

How to submit a nail specimen and other nail pathology clues

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CTA Lab

and

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Oregon Health and Sciences University

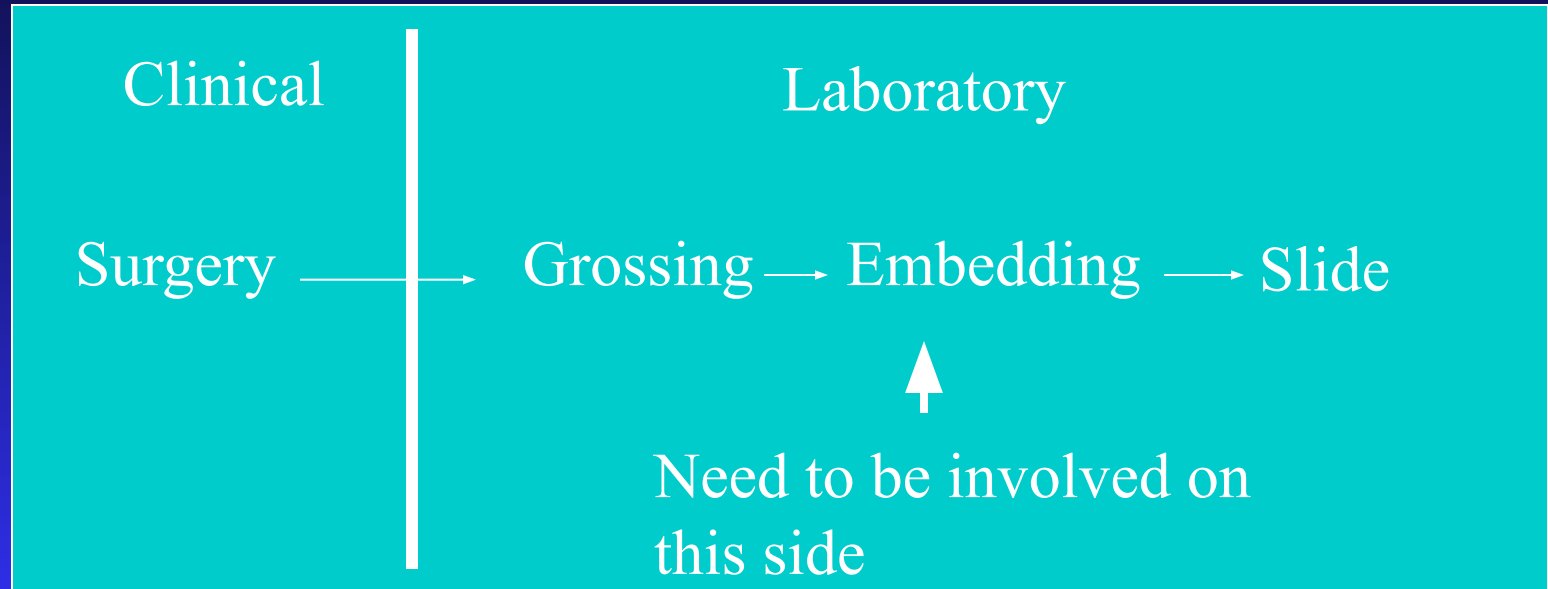
Portland, Oregon, USA

Objectives

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

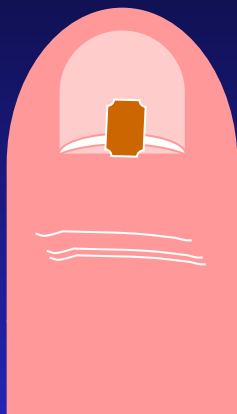
What can the nail surgeon do to submit a bed/matrix specimen for appropriate interpretation?

Need to be involved in lab prep

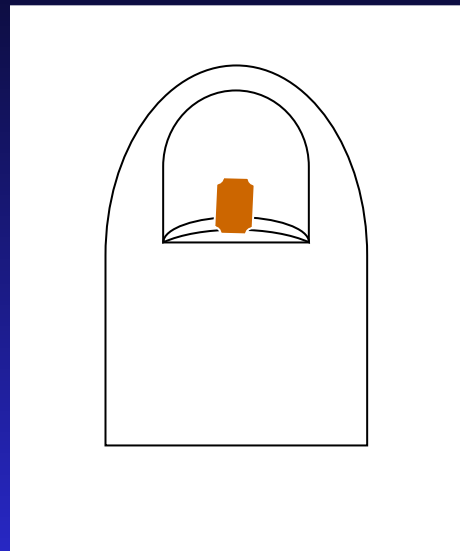


Need concise and clear guidelines for specimen submission:

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



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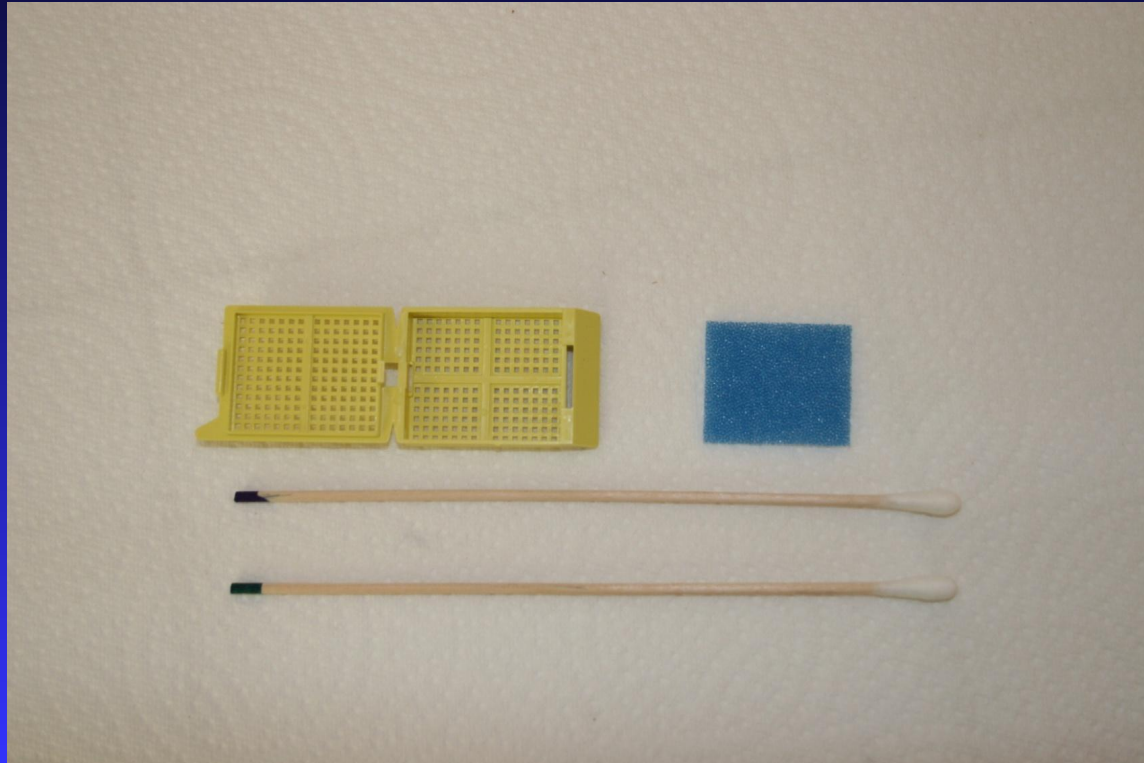






Print template at www.cta-lab.com

Histology Materials



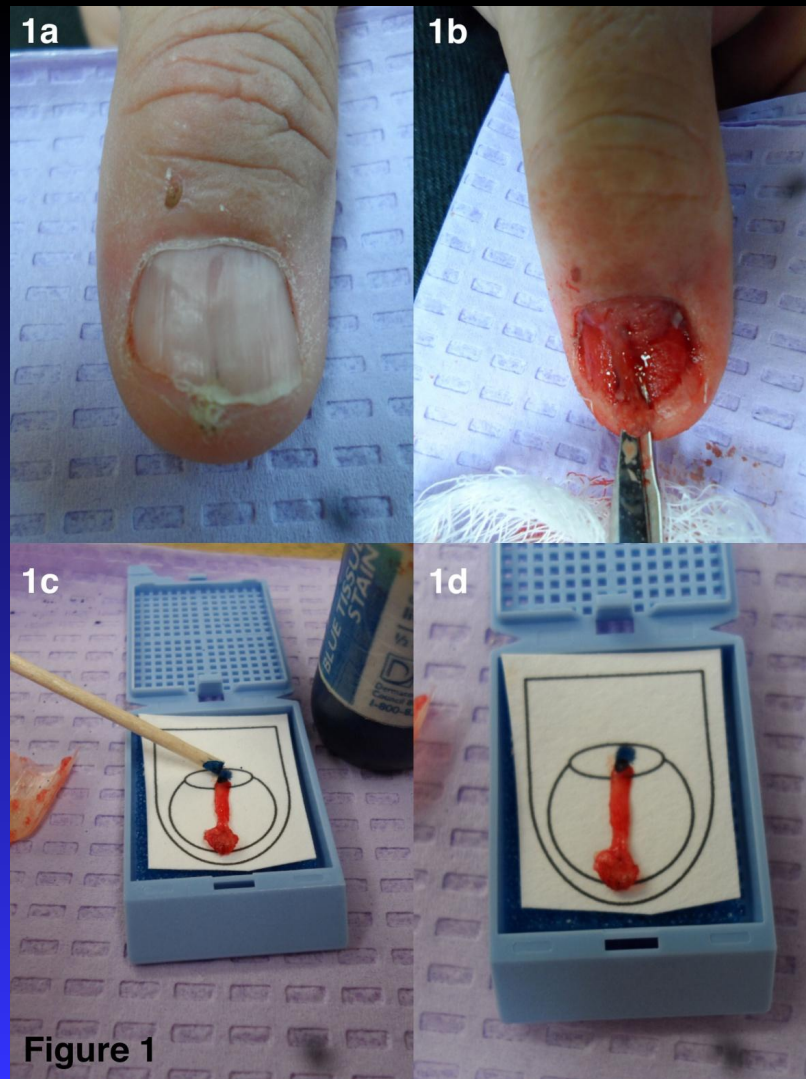
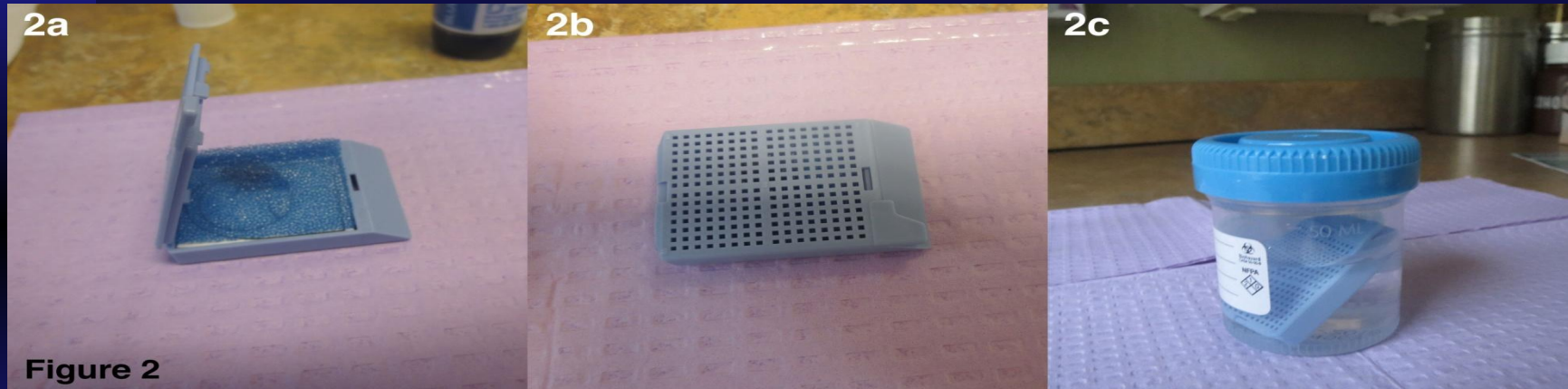
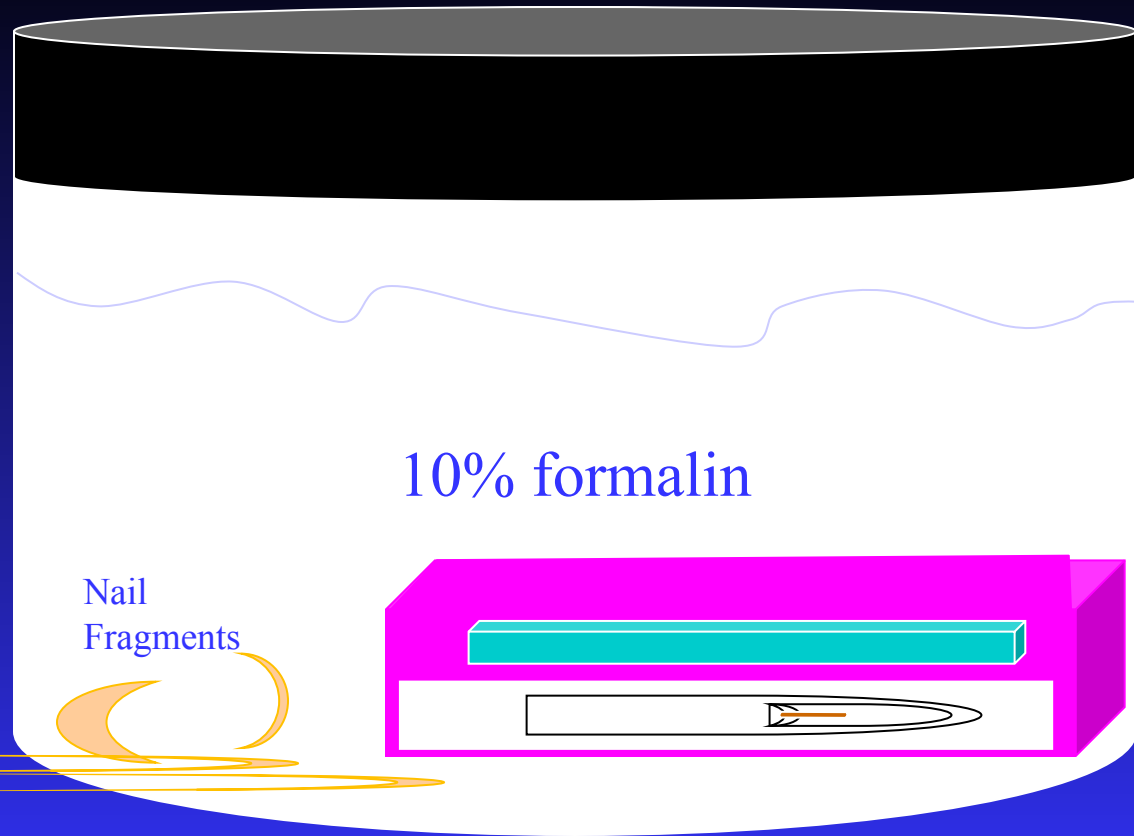


Figure 1





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
- Longitudinal melanonychia

Onychopapilloma



Onychopapilloma

■ Clinical

- ◆ Longitudinal erythronychia (redness)
- ◆ Distal nail split



Onychopapilloma

■ Clinical

- ◆ Longitudinal erythronychia (redness)
- ◆ Distal nail split

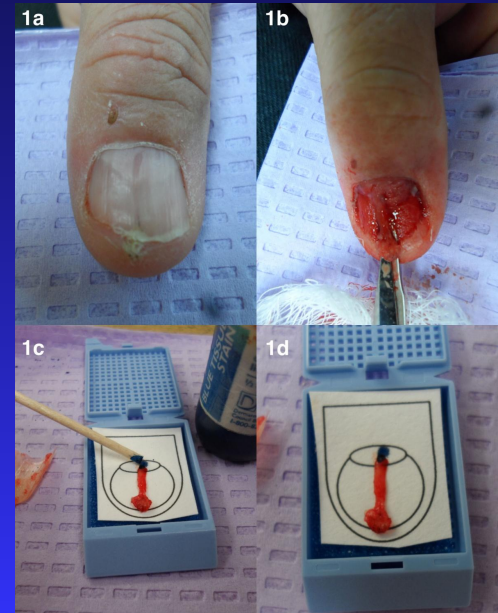


Figure 1

Onychopapilloma

■ Clinical

- ◆ Longitudinal erythronychia (redness)
- ◆ Distal nail split

Embed proximal to distal

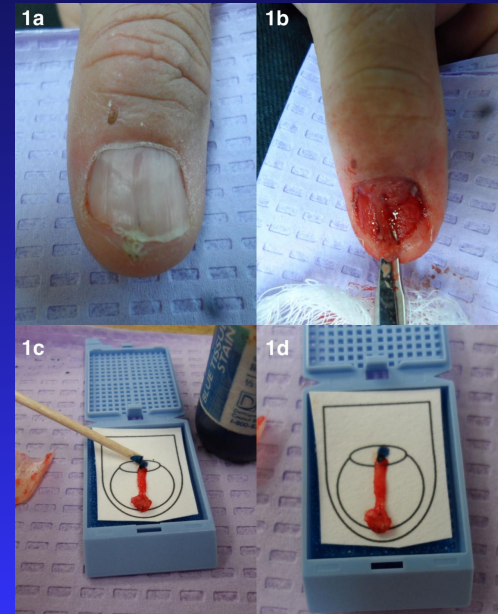
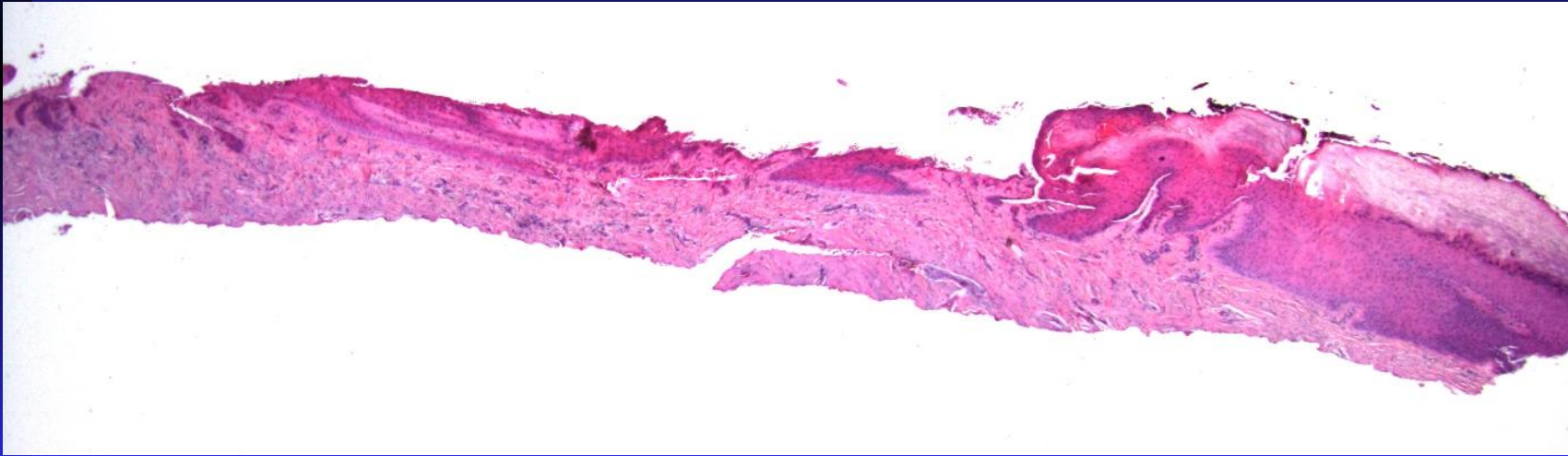
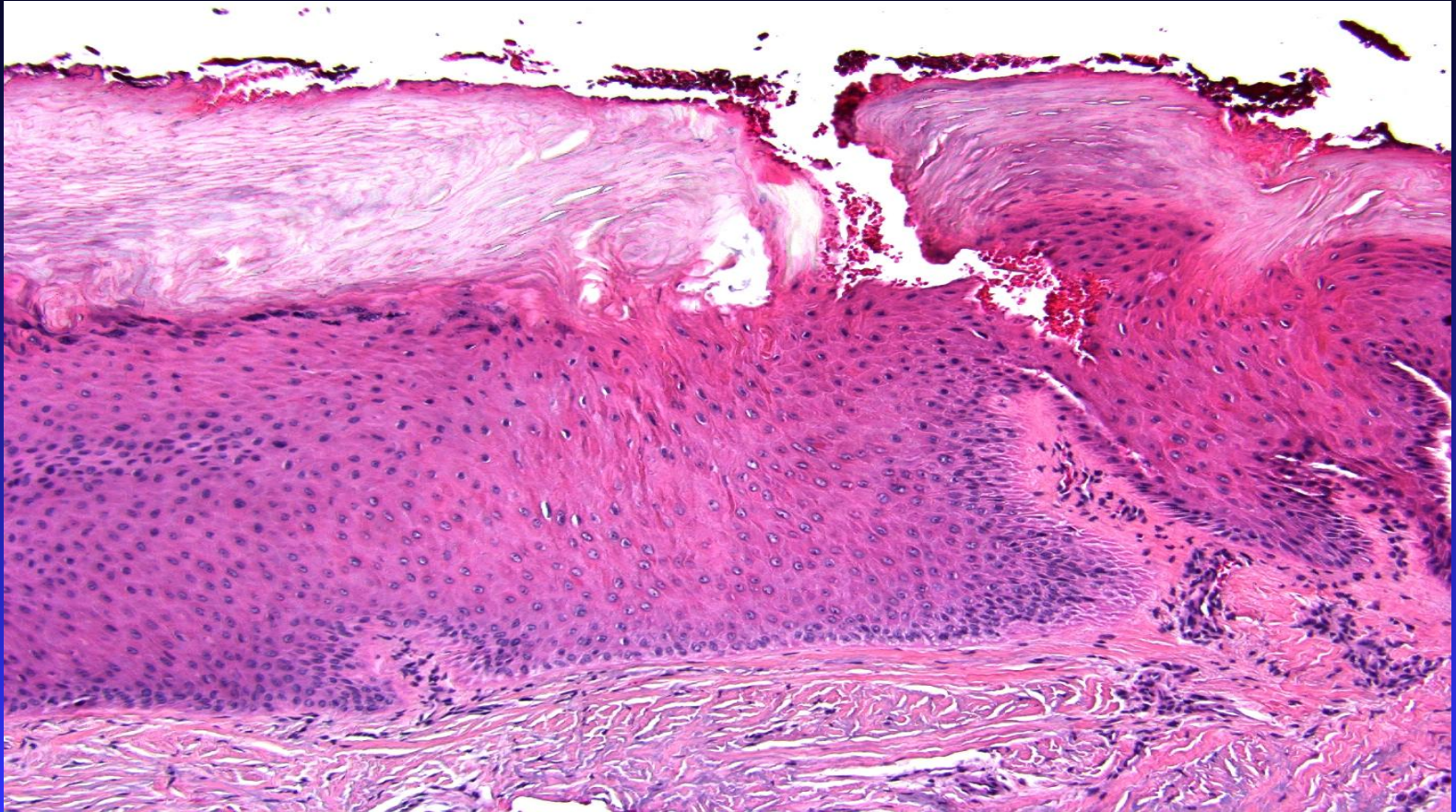


Figure 1

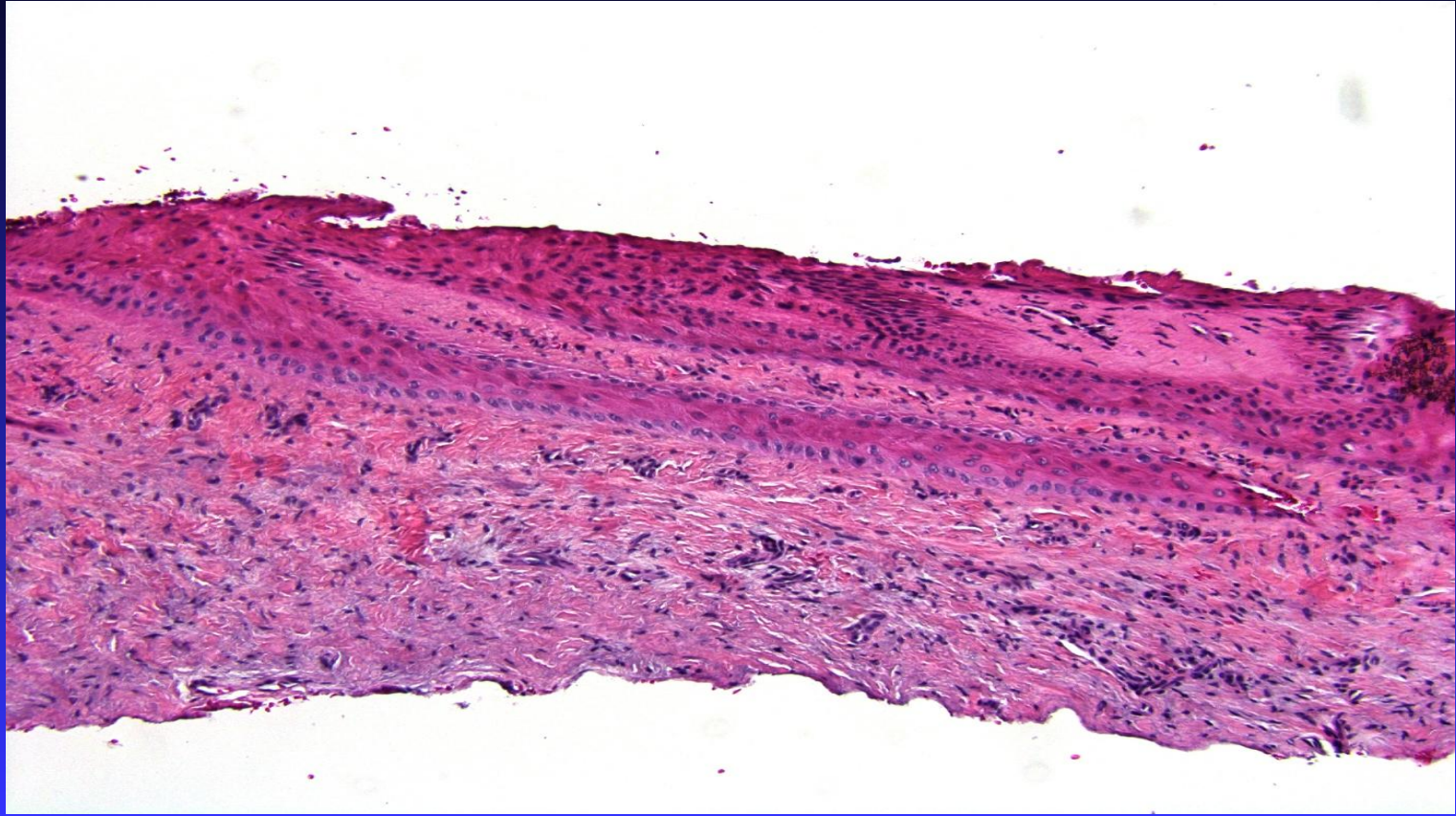
Onychopapilloma—Keratin Producing



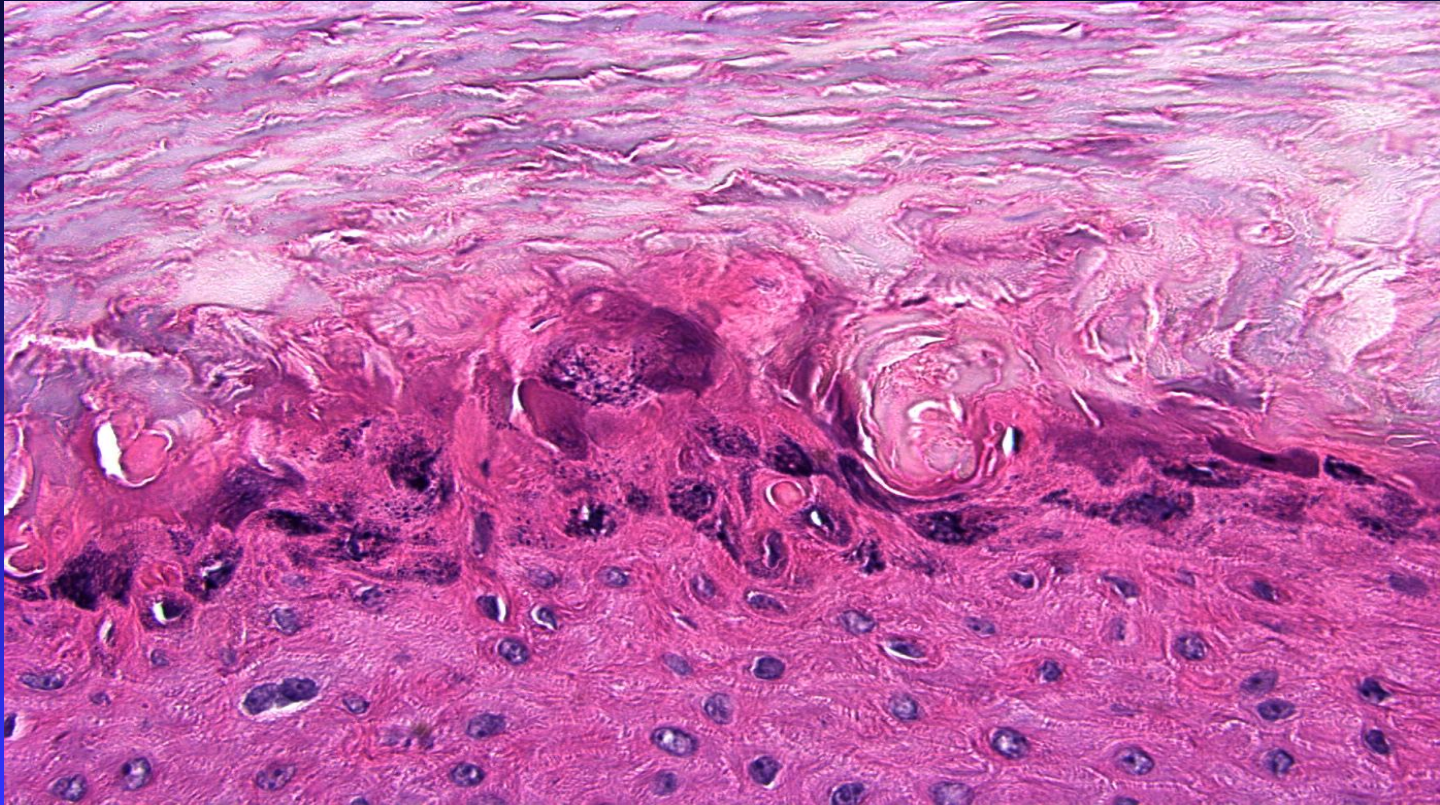
Onychopapilloma—Keratin Producing



Onychopapilloma



Onychopapilloma—Not a wart

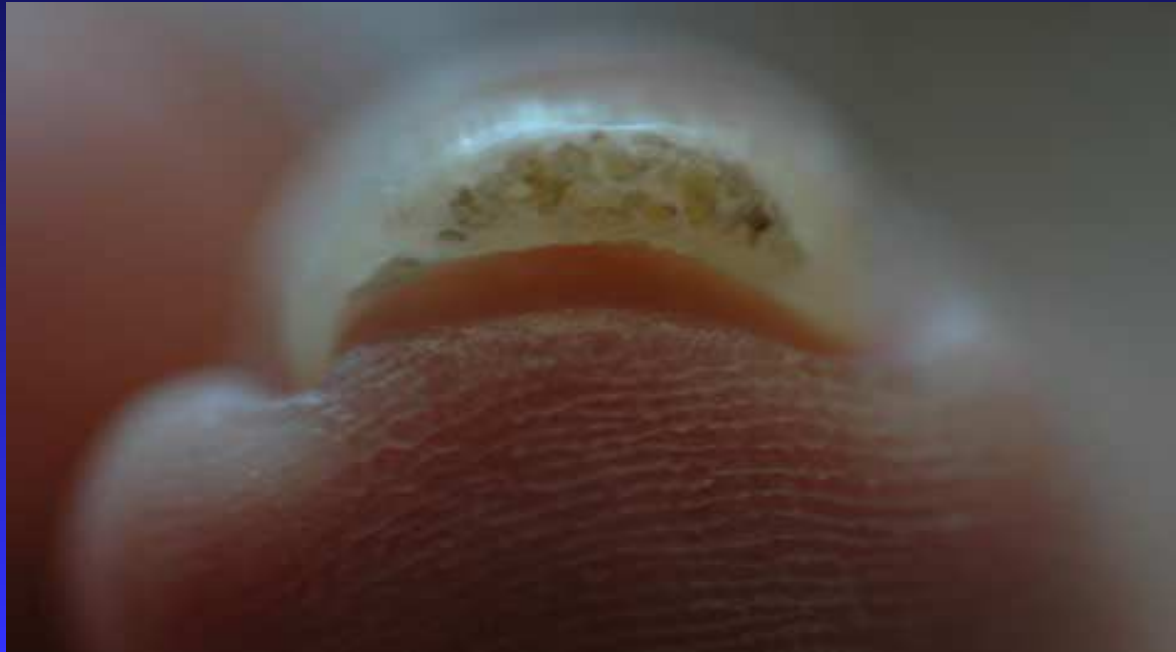


Onychomatricoma



Onychomatricoma

- Examine nail for holes—Transverse sections of dystrophic nail

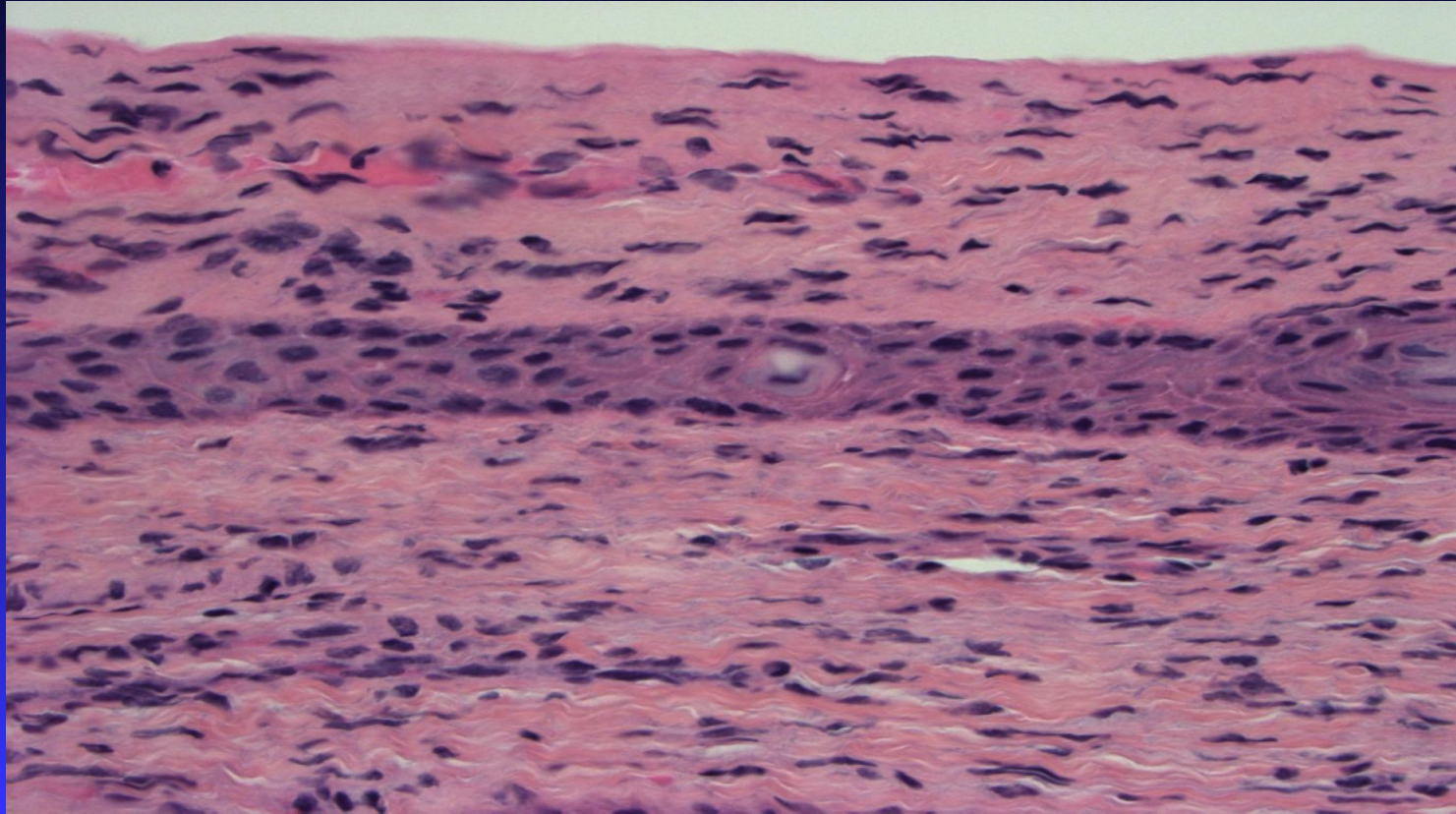


Onychomatricoma

Epithelial and dermal components



Onychomatricoma

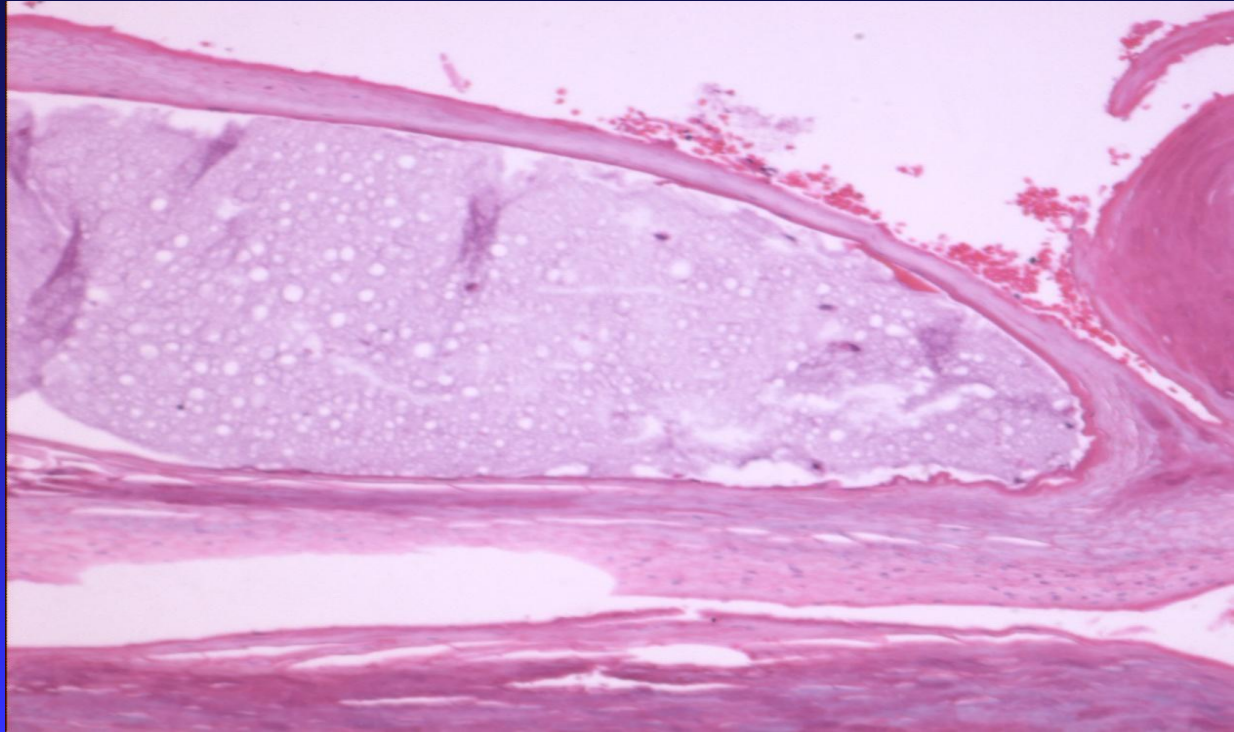


Digital Myxoid/Mucous Cyst

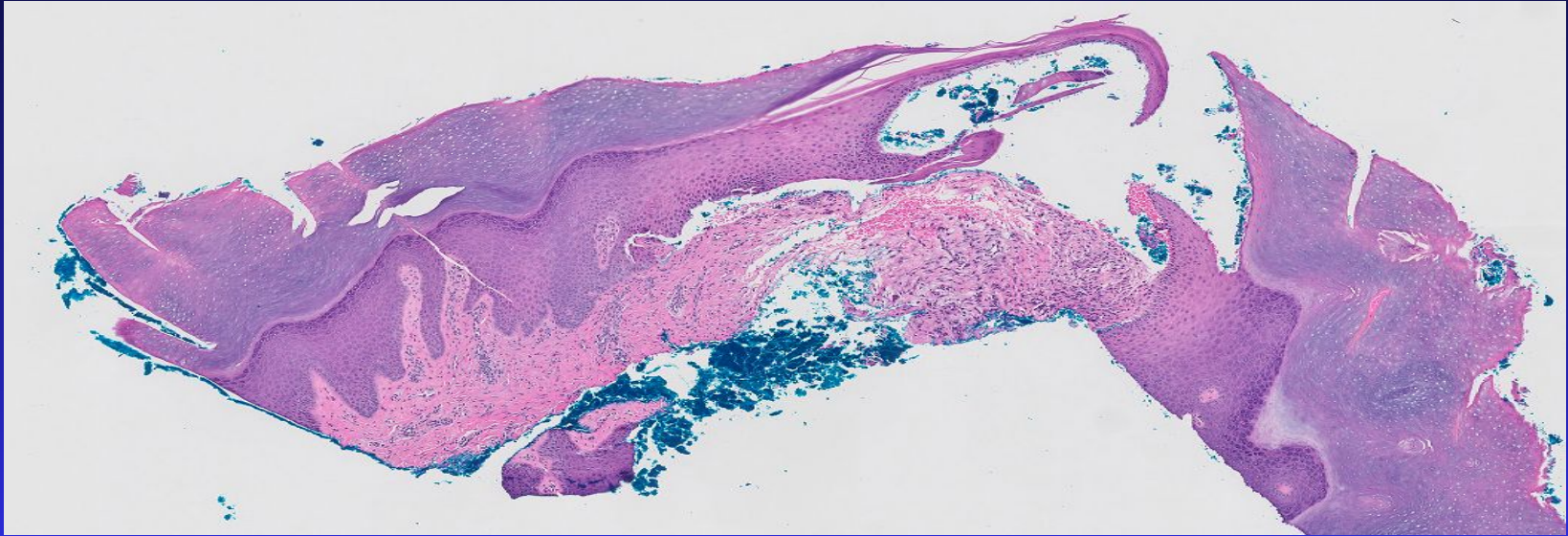


Digital Myxoid/Mucous Cyst

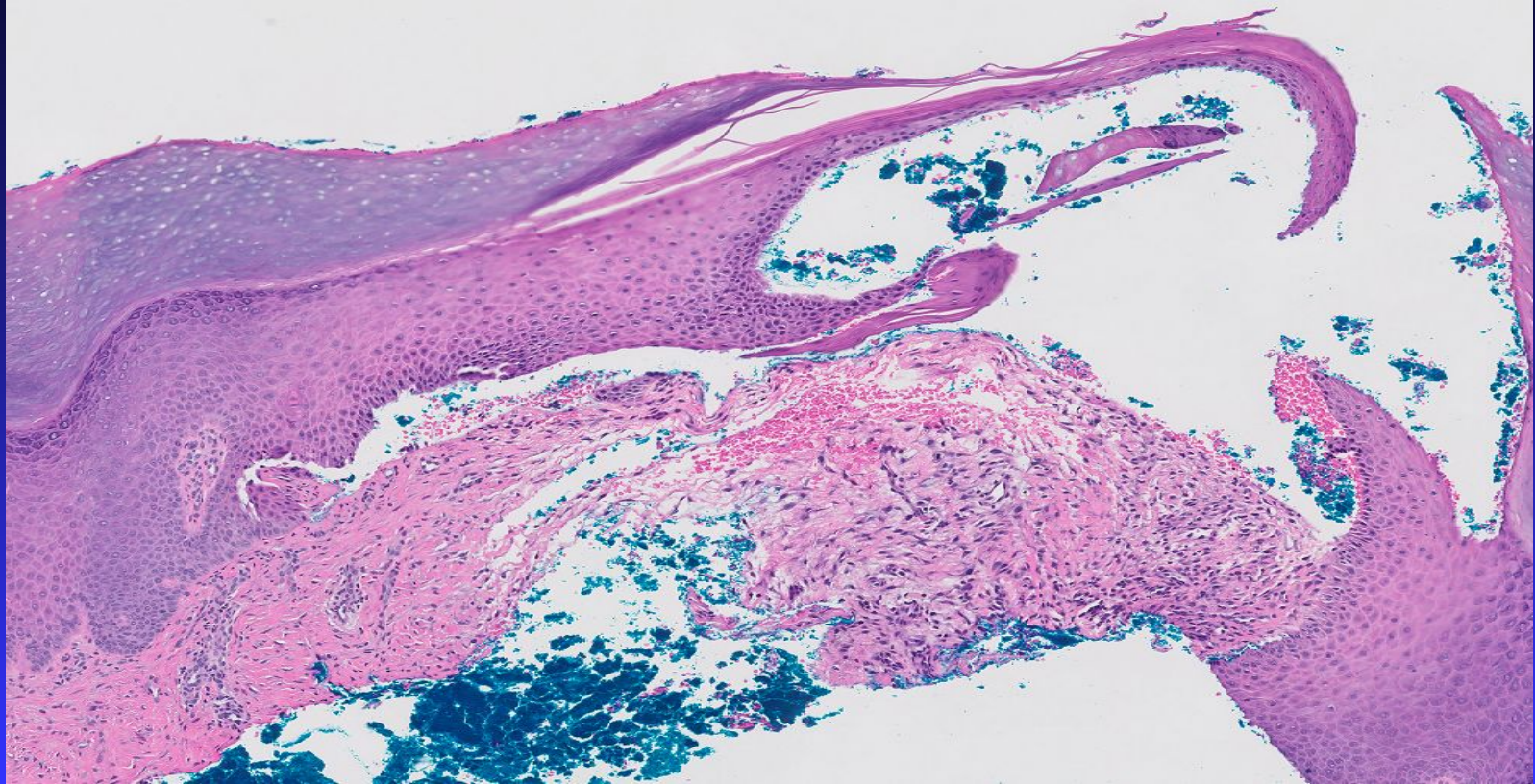
- Mucin may be anywhere



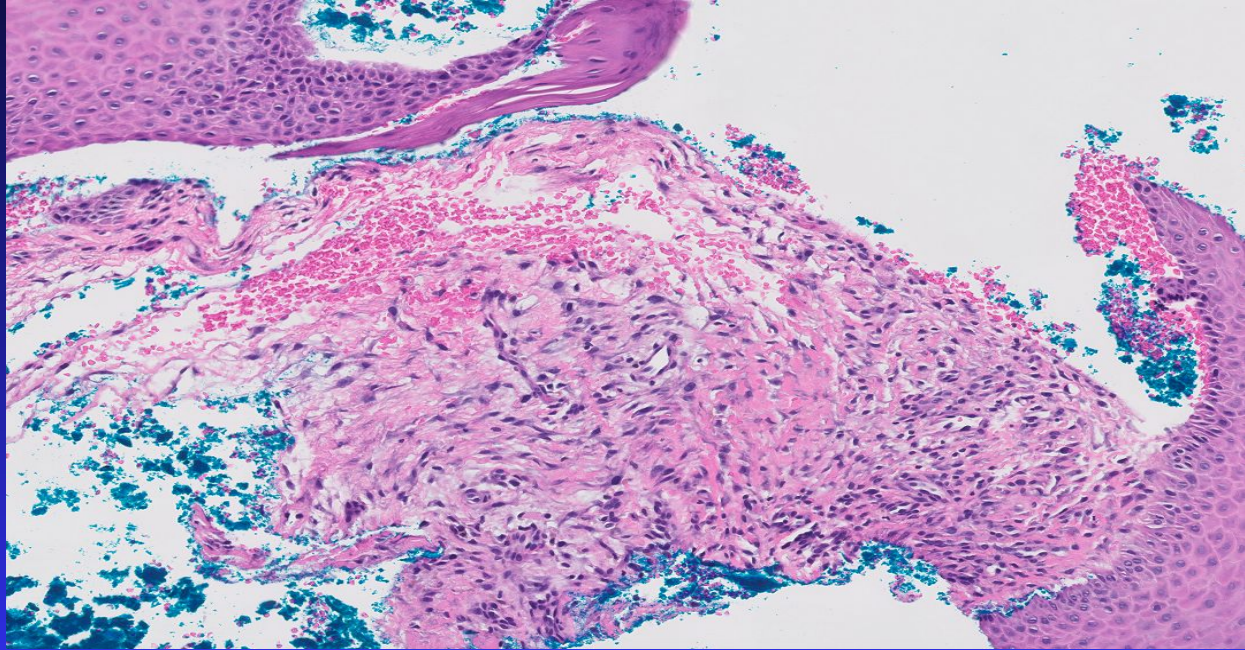
H&E may show only scar and
reactive change



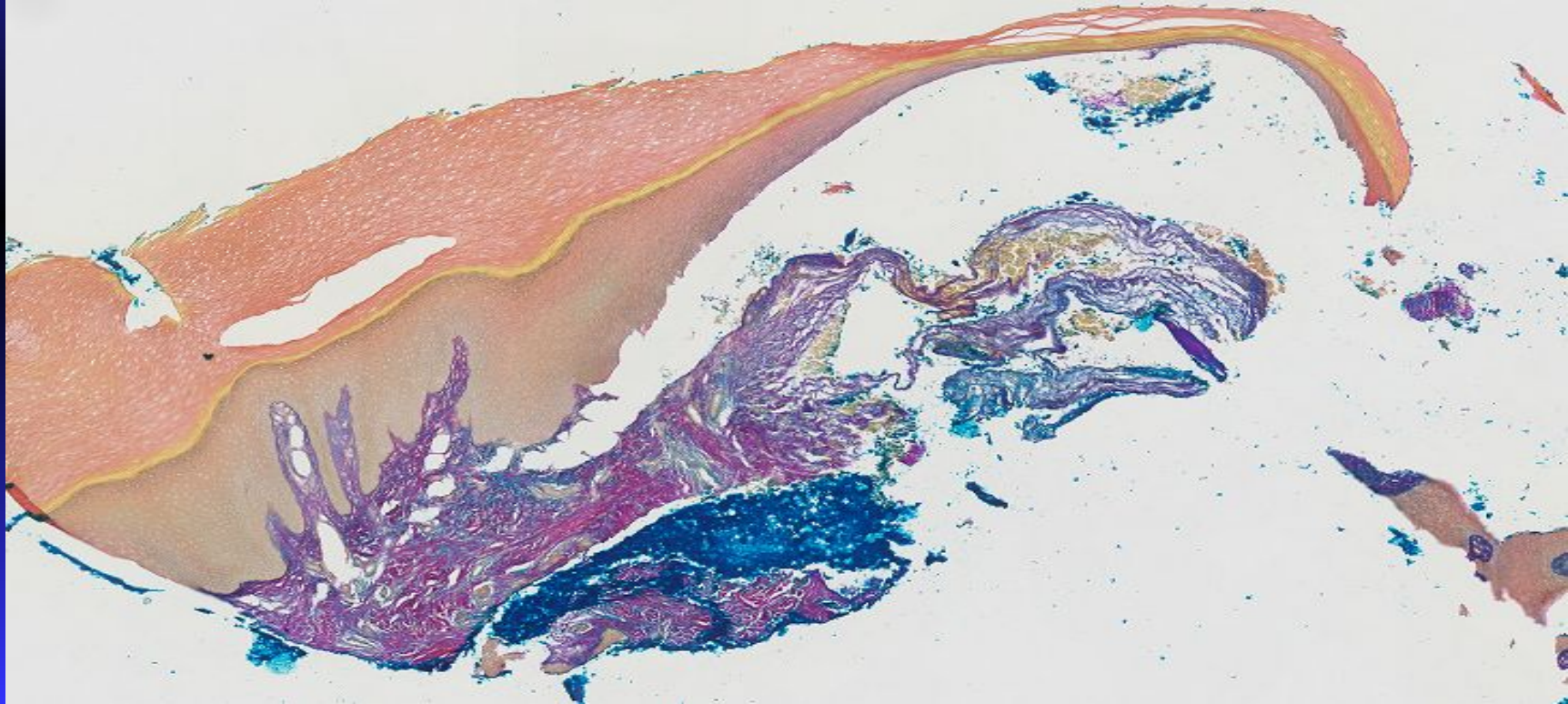
H&E may not show mucin



H&E may not show mucin



Mucin stain often required



Think about the diagnosis when grossing

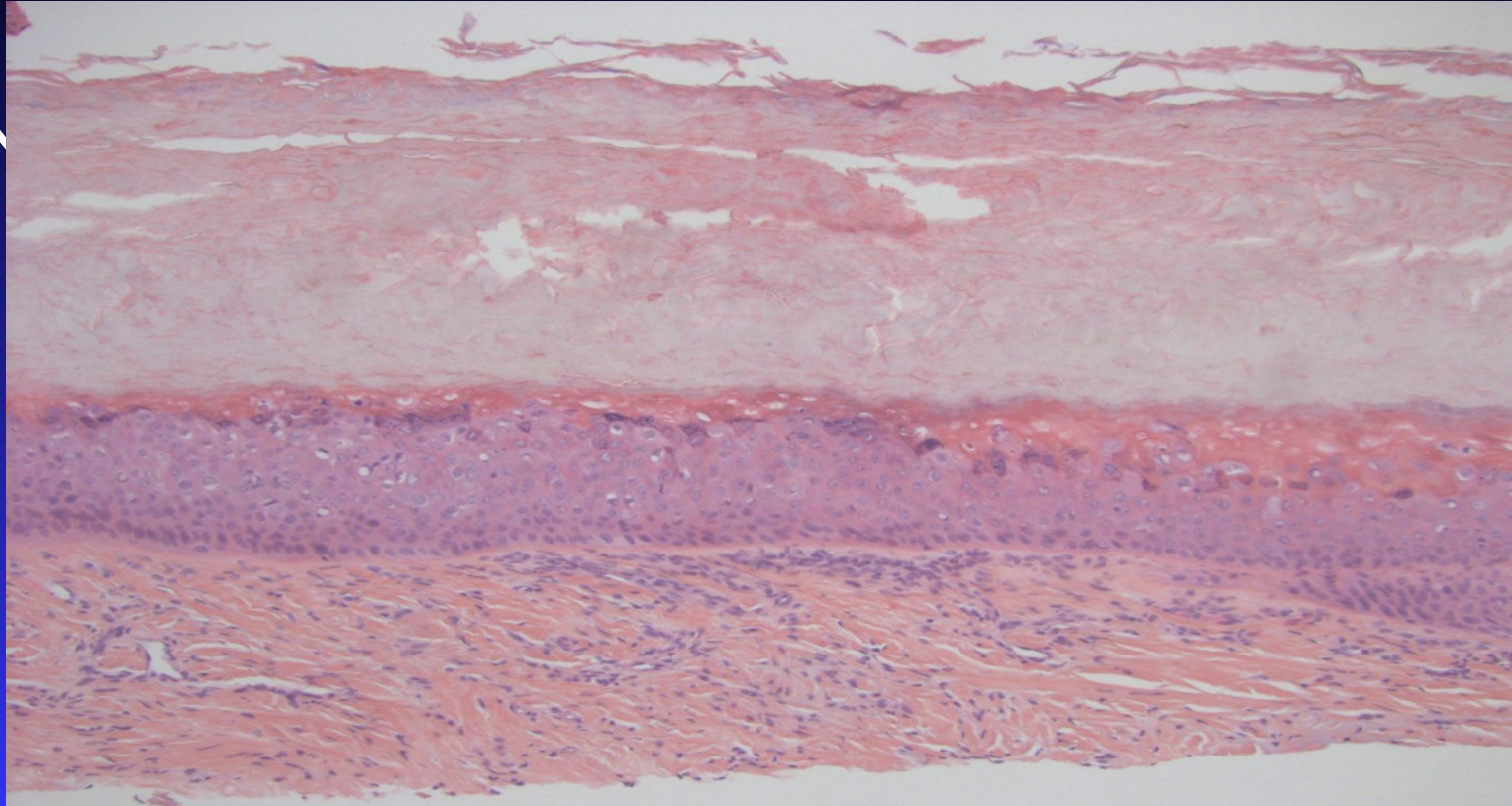
- Squamous cell carcinoma
 - ◆ Sampling
 - ◆ HPV-Verruca etiology

Squamous cell carcinoma



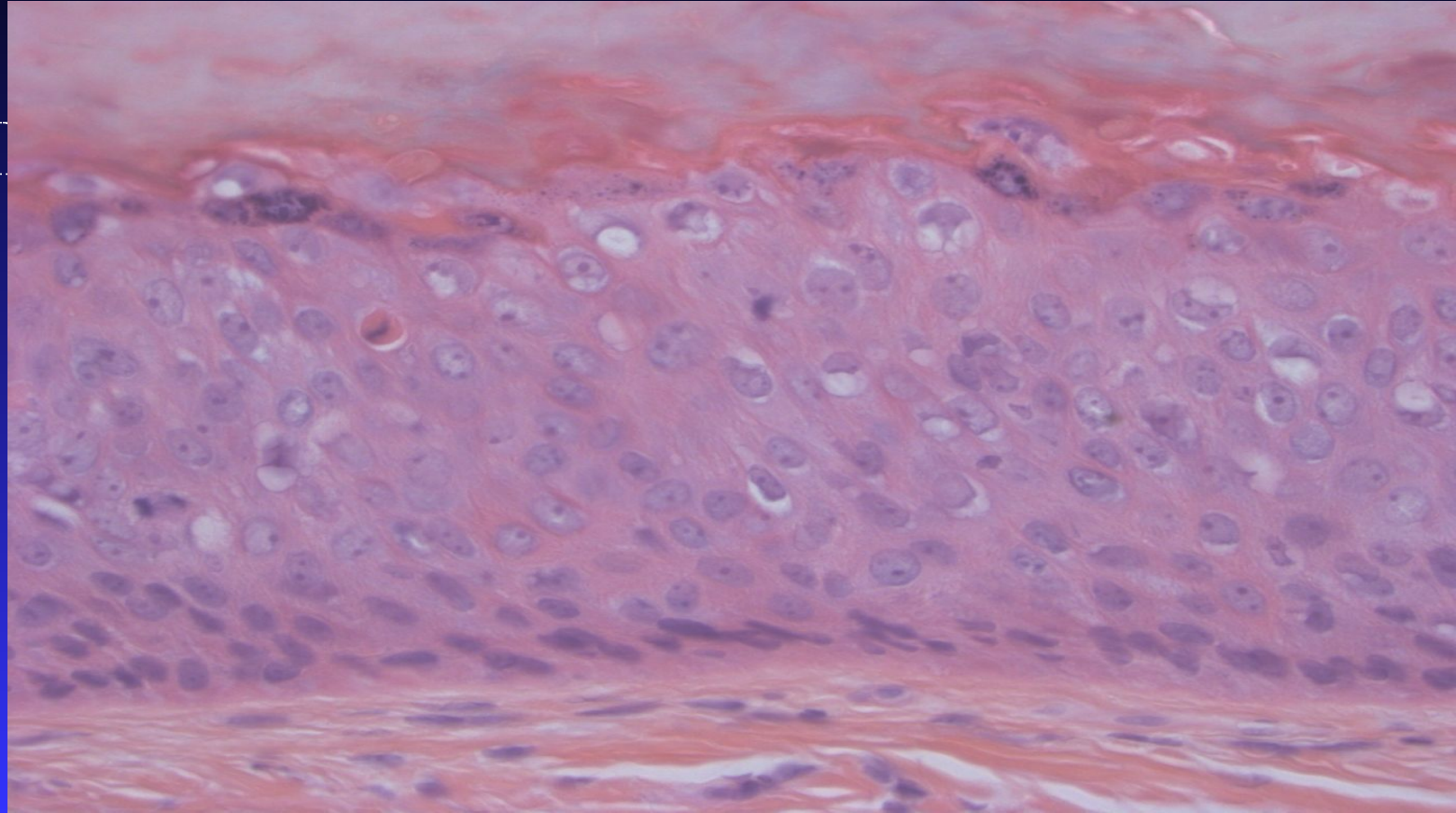
Squamous cell carcinoma

■ IN



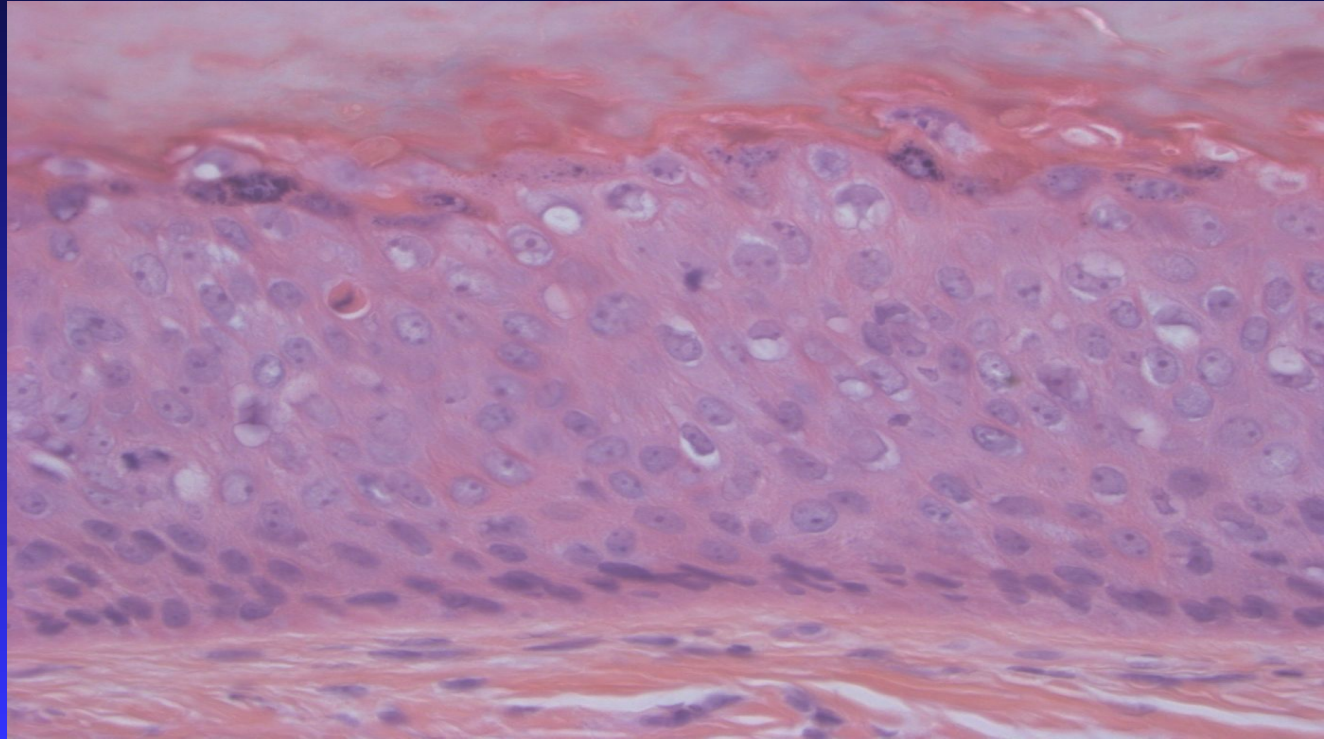
Squamous cell carcinoma in-situ

- I

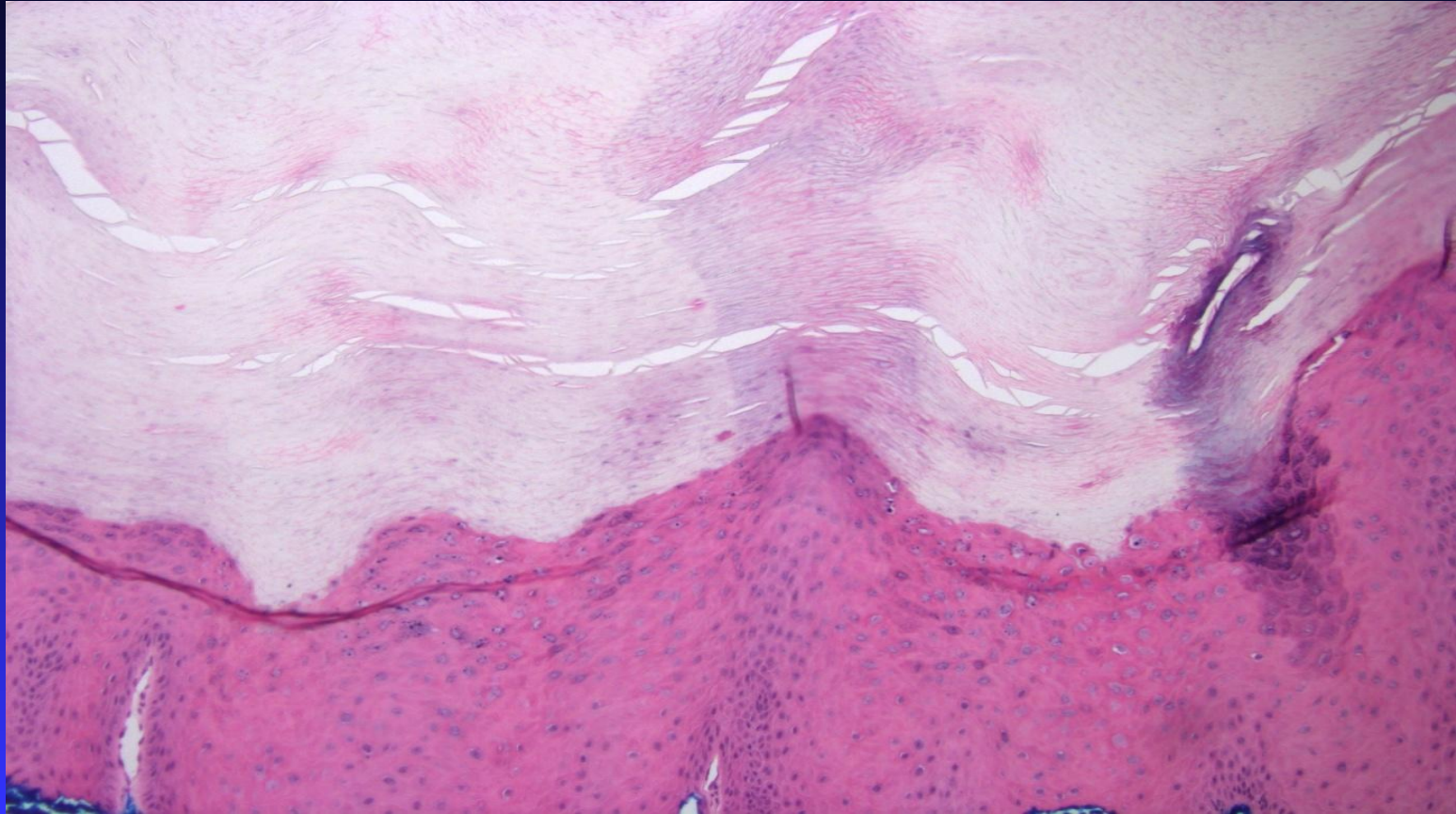


Squamous cell carcinoma in-situ

- 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

- Longitudinal melanonychia
 - ◆ Identify source of clinical pigmentation



Histopathology of benign activation

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

Benign activation of junctional melanocytes

- Synonyms

- Melanotic macule of the nail
- Nail unit lentigo

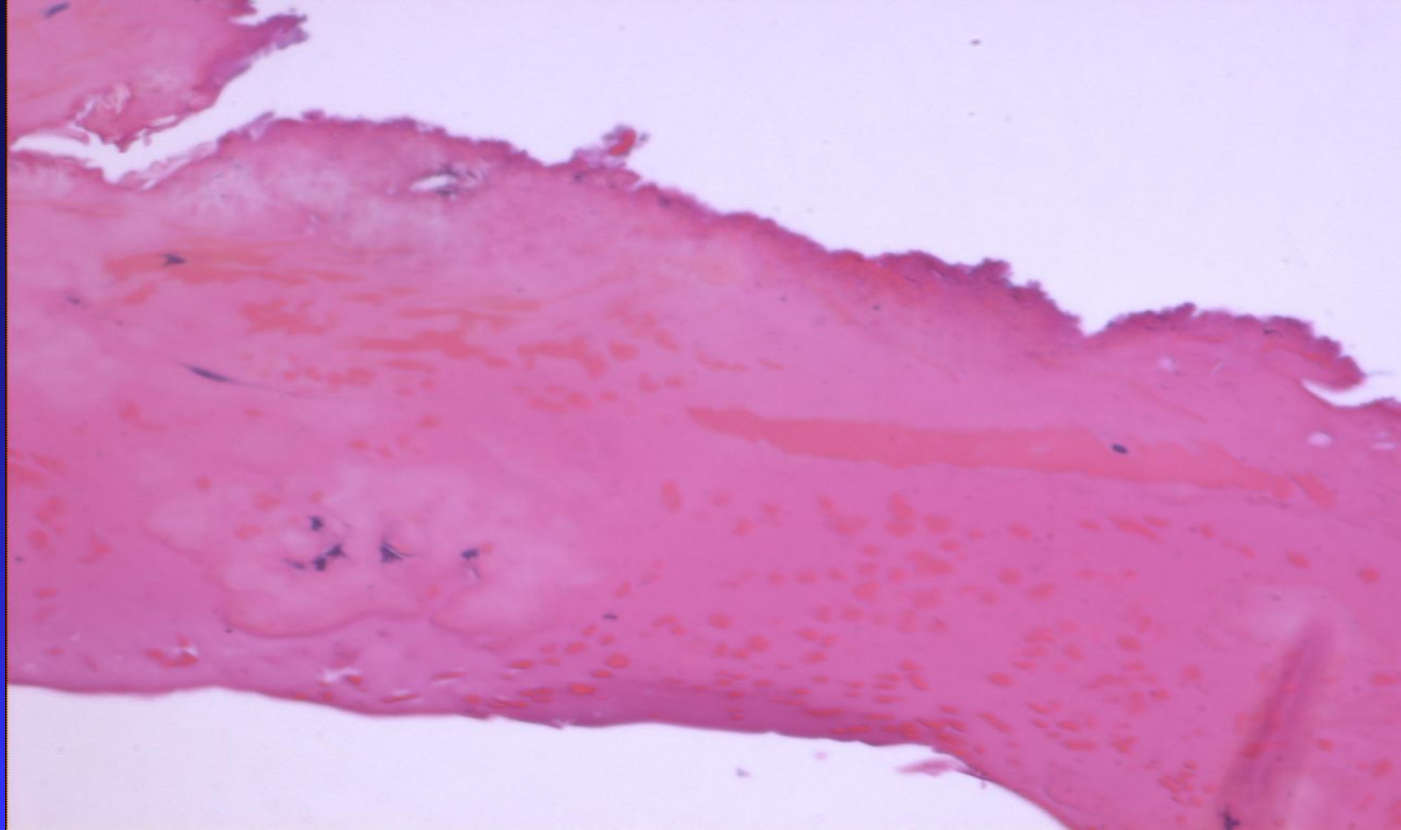
Features of melanotic macule can be subtle.

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

H&E for melanonychia

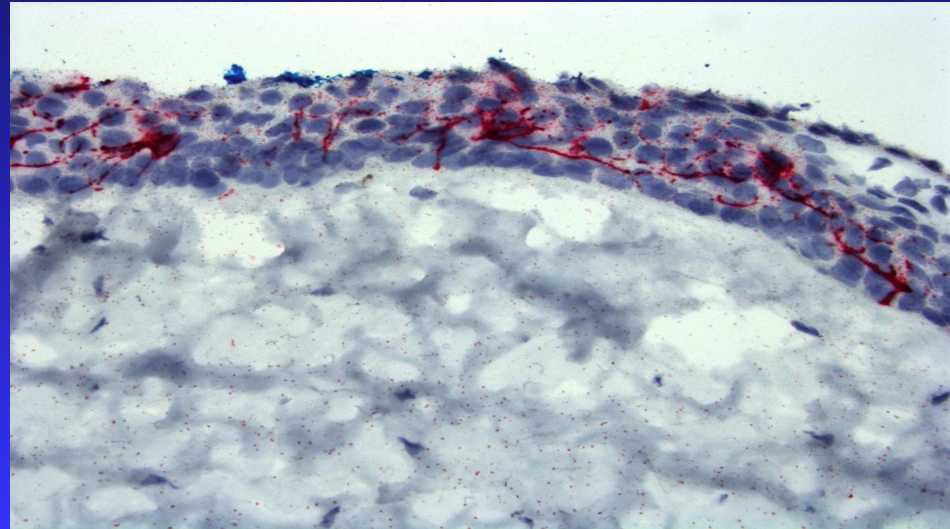
- H&E level sections
 - ◆ Blood
 - ◆ Exogenous material
 - ◆ Medication deposition

Blood in nail plate

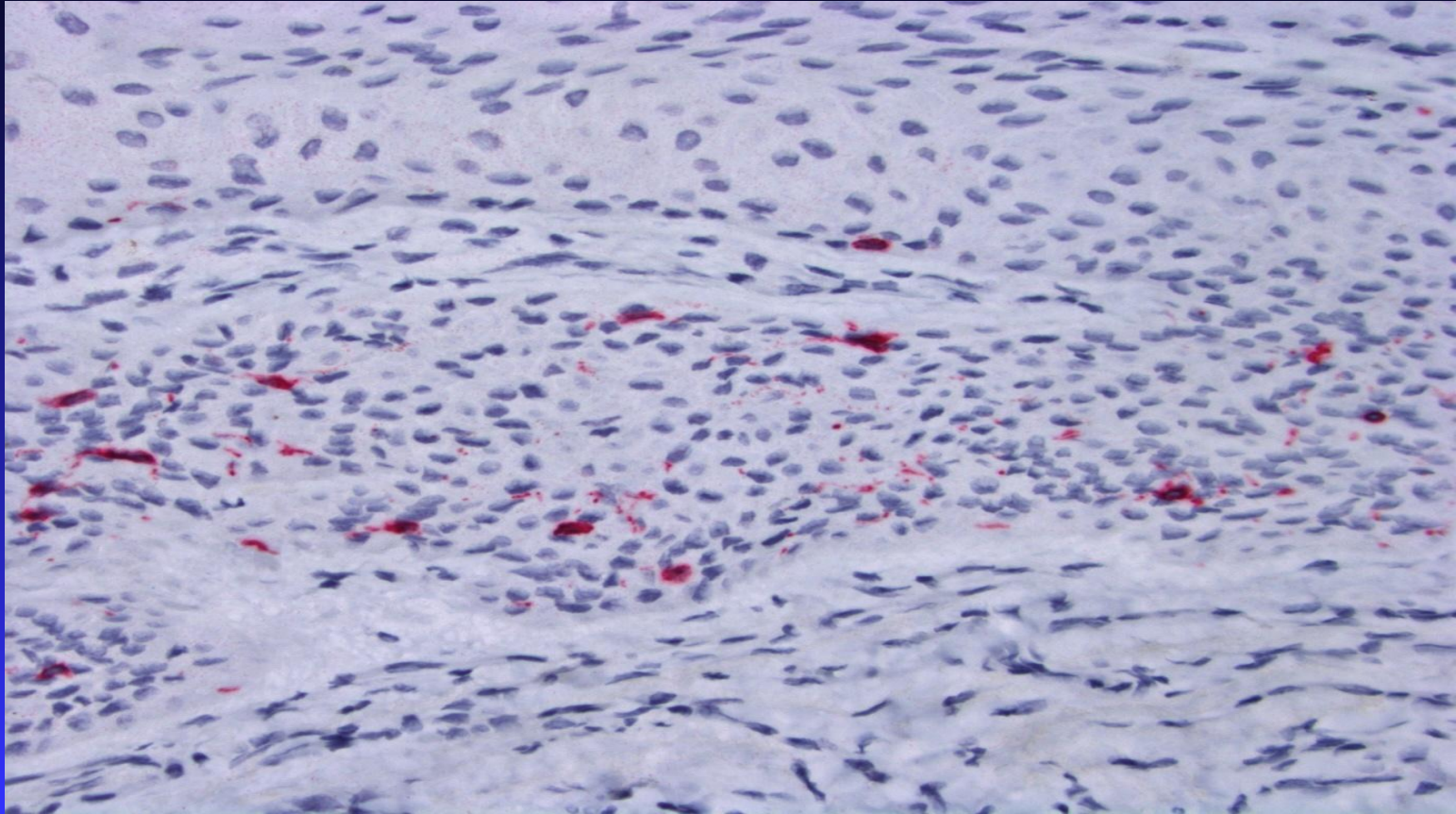


Immunohistochemistry for melanonychia

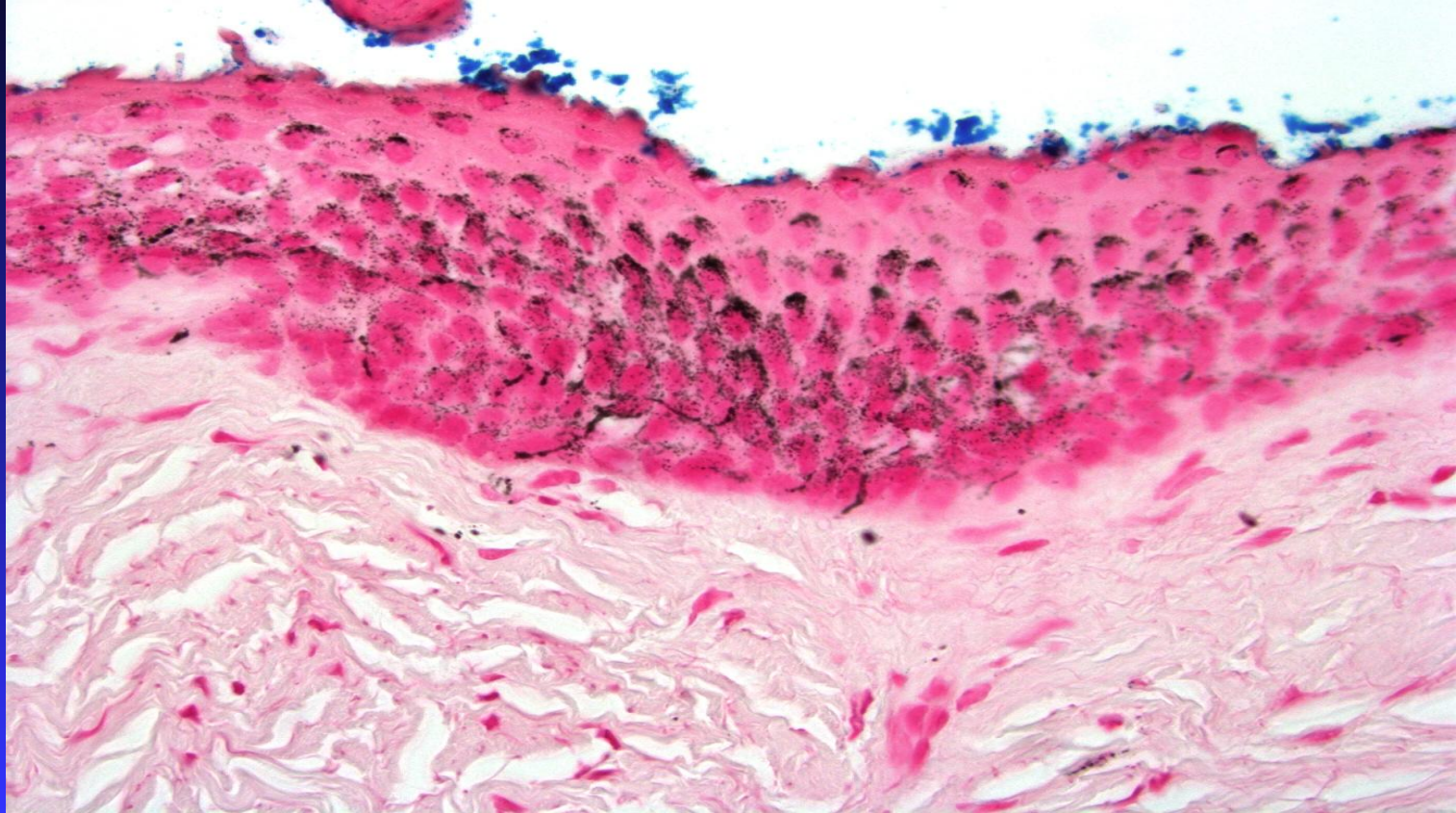
- Melanocytes density may vary highly, especially in melanoma in-situ
- Use a red chromogen



Variable density of melanocytes

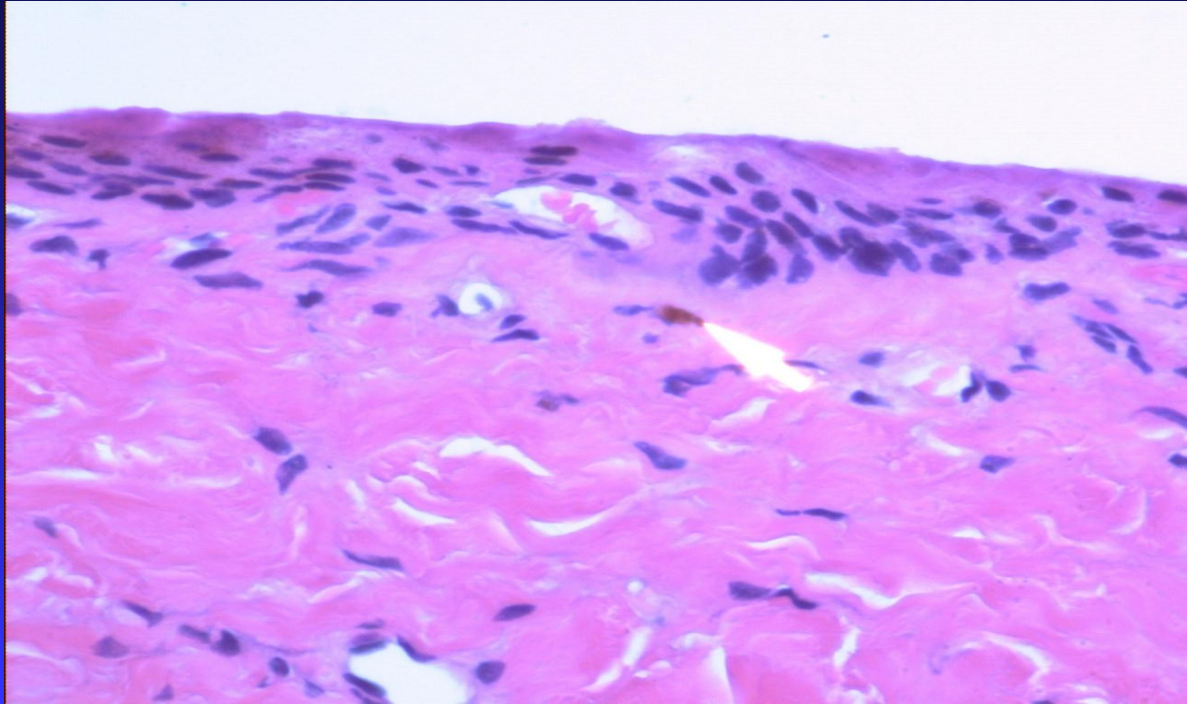


Fontana-Masson for melanonychia



Single melanophage

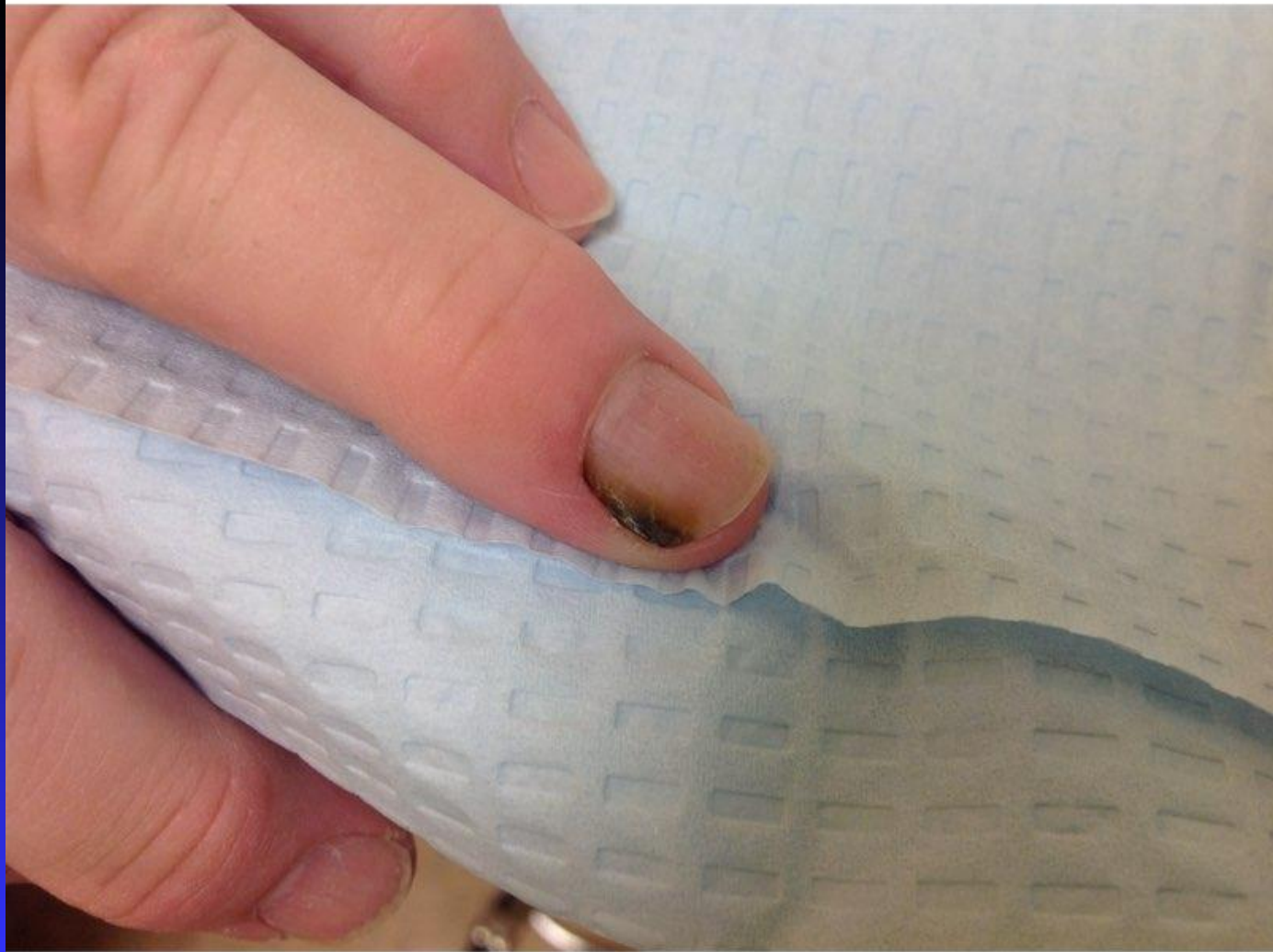
May be the only diagnostic findings in benign activation



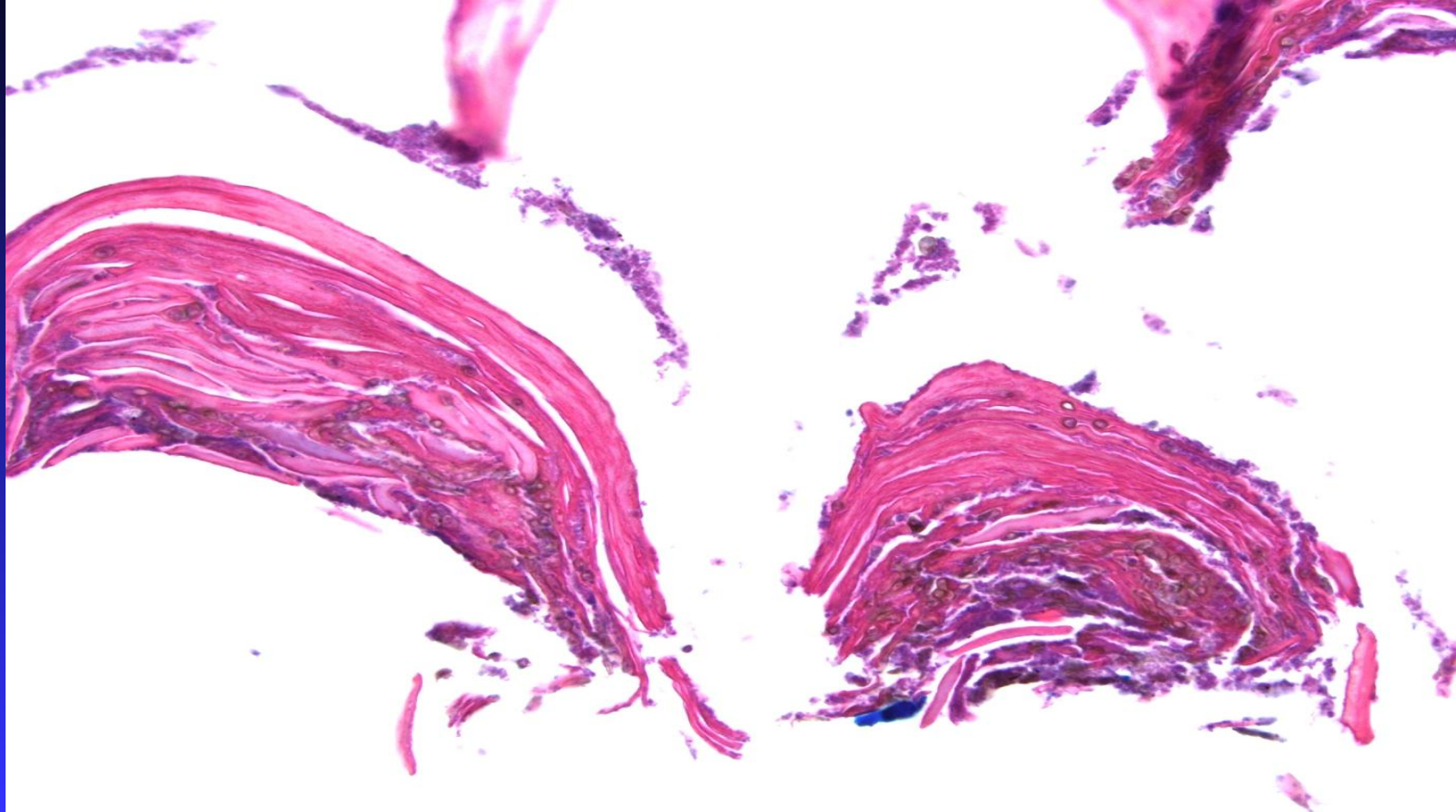
Special stains for pigment

- Perl's iron— Fe^{2+} still in heme
- Fontana-Masson—must dilute

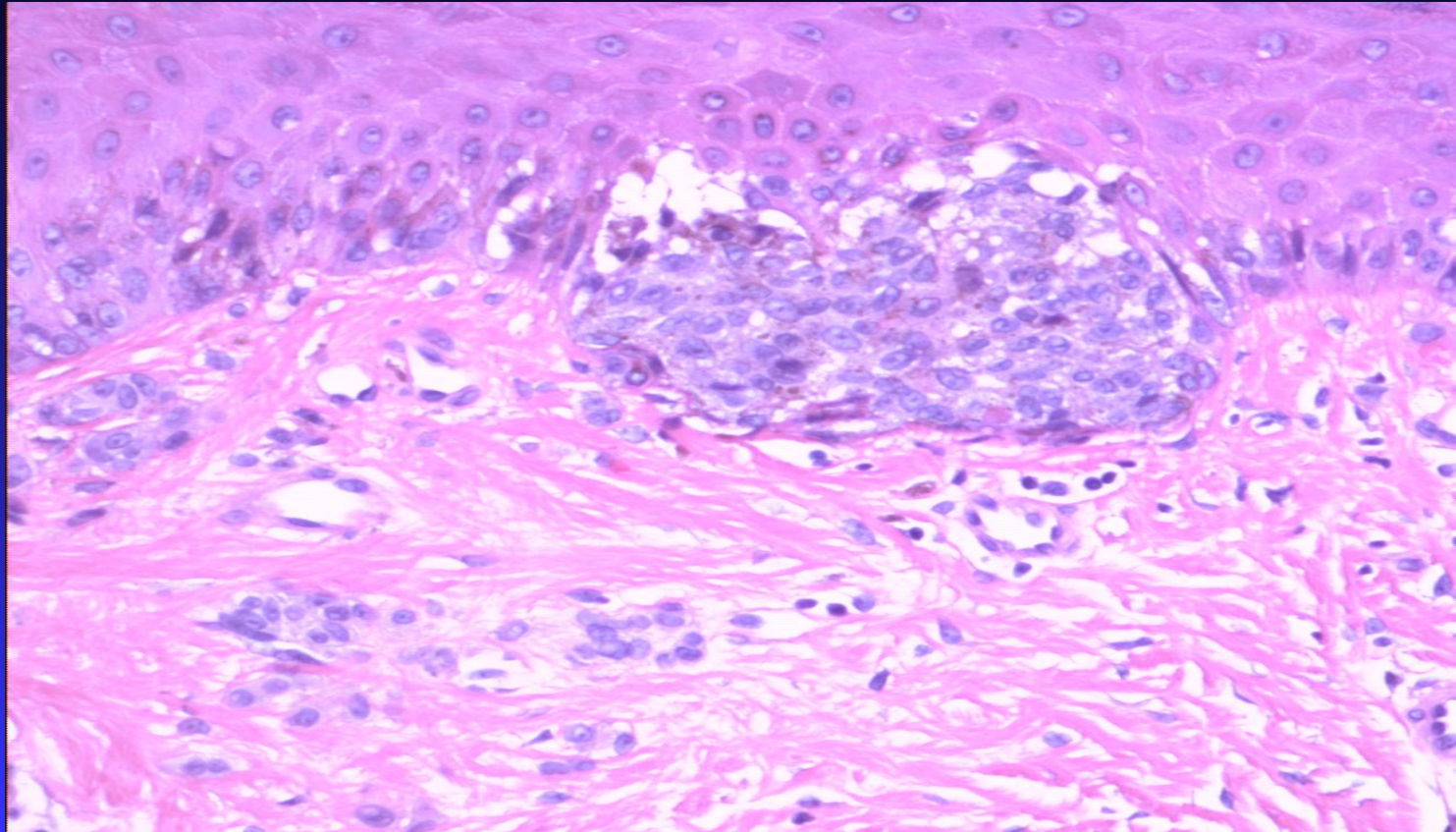




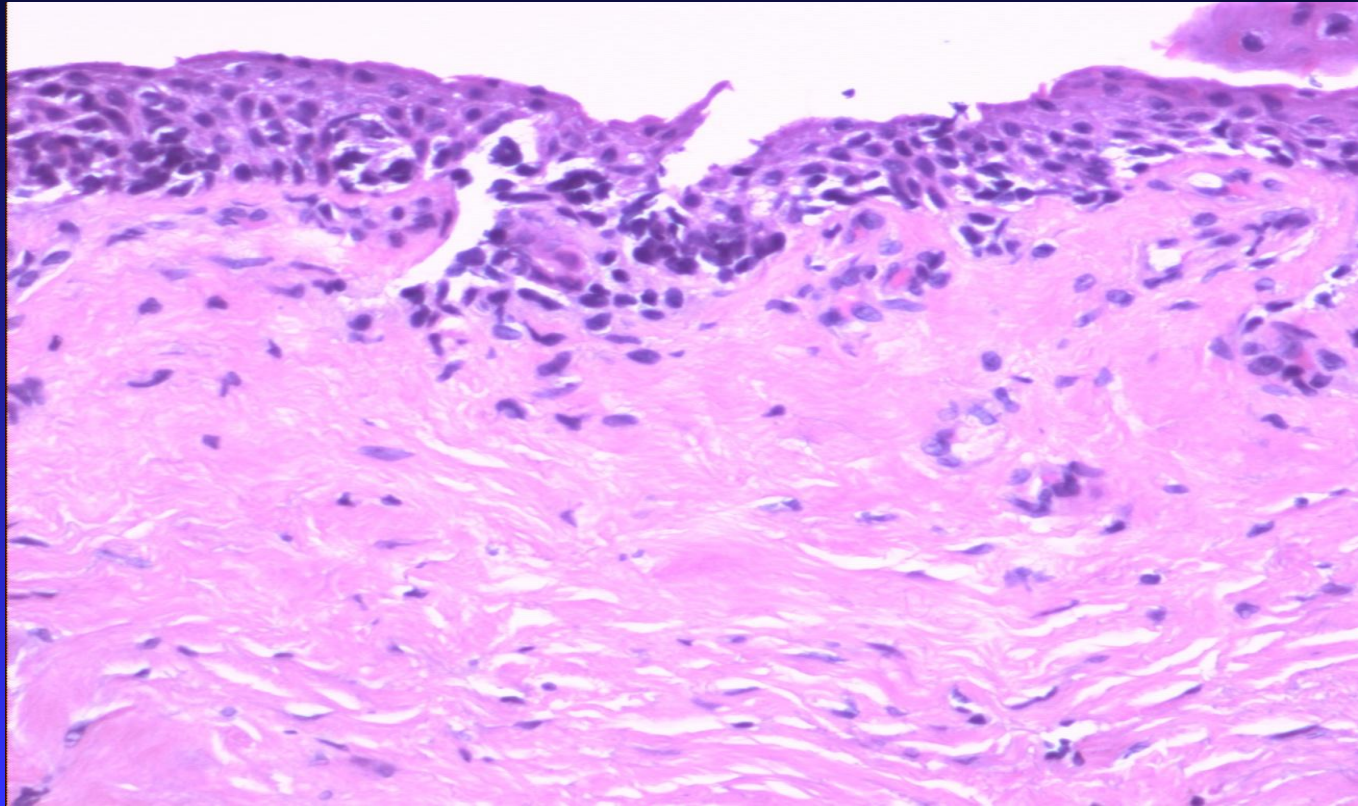
Pigmented fungus



Benign melanocytic nevus



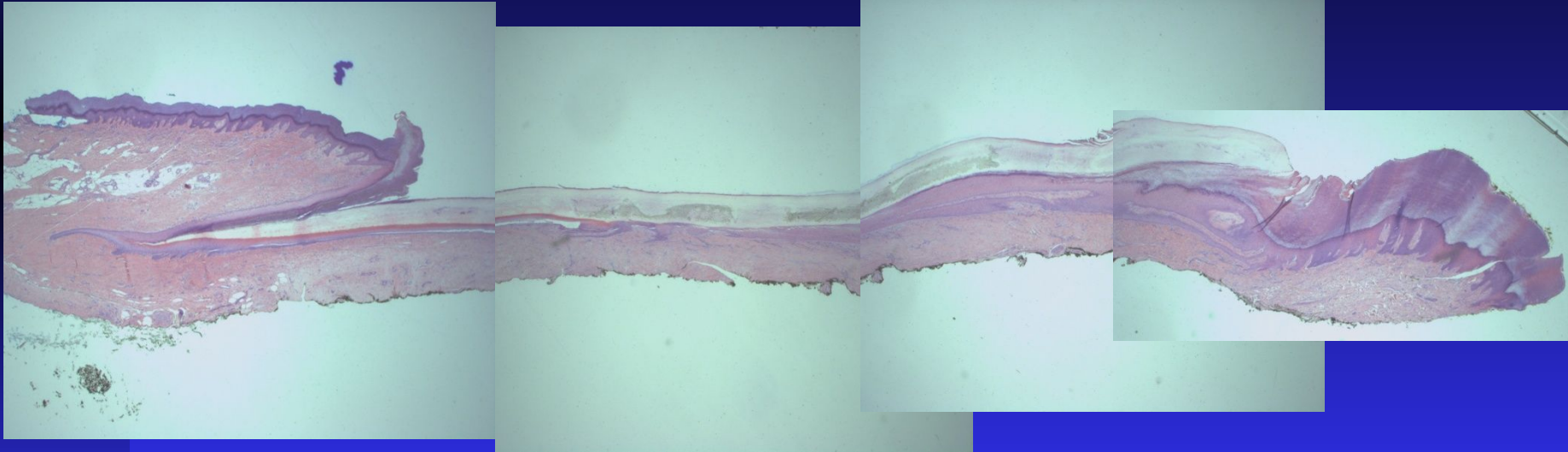
Melanoma in-situ



Hutchinson's Sign



Hutchinson's Sign



Hutchinson's Sign

- J Am Acad Dermatol. 2001 Feb;44(2):305-7.
- **Two kinds of Hutchinson's sign, benign and malignant.**
- Kawabata YKawabata Y, Ohara KKawabata Y, Ohara K, Hino H, Tamaki K.
- Department of Dermatology, Faculty of Medicine, University of Tokyo, Japan. KAWABATA-der@h.u-tokyo.ac.jp
- We examined 6 subungual melanomas in situ and 18 melanocytic nevi and compared pigmentation of the nail plates and hyponychium with the use of a dermatoscope. Hutchinson's sign on the hyponychium was not always evidence of subungual melanoma because it can be seen in both diseases. However, there was a wide difference in their dermatoscopic features. We believe that observation of pigmentation on the hyponychium with the use of a dermatoscope contributes to the

Dr. Rich's Differential Diagnosis

- Trauma pigment
- Nevus
- Lentigo
- R/O Melanoma

Biopsy

- Nail plate reflected and matrix sampled
- Proximal nail fold sampled

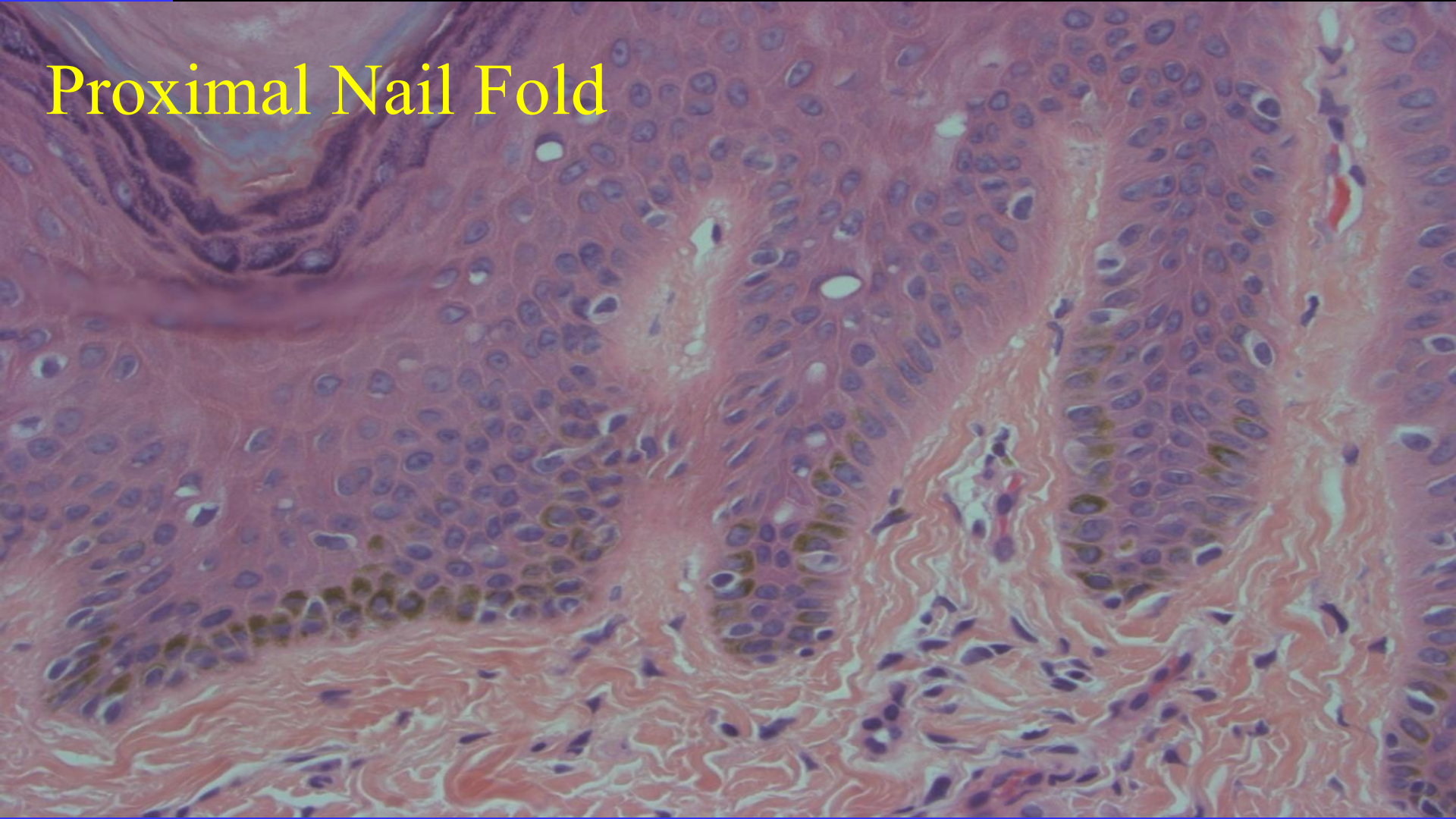


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Proximal Nail Fold

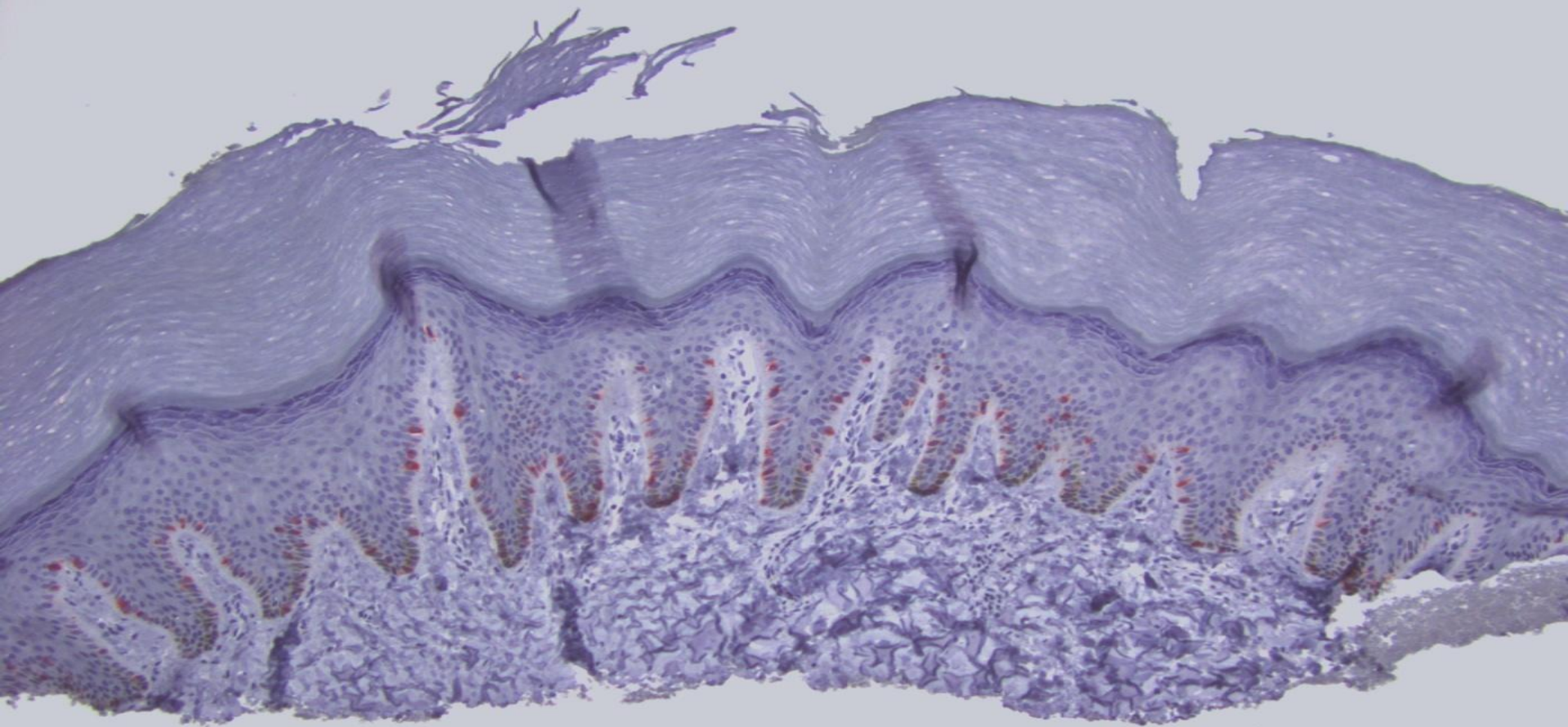


Proximal Nail Fold

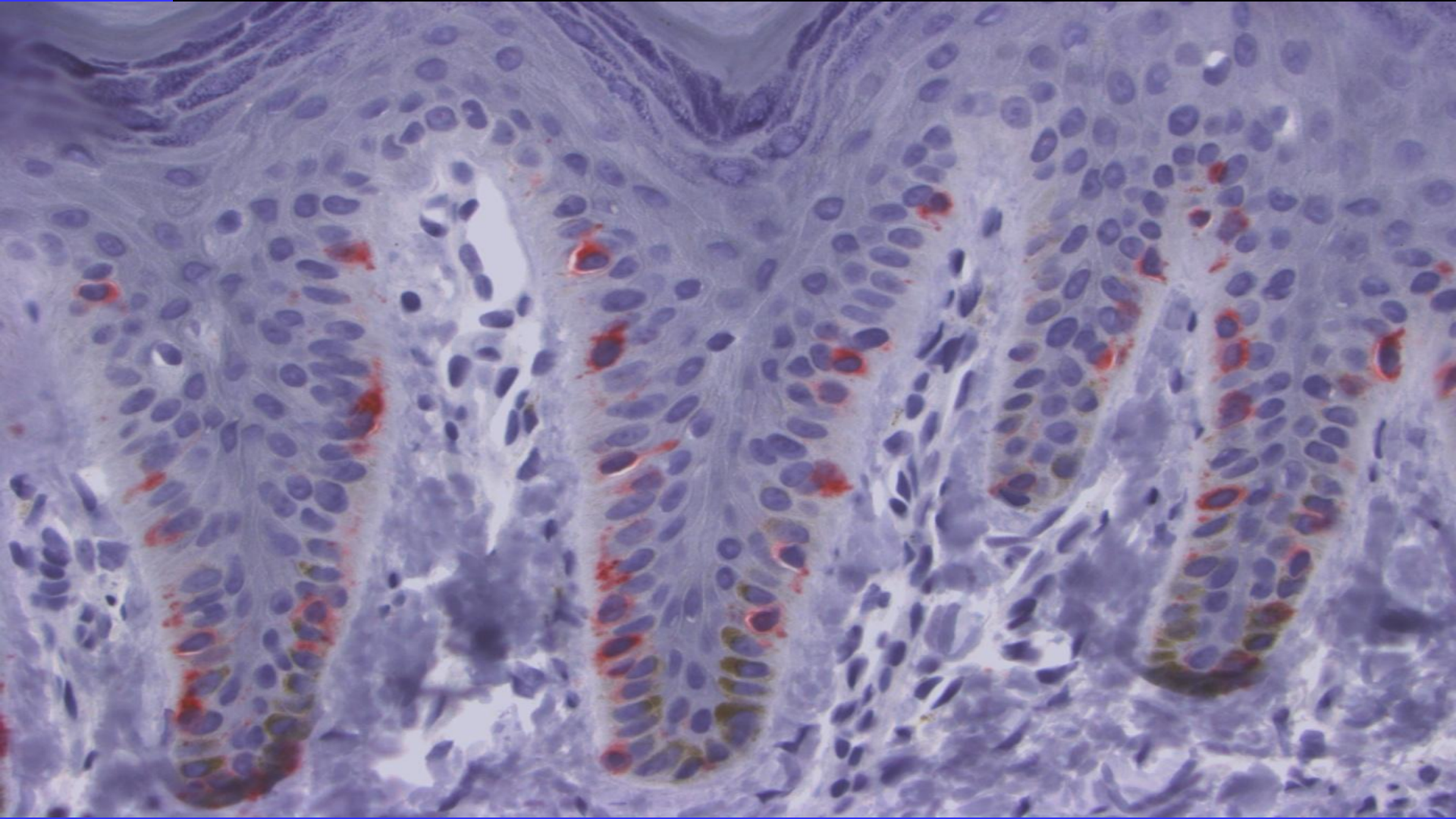




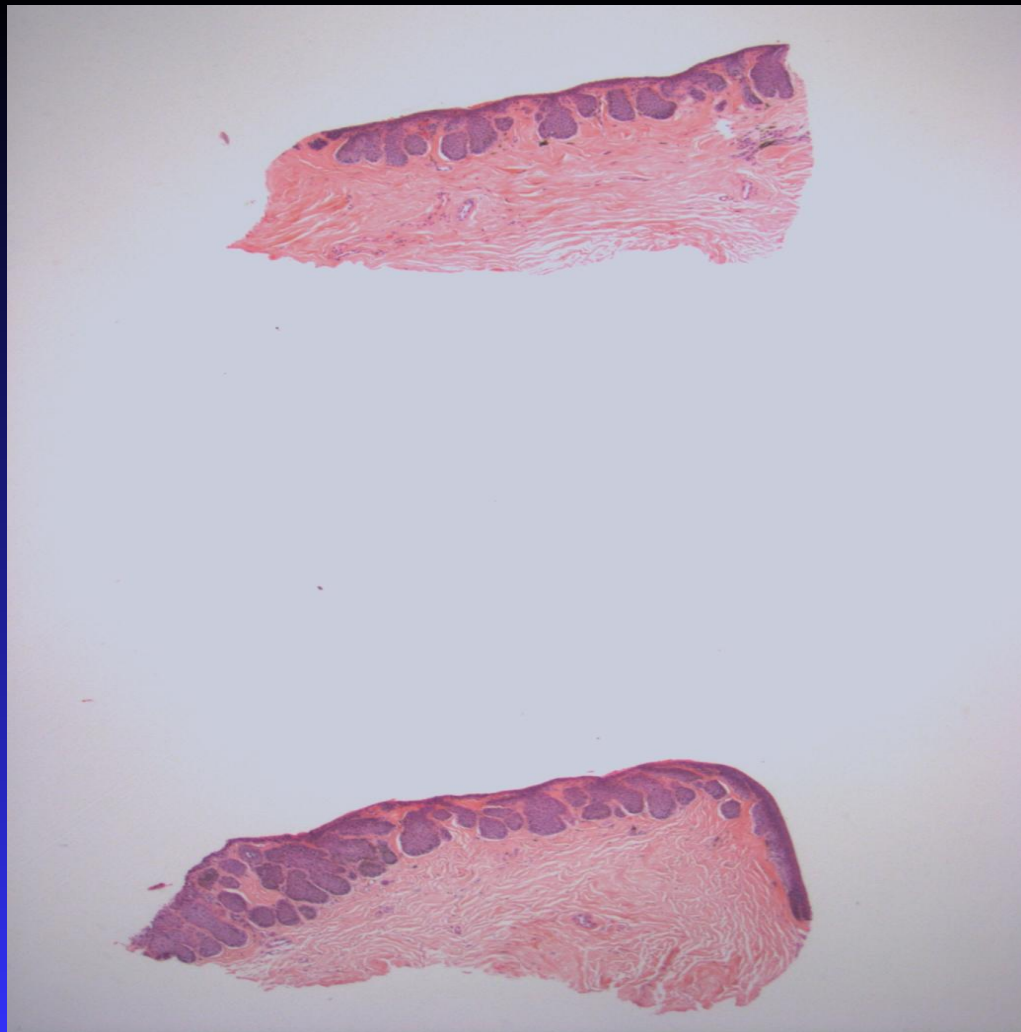
Fontana-Masson Stain

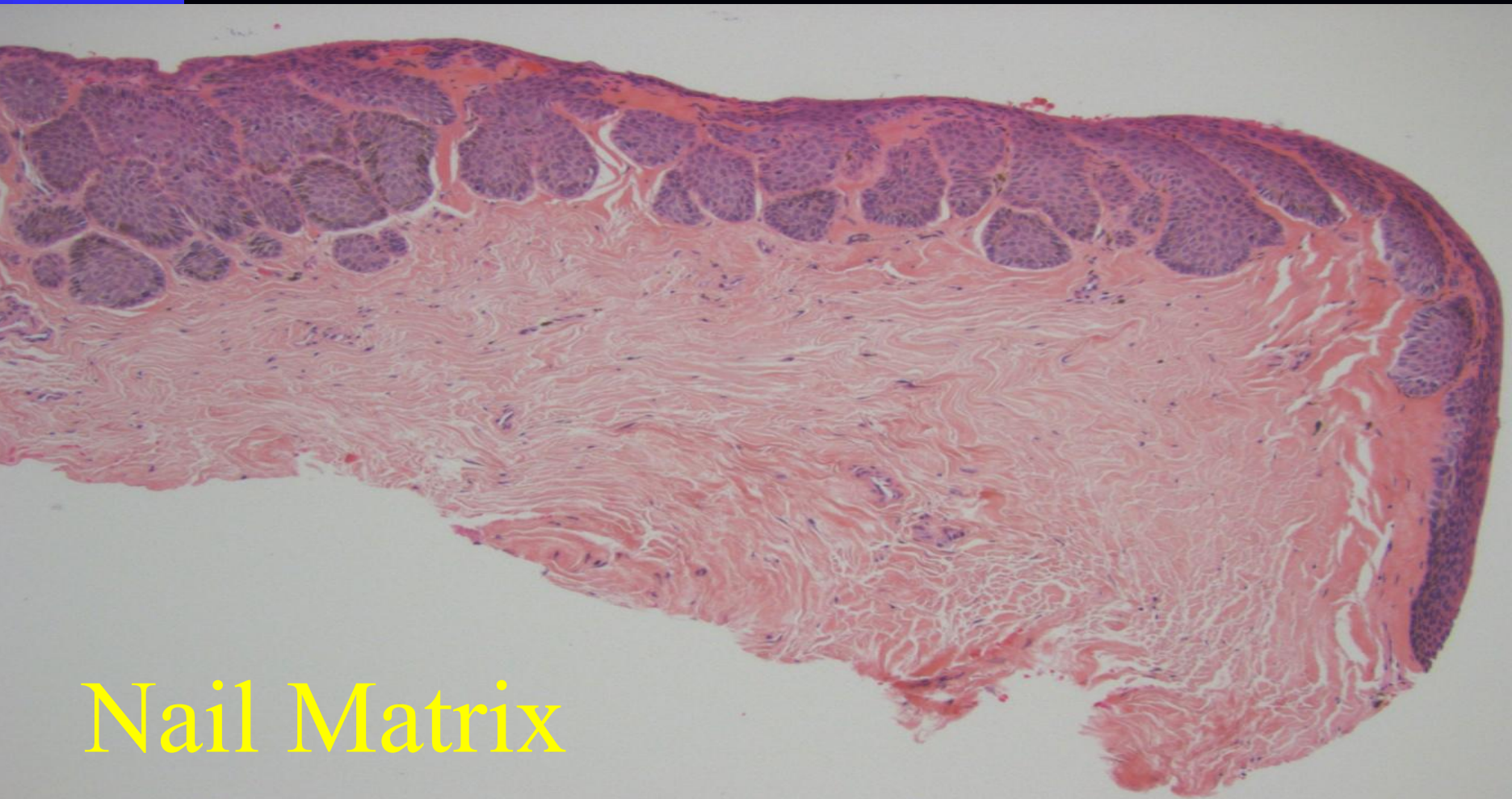


MelanA IHC Study



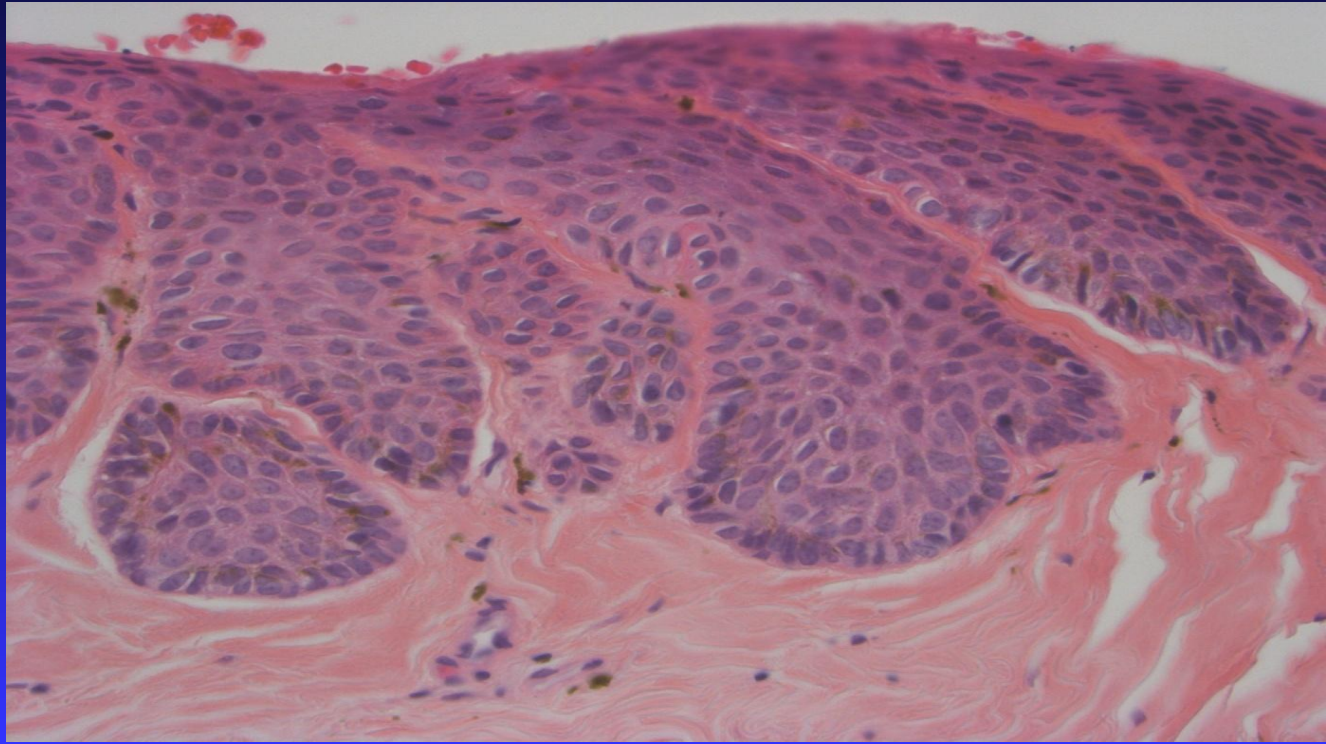
Nail Matrix

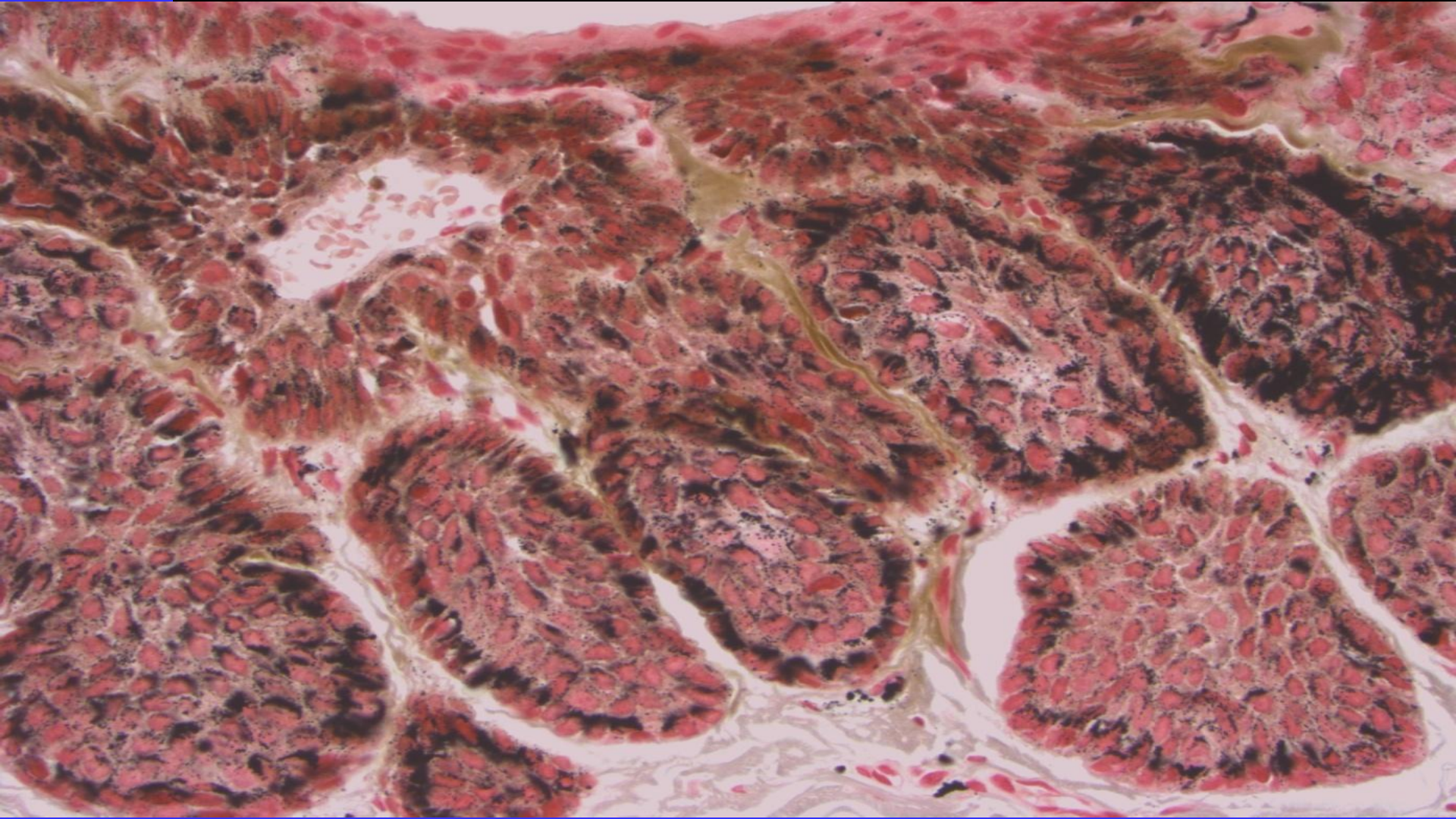


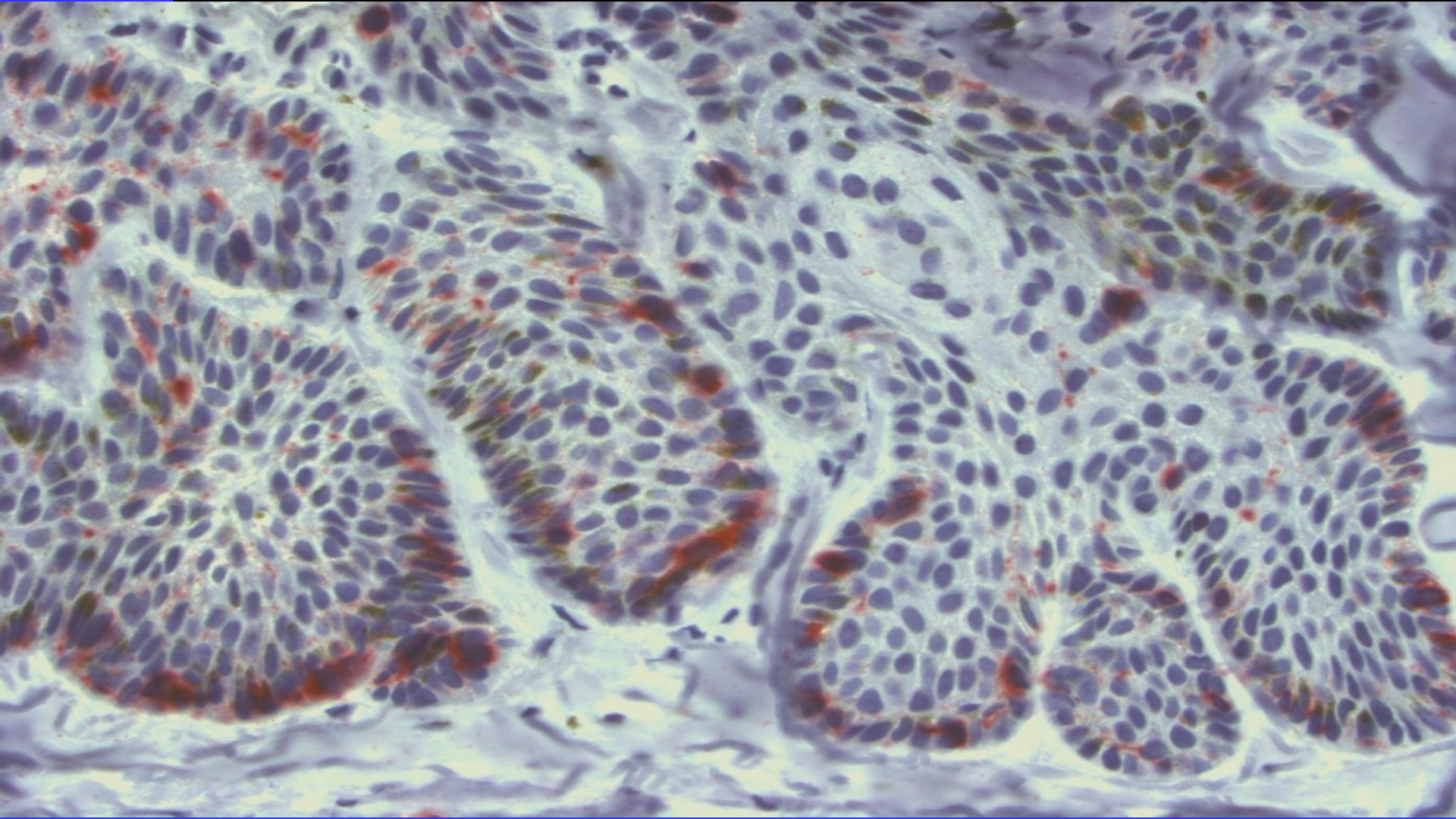


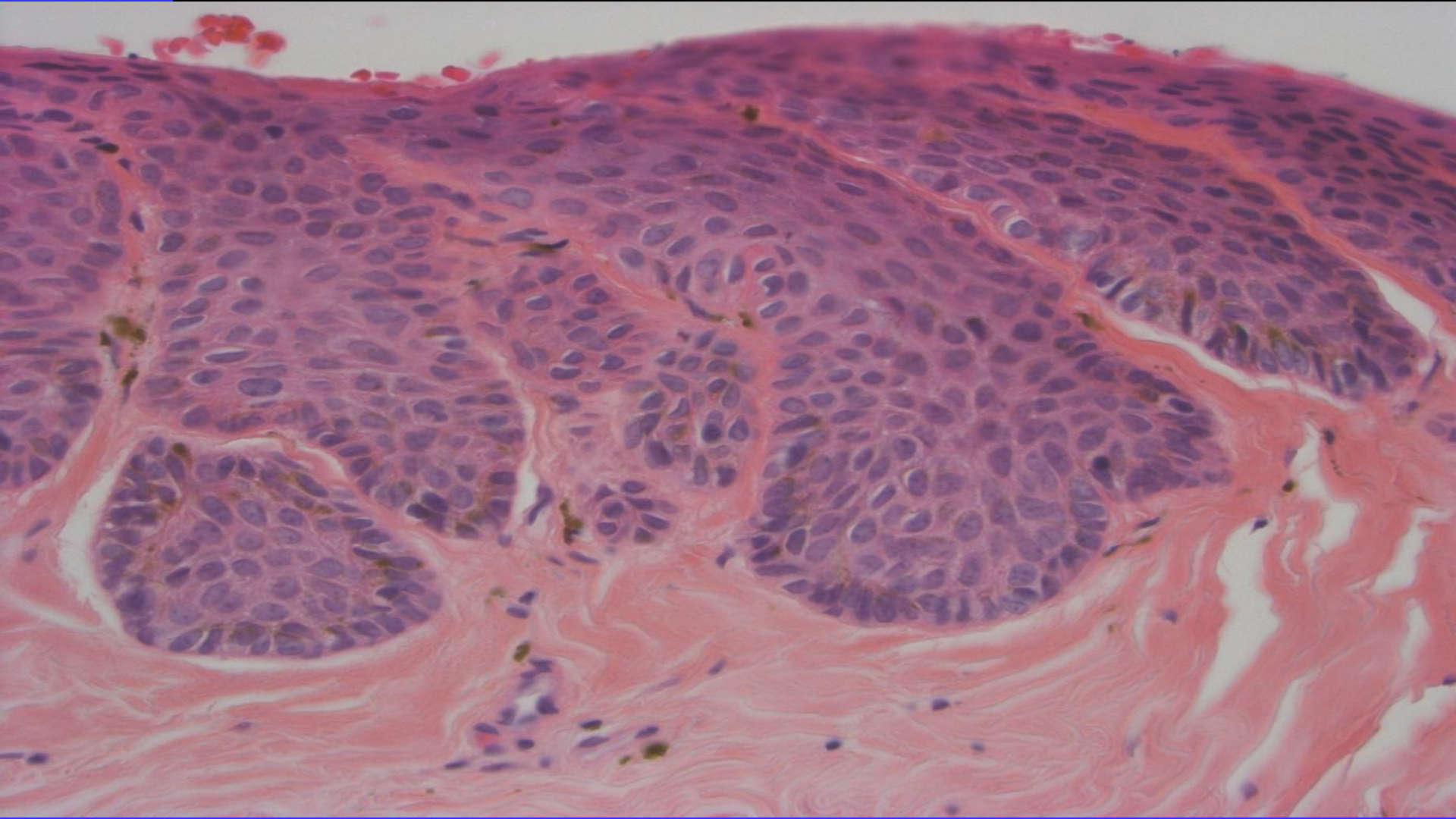
Nail Matrix

Onychocytic matricoma with a Hutchinson's sign









Onychocytic Matricoma

Am J Dermatopathol. 2012 Feb;34(1):54-9. doi: 10.1097/DAD.0b013e31822c3d8b.

Onychocytic matricoma presenting as pachymelanonychia longitudinal. A new entity (report of five cases).

Perrin C¹, Cannata GE, Bossard C, Grill JM, Ambrossetti D, Michiels JF.

Author information

Abstract

Among the tumors of the epidermal appendages, only rare tumors have been proved as differentiating in the direction of the nail. Beside onychomatricoma, we report a new matrical tumor of the nail: onychocytic matricoma (acanthoma of the nail matrix producing onychocytes). The main differential diagnosis of onychocytic matricoma is seborrheic keratosis. However, if attention is paid to the nature of the different layers of the tumor and the peculiar microanatomy of the nail matrix, the differentiation is not difficult. Onychocytic matricoma is a localized (monodactylous) longitudinal melanonychia which is slightly raised. The term pachymelanonychia is used to define the 2 clinical features of the tumor. Pachyonychia indicate a localized thickening of the nail plate, and melanonychia indicate its longitudinal pigmented band. Onychocytic matricoma is composed of a basal compartment with a varying admixture of prekeratogenous cells and keratogenous cells. Endokeratinization originating in the deep portion of the tumor and nests of prekeratogenous and keratogenous cells in concentric arrangement are a characteristic feature. Three major patterns can be identified as follows: acanthotic, papillomatous, keratogenous type with retarded maturation. Given the peculiar thickening of the nail plate observed both in pigmented onychomatricoma and onychocytic matricoma, the term pachymelanonychia longitudinal could be proposed to specify clinically these 2 lesions, which the clinician sometimes mistakes for melanoma.

Nail Fungus Diagnostics

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

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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

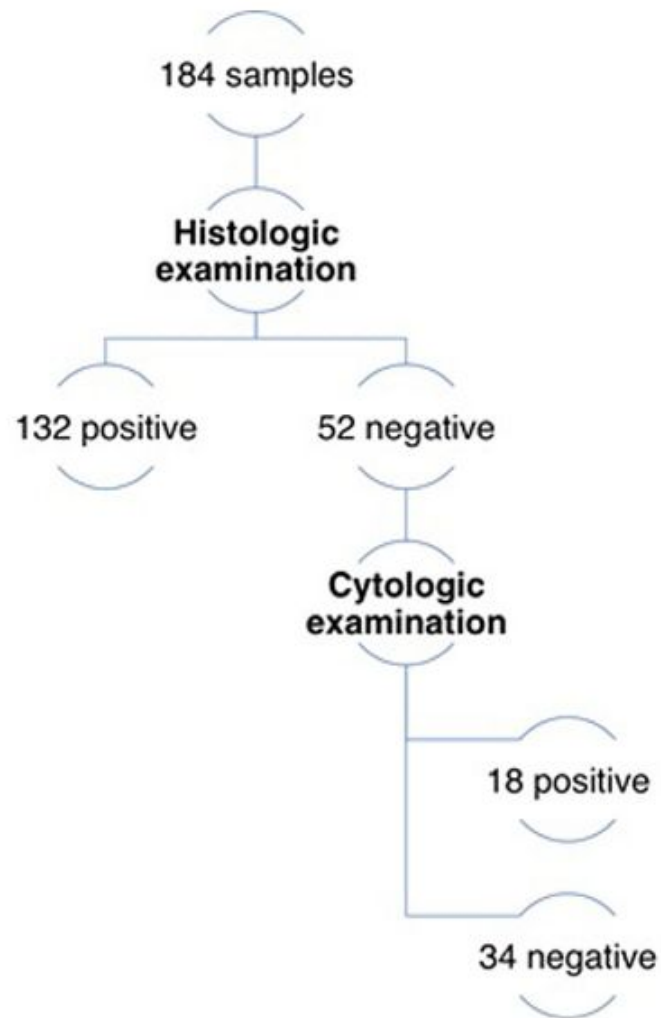


Centrifuge with slide



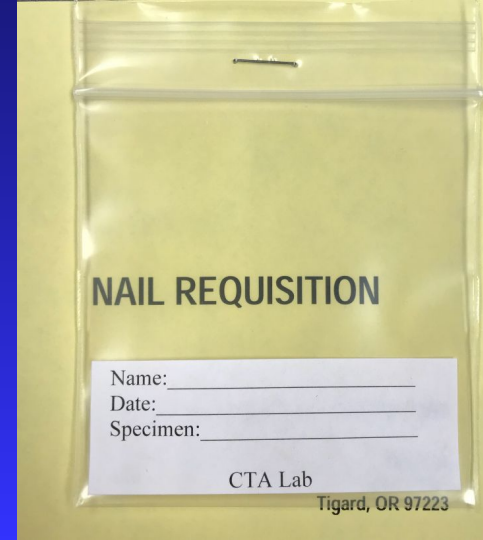


Fig 1. Onychomycosis. Microscopic examination of PAS-stained subungual debris. (Original magnification: $\times 400$.) Subungual debris was collected by centrifugation of the formalin in which nail clipping specimens were submitted. Microscopic examination of a thin-layer preparation of PAS-stained subungual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

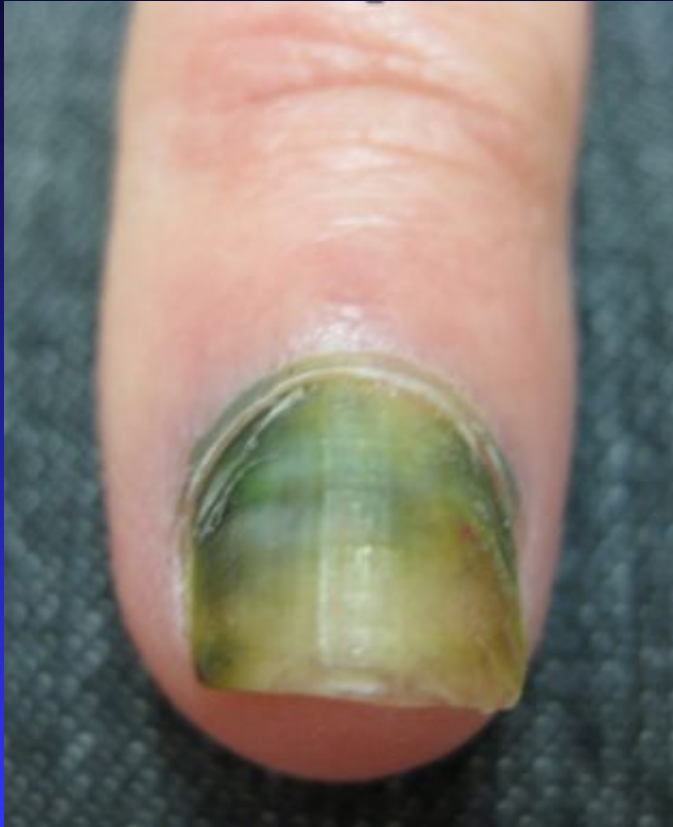


Submit specimen dry in a small envelope

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

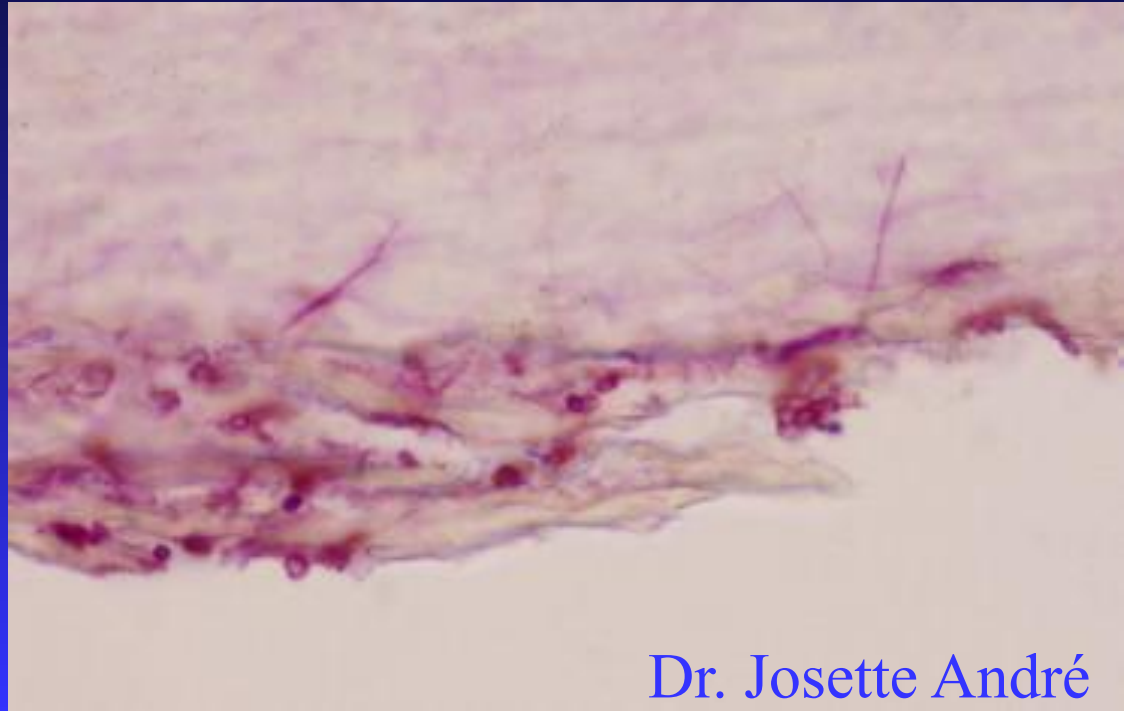


Mold



Mold vs Dermatophyte

- Invades vertical to nail plate.



Dr. Josette André

Mold

- Clinical suspicion
- PCR preferred to culture (CutisDx.com)
 - ◆ Culture must be with a cycloheximide-free media
 - ◆ Must notify lab of possibility

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

Thanks!

curtisinportland@gmail.com

