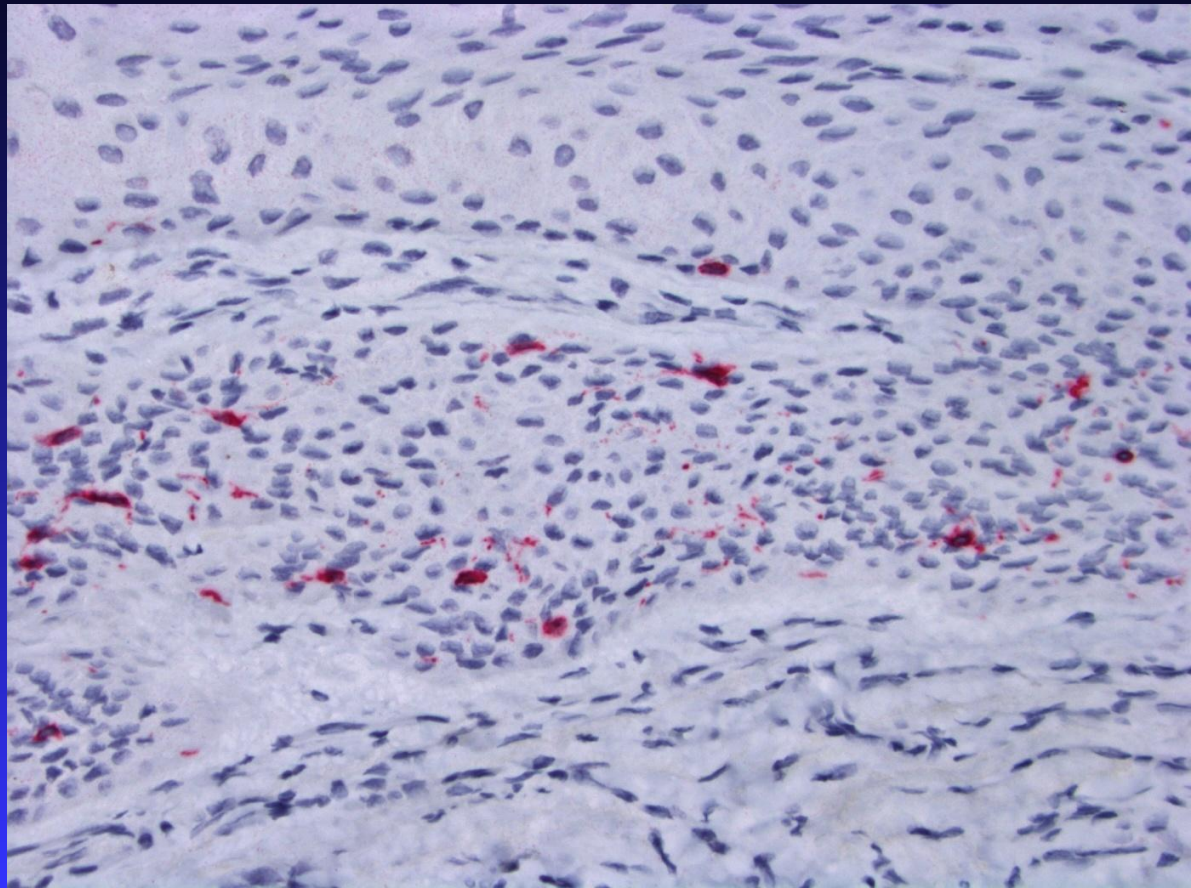


MelanA/Mart1 for melanonychia

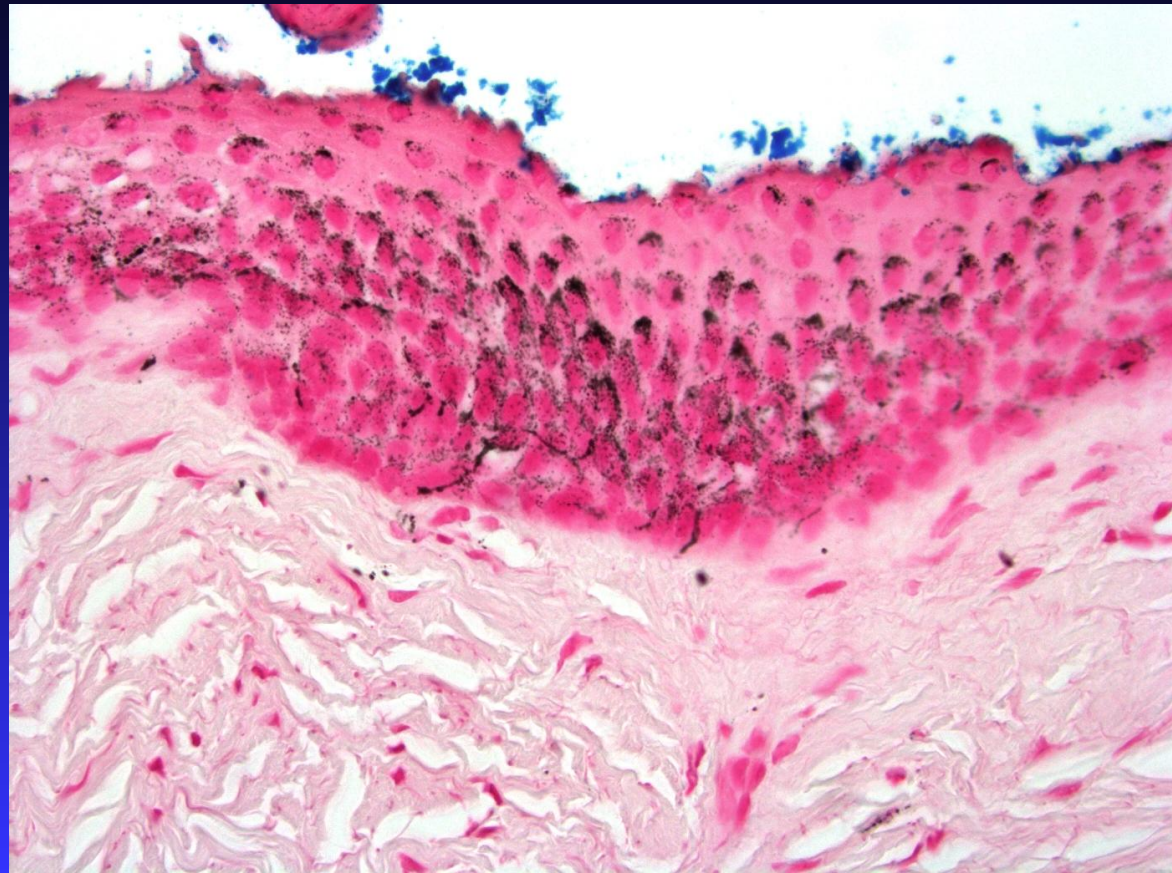
- Melanocytes density may vary highly, especially in melanoma in-situ
- Use a red chromogen



Variable density of melanocytes

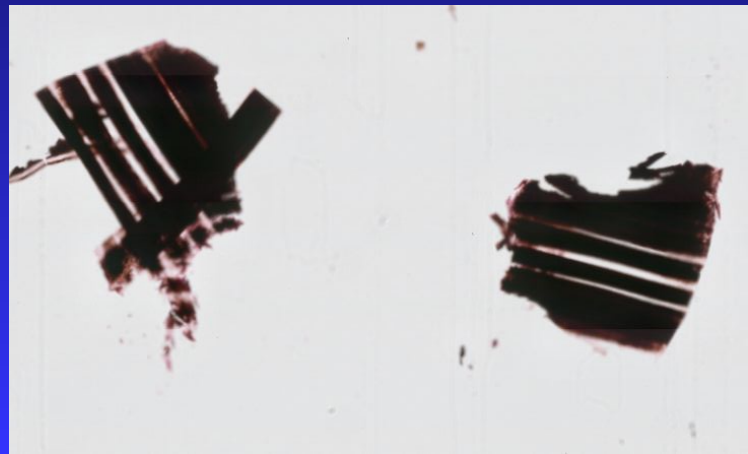


Fontana-Masson for melanonychia

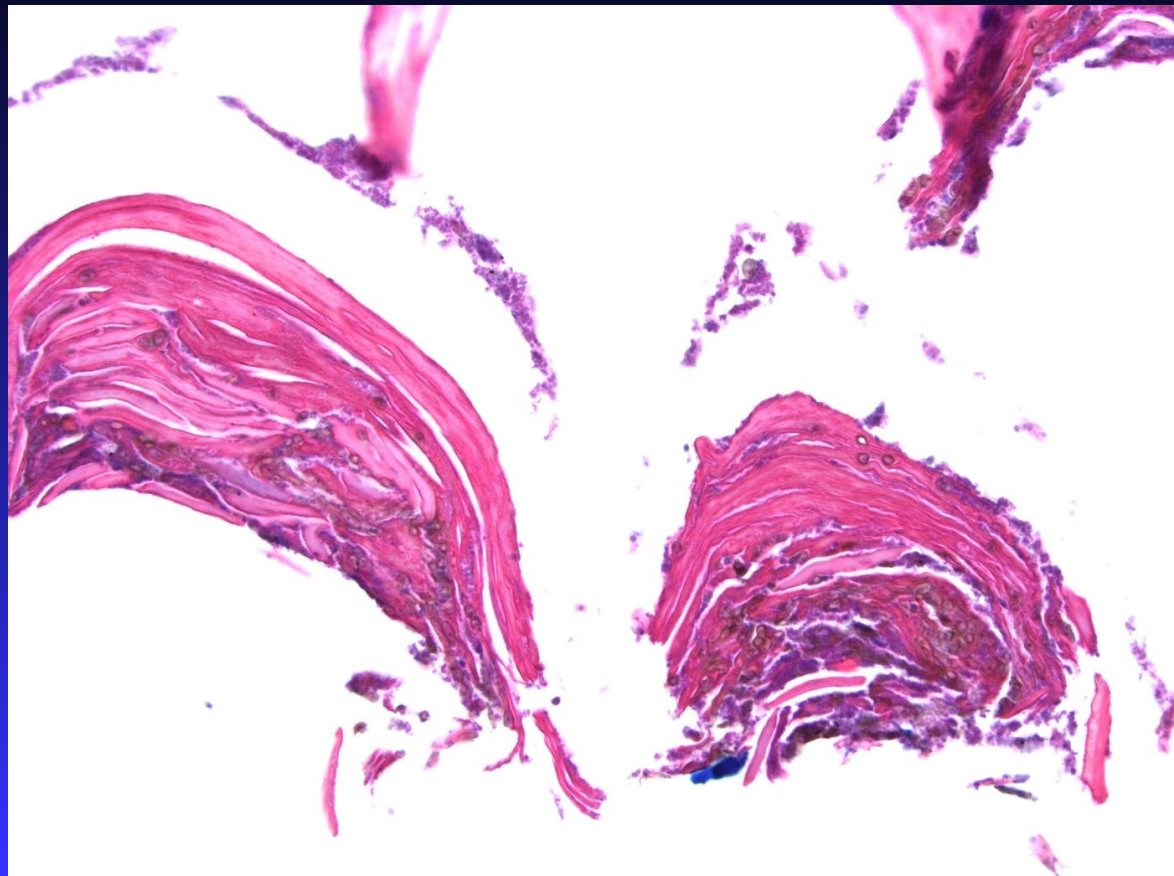


Special stains for pigment do not work in nail plate

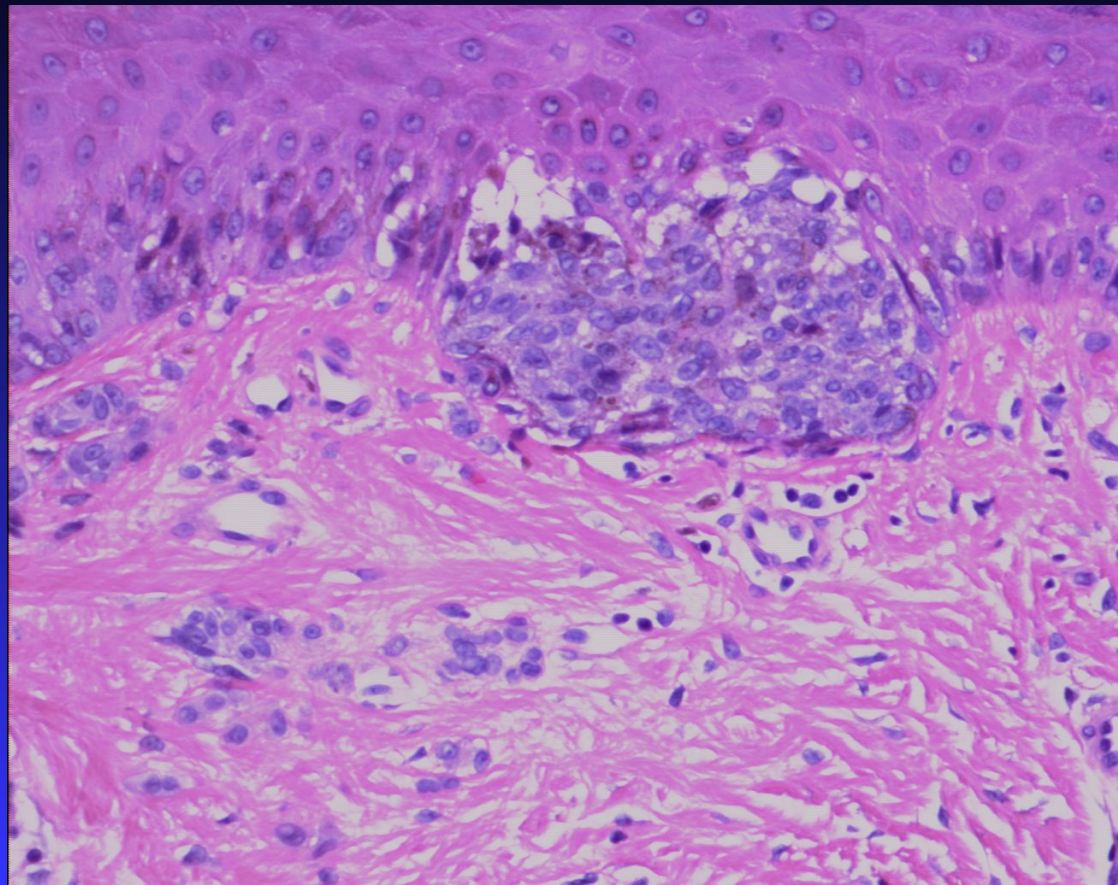
- Perl's iron—Fe^{2+} still in heme
- Fontana-Masson—overstains plate—must be diluted



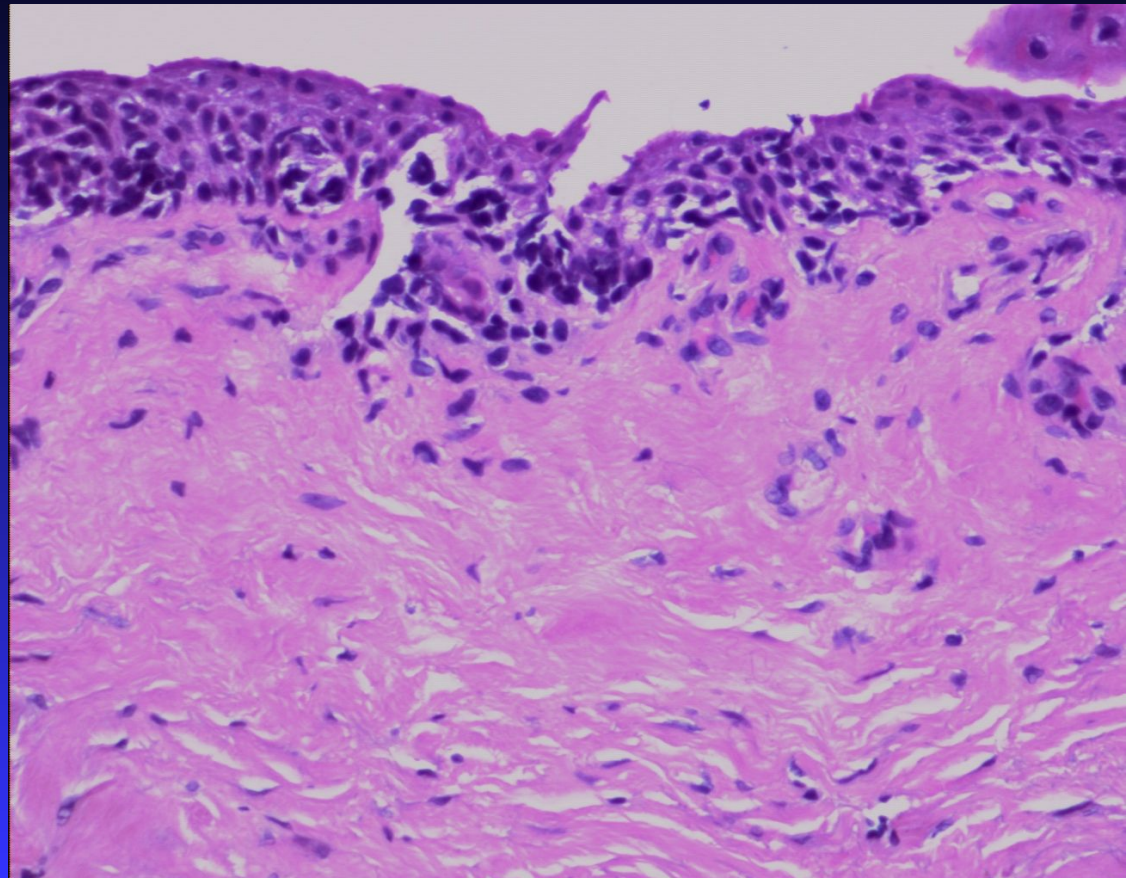
Pigmented fungus



Benign melanocytic nevus



Melanoma in-situ



Nail Fungus Diagnostics

- Sampling is an issue
  - Subungal debris is better than nail plate for sampling.

JAAD
Journal of the American Academy of Dermatology

Subungual debris cytopathology increases sensitivity of fungus detection in onychomycosis

Christian S. Jordan, MD, PhD, Brandon Stokes, CHT, Curtis T. Thompson, MD

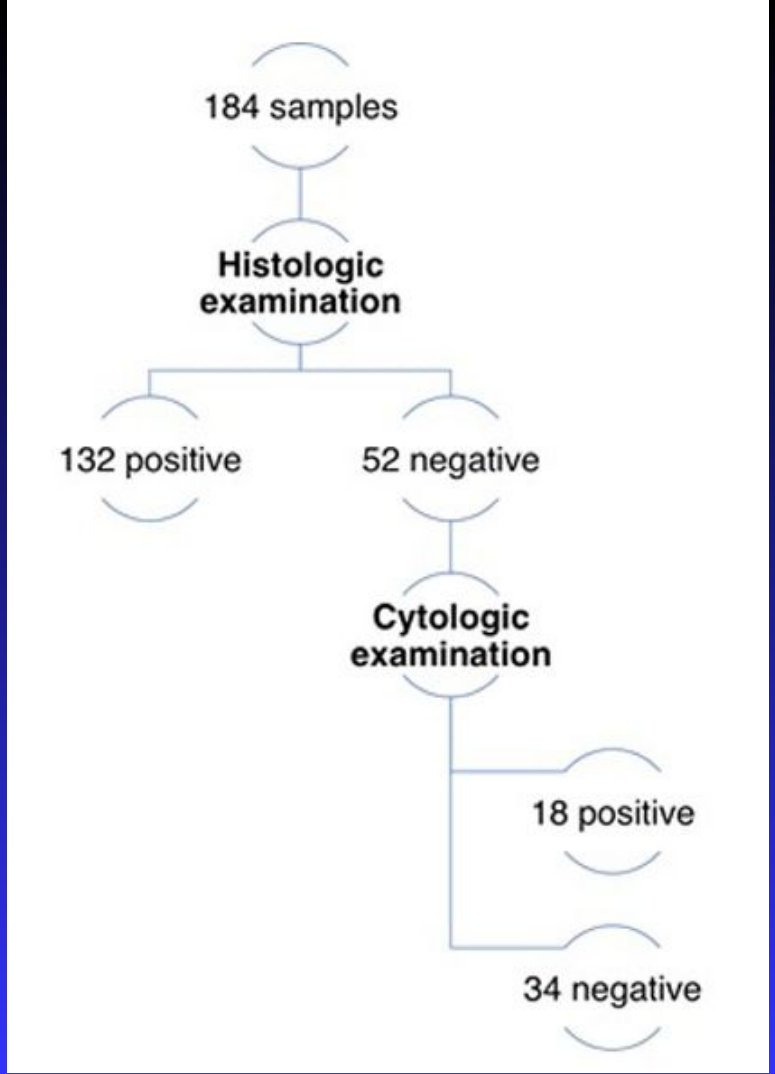
Centrifuge
(Cytospin, Fisher HealthCare)

Centrifuge with slide

Centrifuge with slide

J Am Acad Dermatol
Volume 75, Number 1

Fig 1. Onychomycosis. Microscopic examination of PAS-stained subungual debris. (Original magnification: ×400.) Subungual debris was collected by centrifugation of the formalin in which nail clipping specimens were submitted. Microscopic examination of a thin-layer preparation of PAS-stained subungual debris reveals multiple darkly staining fungal forms associated with a single keratin aggregate.


184 samples
Histologic examination
132 positive
52 negative
Cytologic examination
18 positive
34 negative

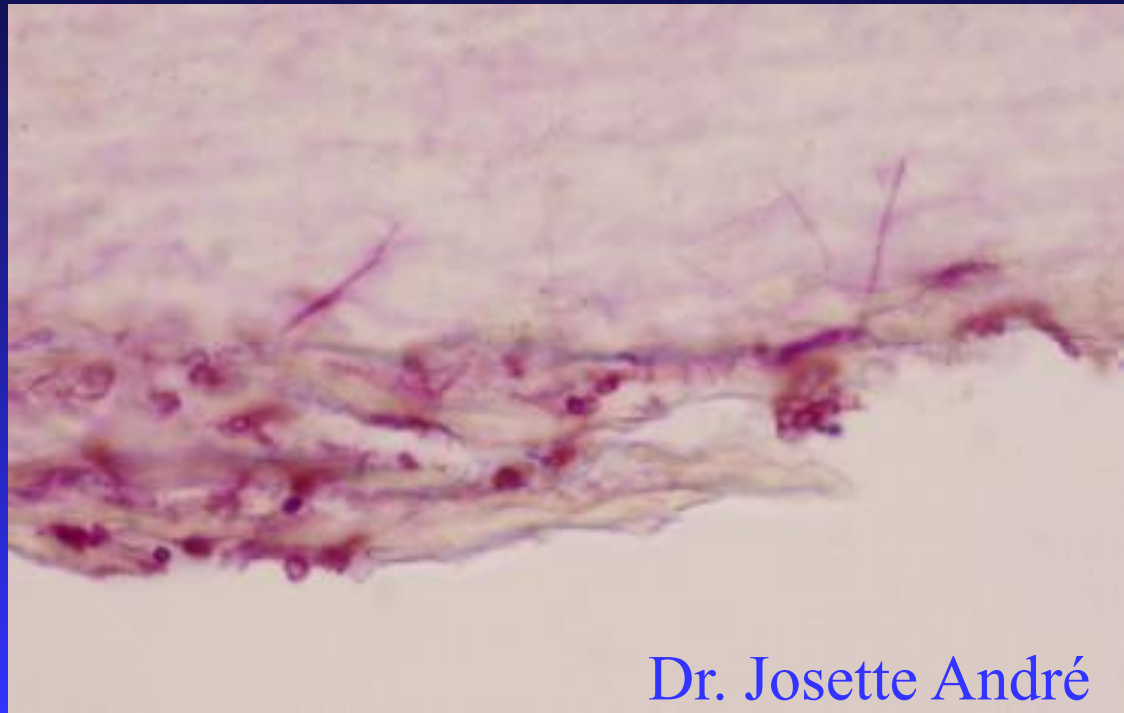
Submit specimen dry in a small envelope

- Test nail plate first
- If plate negative, then centrifugre and PAS

Mold

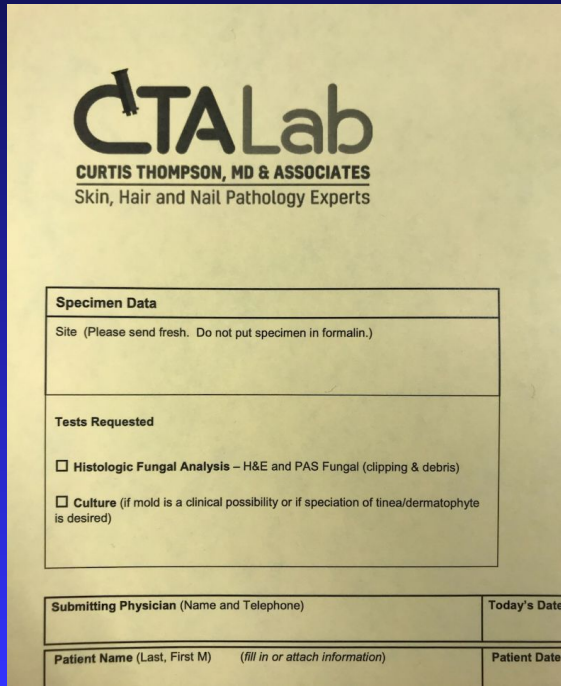
Mold vs Dermatophyte

- Invades vertical to nail plate.



Mold

- Clinical suspicion
- Culture with cycloheximide-free media
  - Must notify lab of possibility



CTA Lab
CURTIS THOMPSON, MD & ASSOCIATES
Skin, Hair and Nail Pathology Experts

Specimen Data
Site (Please send fresh. Do not put specimen in formalin.)
Tests Requested ☐ **Histologic Fungal Analysis** – H&E and PAS Fungal (clipping & debris) ☐ **Culture** (if mold is a clinical possibility or if speciation of tinea/dermatophyte is desired)

Submitting Physician (Name and Telephone)	**Today's Date**
Patient Name (Last, First M) *(fill in or attach information)*	**Patient Date**

Acknowledgements

- Phoebe Rich, Antonella Tosti and Martin Zaiac
- Josette André and Bertrand Richert—Brussels
- Alex Chu—Medical Student
- Brandon Stokes--Portland

Thanks!

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