EYE PATHOLOGY:
Cornea, conjunctiva, and eyelid

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Disclosures

- I have no relevant financial relationships to disclose

Learning Objectives

Summary: We will cover three areas of eye pathology: **cornea, conjunctiva, and eyelid**. We will discuss the differential diagnosis of lesions at these sites, focusing on the most common entities.

1. Identify the key pathologic features and differential diagnosis of **corneal** lesions.

2. Identify the key pathologic features and differential diagnosis of **conjunctival** lesions.

3. Identify the key pathologic features and differential diagnosis of select **eyelid** lesions.

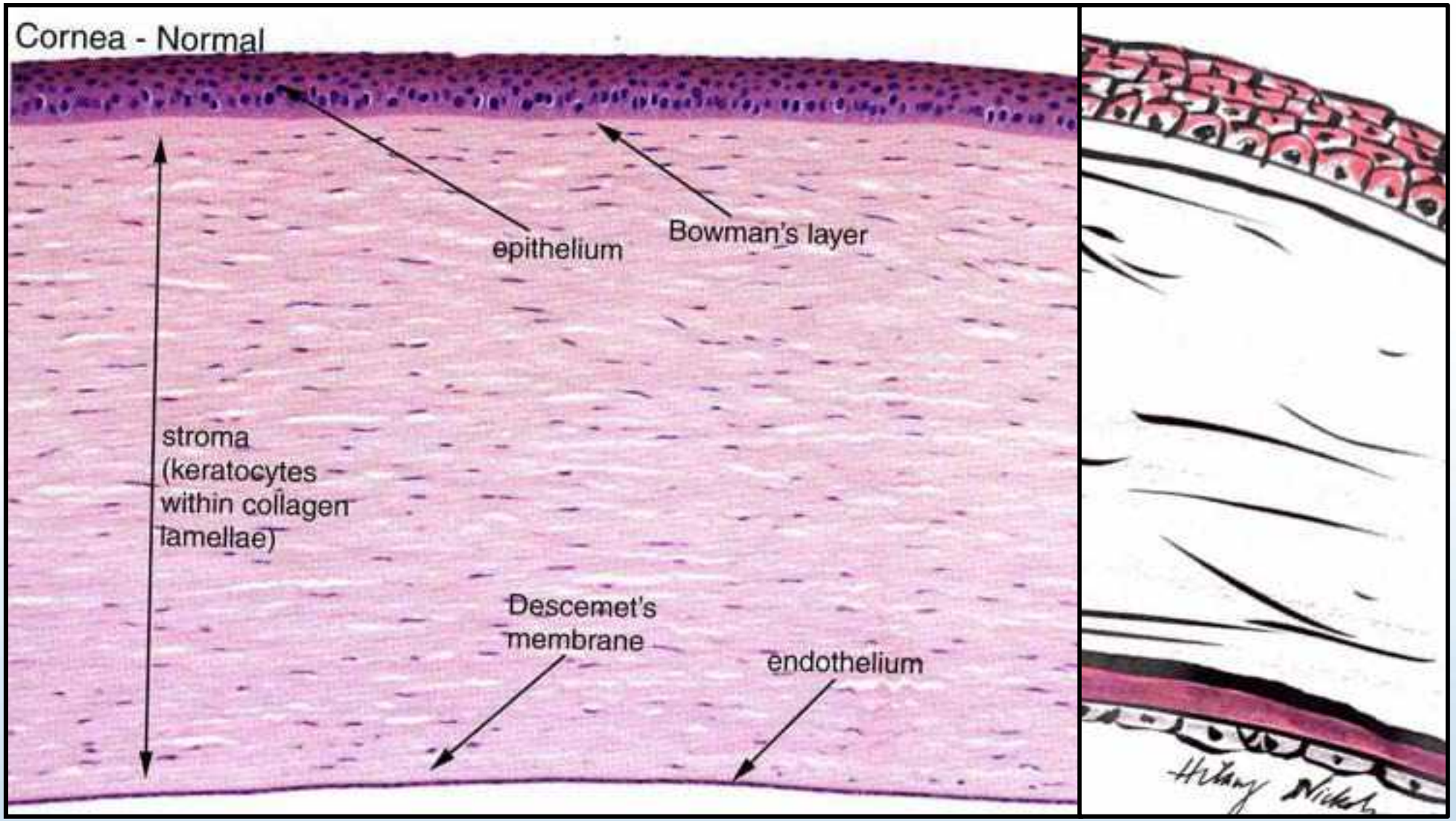
NO PHOTOGRAPHY

OR SOCIAL MEDIA SHARING

Thank you!

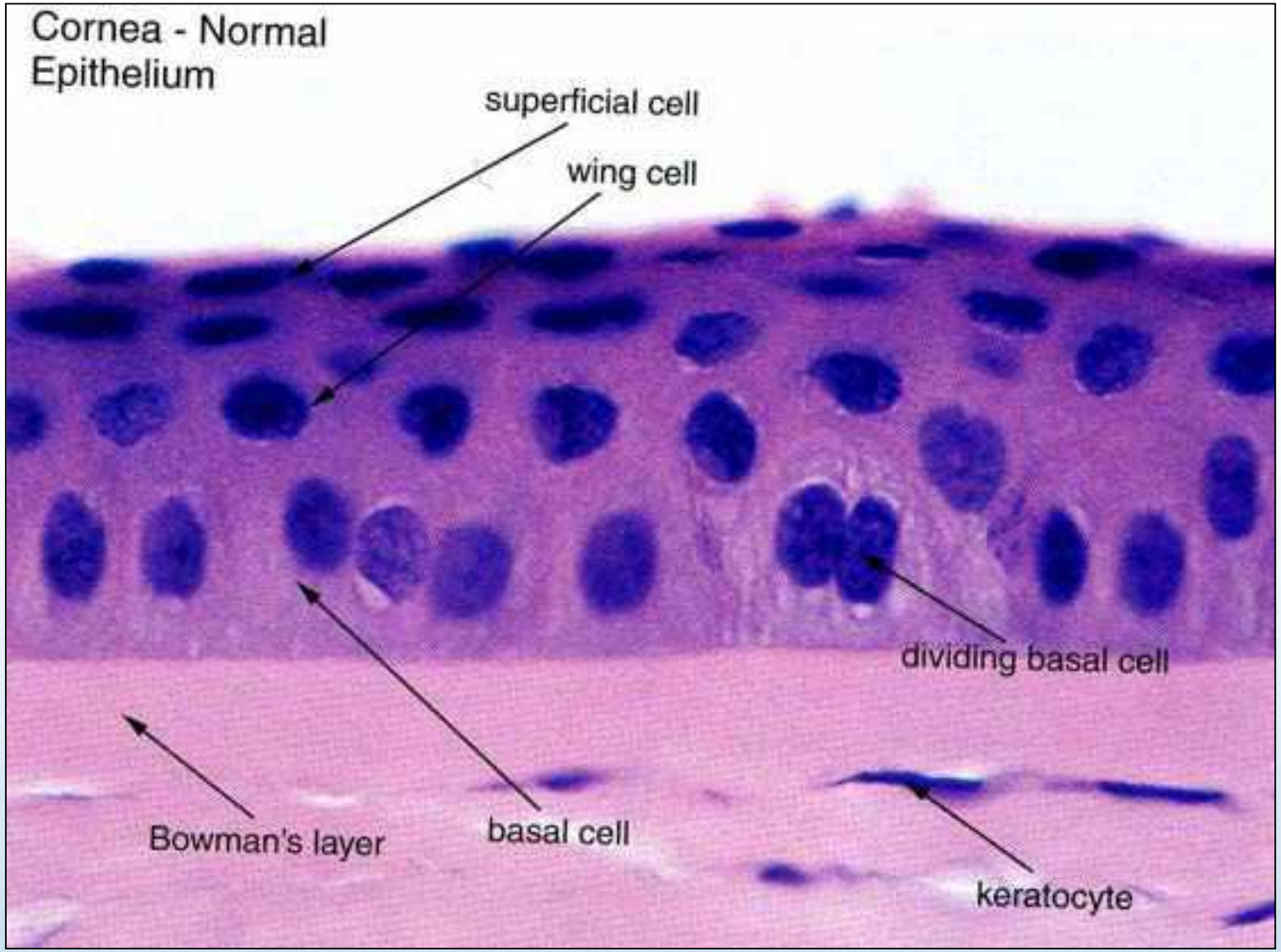
CORNEA

CORNEA



Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

Epithelium



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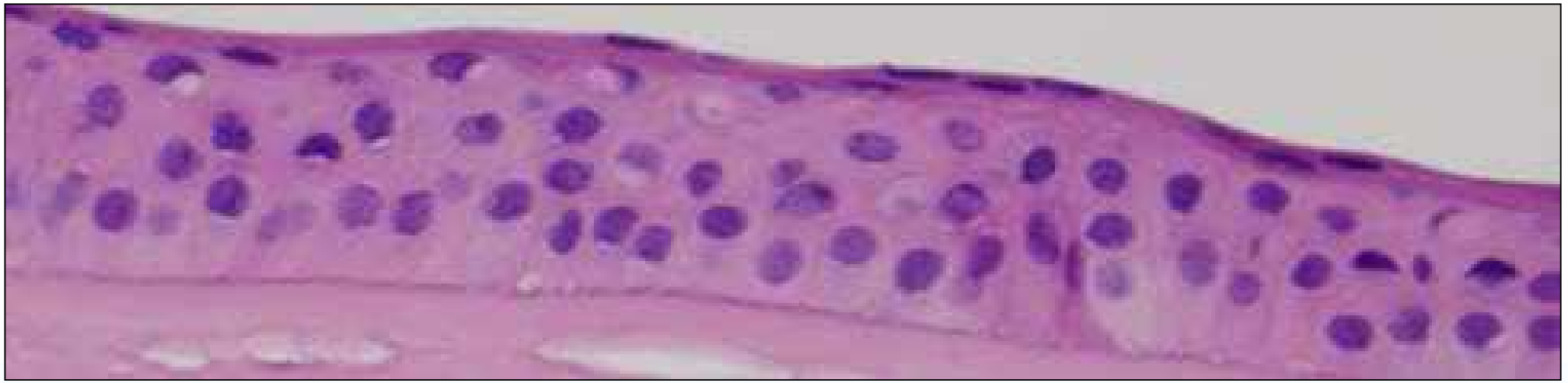
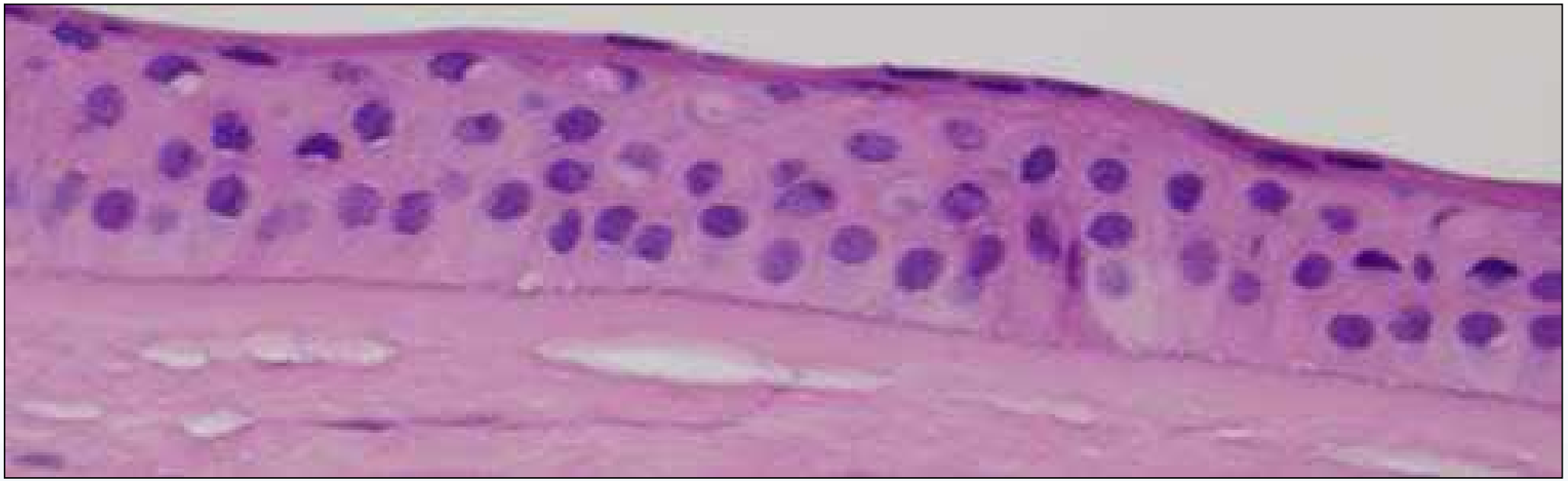
Epithelium



- stratified squamous, non-keratinizing,
- 5-7 layers thick; stains with PAS
- mitotically active basal layer attached to basement membrane
- wing cells second layer designed to fit over the rounded anterior surface of basal cells
- superficial cells, flatten as reach surface
- basal layers connected to Bowman's by an anchoring complex
- cells connected by desmosomes

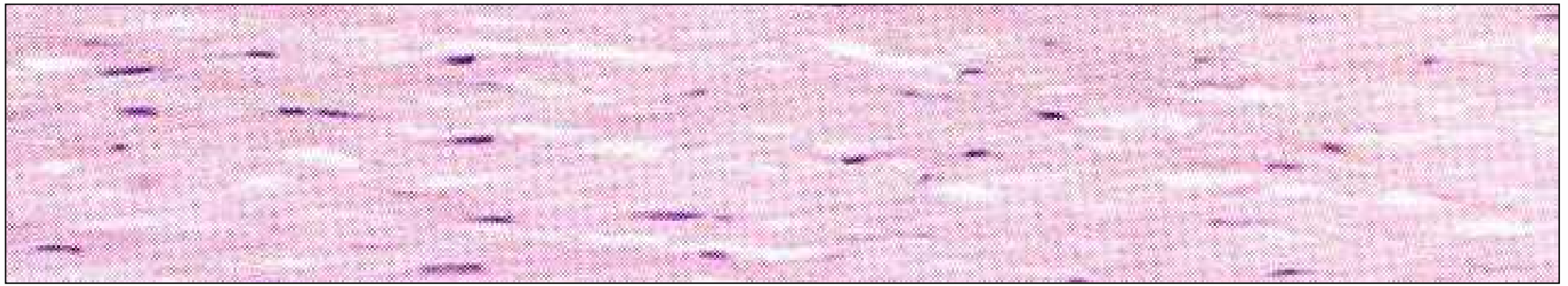
Bowman's layer



- beneath epithelial basement membrane (PAS+)
- acellular collagen layer
- 8-14nm thick
- once destroyed (trauma/ulcer), never replaced

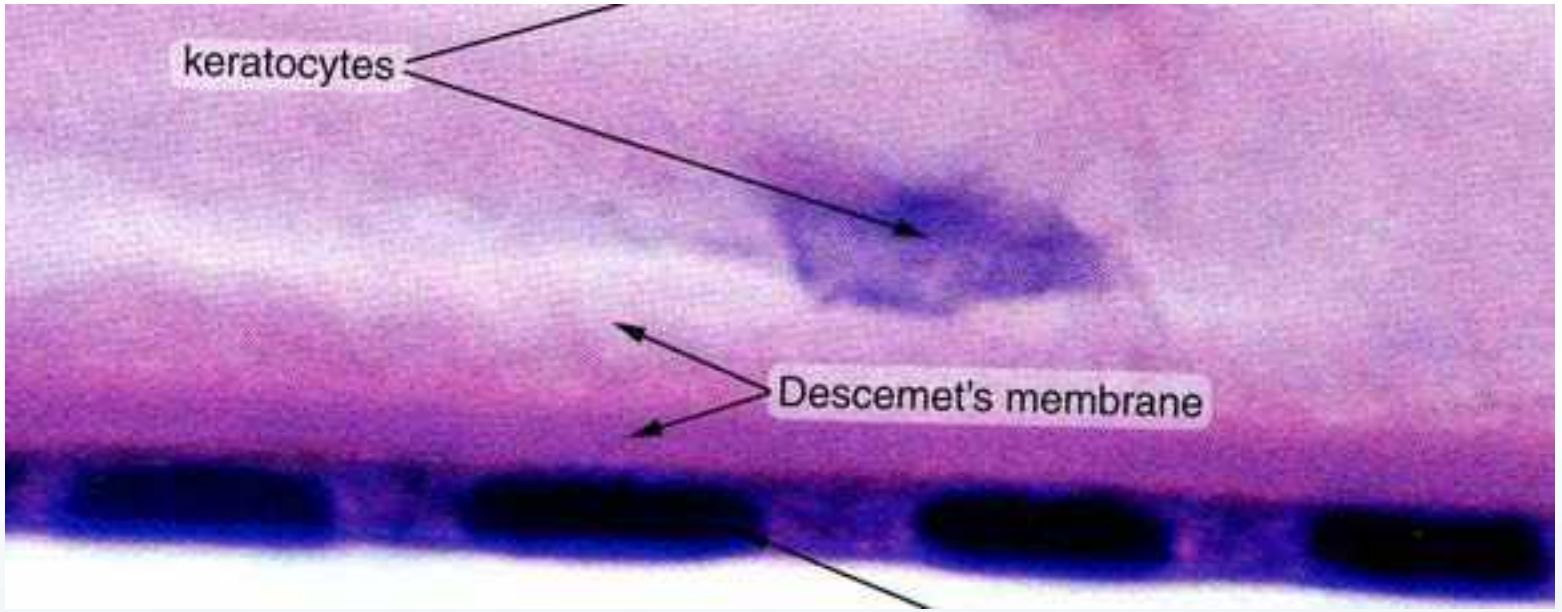
AANP

Stromal layer



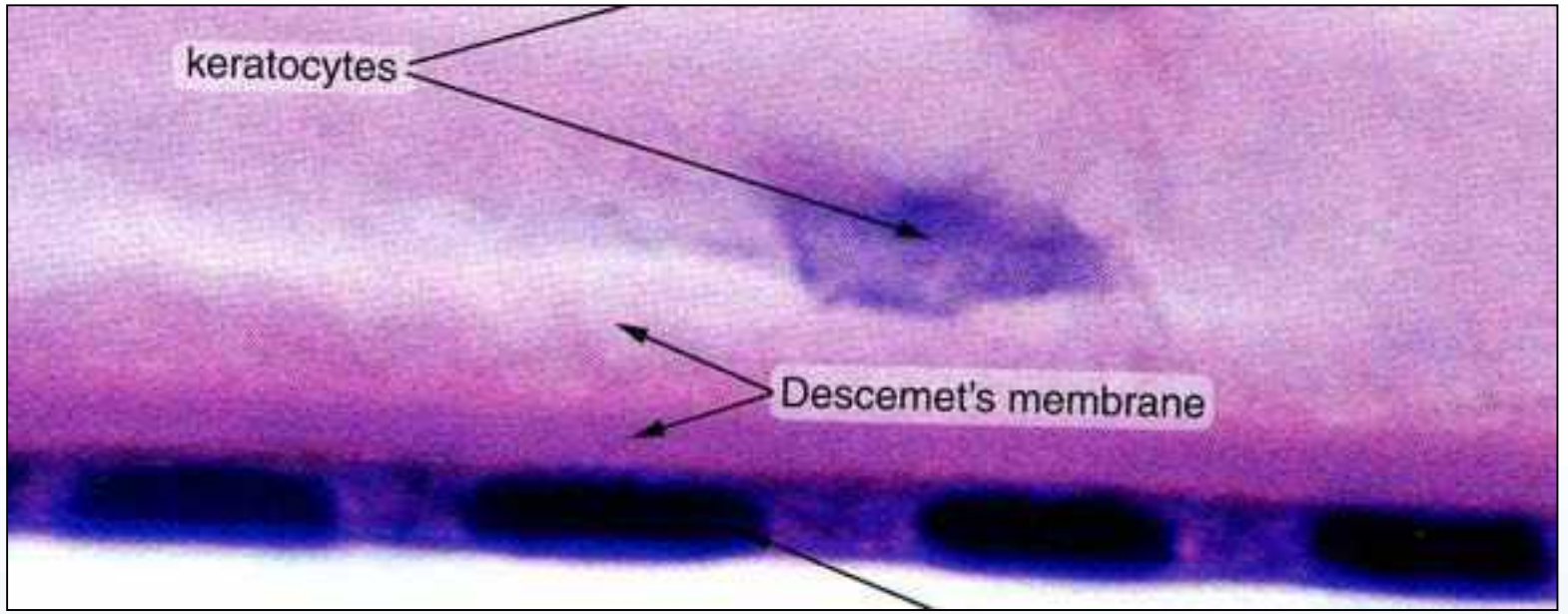
- 90% of corneal thickness (500mM)
- spindled keratocytes with long branching interconnected processes, lie between lamellae with uniformly spaced collagen fibrils
- elongate collagenous lamellae
- ground substance of mucoprotein and glycoprotein coats each fibril

Descemet’s membrane



- Thin elastic membrane of high tensile strength
- Contains proteoglycans and glycoproteins in addition to collagen
- Basement membrane elaborated by endothelium
- Composed of type IV collagen
- Strongly PAS positive

Endothelium

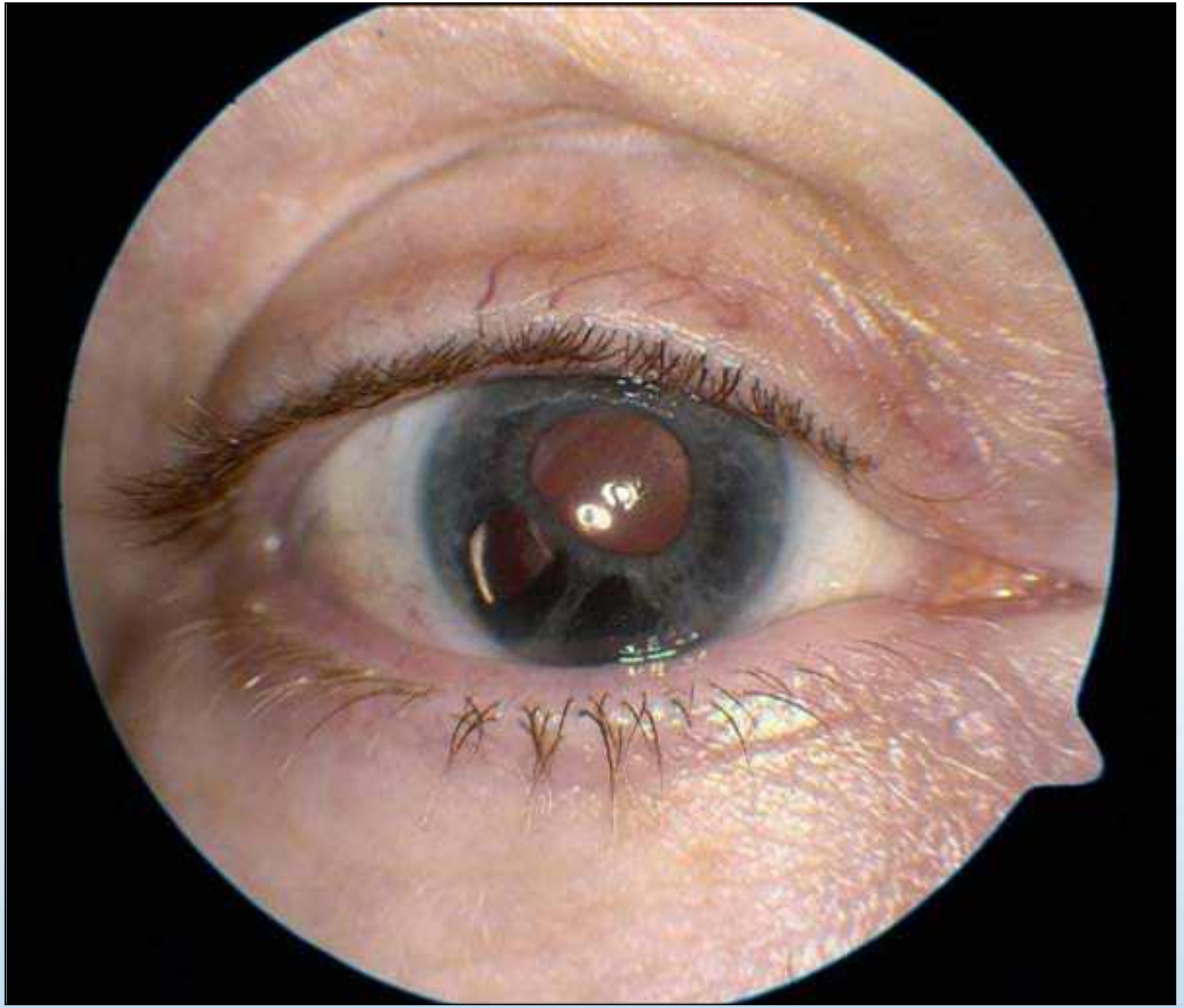


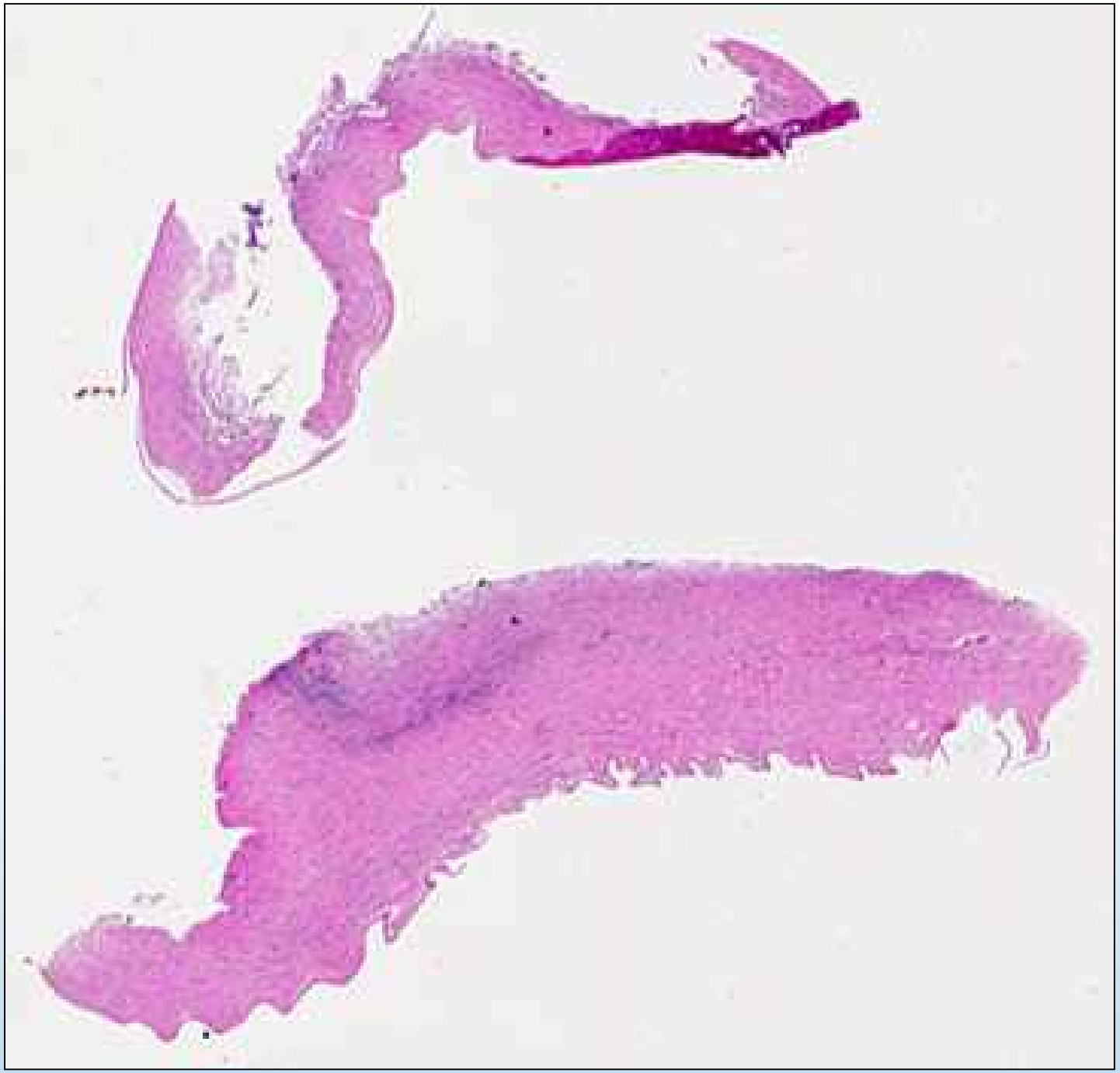
- Monolayer of flattened cuboidal cells
- Derived from neural crest
- Maintains corneal clarity by removing water from stromal layer
- Cell population declines with age

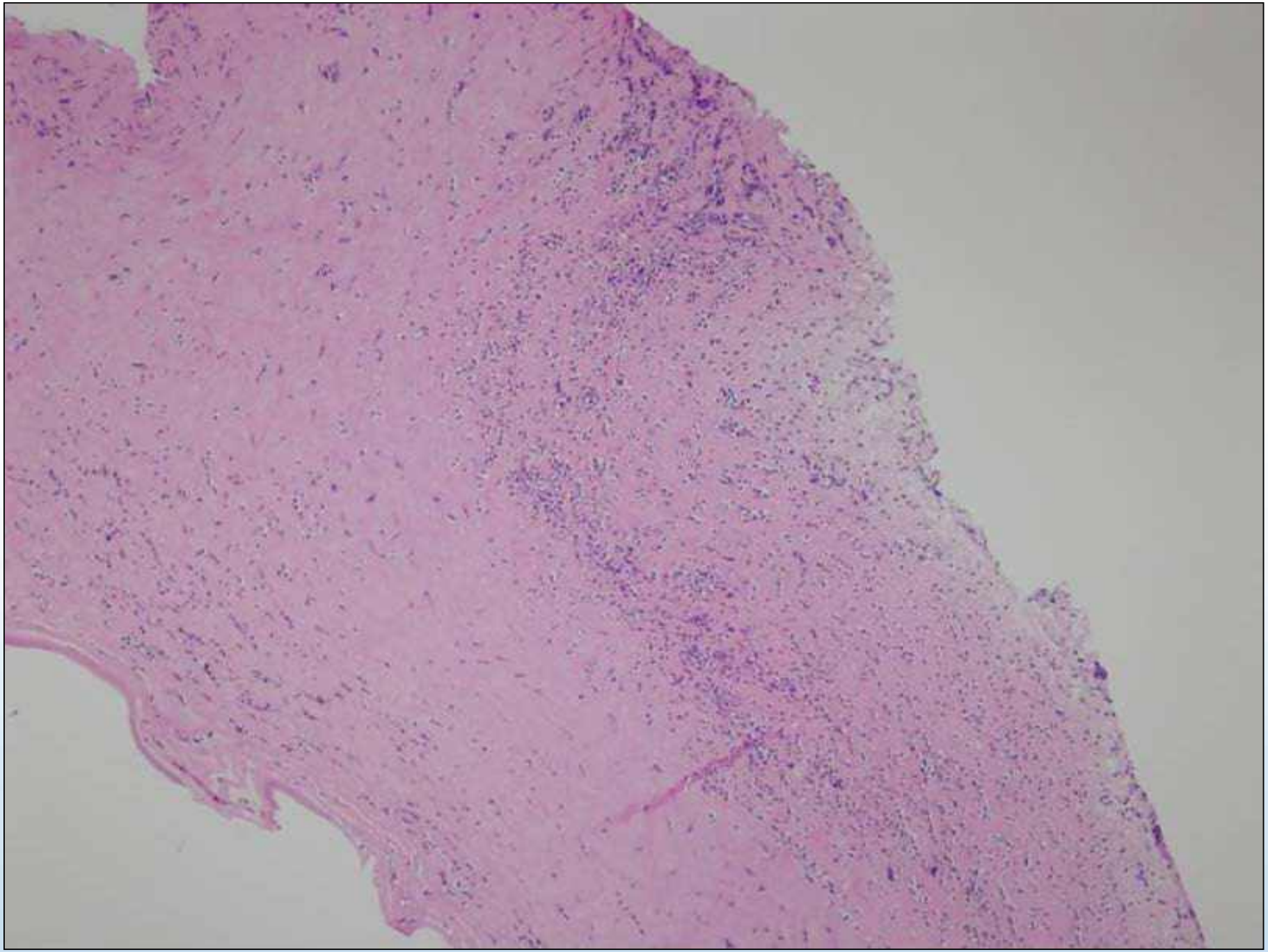
Corneal infection

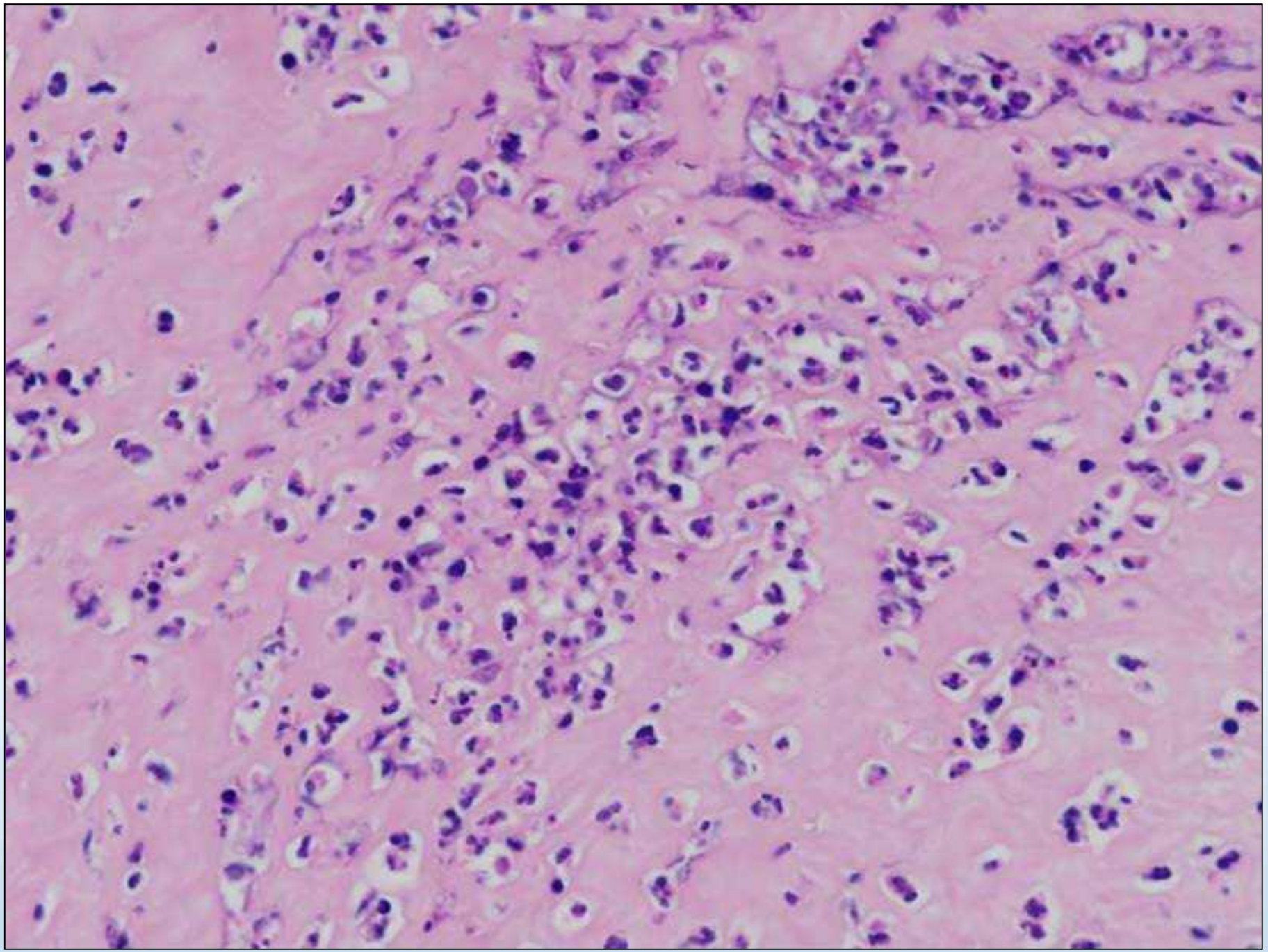
- Mechanisms protecting cornea from infection
  - Corneal epithelium
  - Mucous strands of conjunctival epithelium ensnare microorganisms
  - Tears: lactoferrin, lysozyme, antibodies (lymphs/PCs)

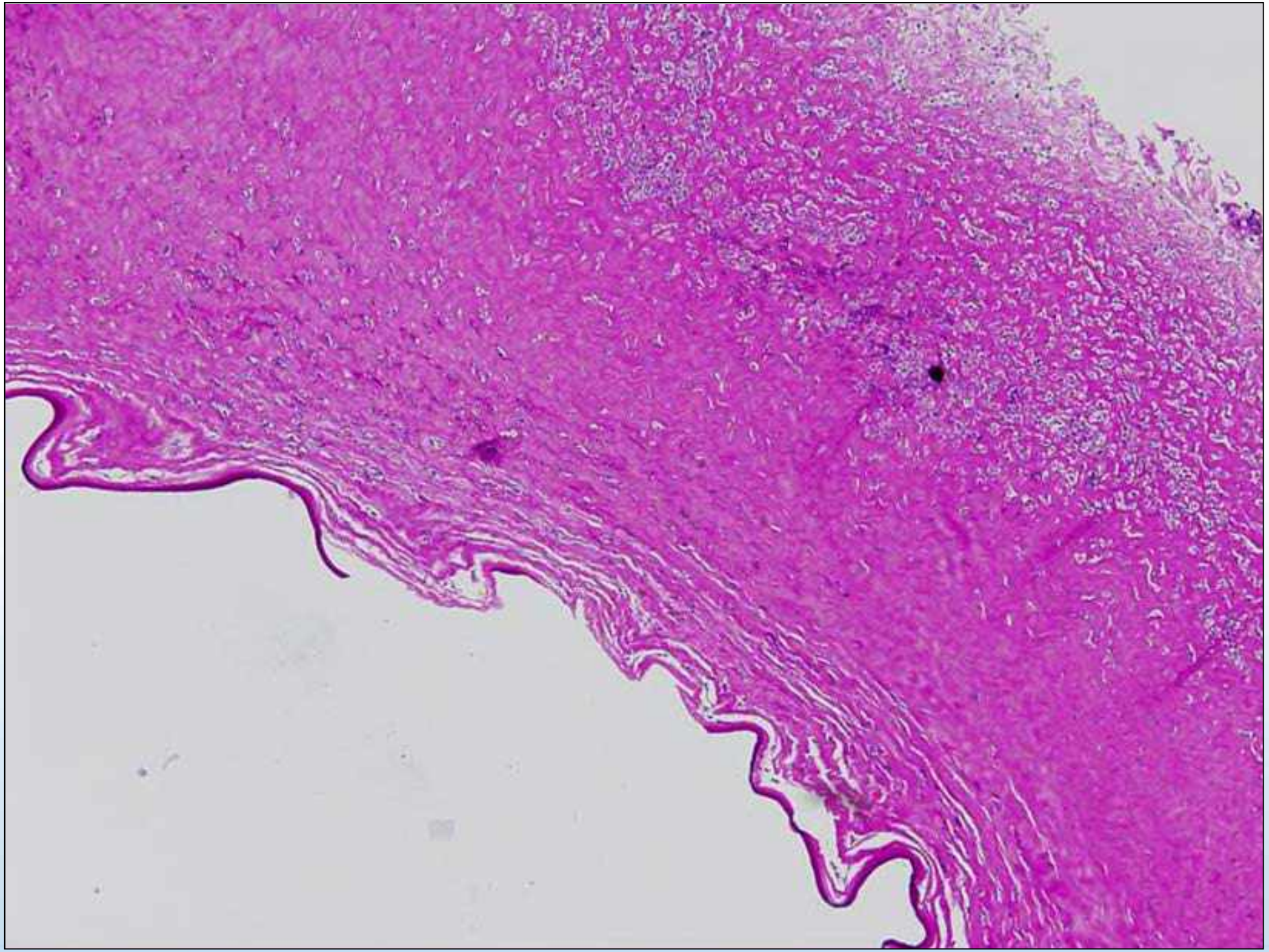
- Compromise of protective mechanisms
  - Inoculation by foreign body
  - Epithelial abrasion
  - Invasive organisms (Neisseria gonorrhoeae)





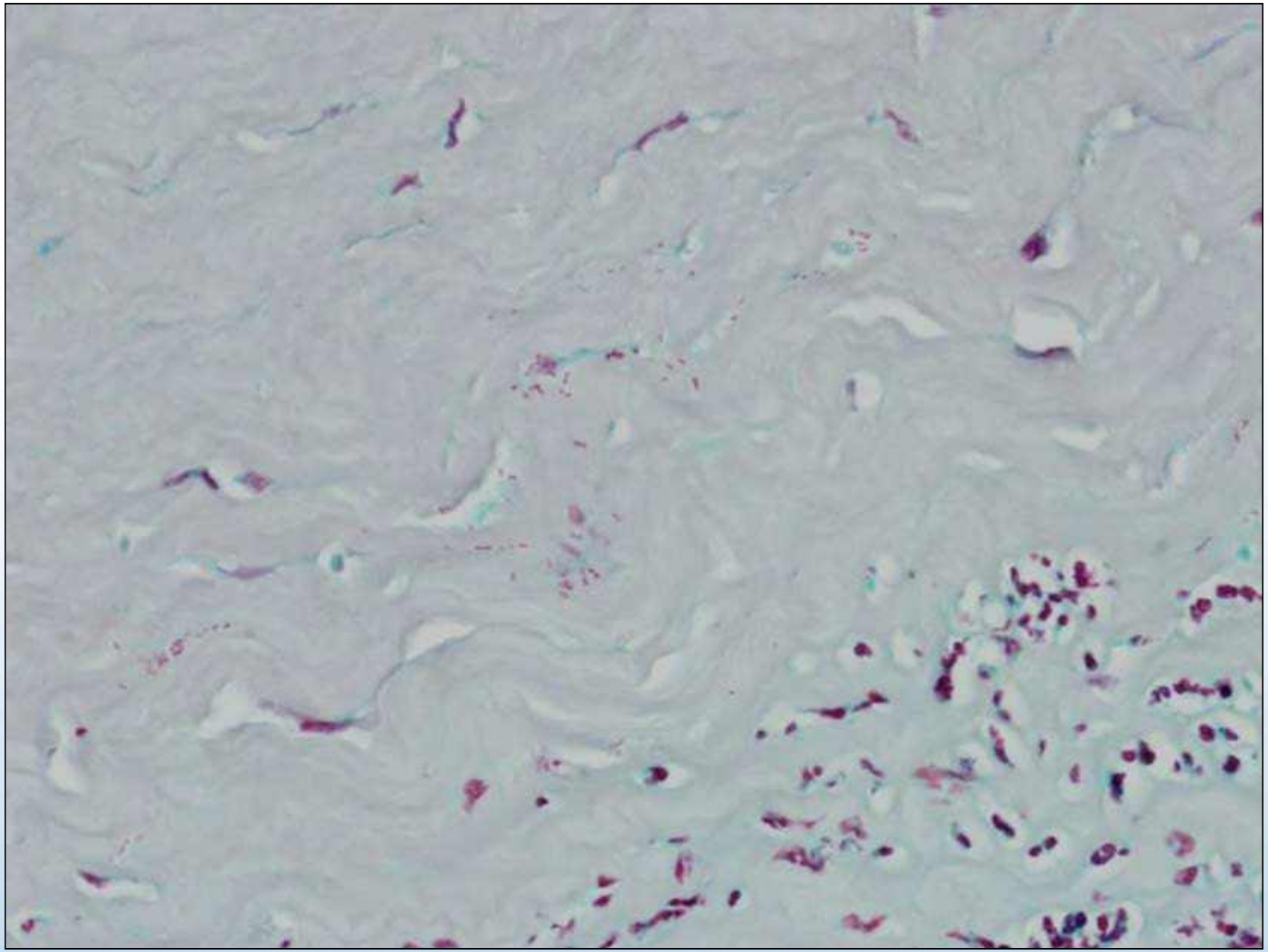






PAS

Gram Stain



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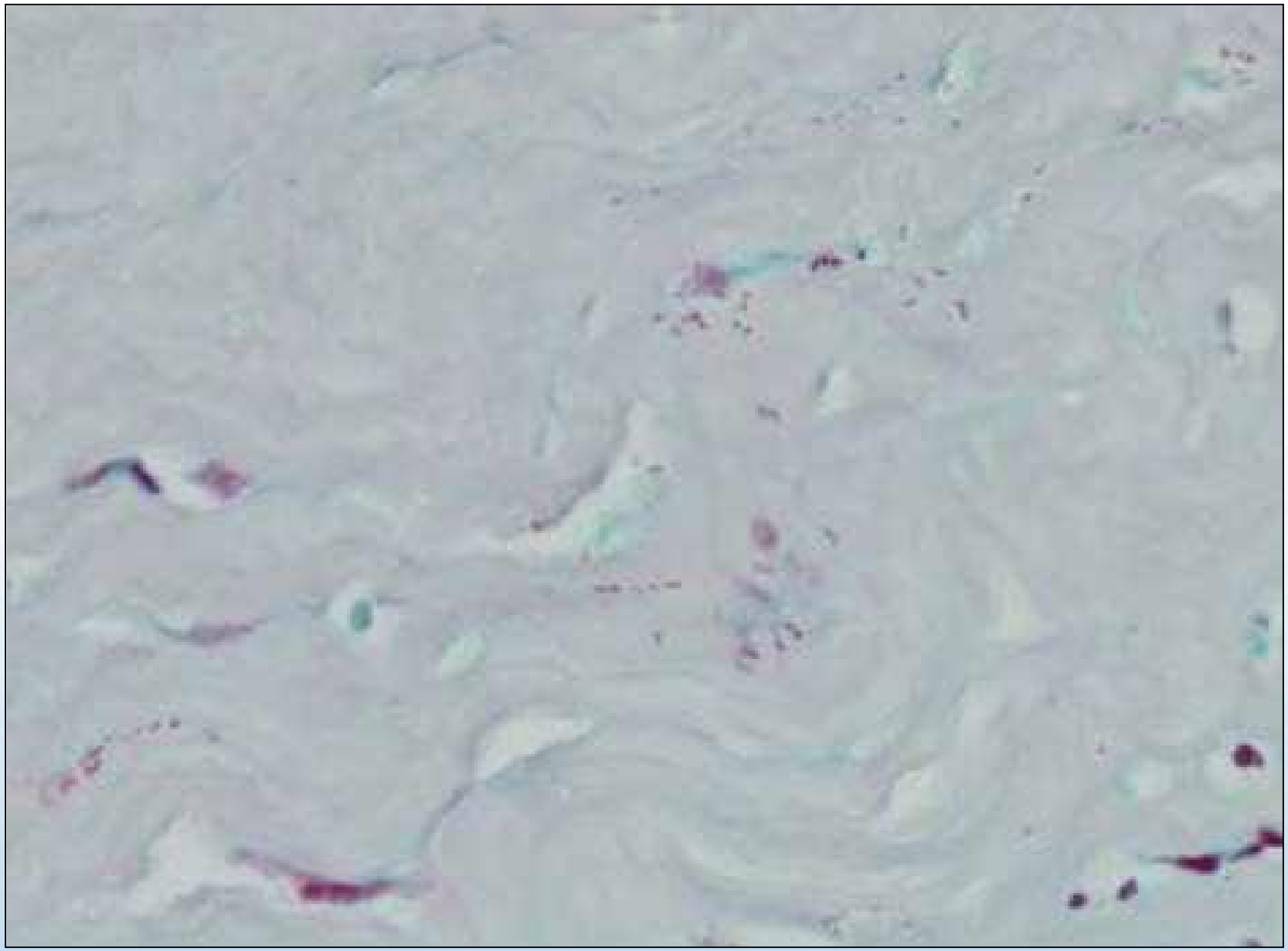


Acute bacterial keratitis

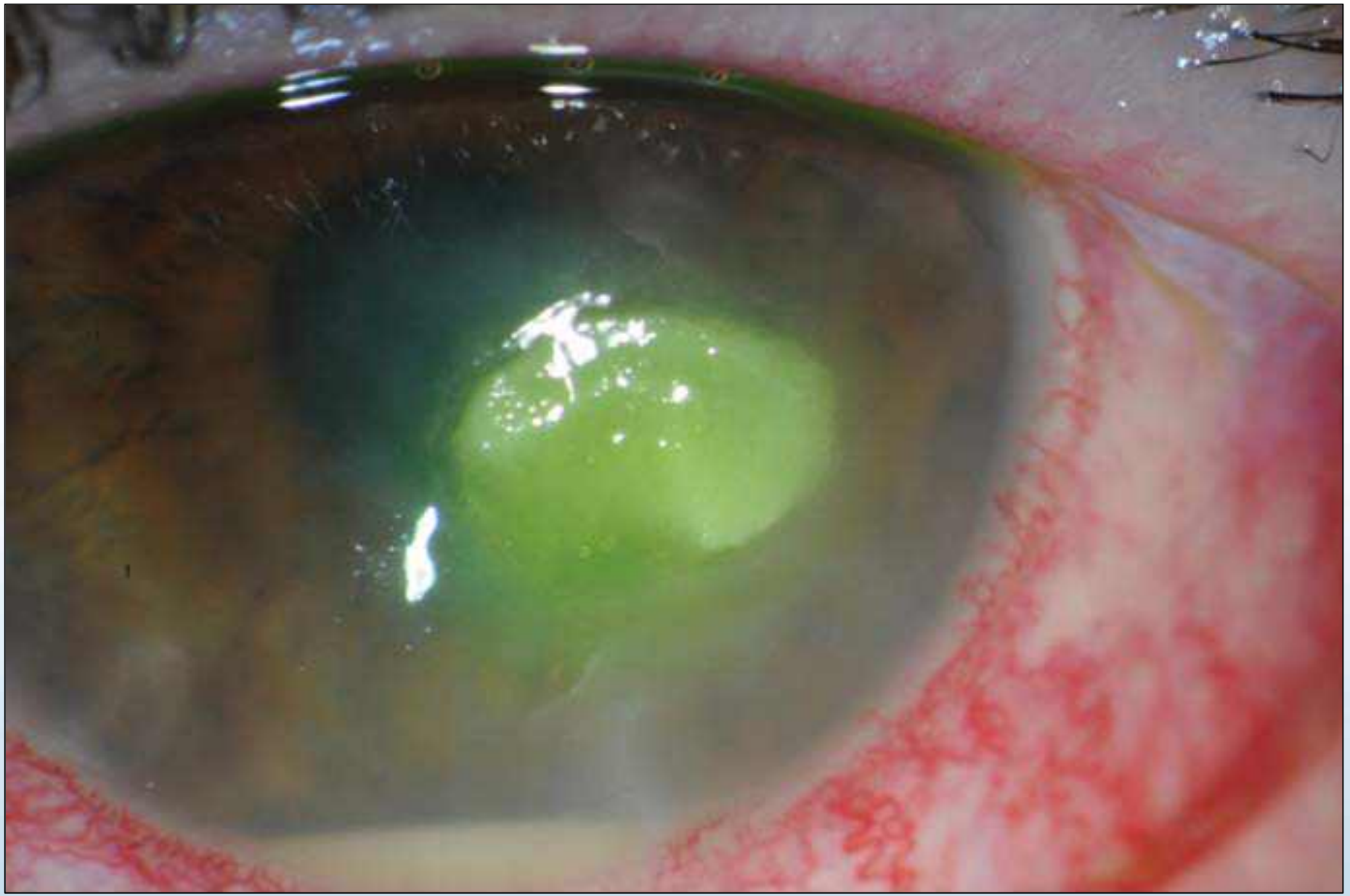
- Infiltration of stroma by PMNs occurs in acute bacterial keratitis
- PMNs collect in clefts between adjacent stromal lamellae
- Digestive enzymes released by dying inflammatory cause stromal necrosis

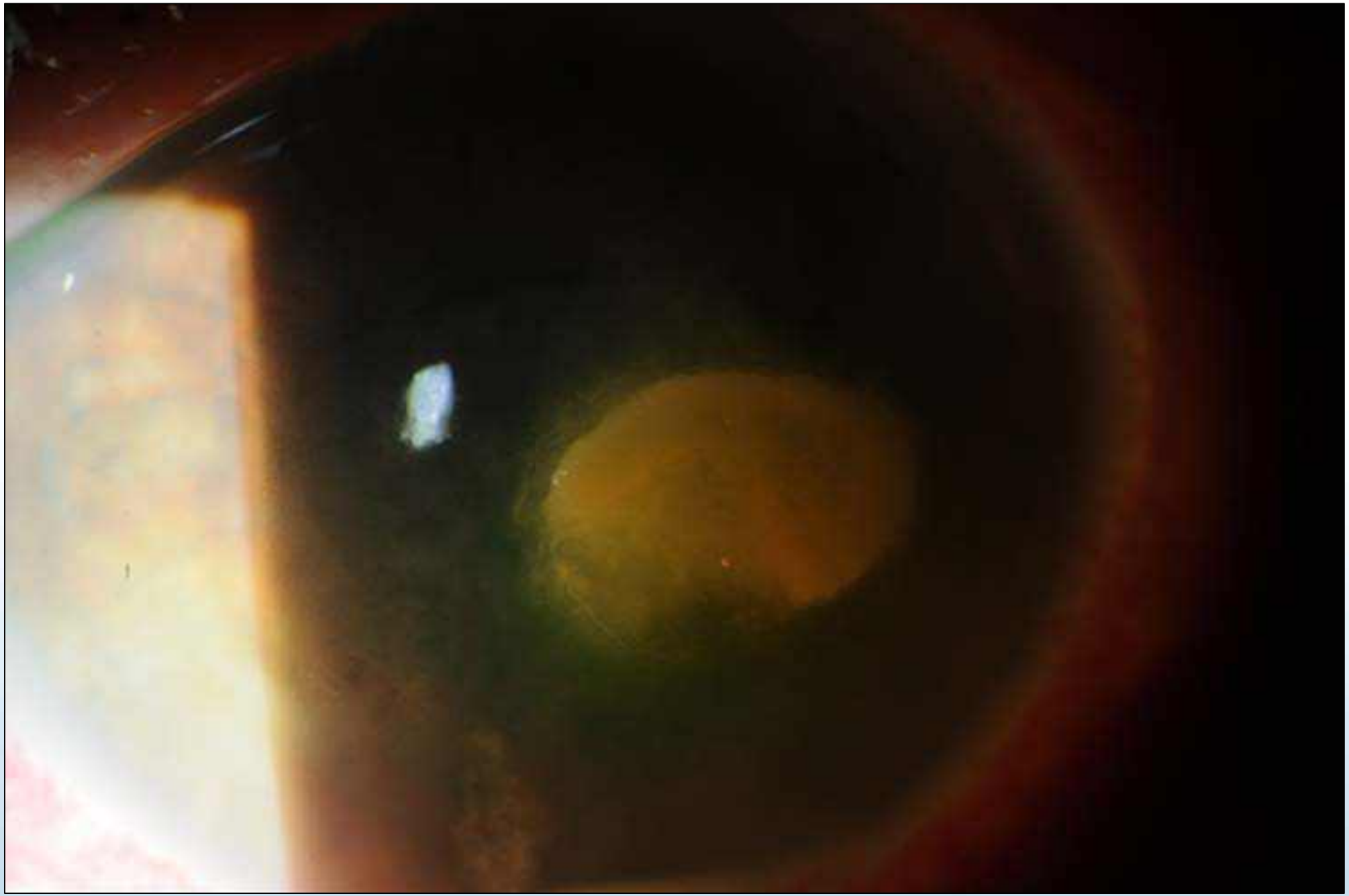
Bacterial Keratitis: Pseudomonas

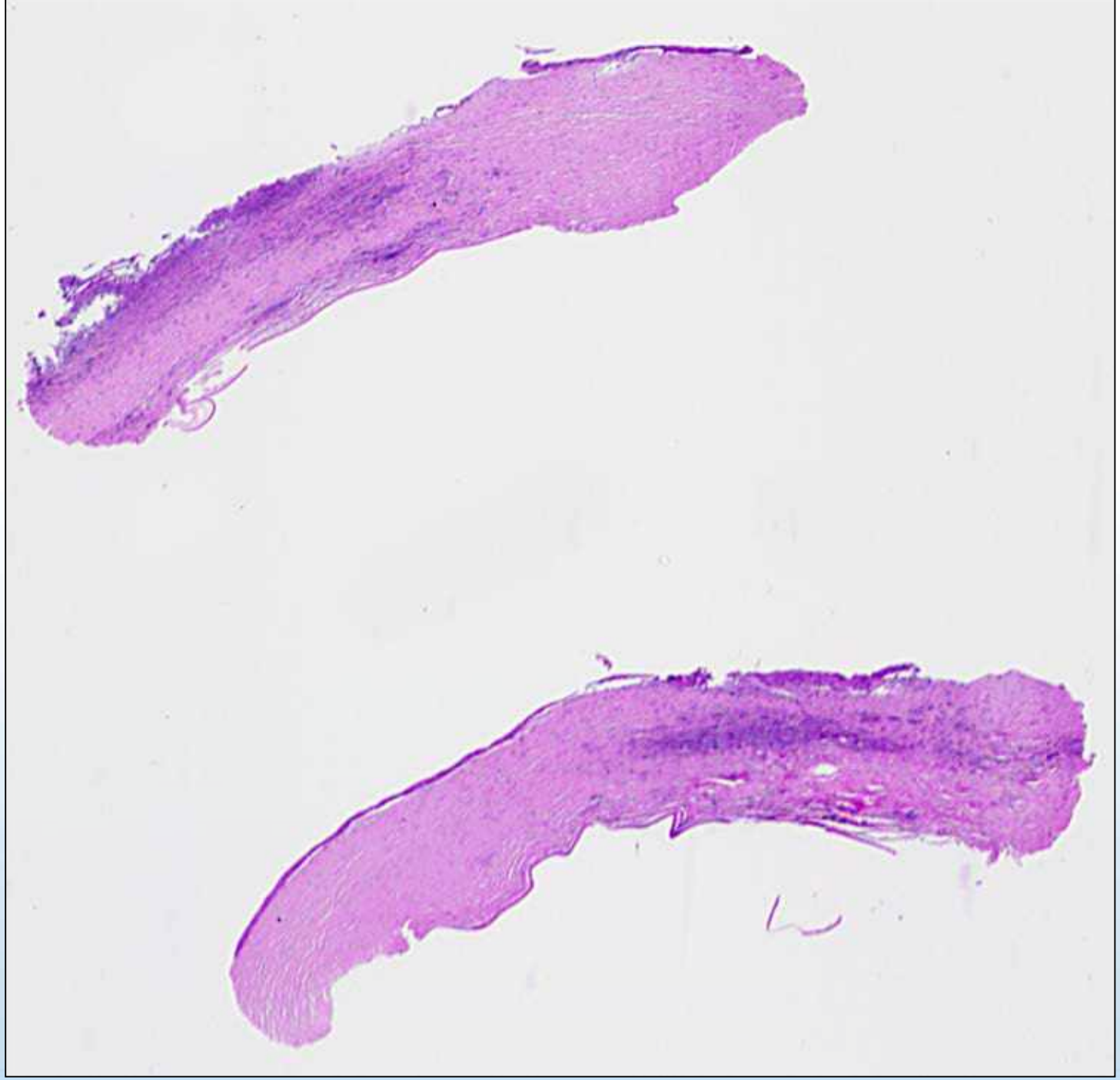
- Pseudomonas produces enzymes that destroy cornea
- Marked stromal edema and dissolution
- Stromal infiltration by neutrophils and necrosis
- Rapid corneal perforation
- Infection can spread posteriorly → sclerokeratitis
- Most frequent cause of contact lens-associated microbial keratitis
- Organisms invade and replicate within surface corneal epithelial cells in animal models of infection

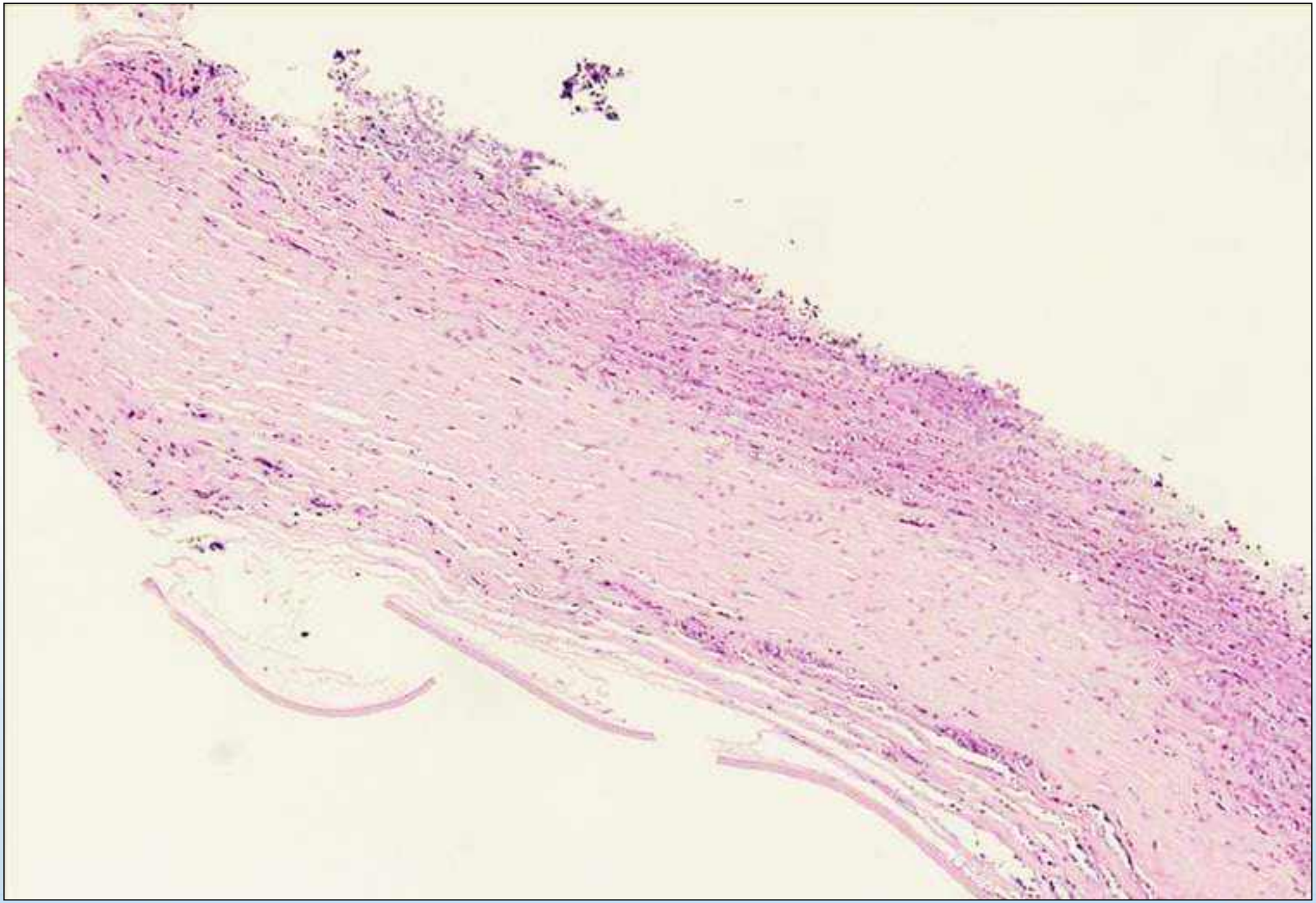
Contact Lens Ant Eye (30) 2007: 94-107

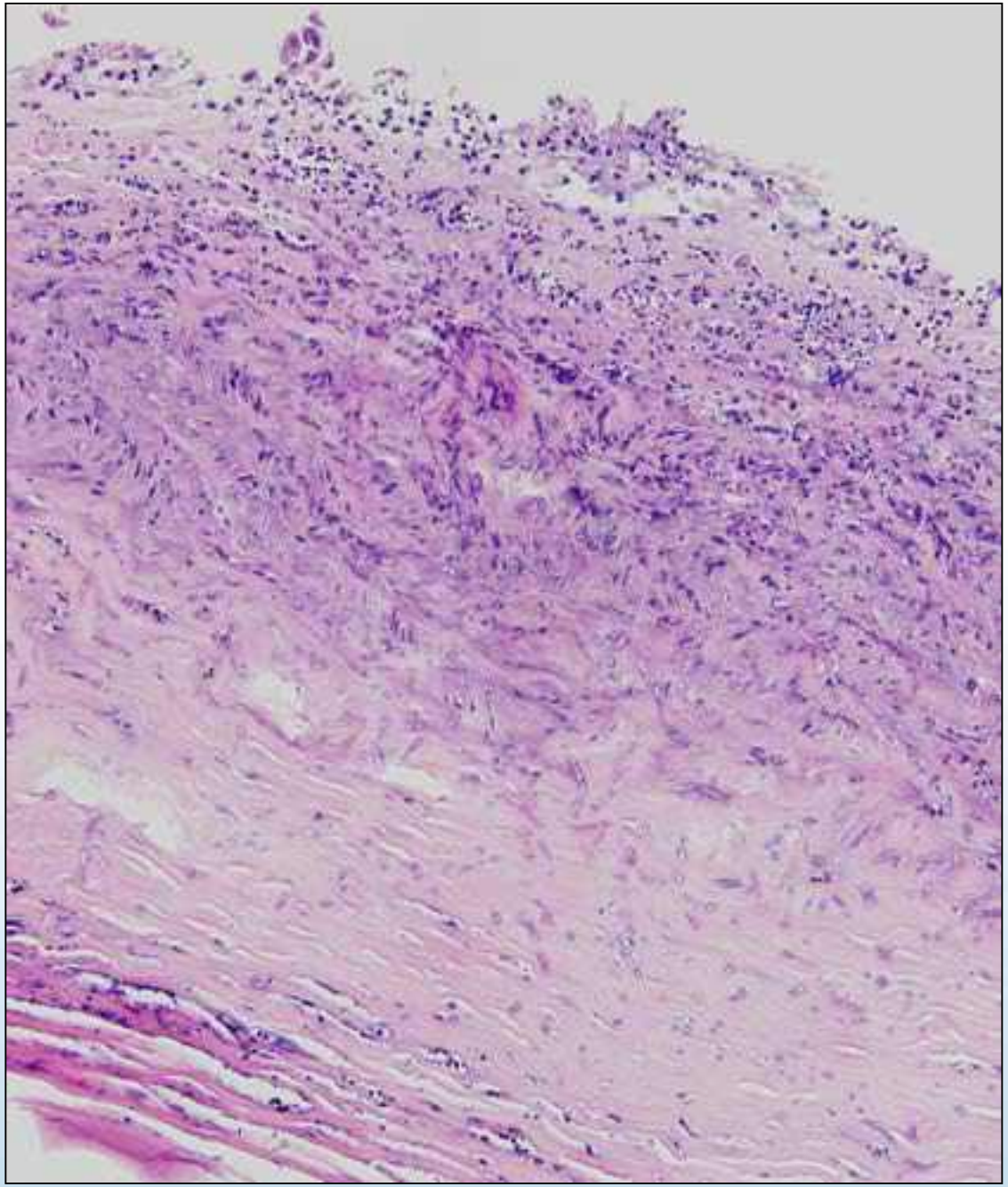
Slit Lamp Photo

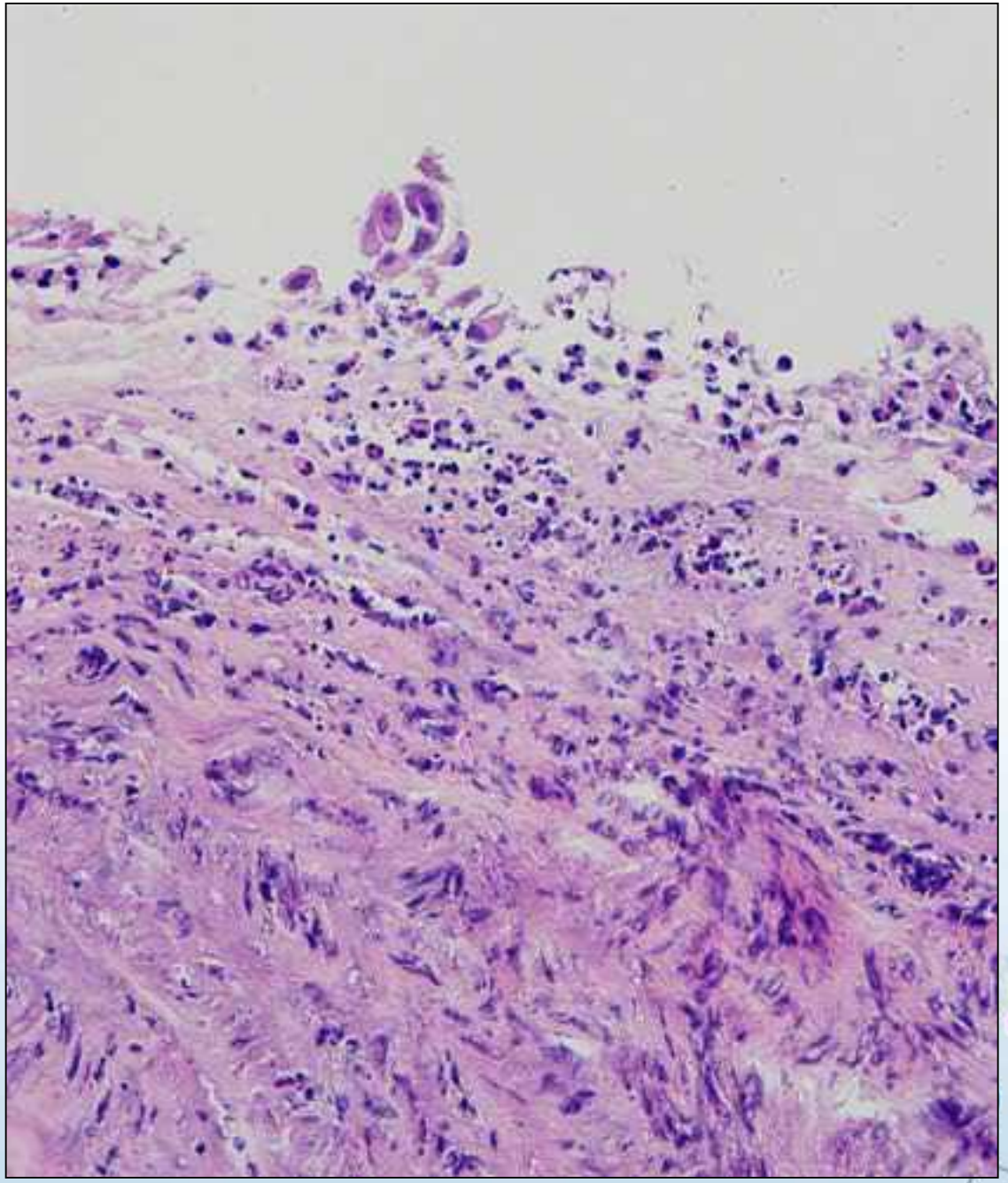


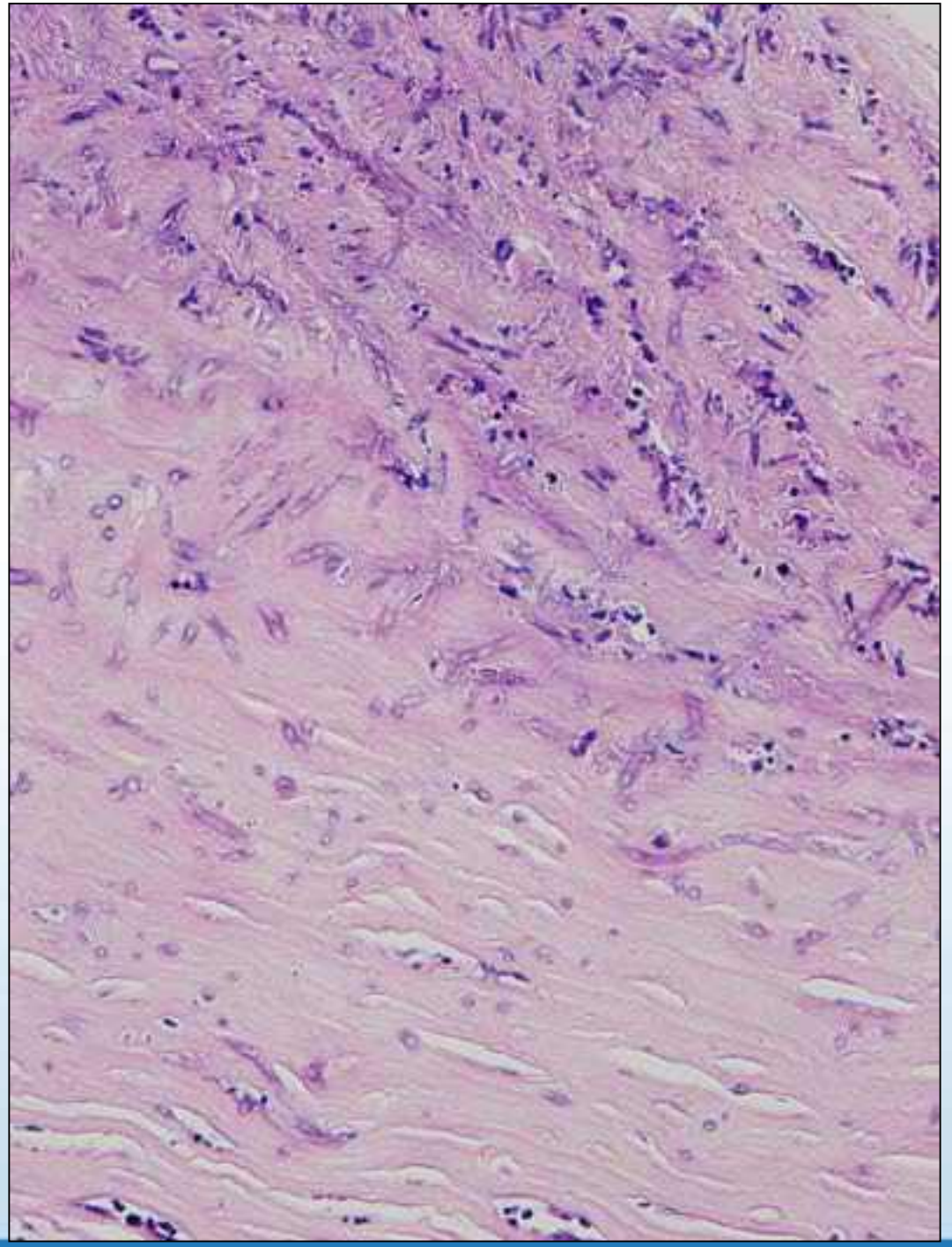


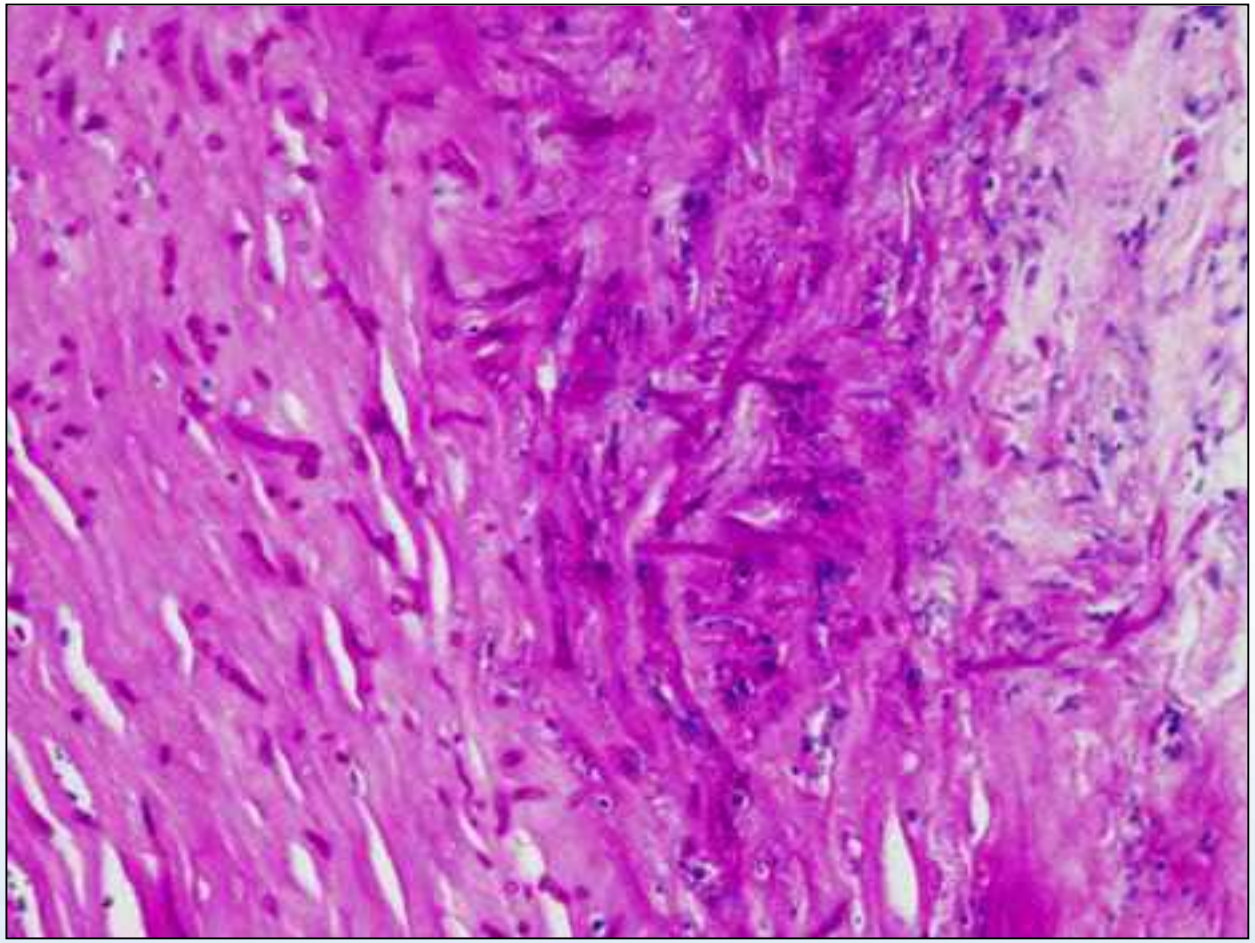


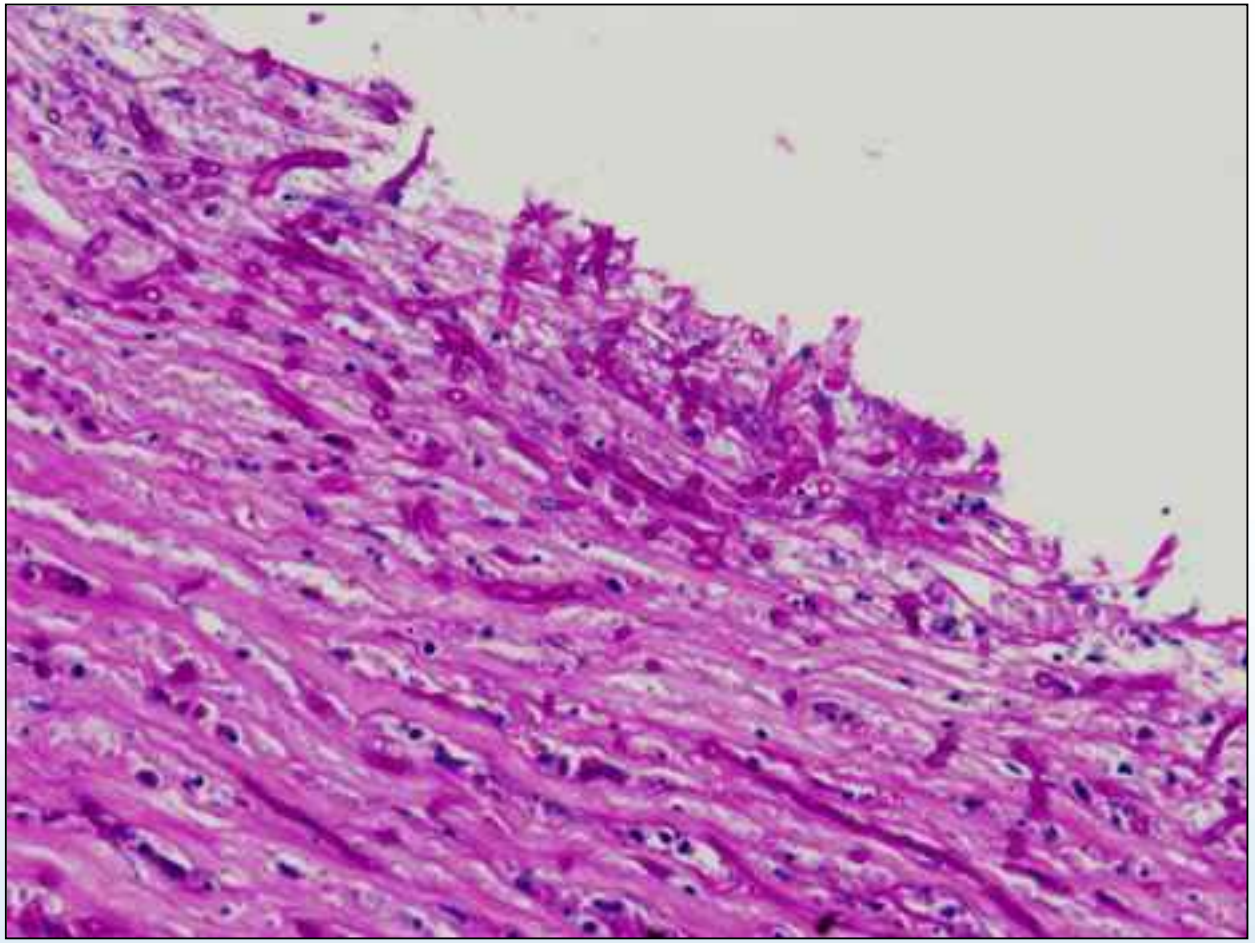






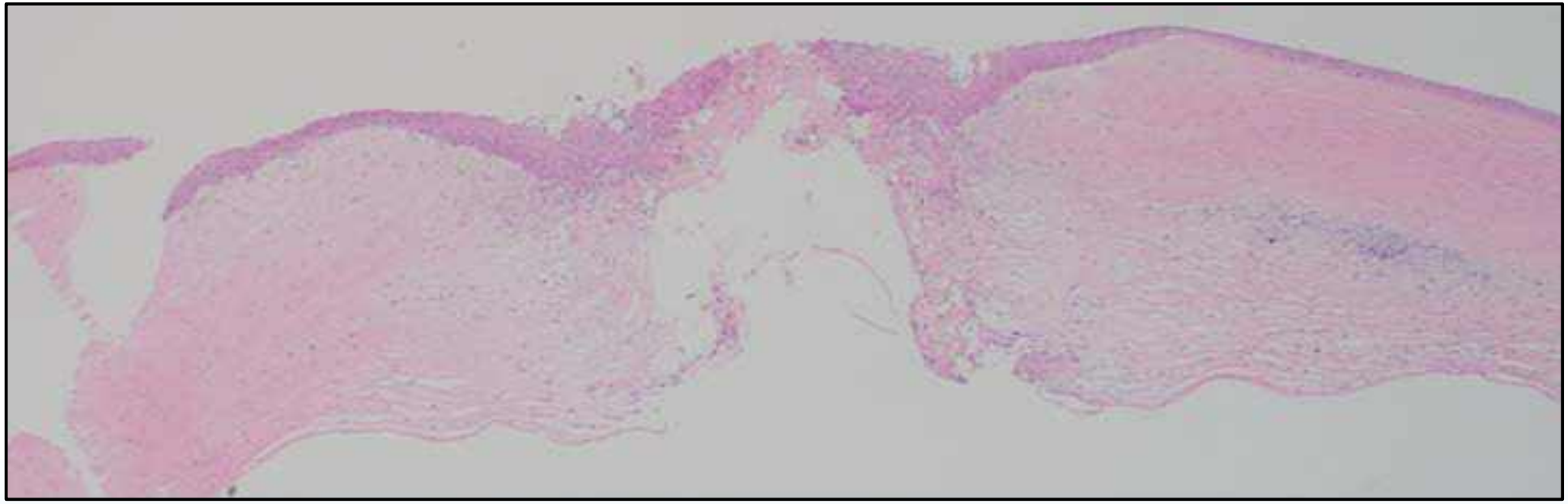


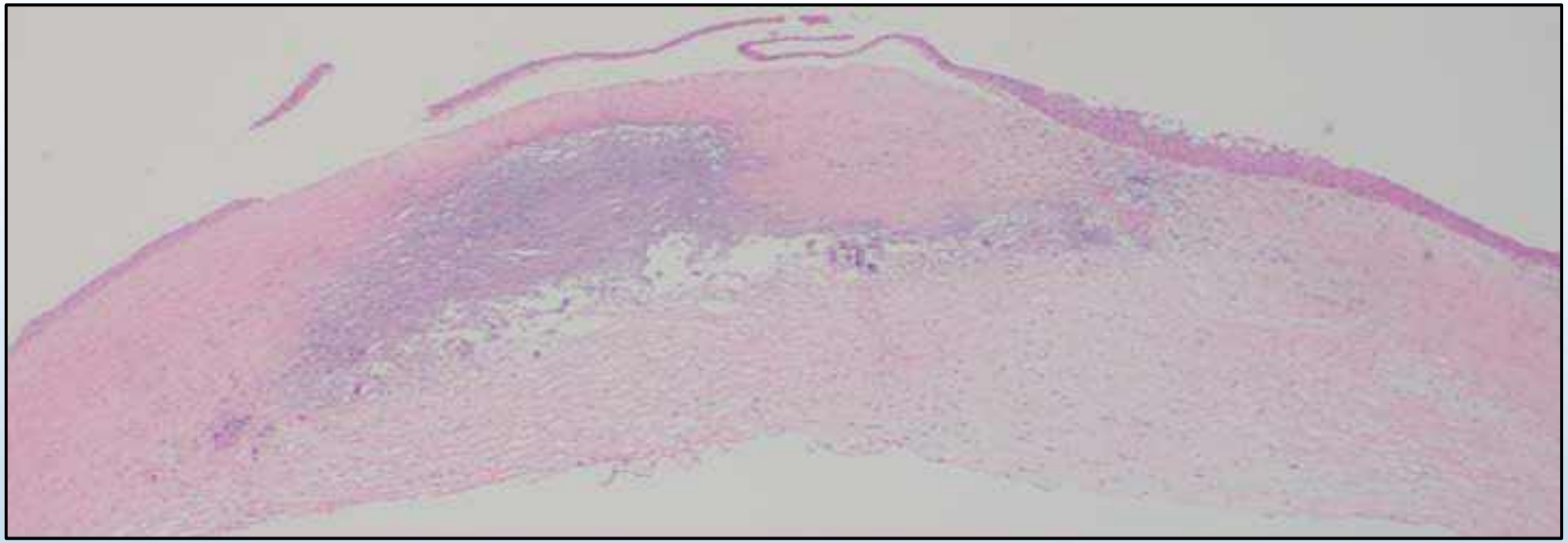


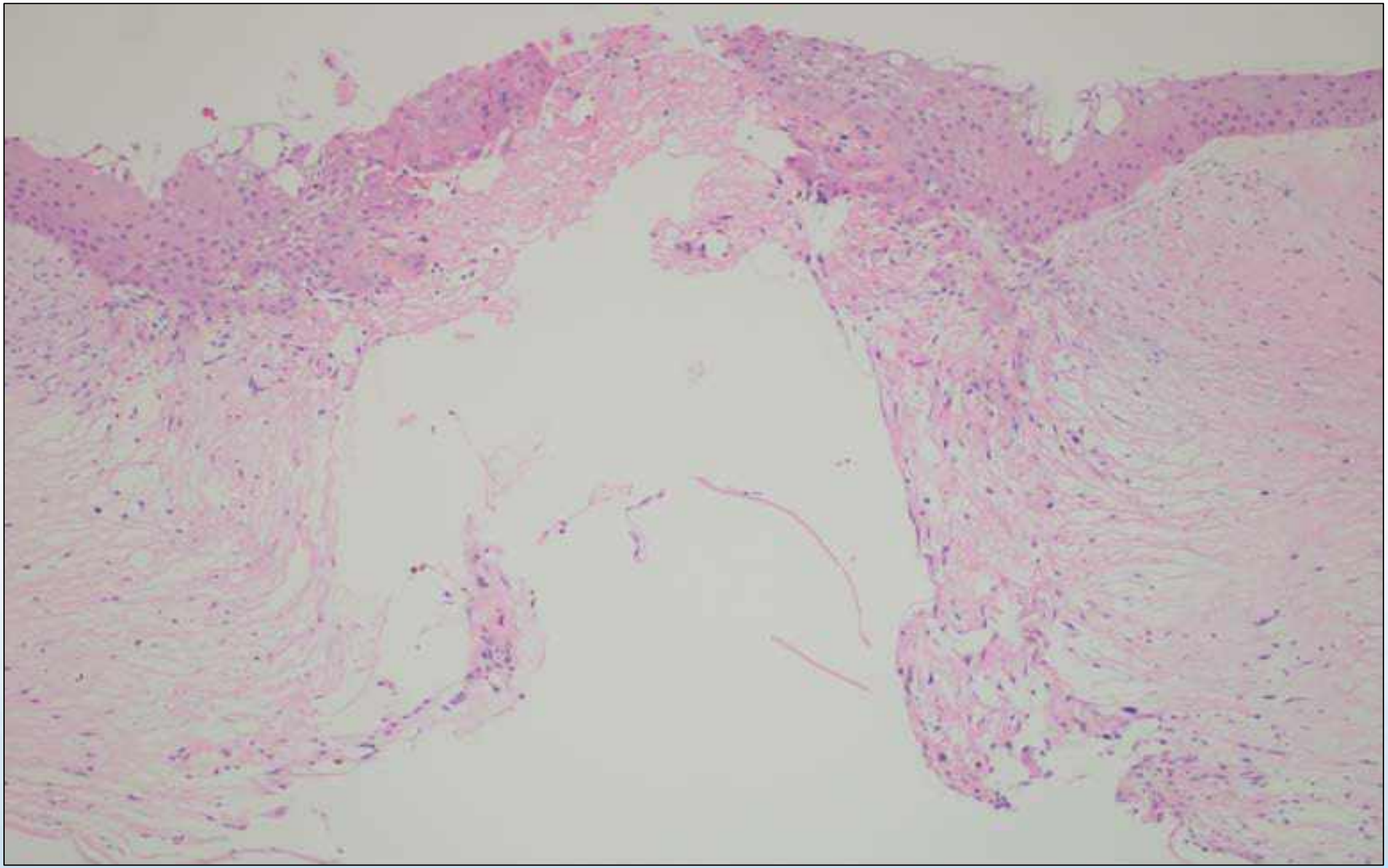


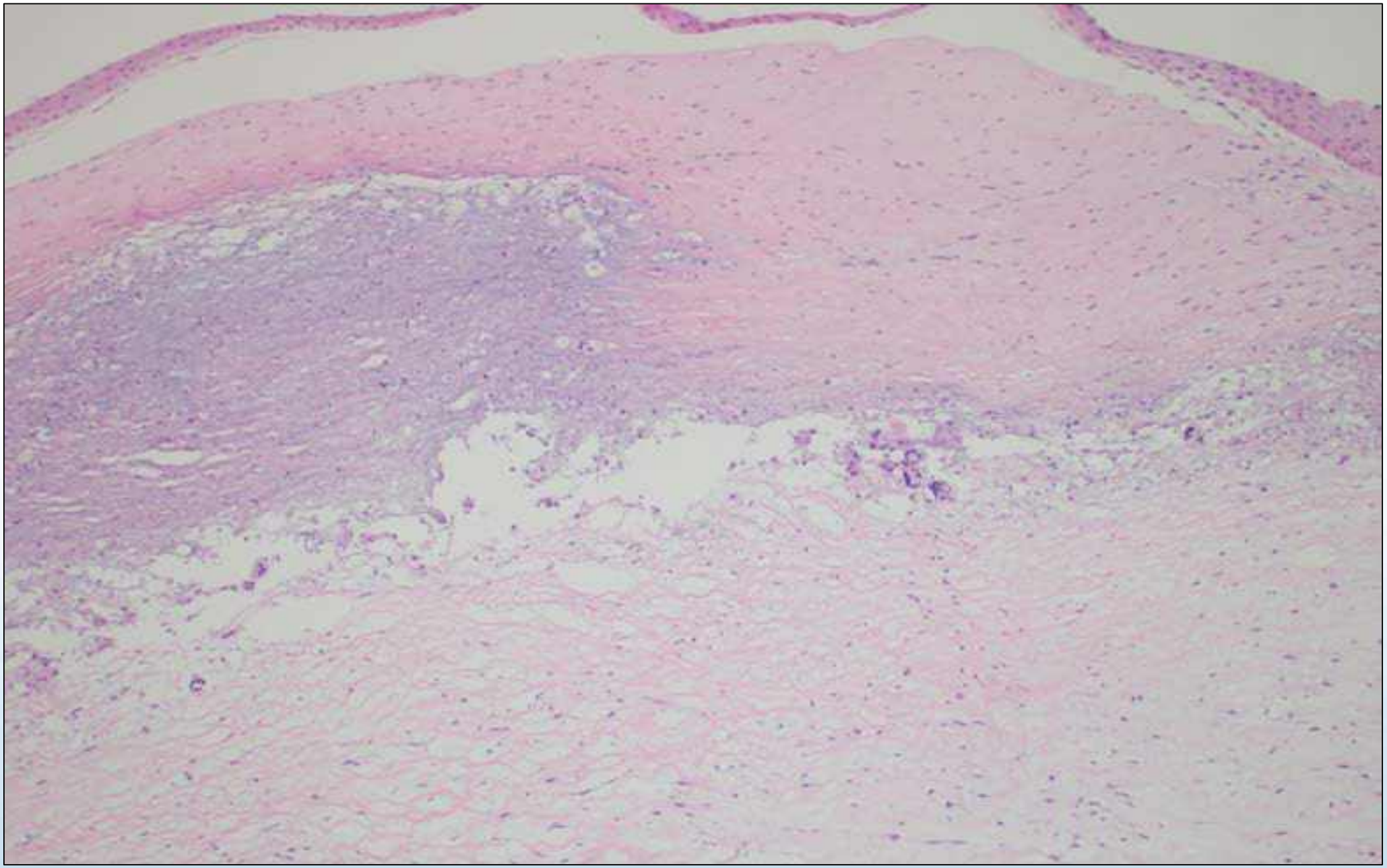
PAS

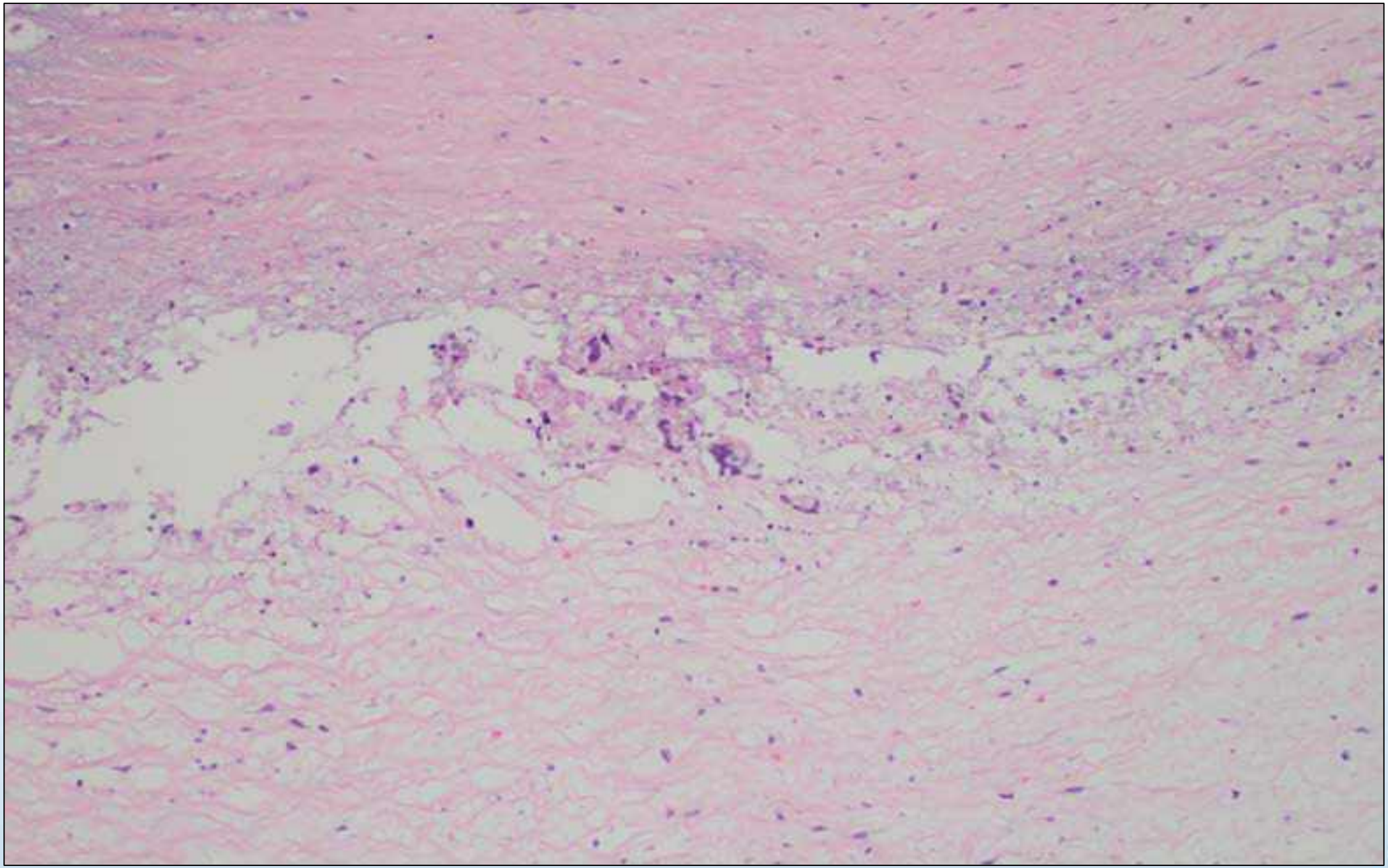
Corneal graft, 61 yo F

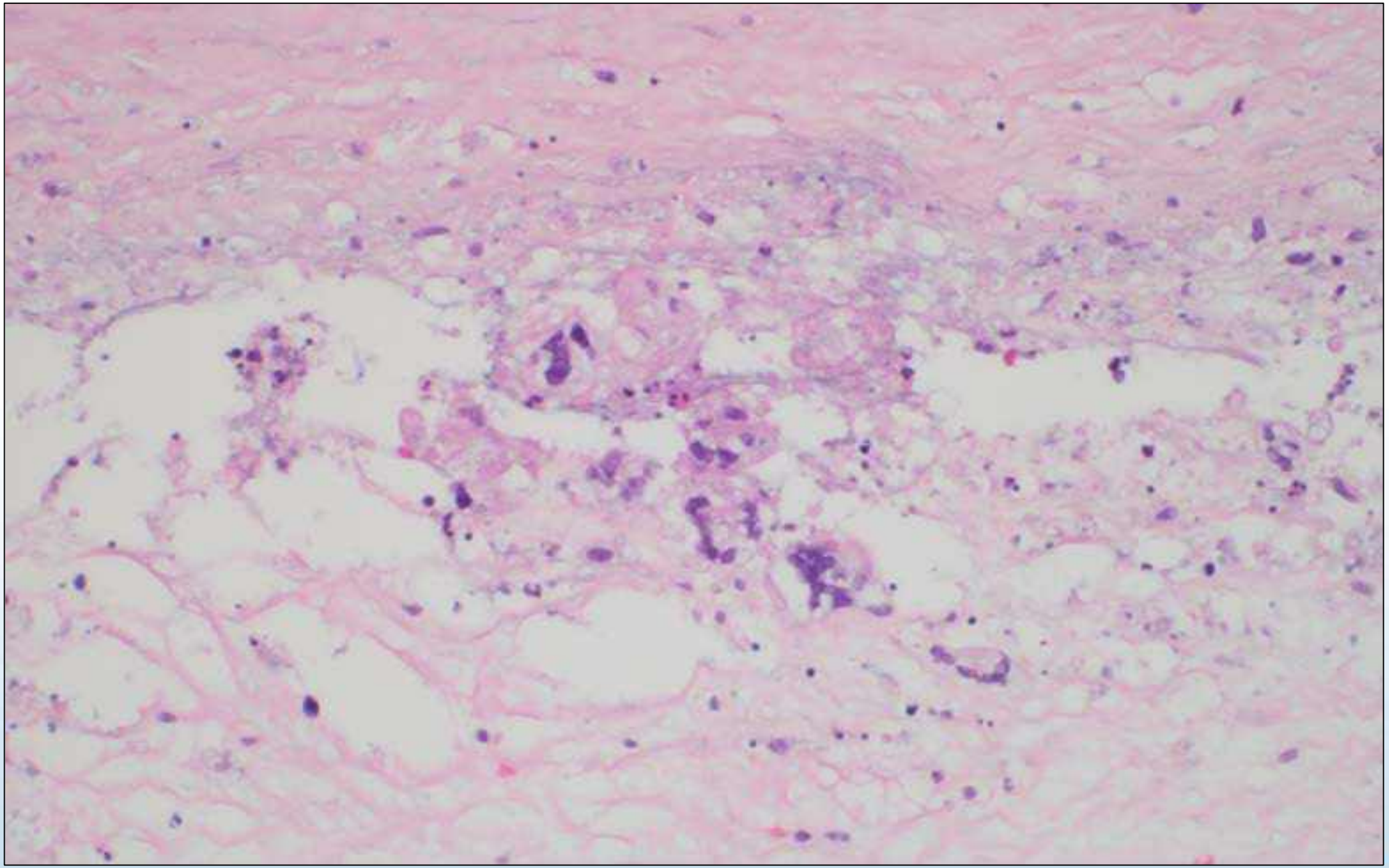


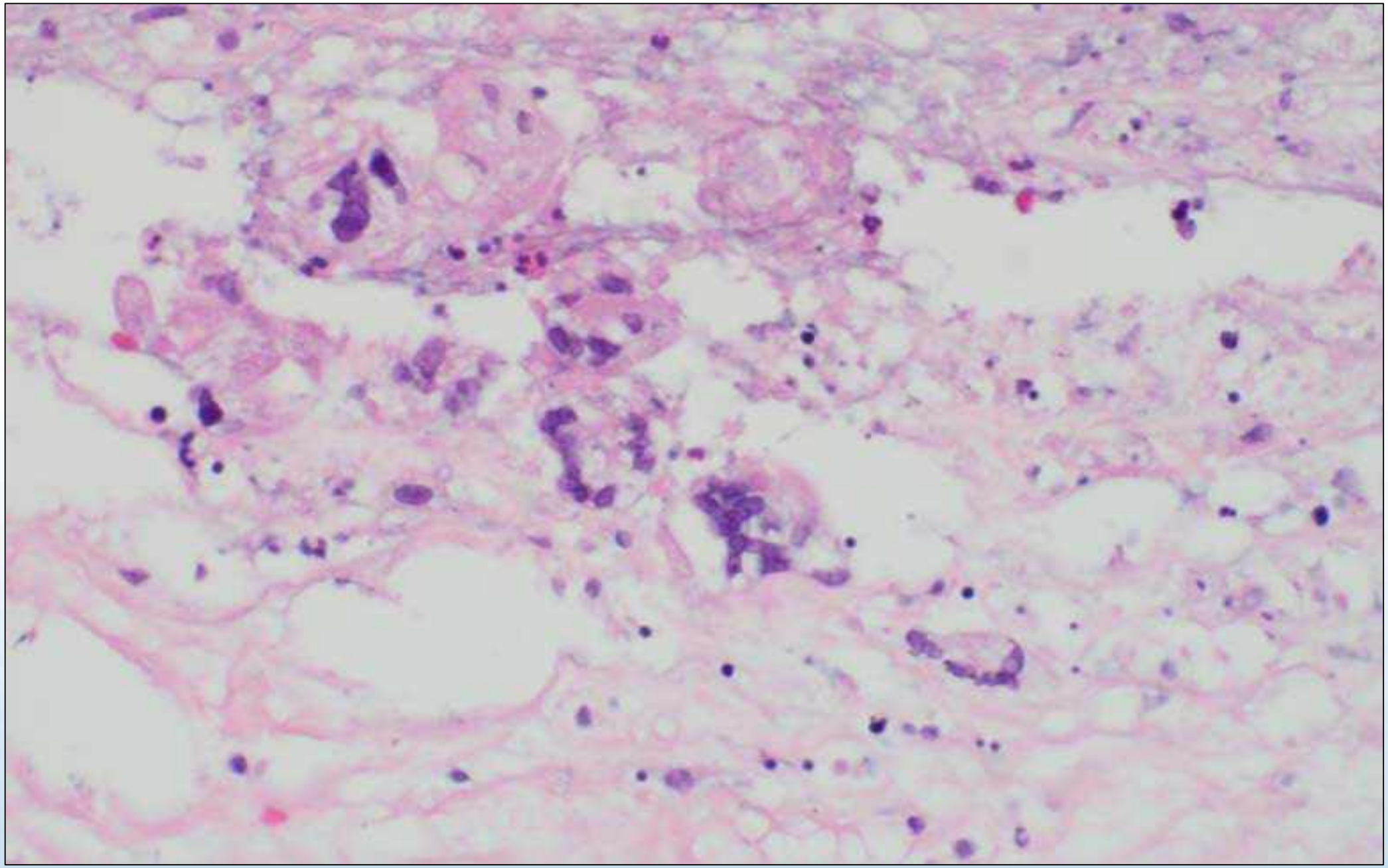


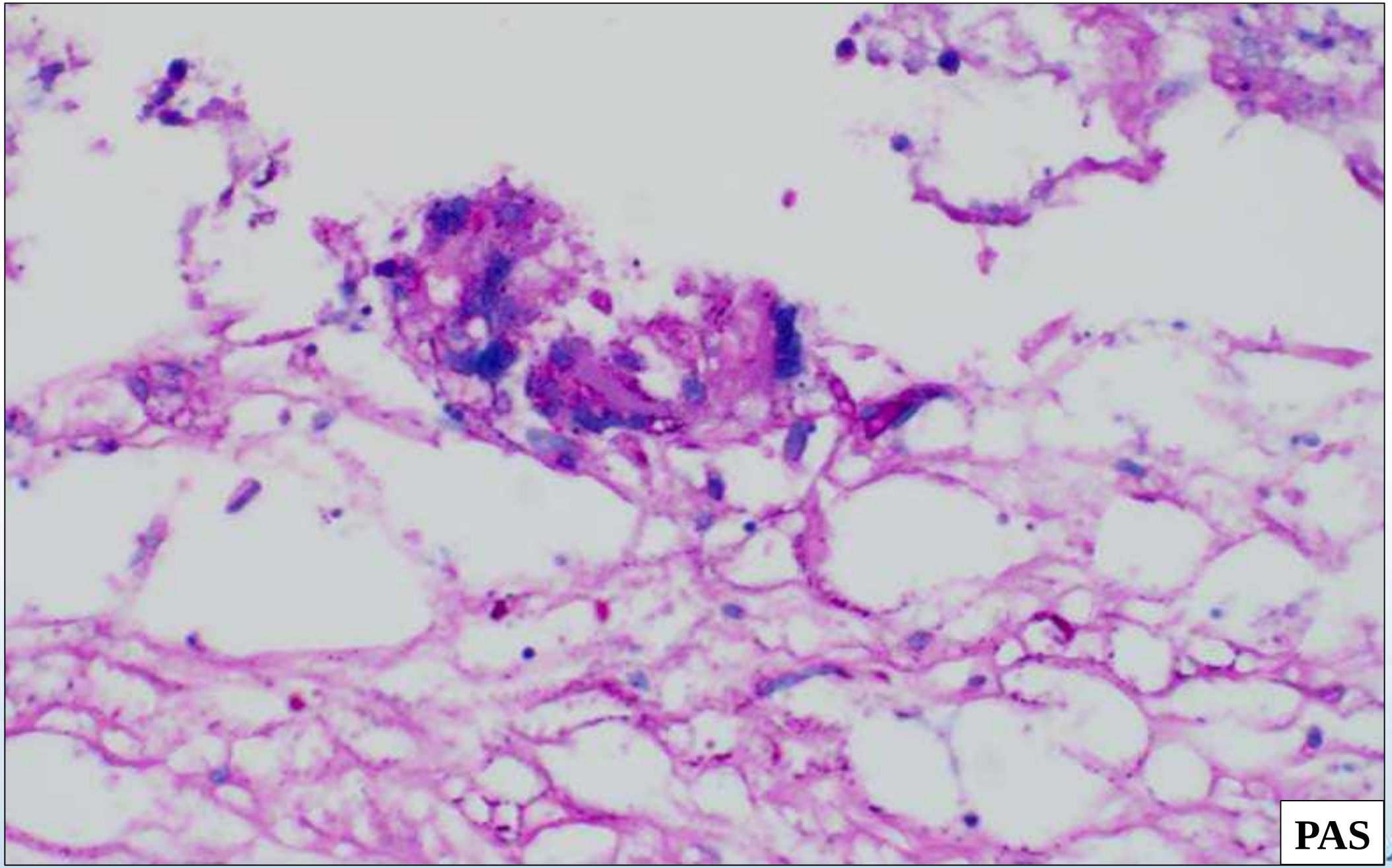












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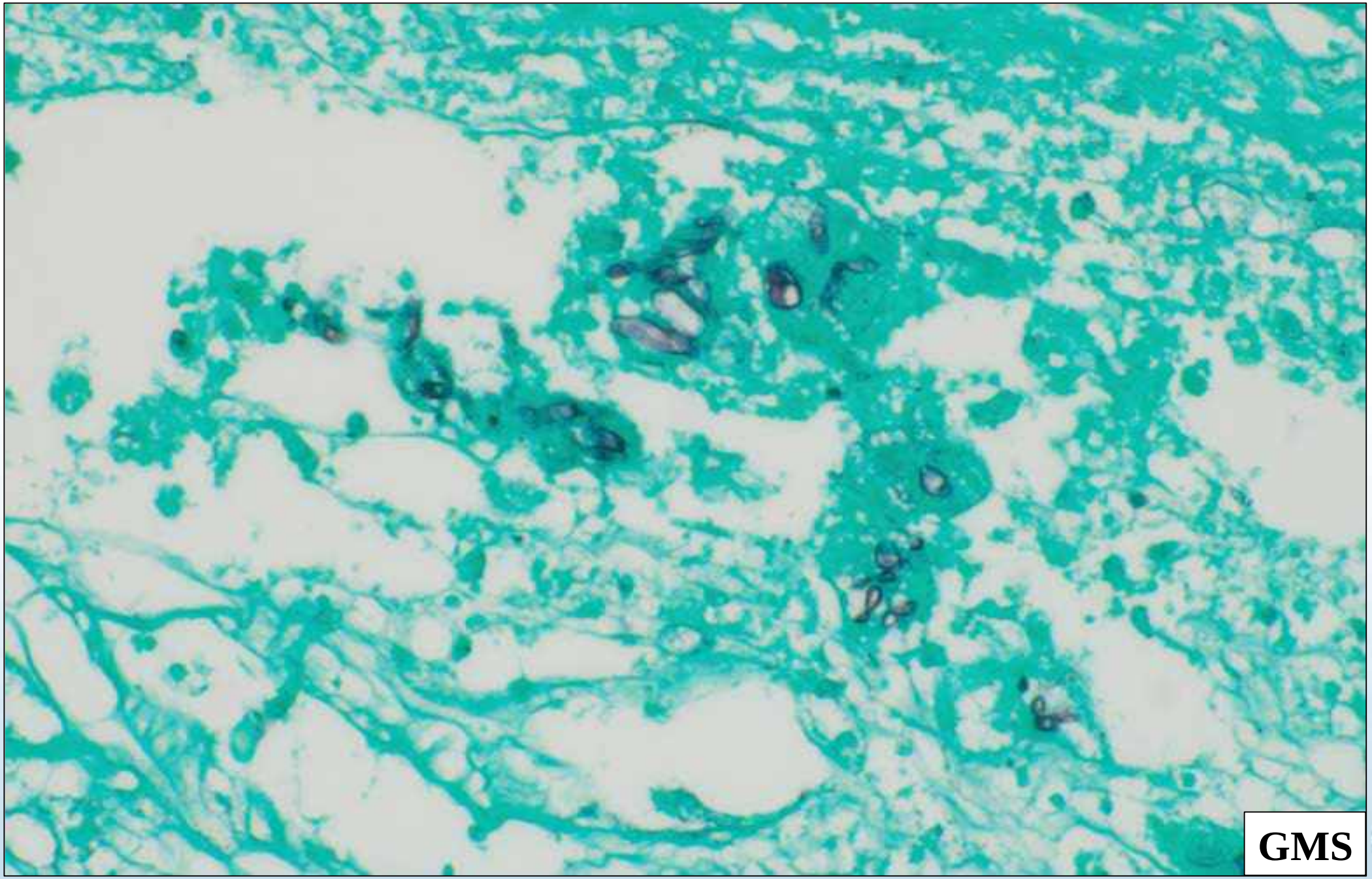

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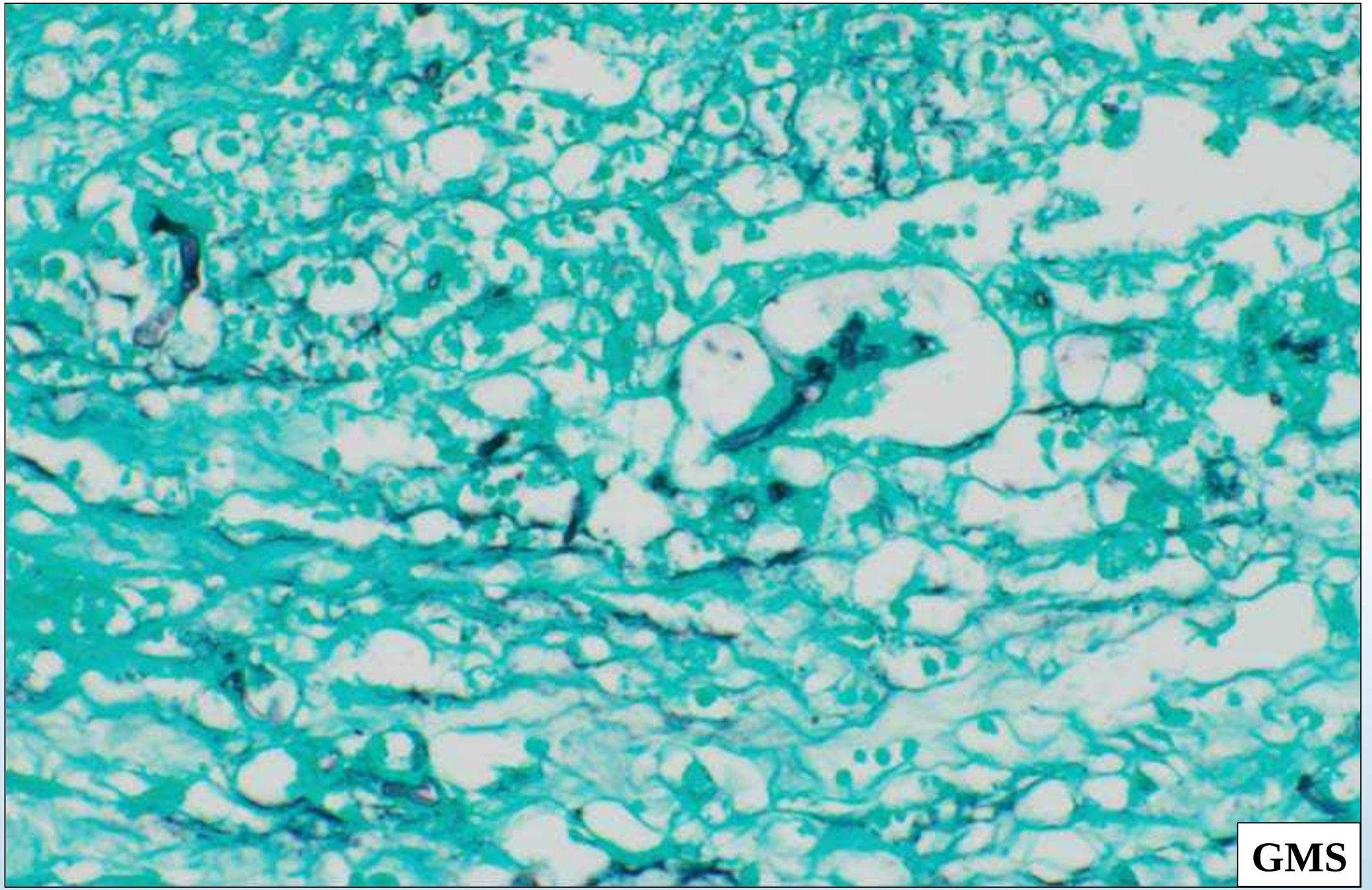
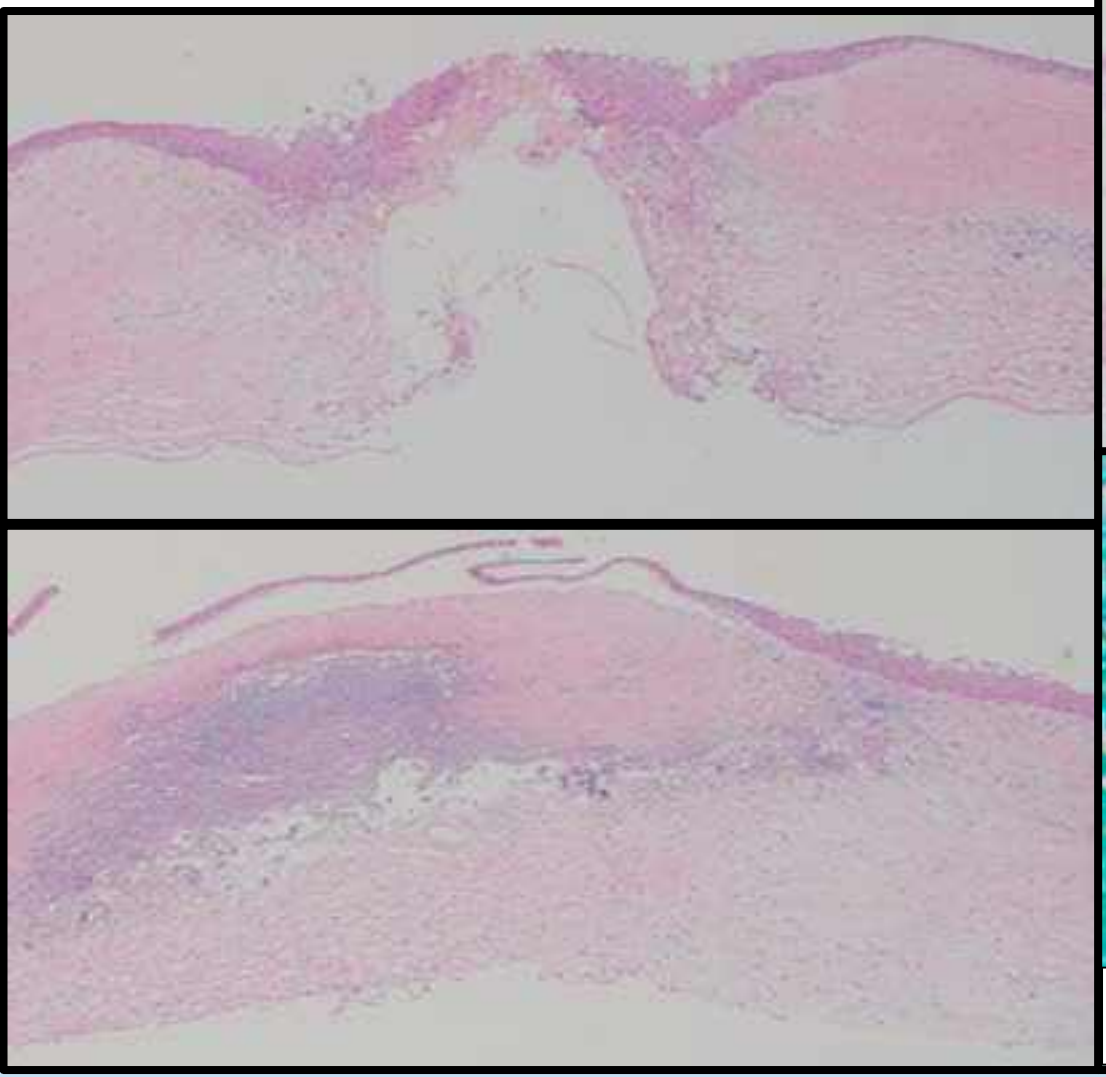
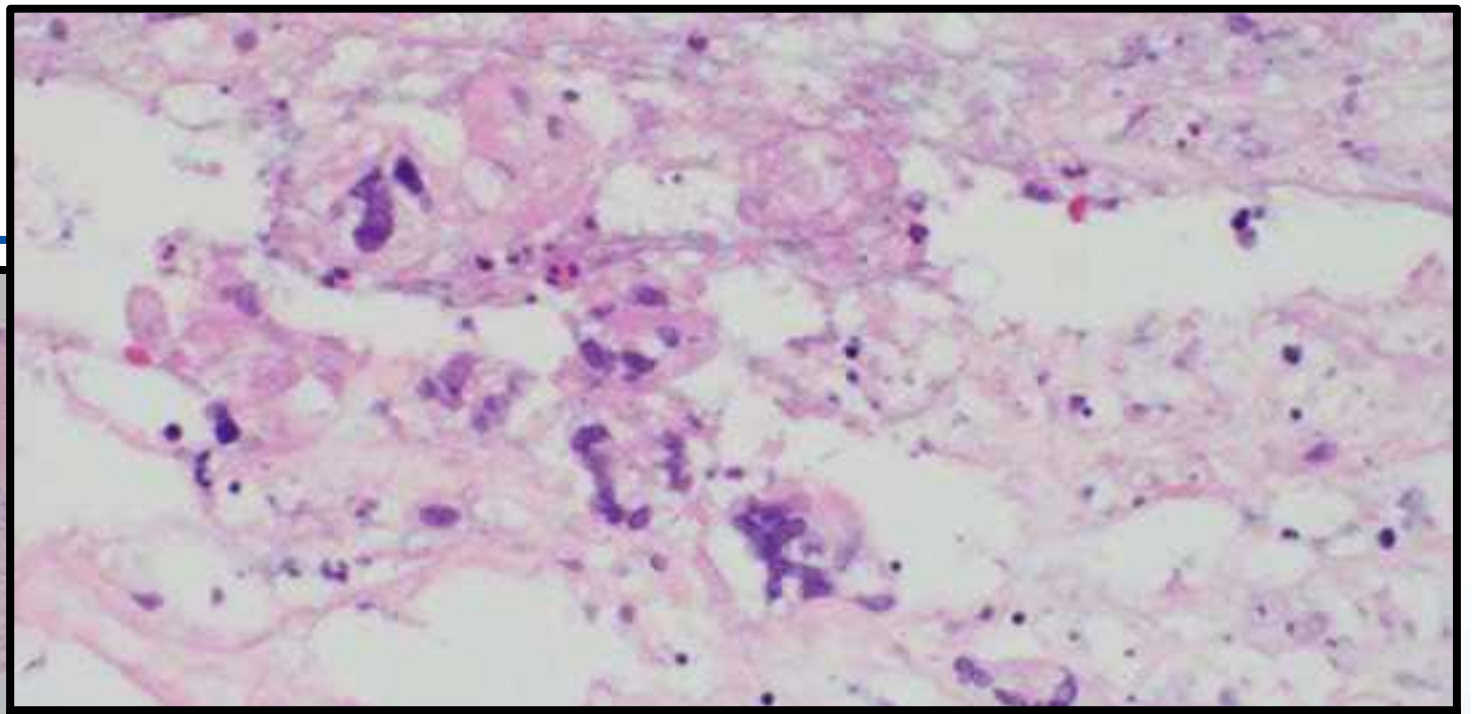
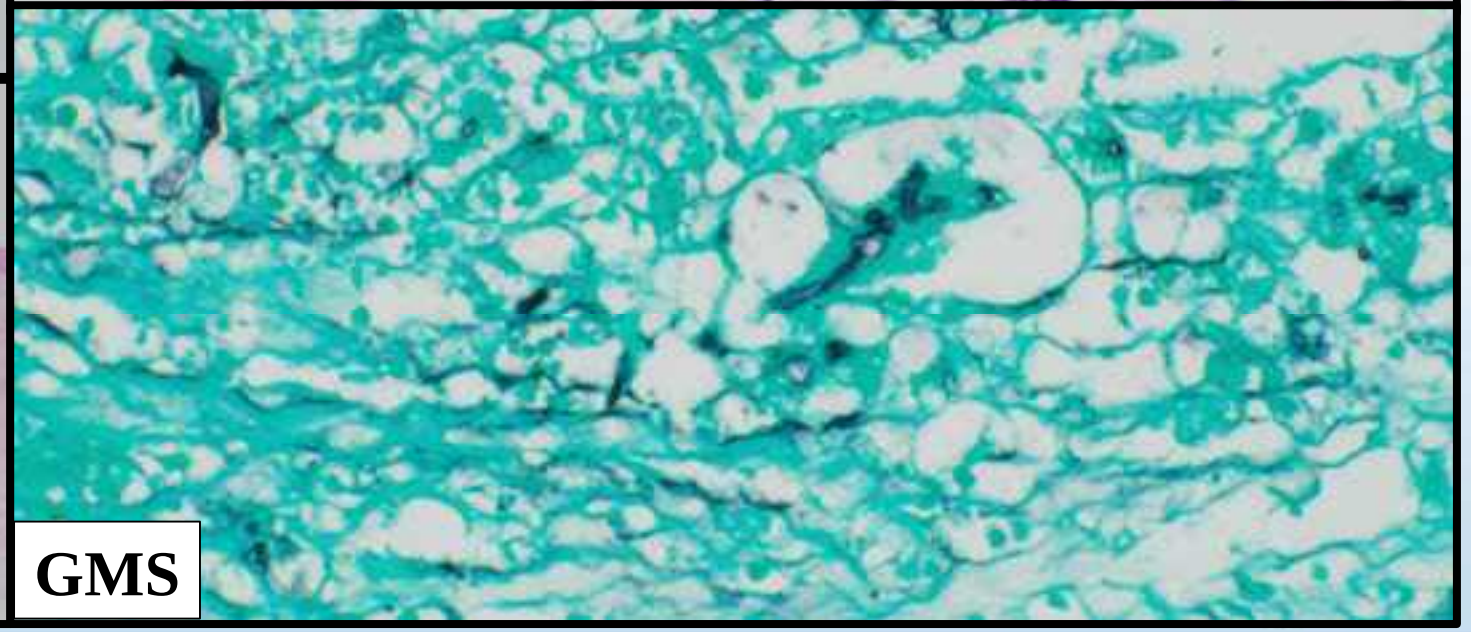

GMS

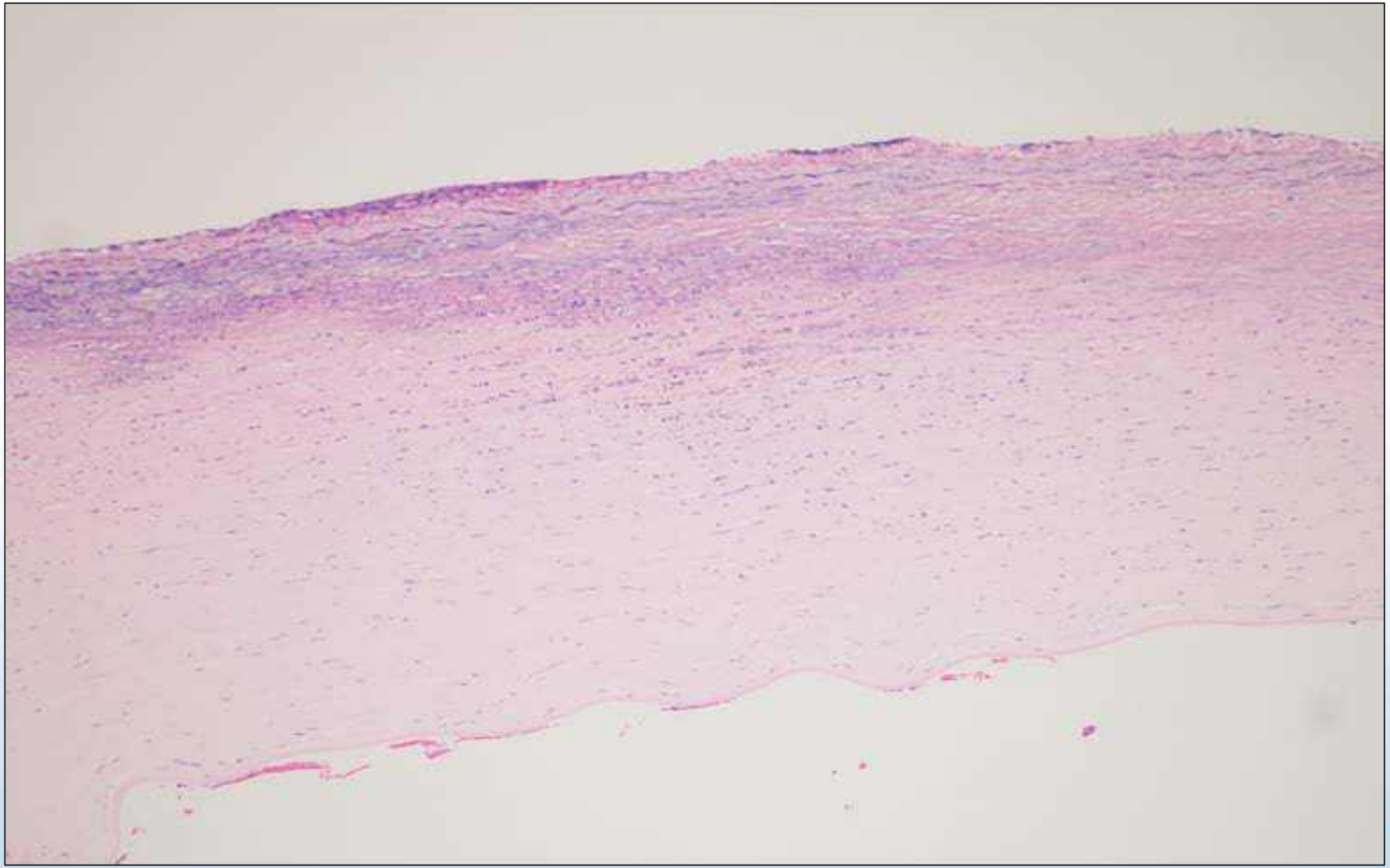
Fungal keratitis: Fusarium

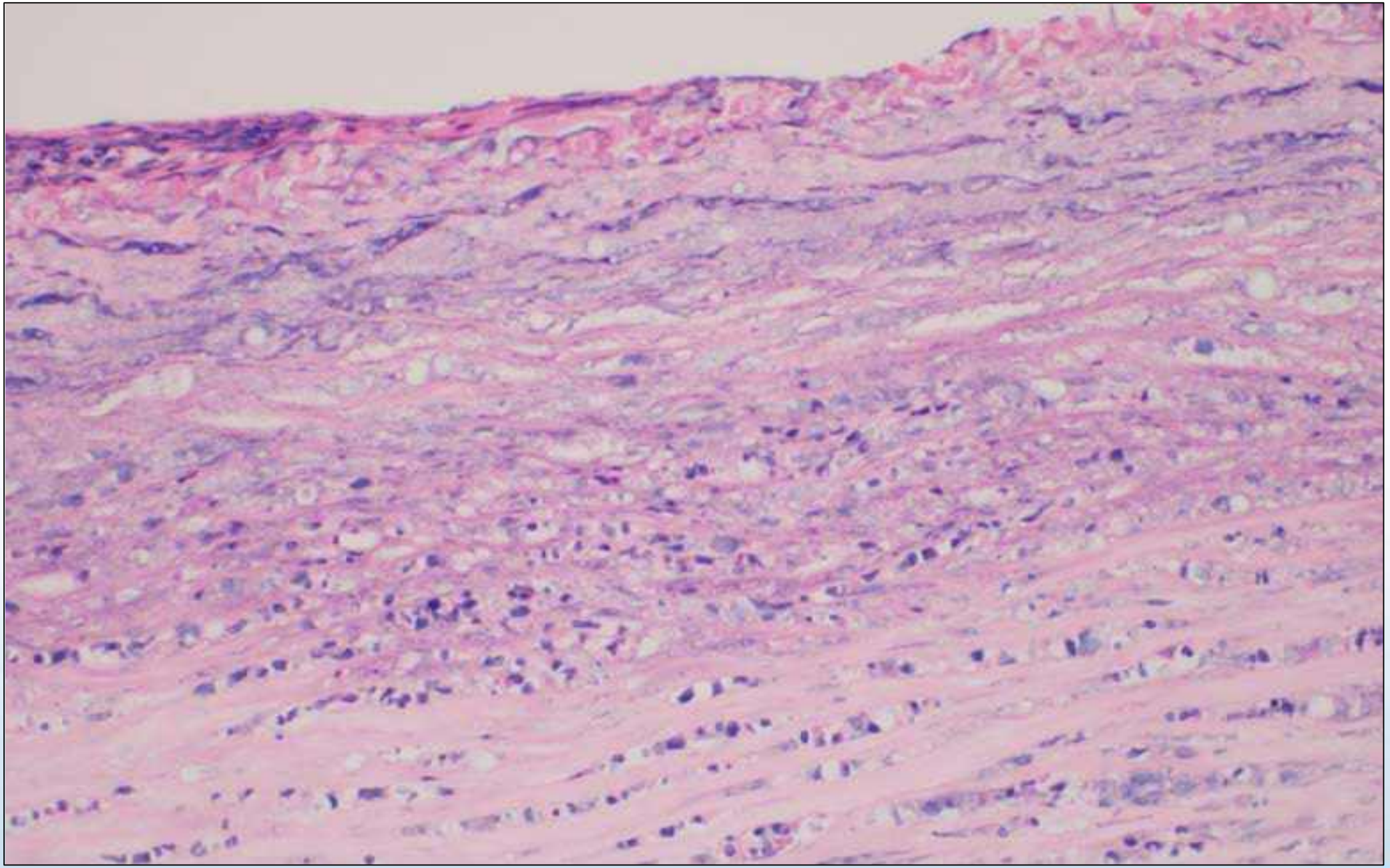


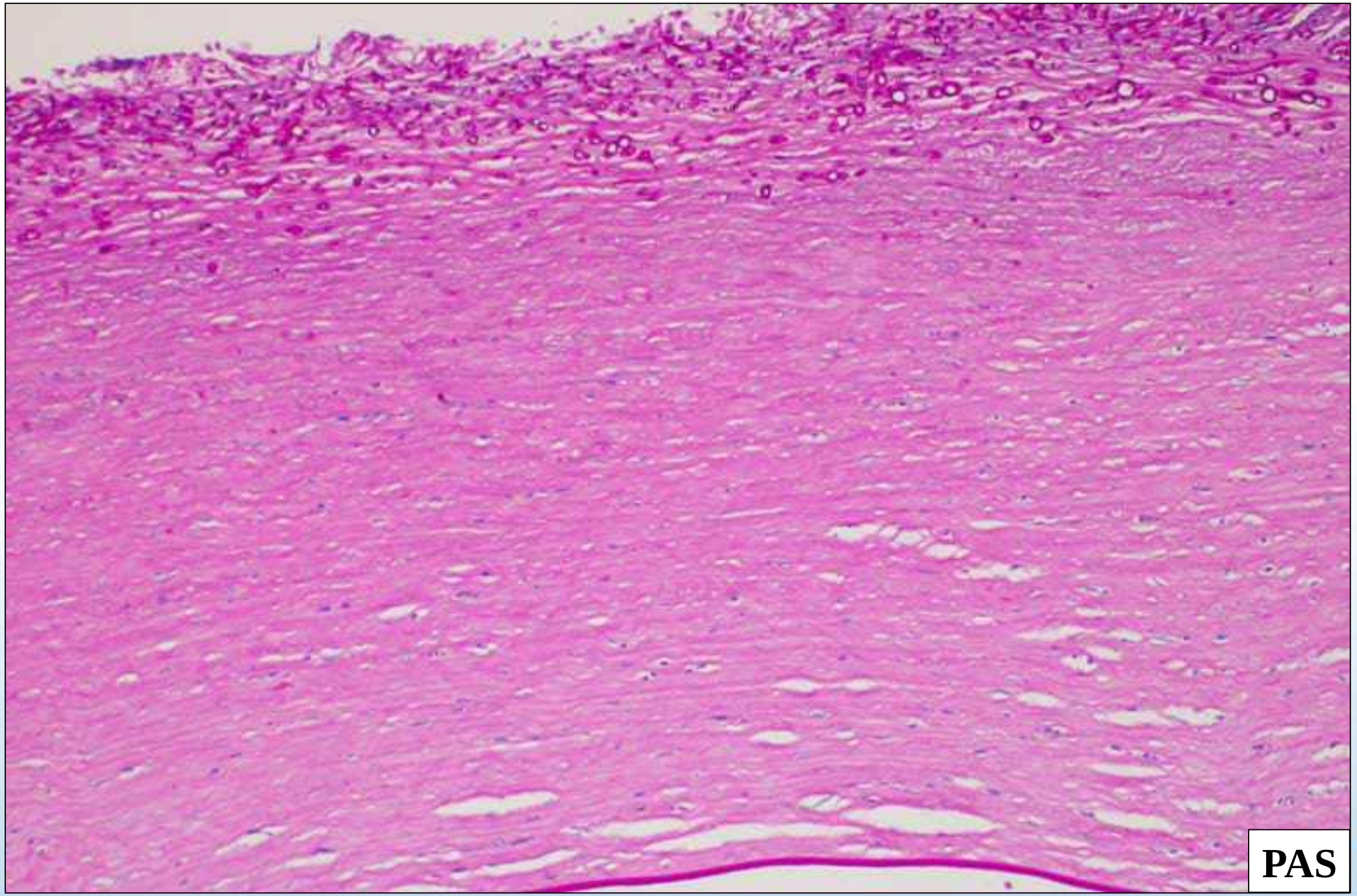


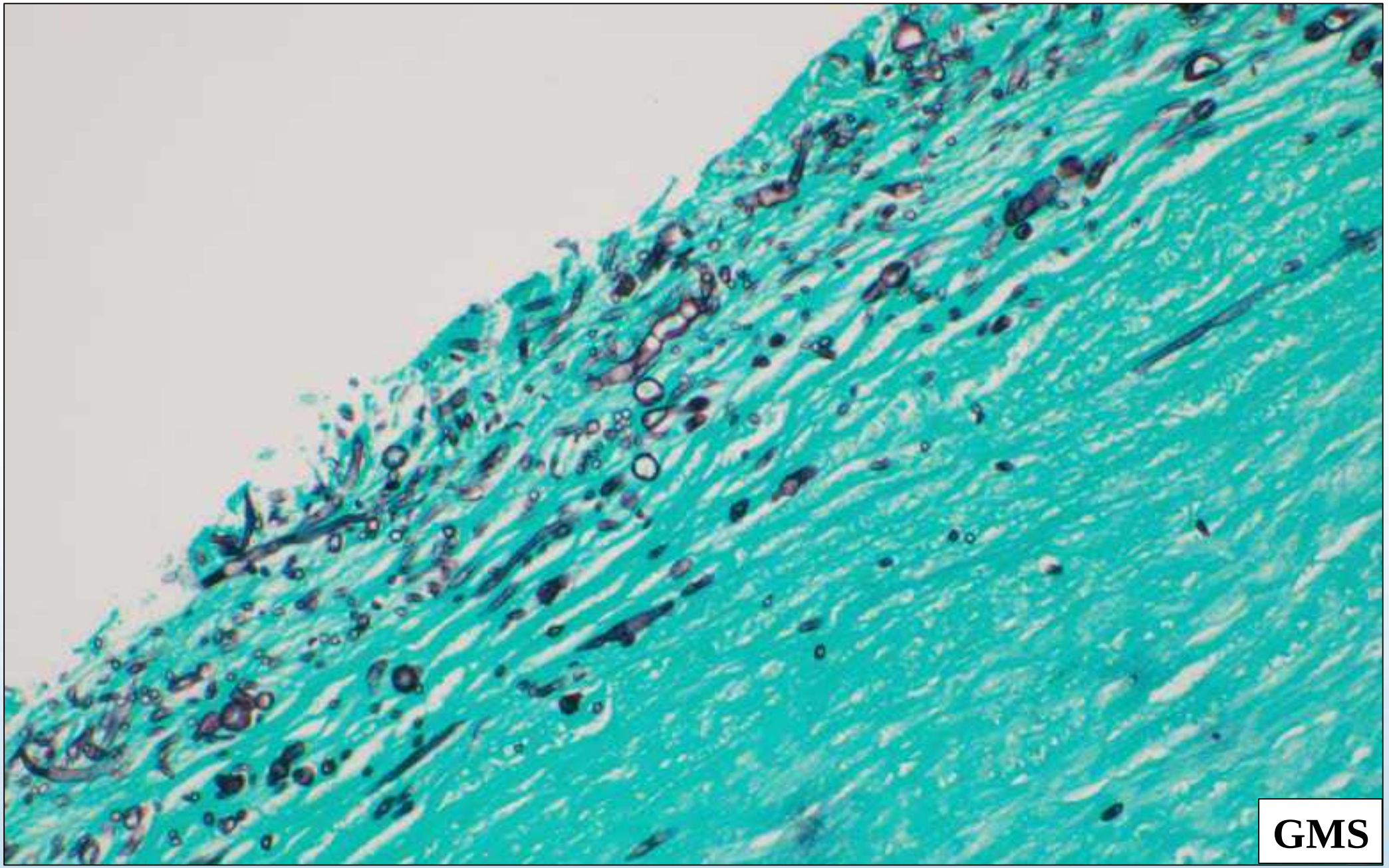


Corneal graft






PAS



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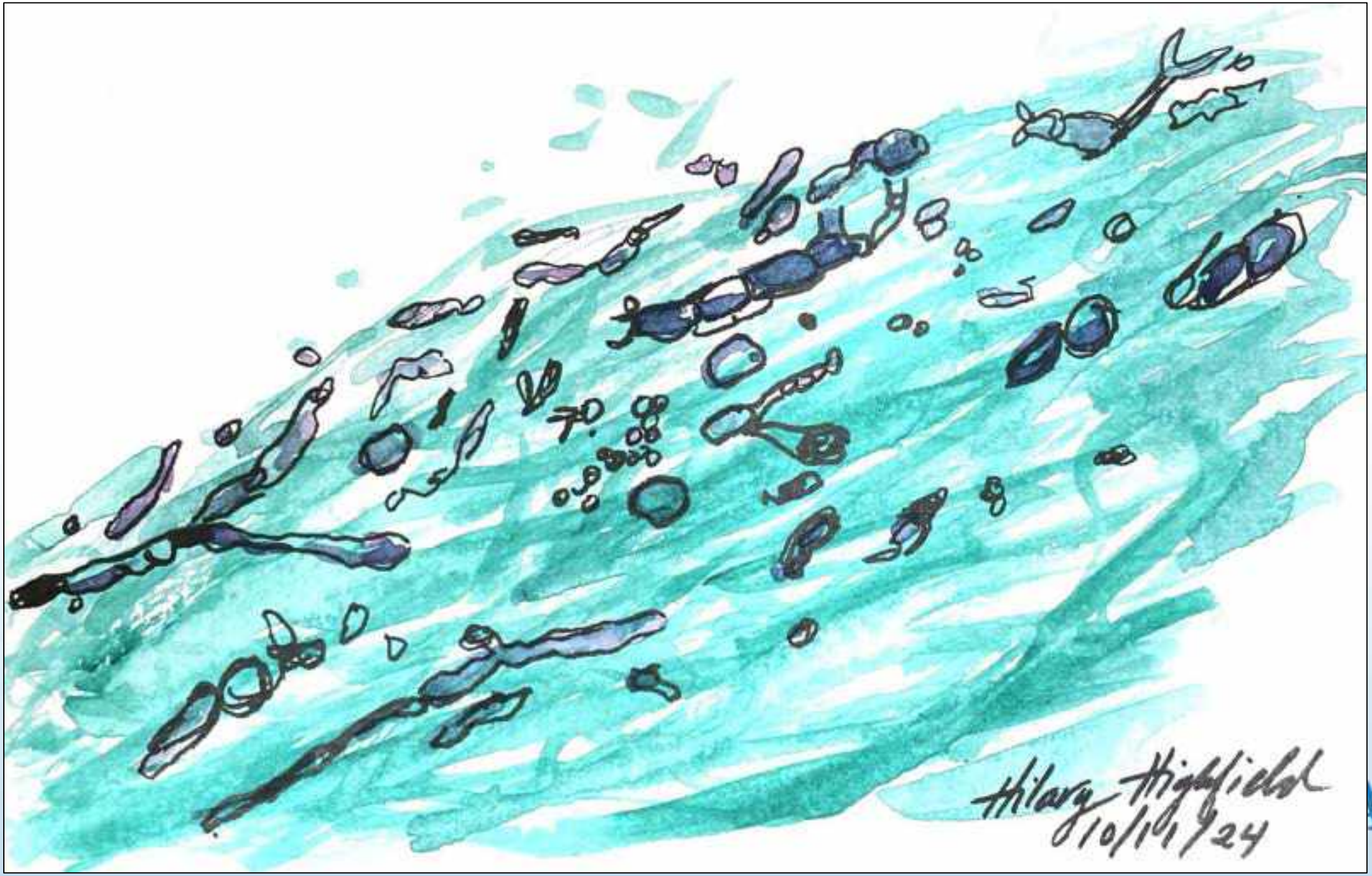
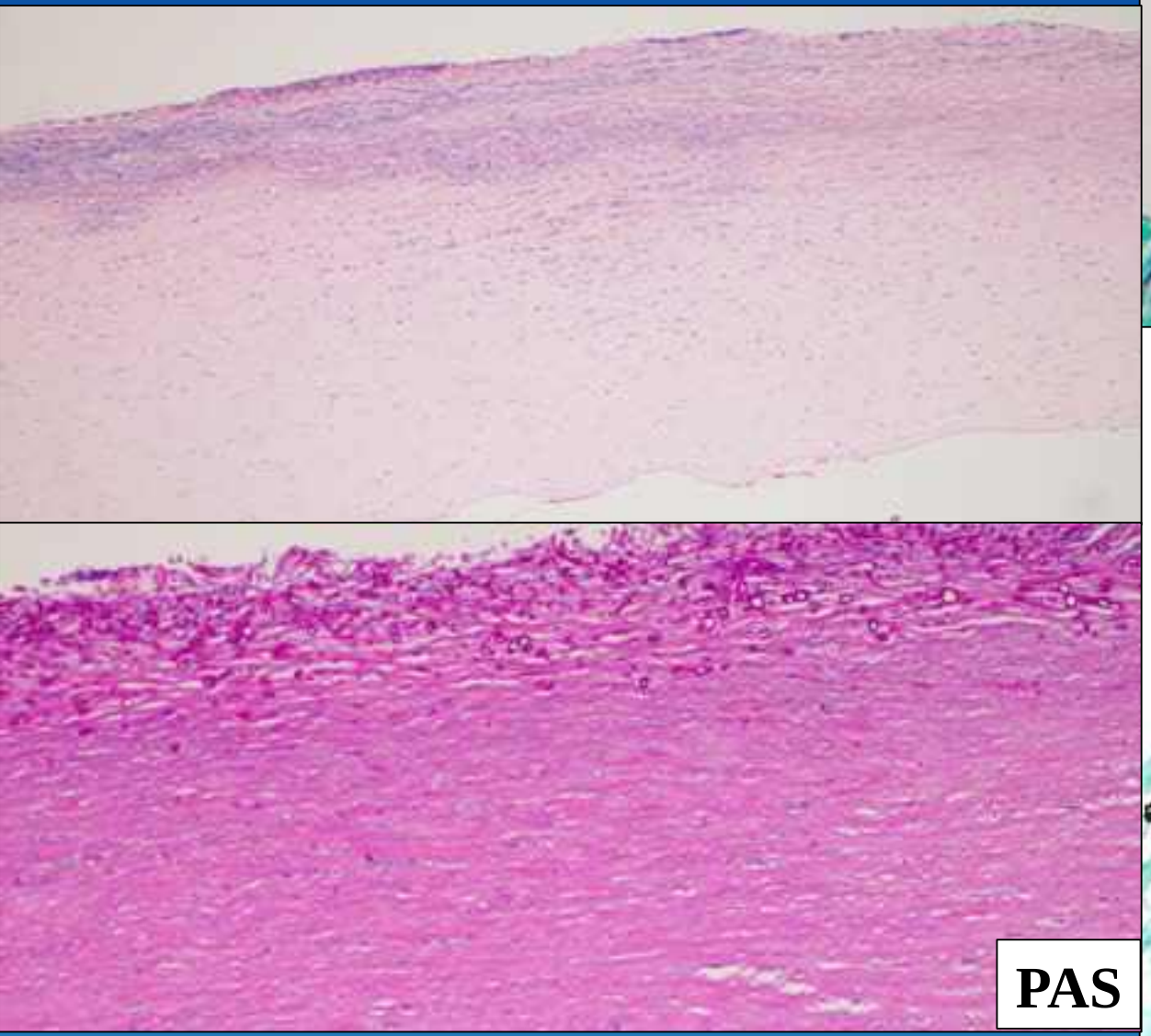

Hilary Highfield
10/10/24

Fungal keratitis: Fusarium



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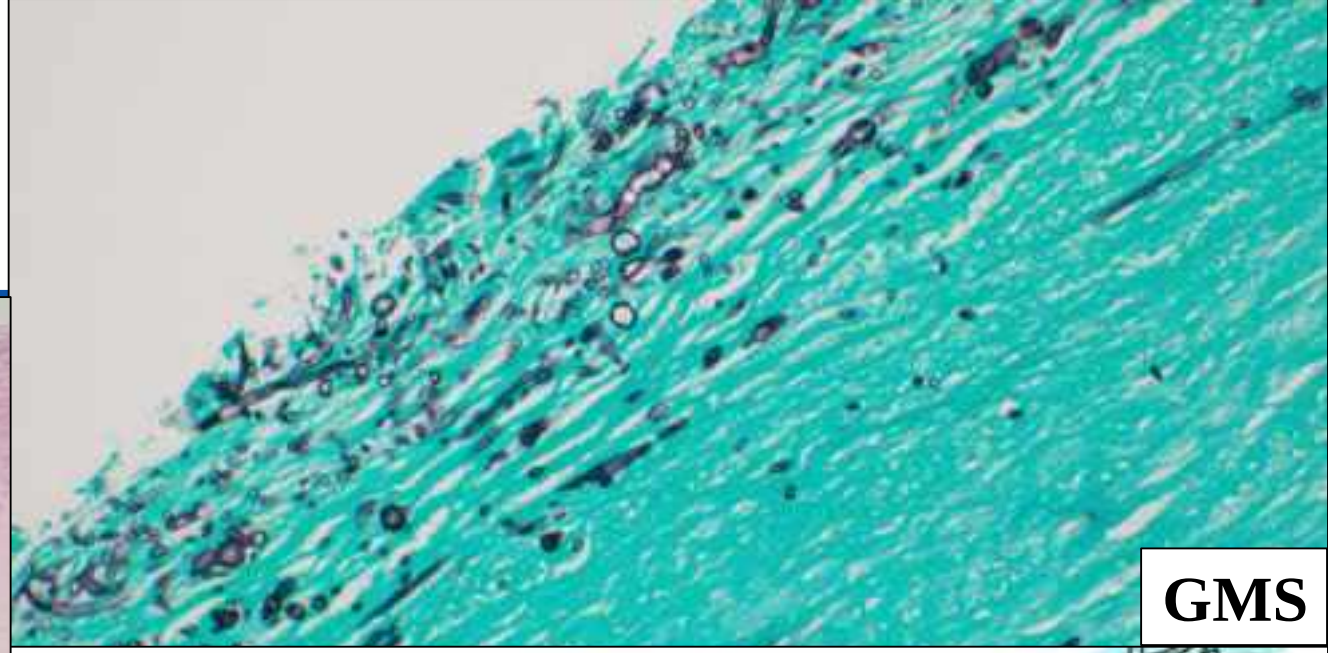
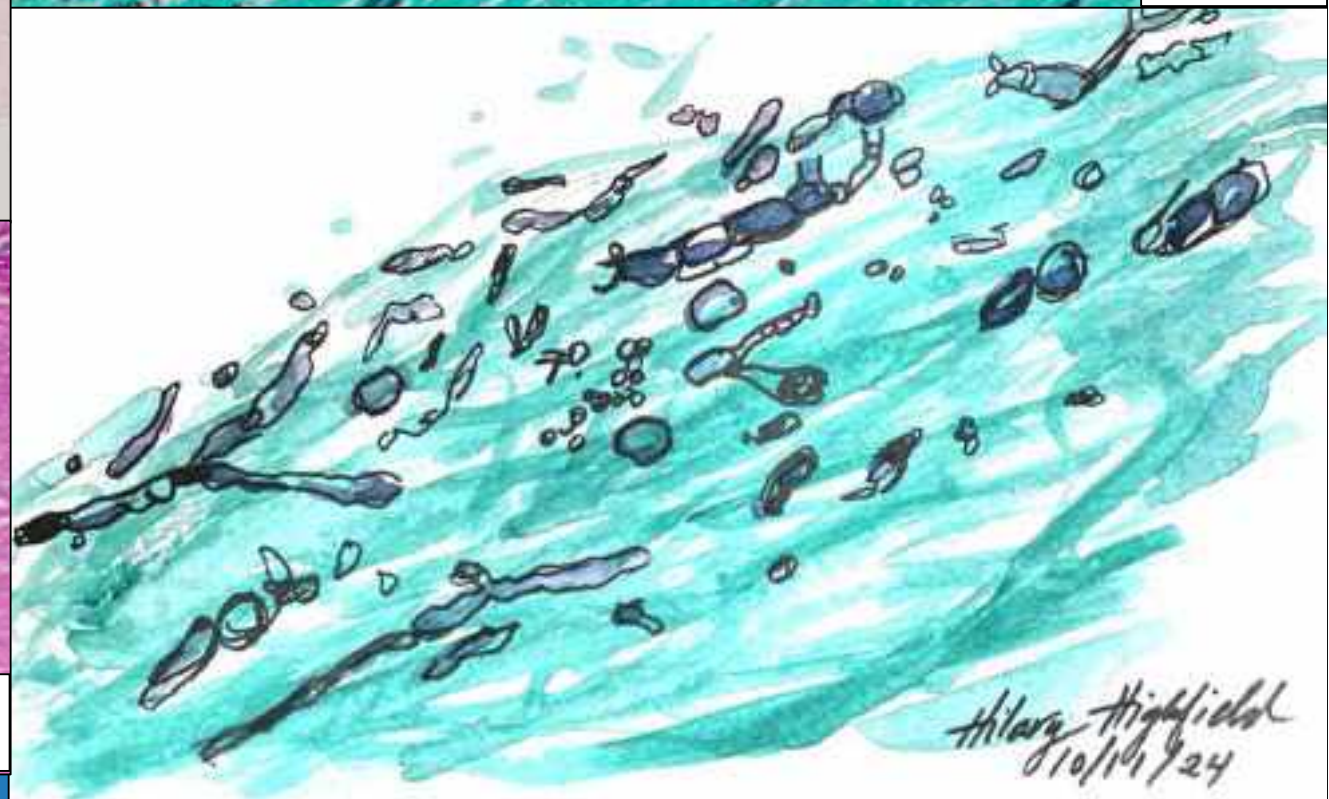


GMS

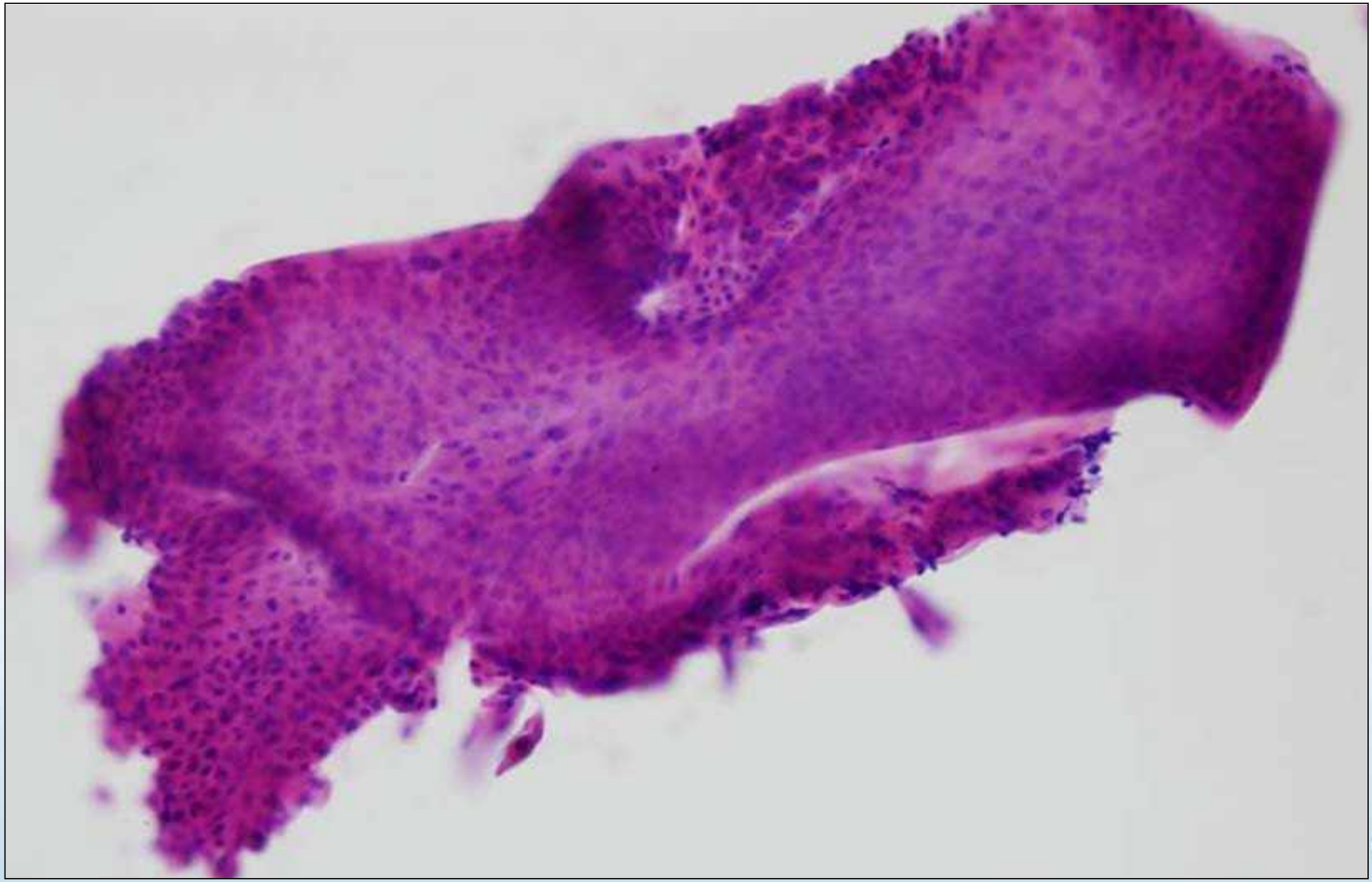


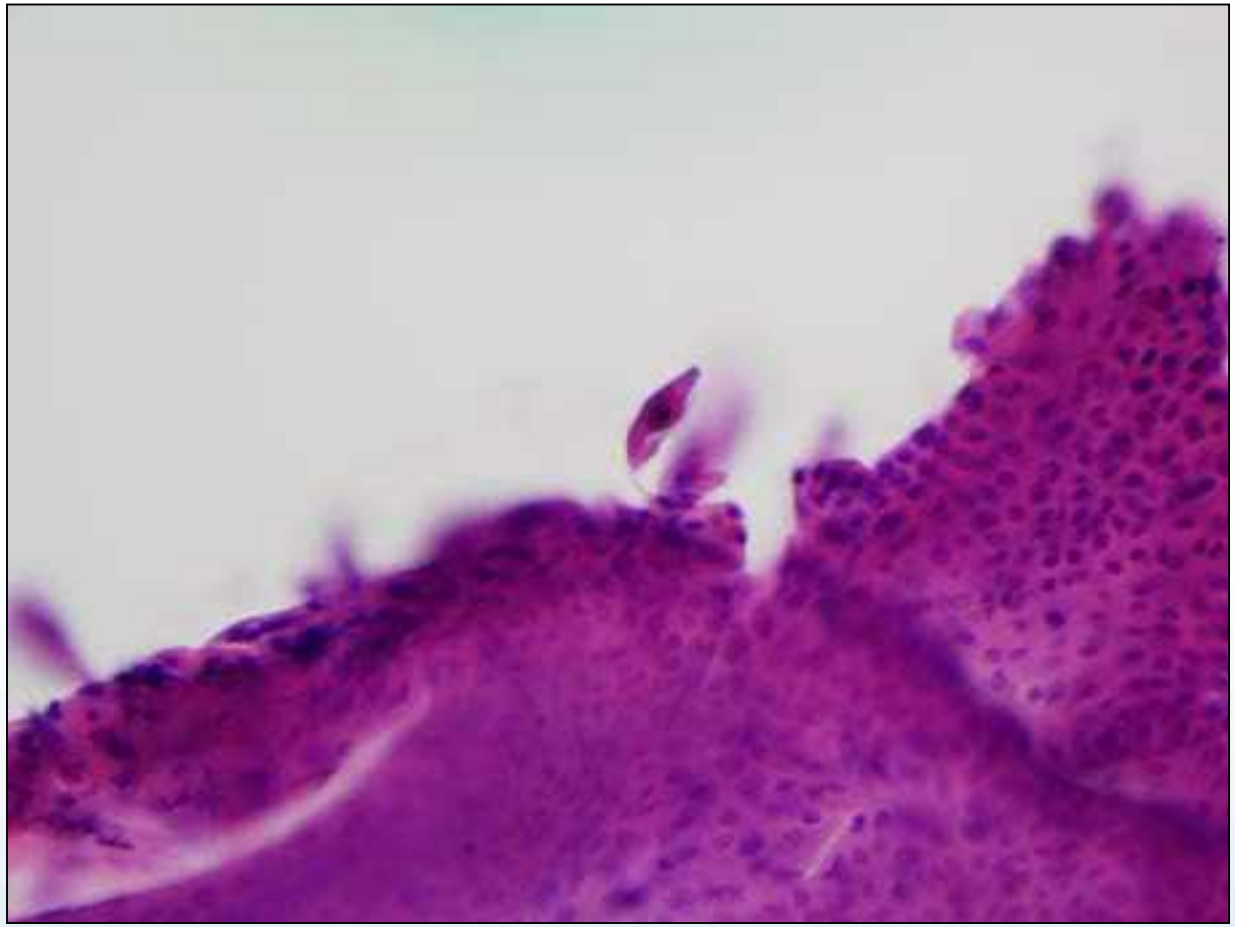
Fungal keratitis

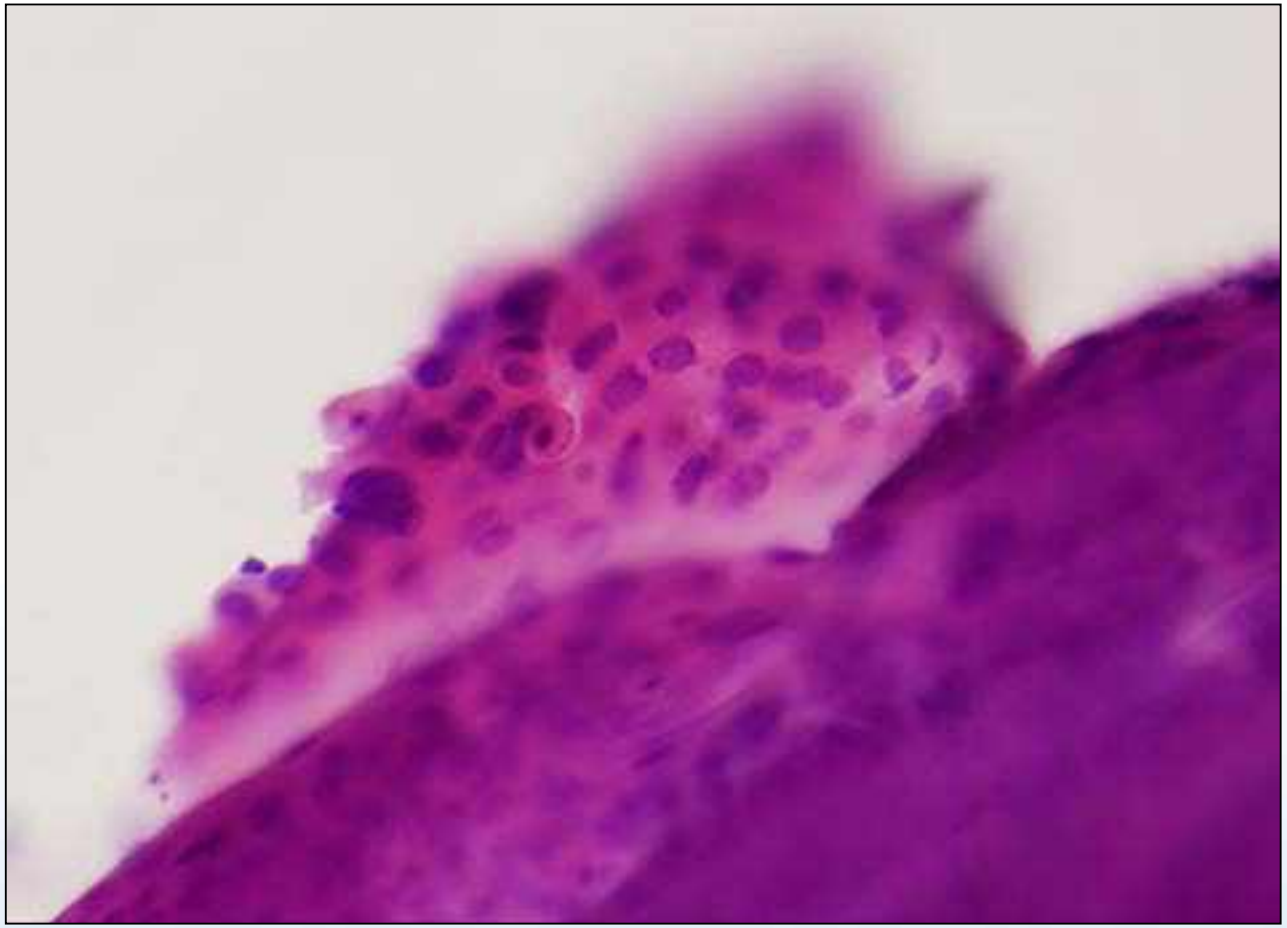
- More prevalent in South
- Rarer than bacterial
- Complicates corneal injury by vegetable matter
- Complicates steroid therapy in debilitated hosts
- 80% Aspergillus, Candida, Fusarium
- Deep crater with raised edges

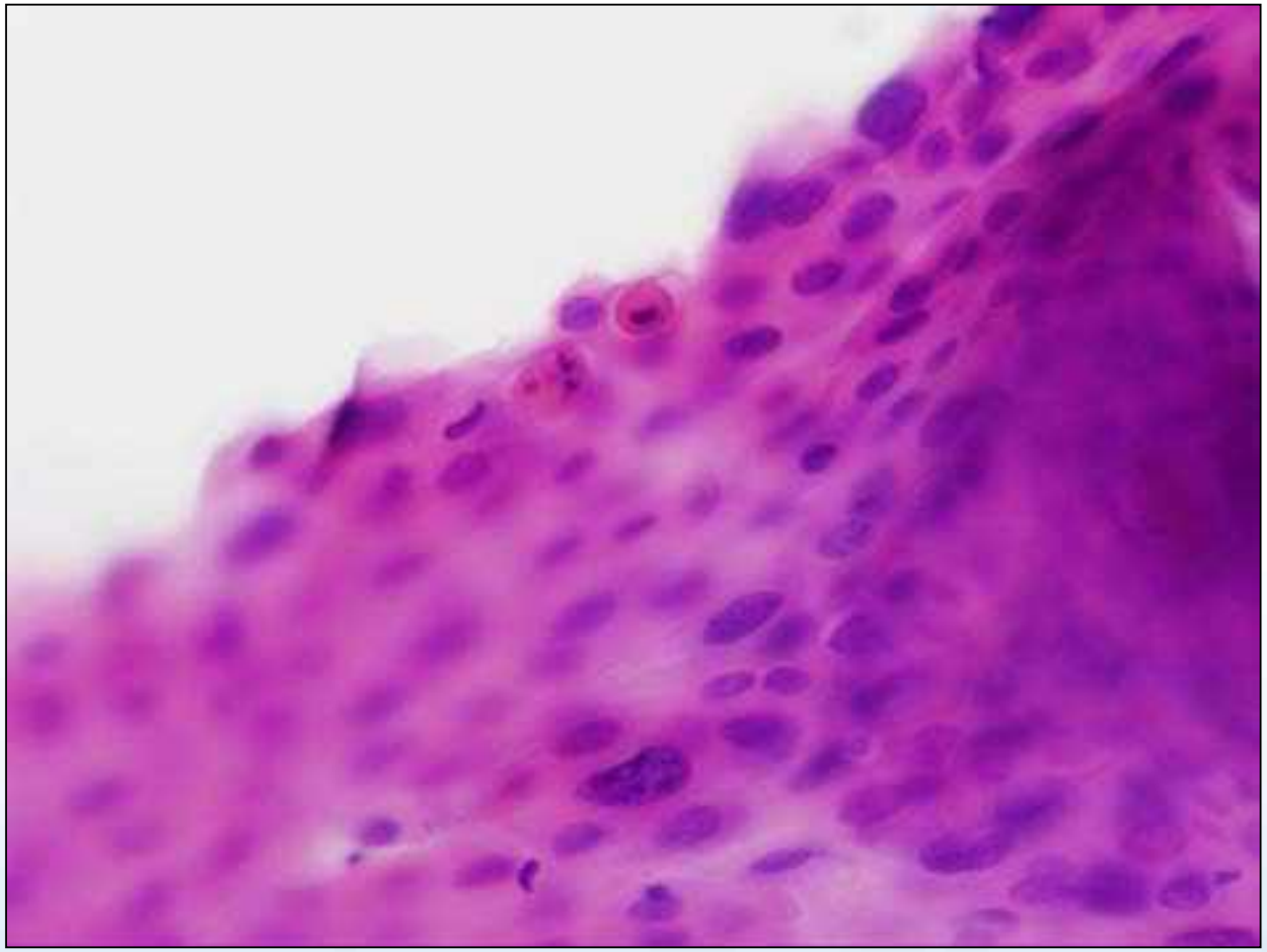
Clin Ophthal 2011; 5: 275-279.

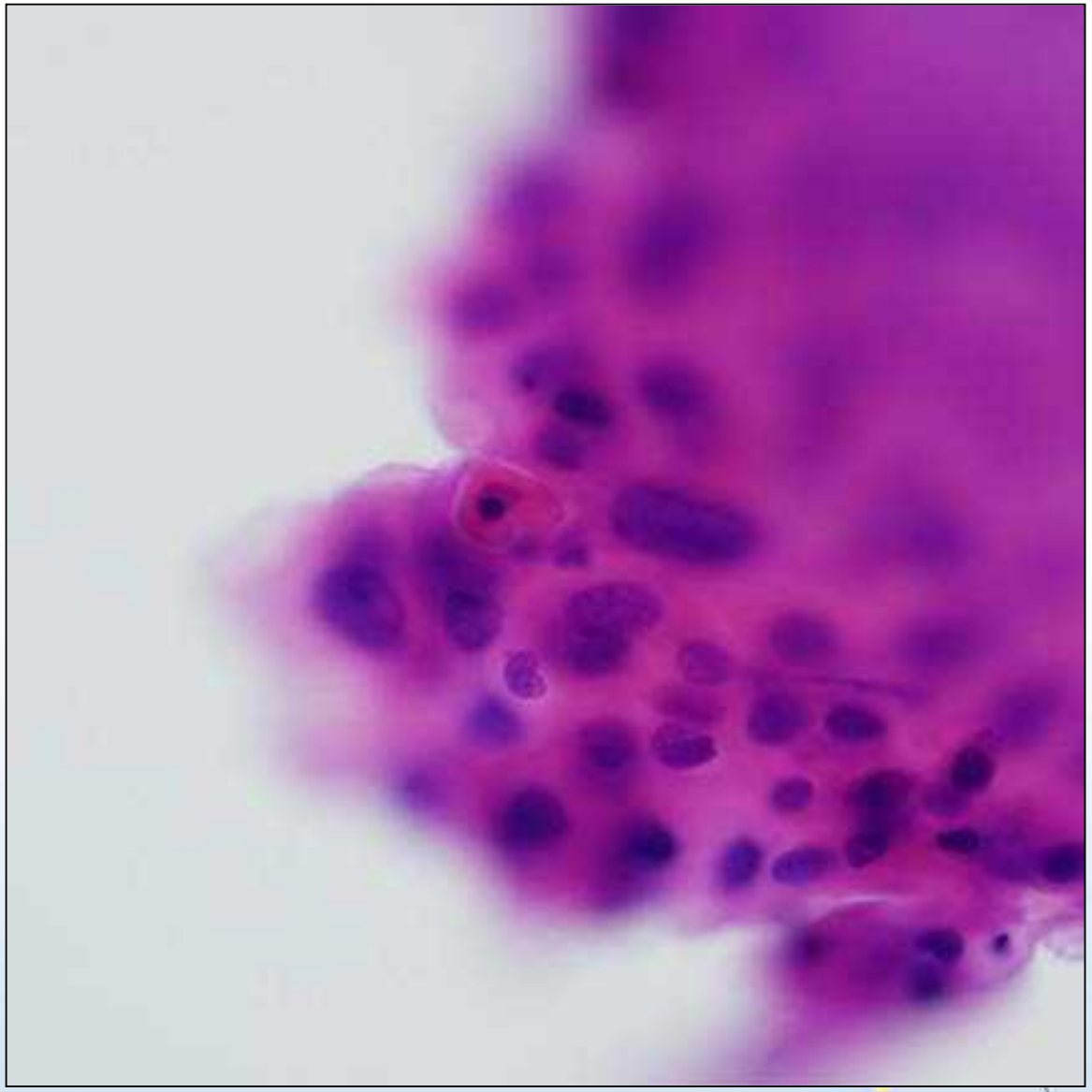
Contact lens wearing patient with corneal lesion











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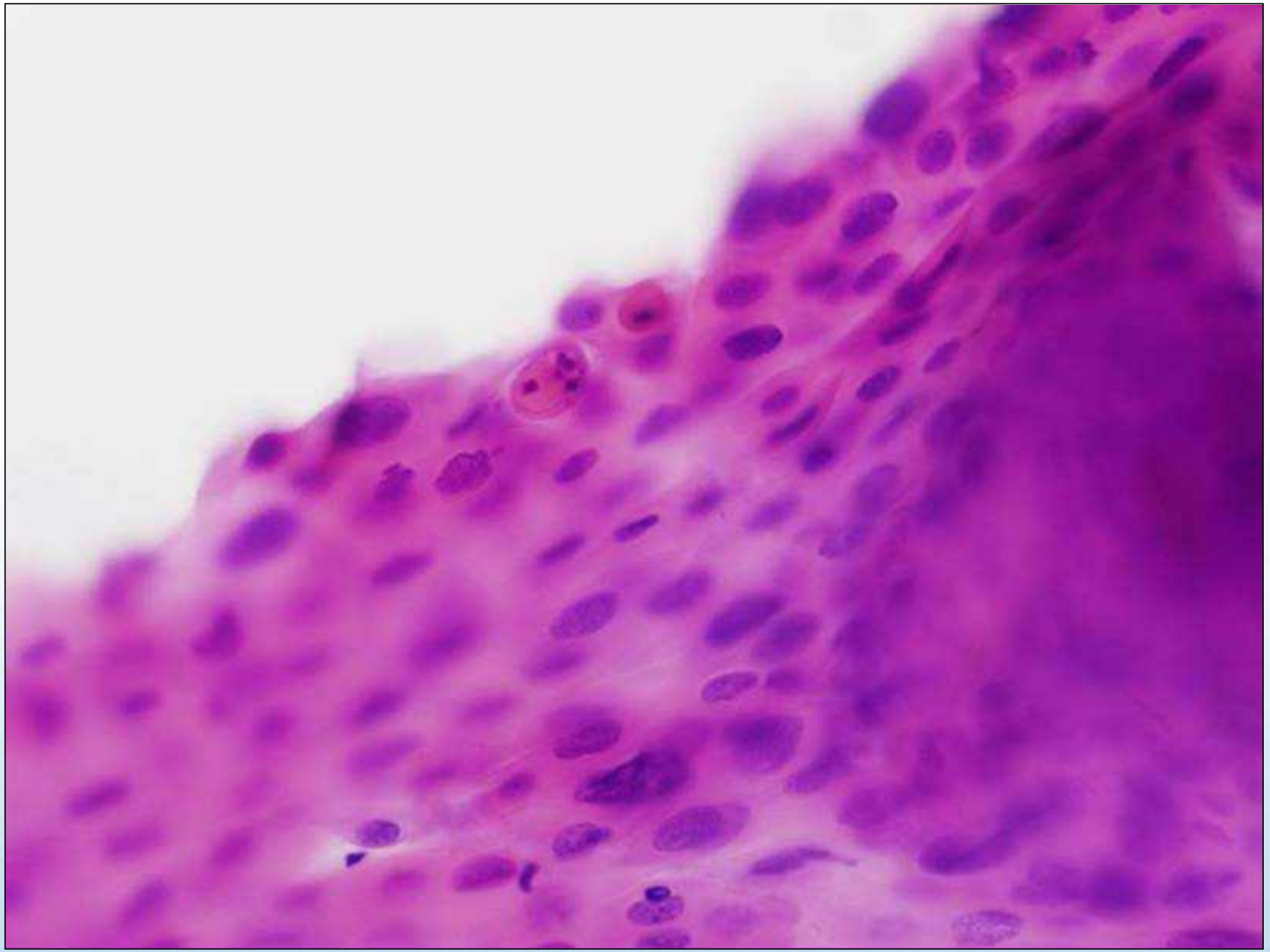
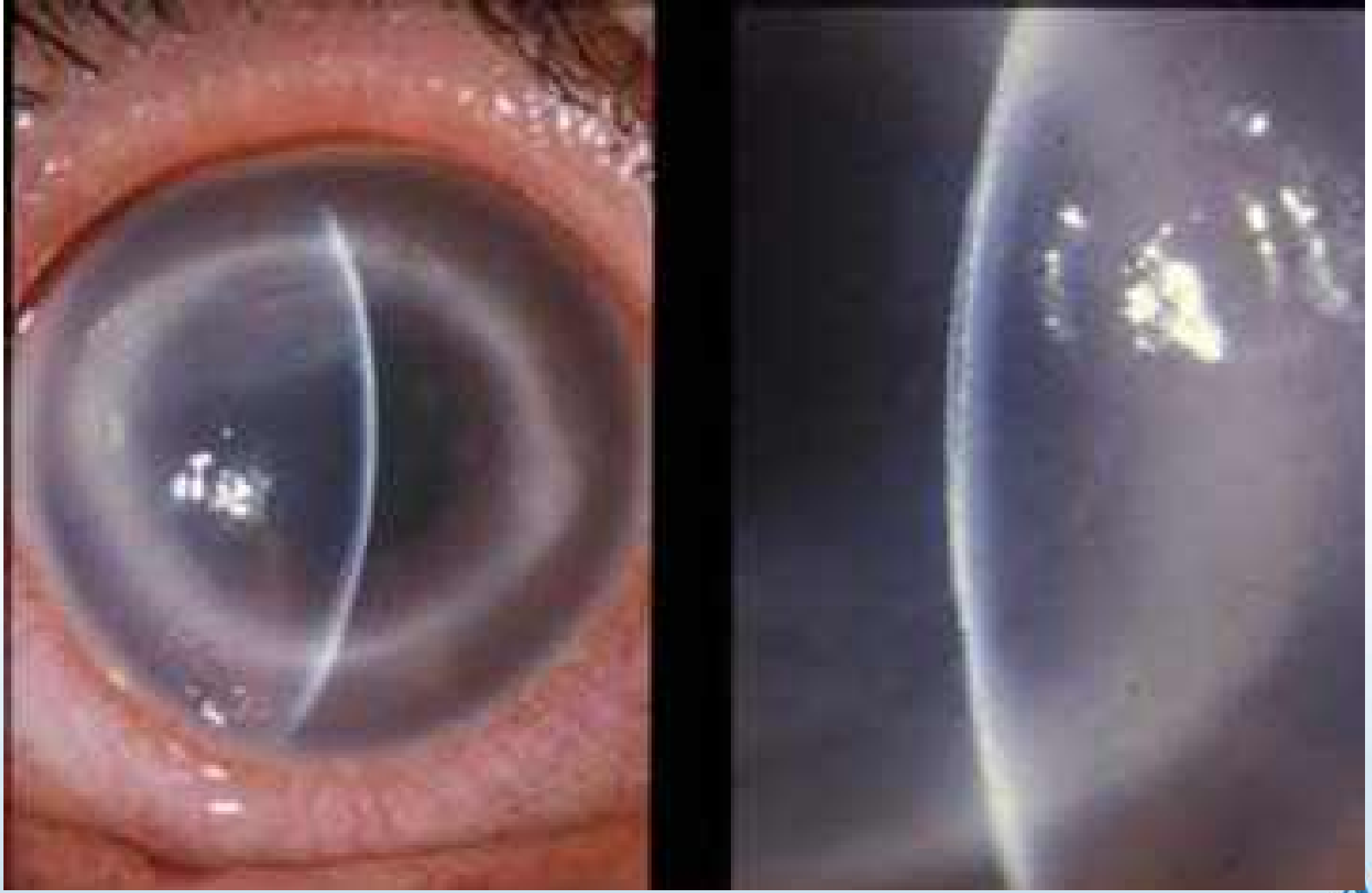
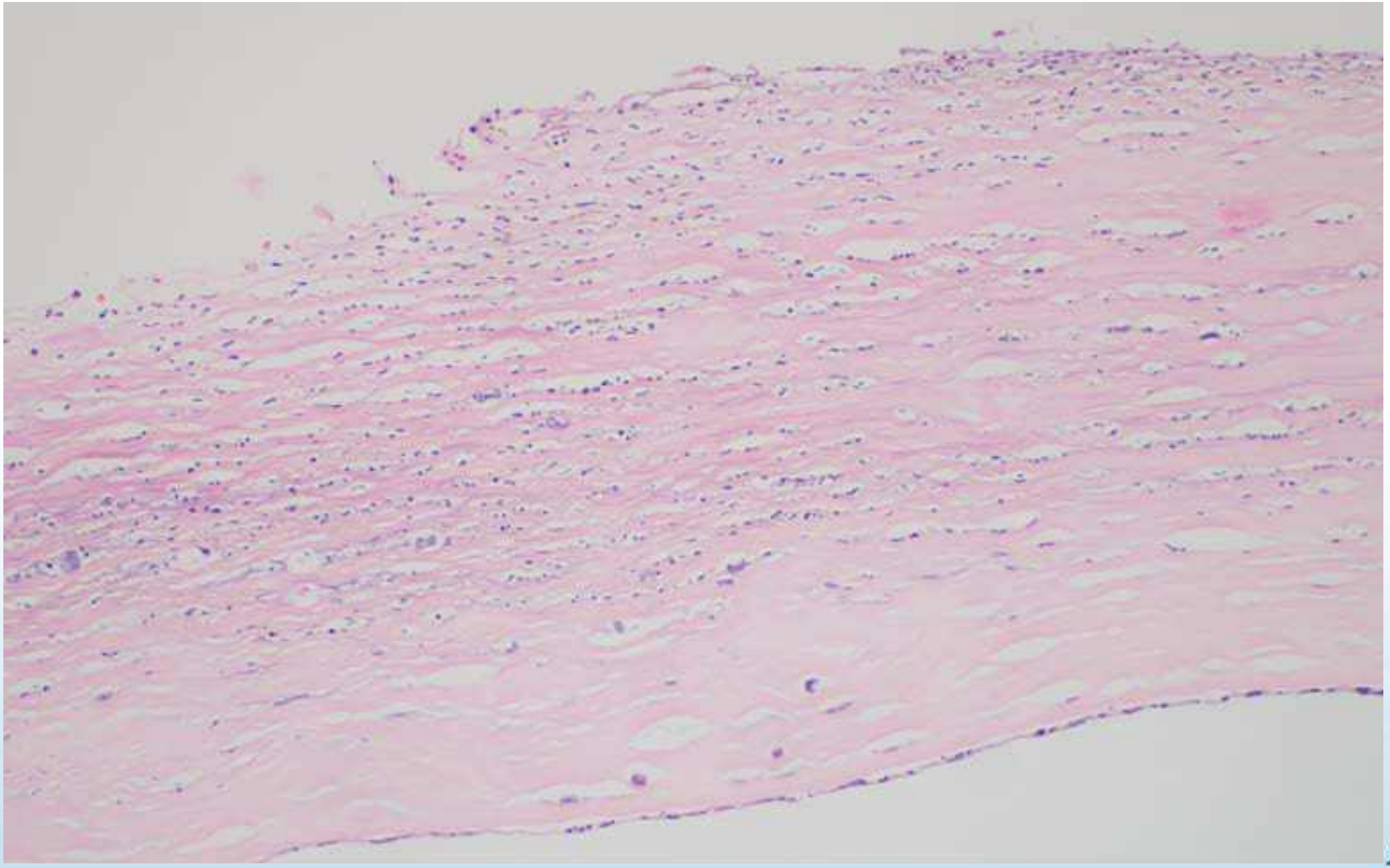
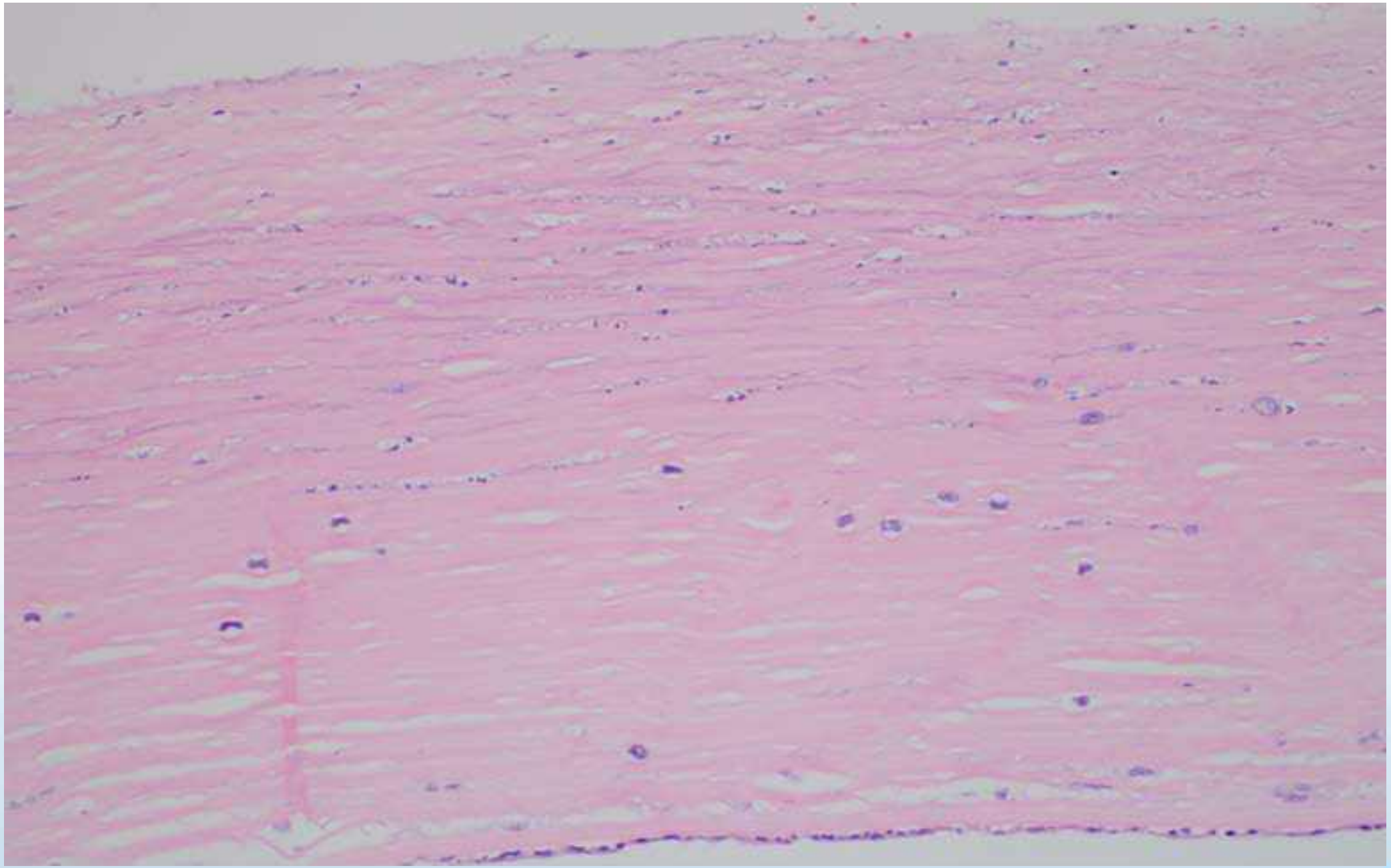
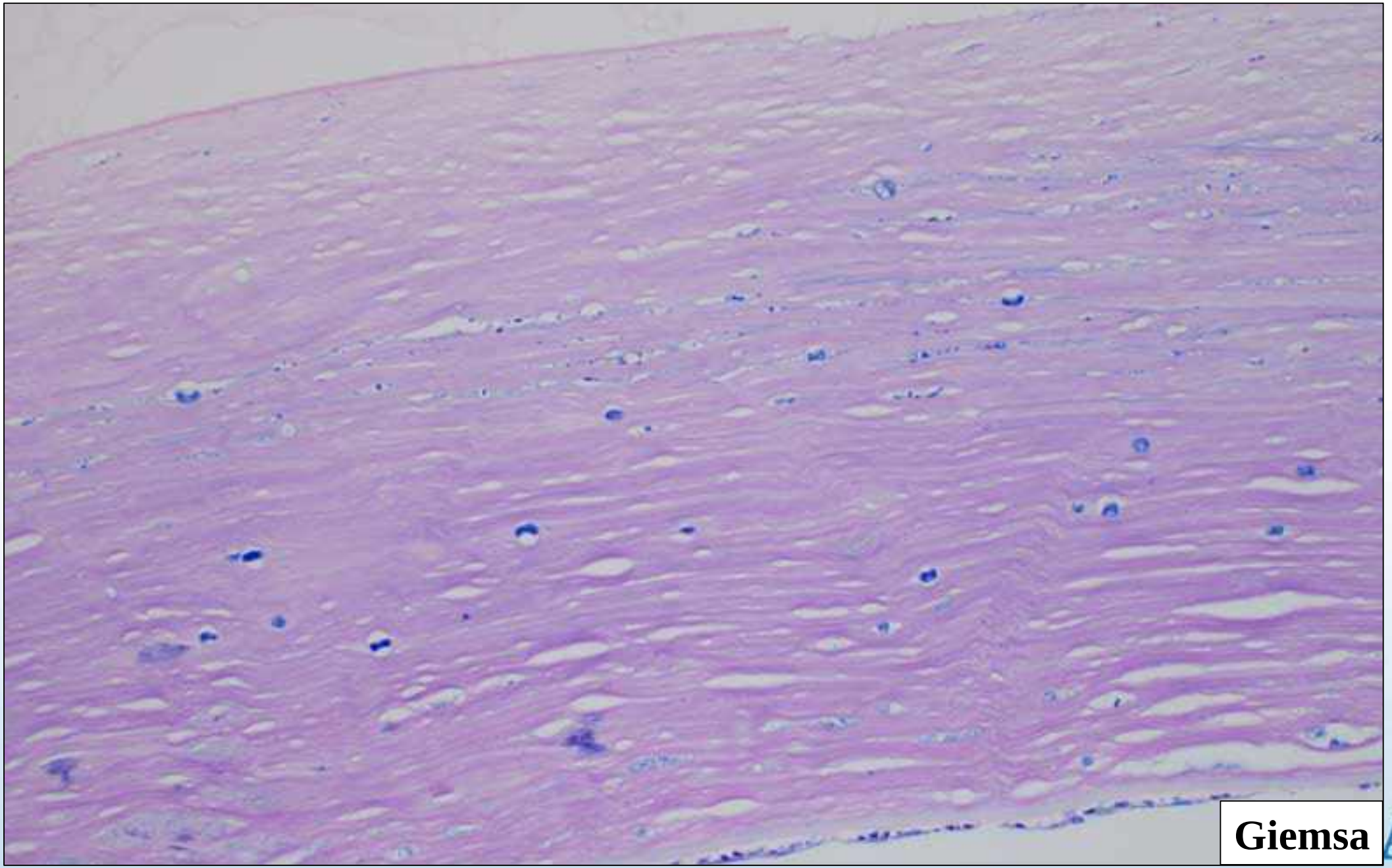




CDC: broad illumination with slit beam; high magnified slit beam, Typical advanced ring infiltrate.

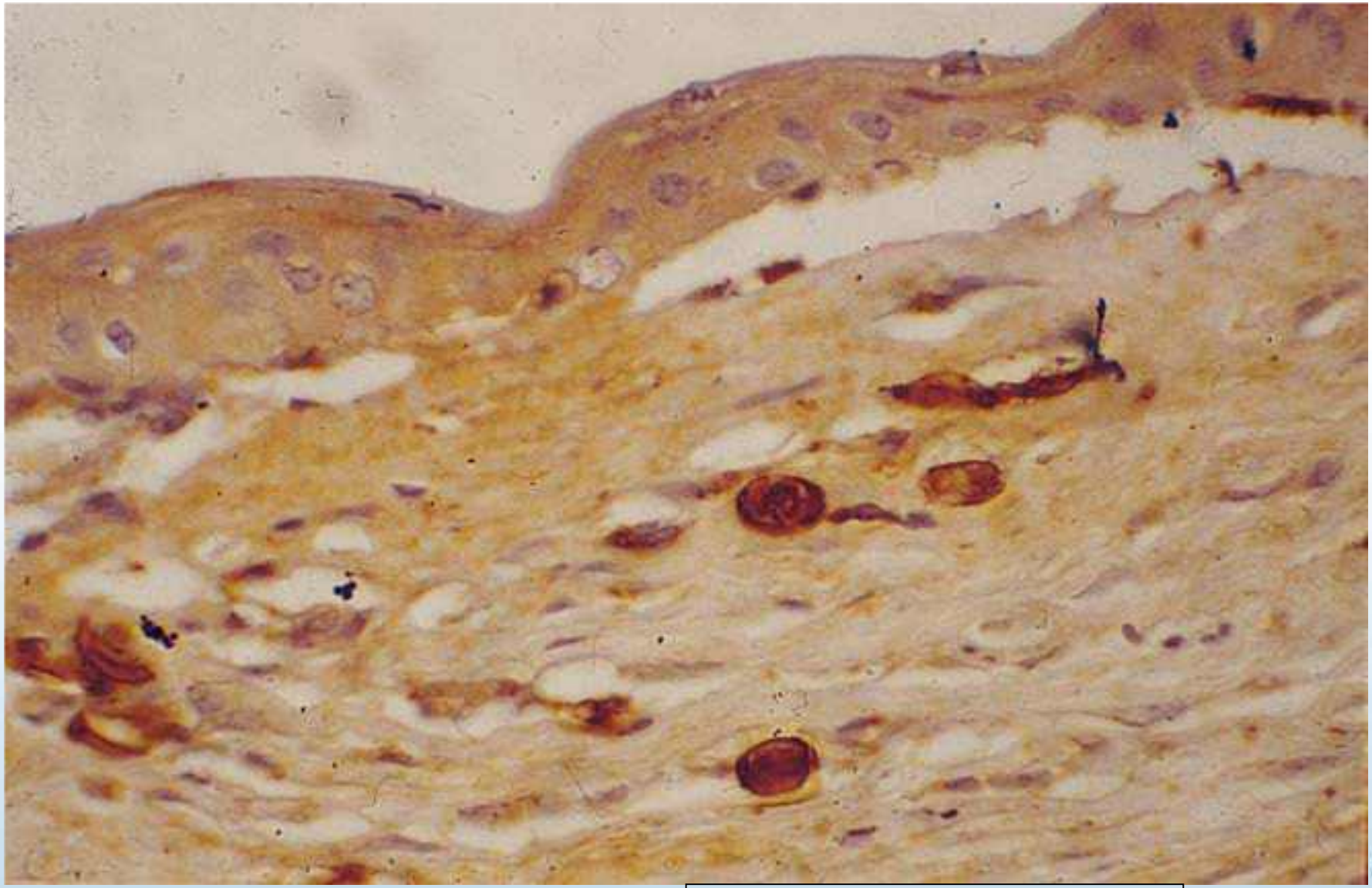






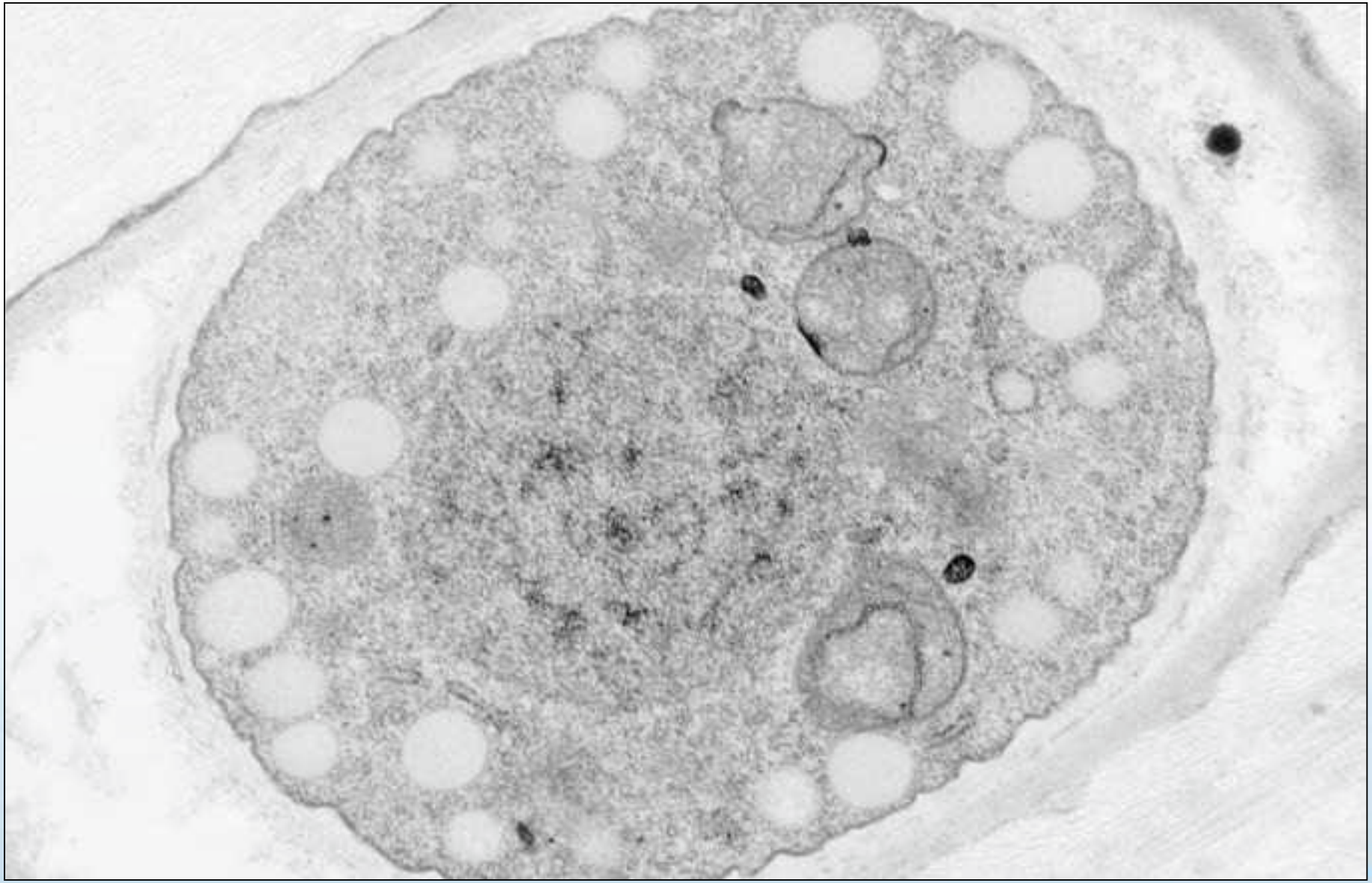
Giemsa

Immunohistochemistry



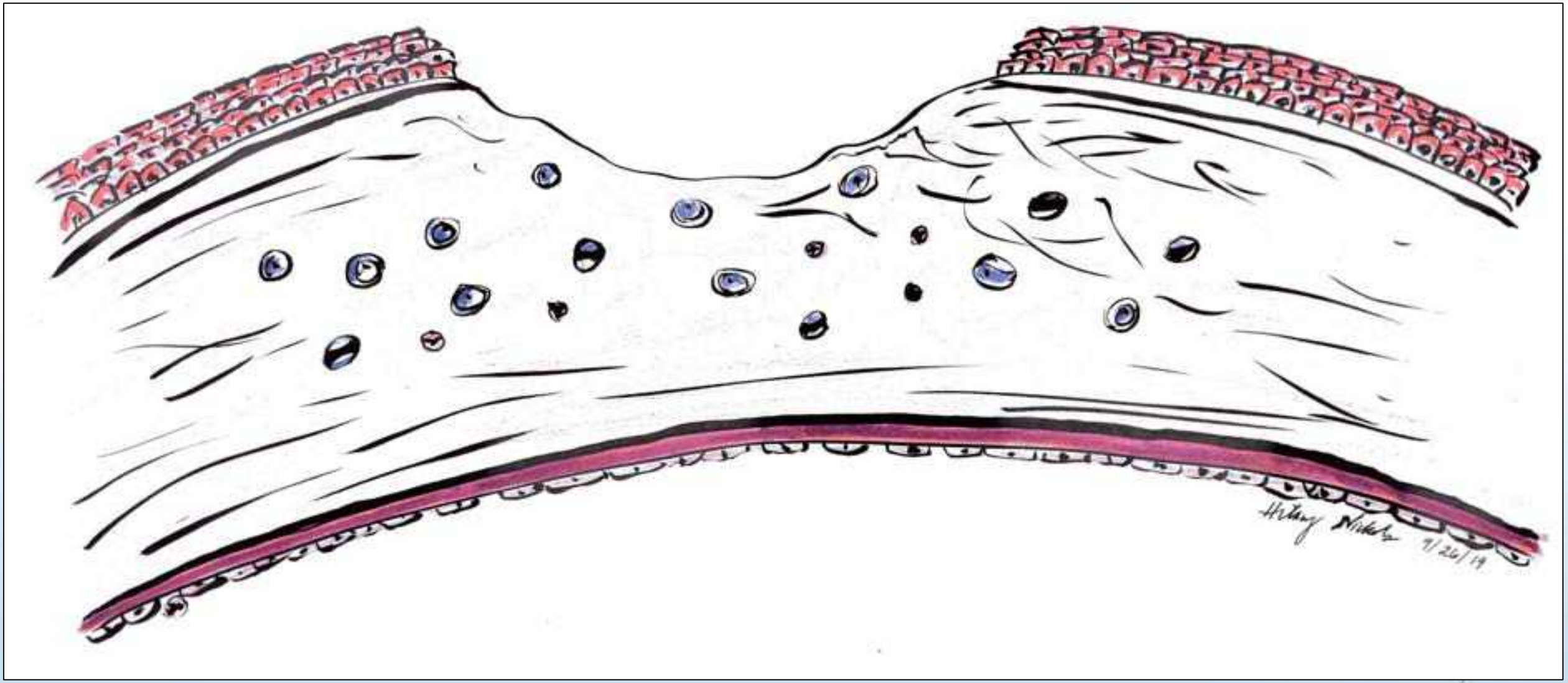
Sur ophthal (1998) 42:493

Electron microscopy



Sur ophthal (1998) 42:493

Acanthamoeba keratitis



Acanthamoeba keratitis

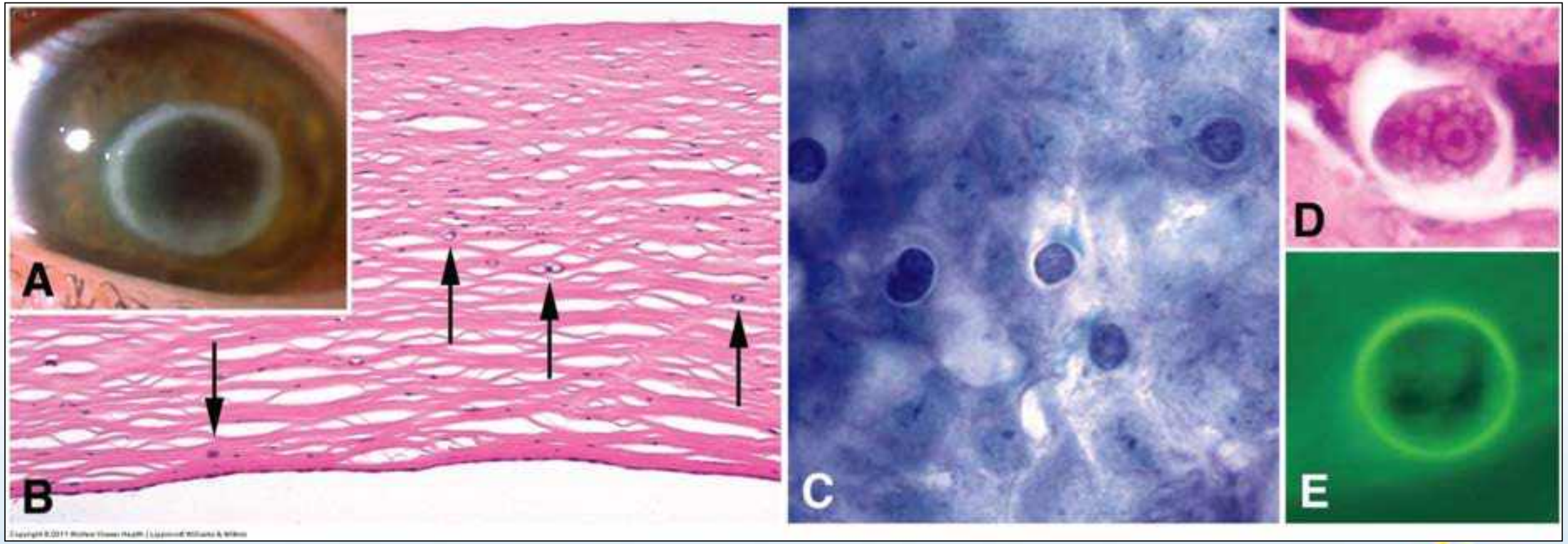
- Protozoan parasite: cyst and trophozoite
- *A castellani* and *A polyphagia* most commonly involved species
- Closely linked to soft contact lens use
- Severely painful
- Interstitial keratitis: non-ulcerative stromal inflammation

Acanthamoeba keratitis

- First described 1970s
- Dramatic increase 1980s with soft contact lens wear
- Risks:
  - Contact lens wear: 80%
    - Frequent-replacement soft contacts
    - Overnight orthokeratology patients
    - Swimming, tap water cleaning
- DDx includes ***herpetic*** and ***fungal*** keratitis

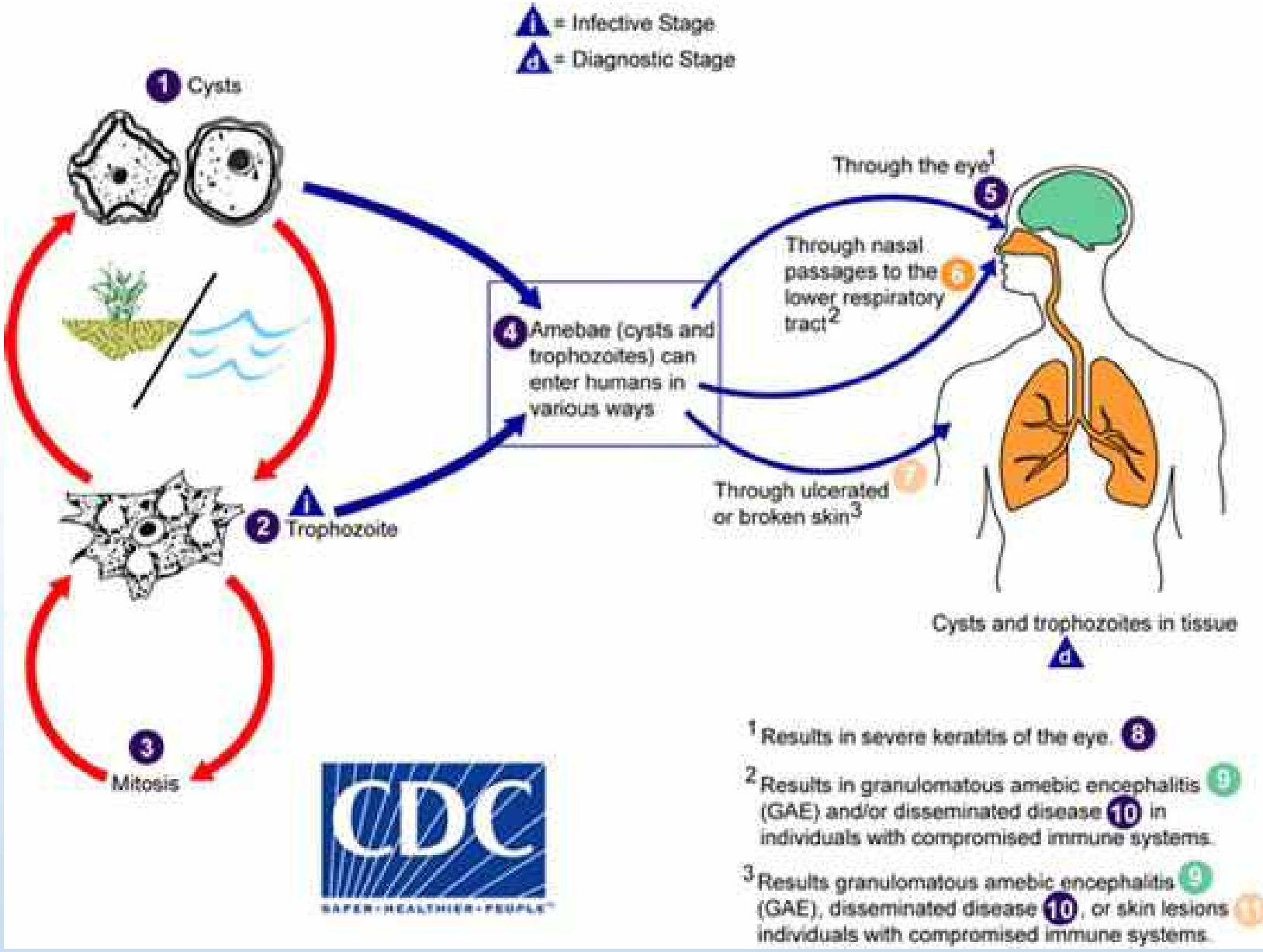
Curr Opin Ophthal 2006; 17:327-331.

Acanthamoeba keratitis



Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

Acanthamoeba lifecycle



CDC
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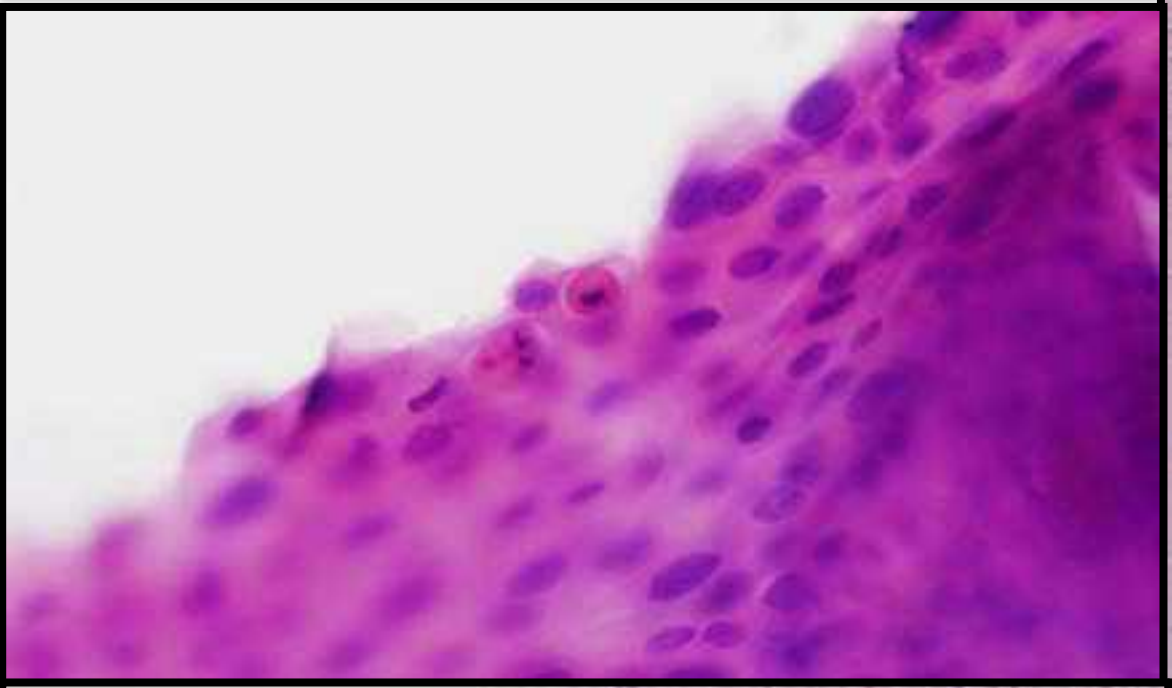
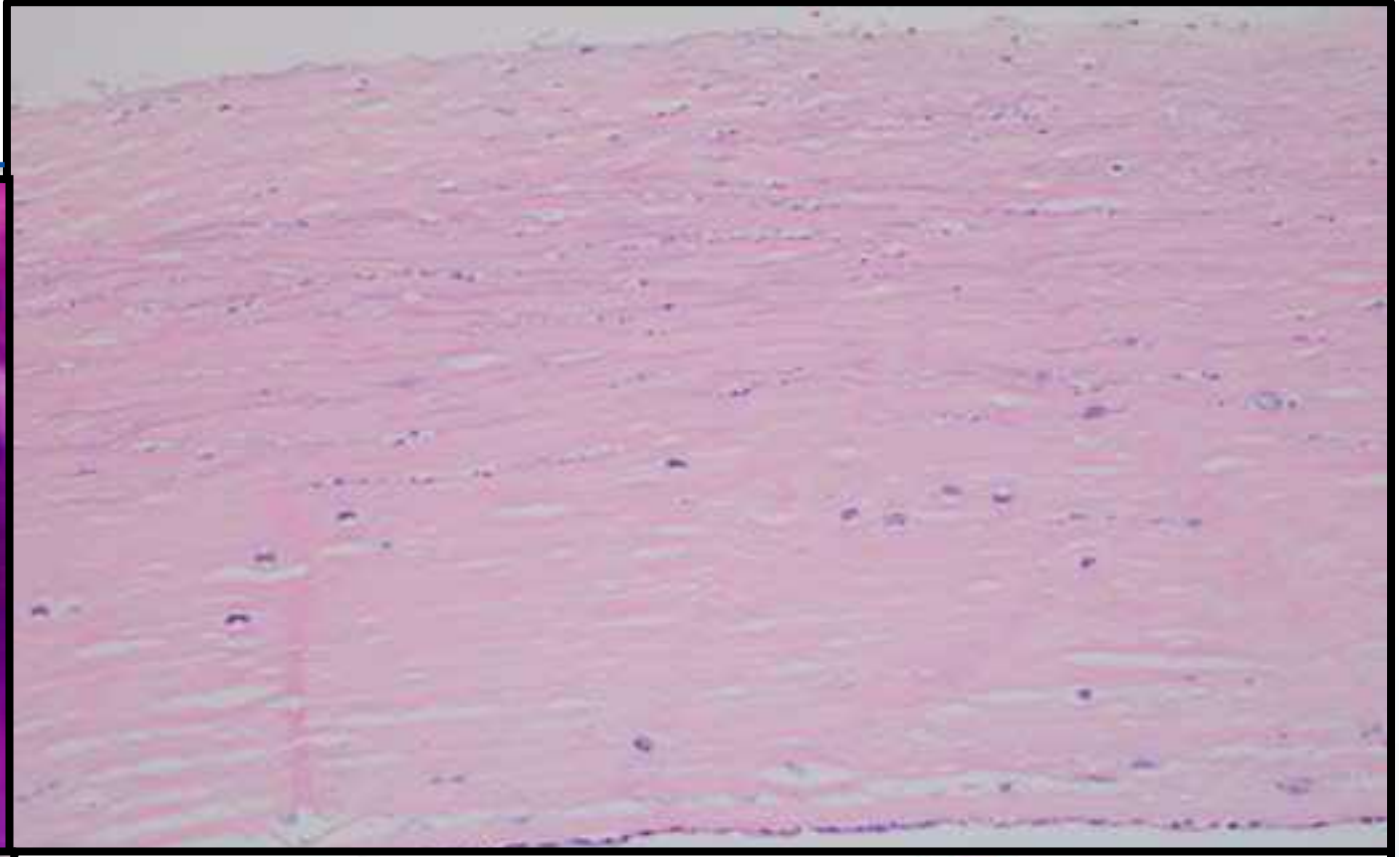
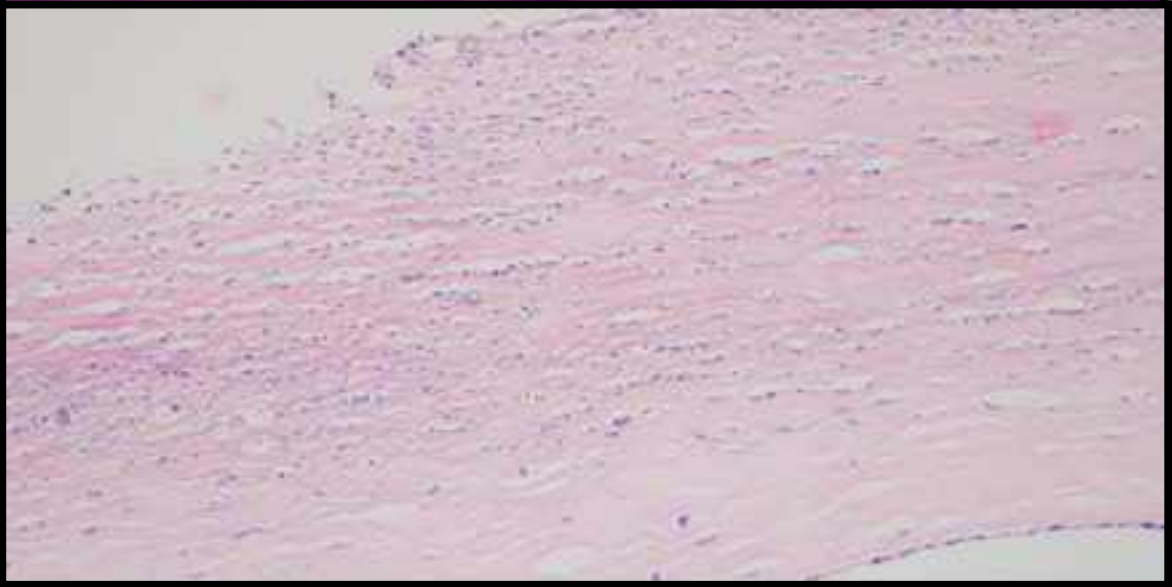
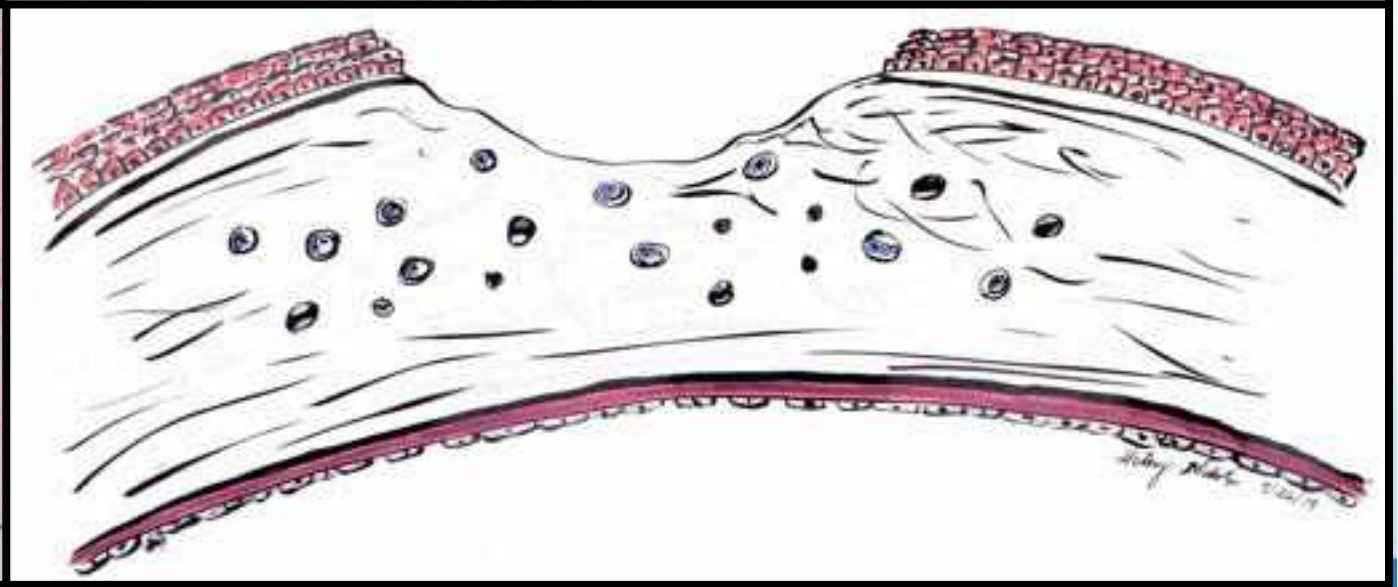
Acanthamoeba keratitis

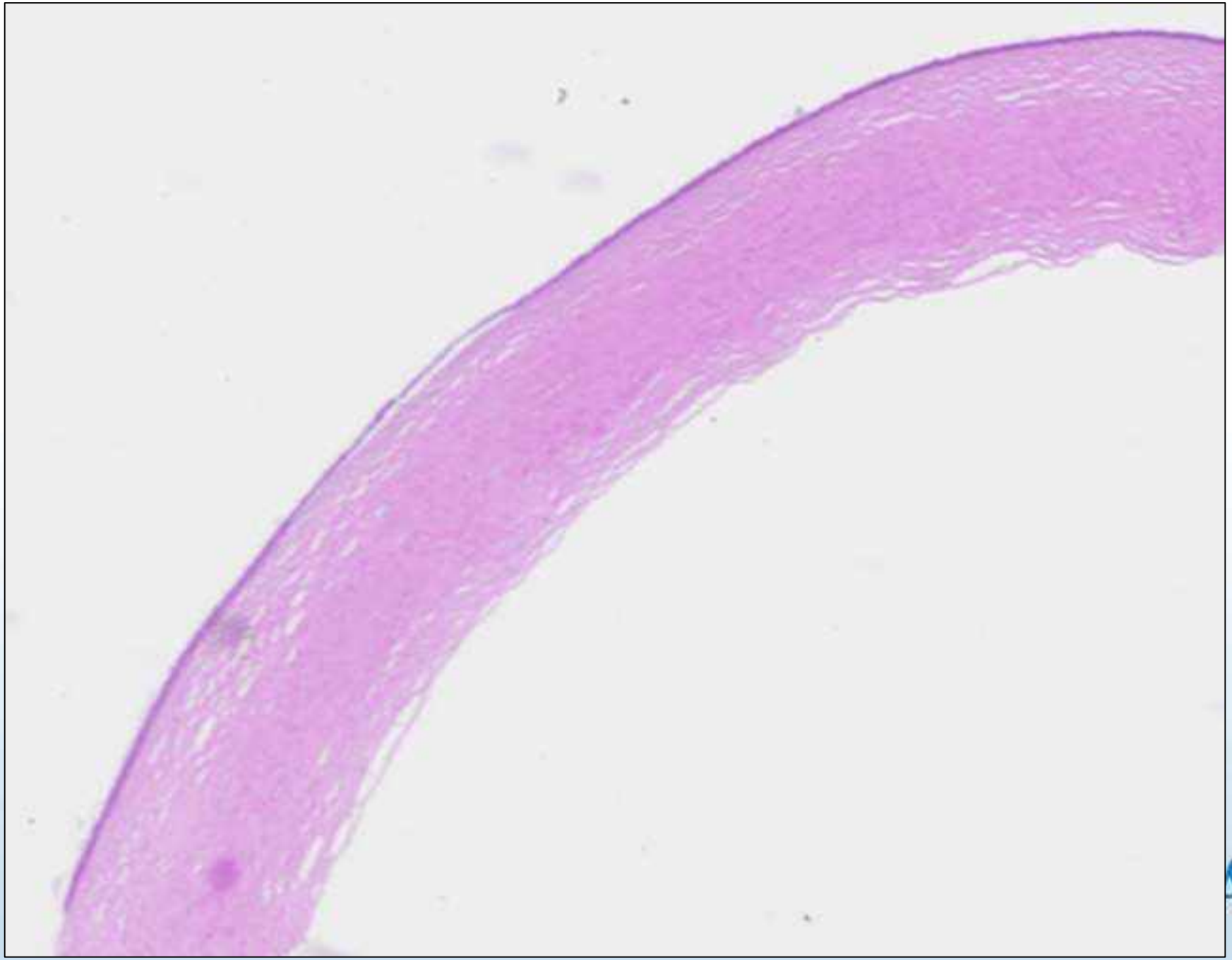


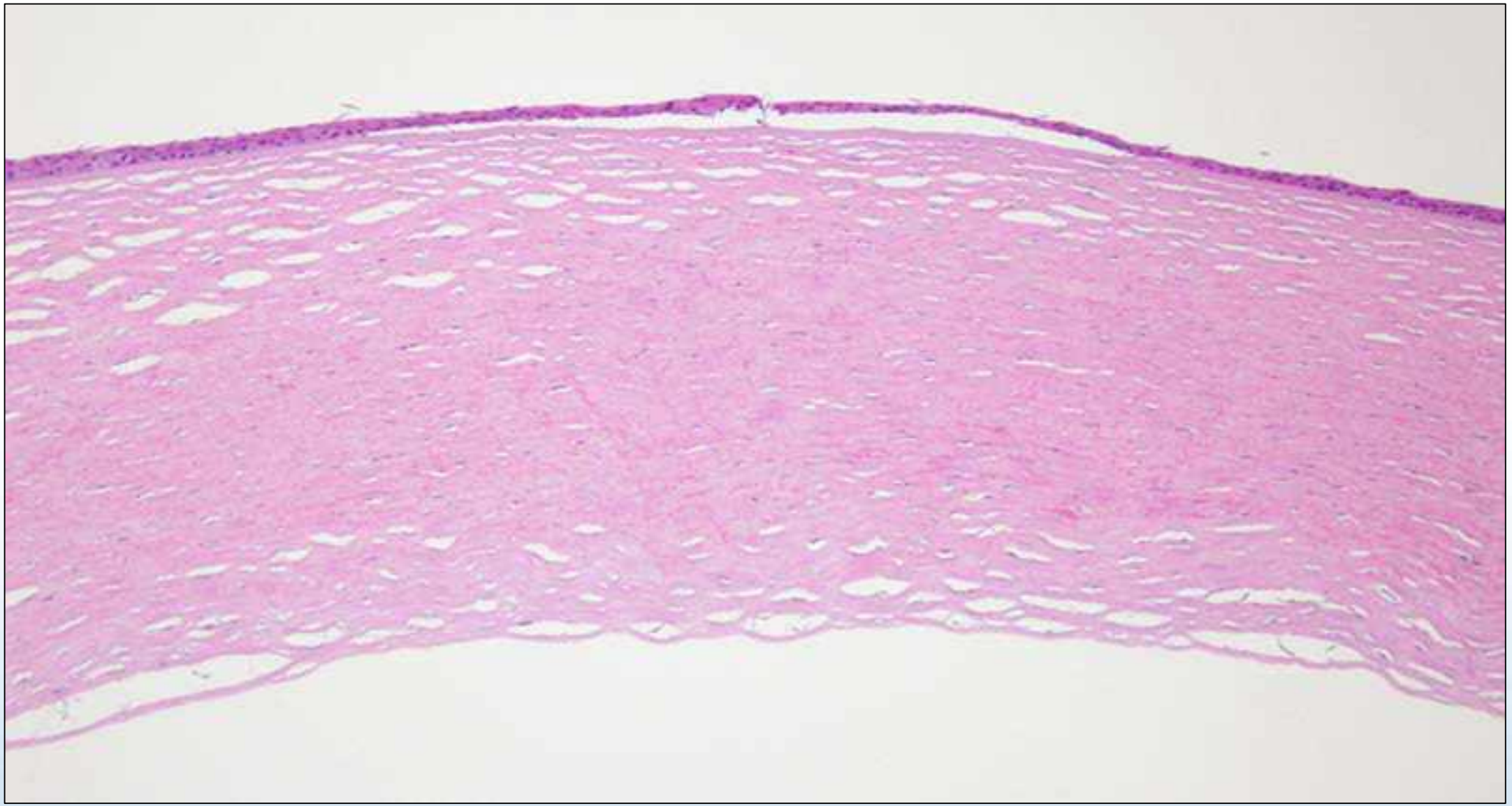


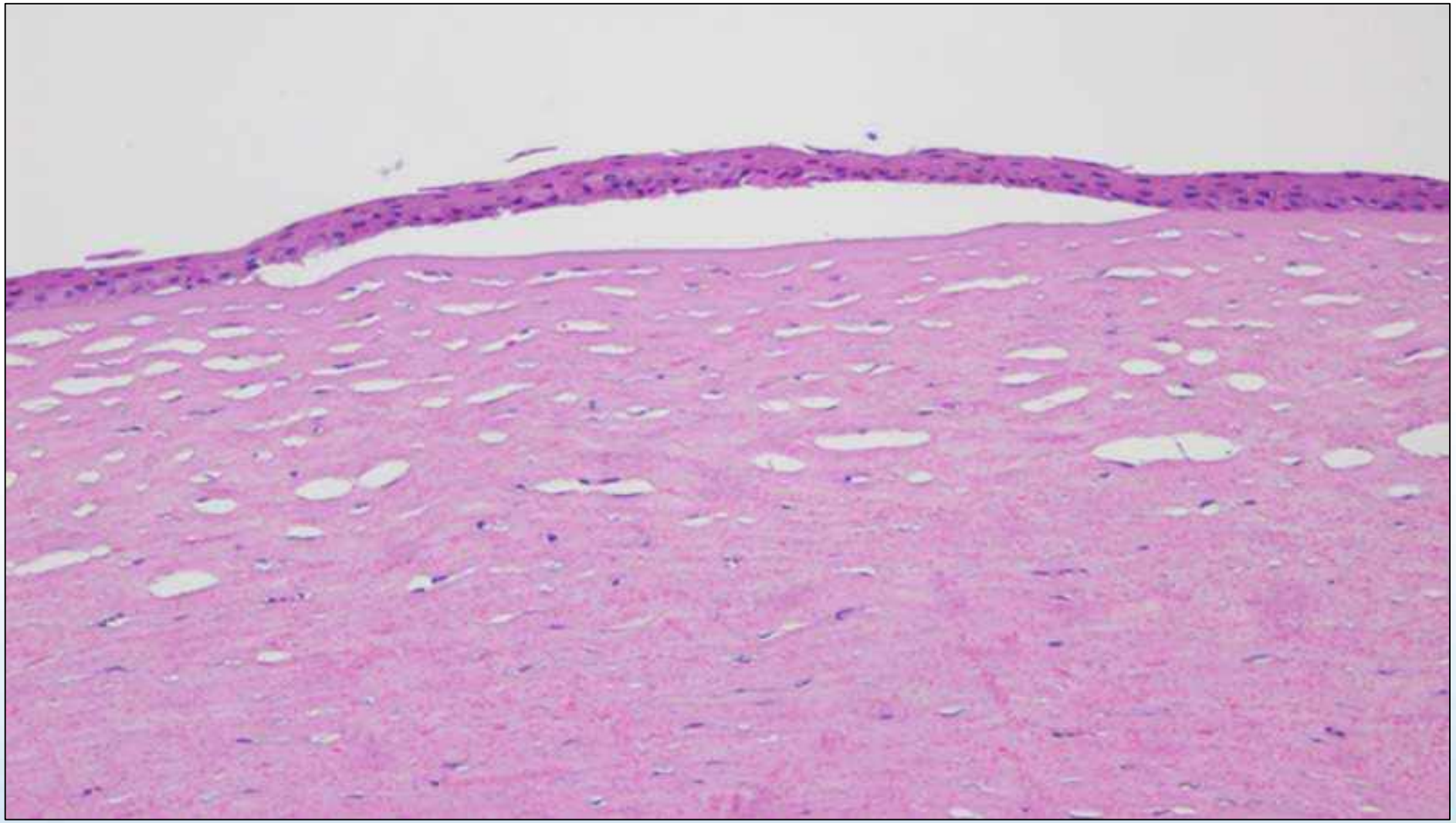




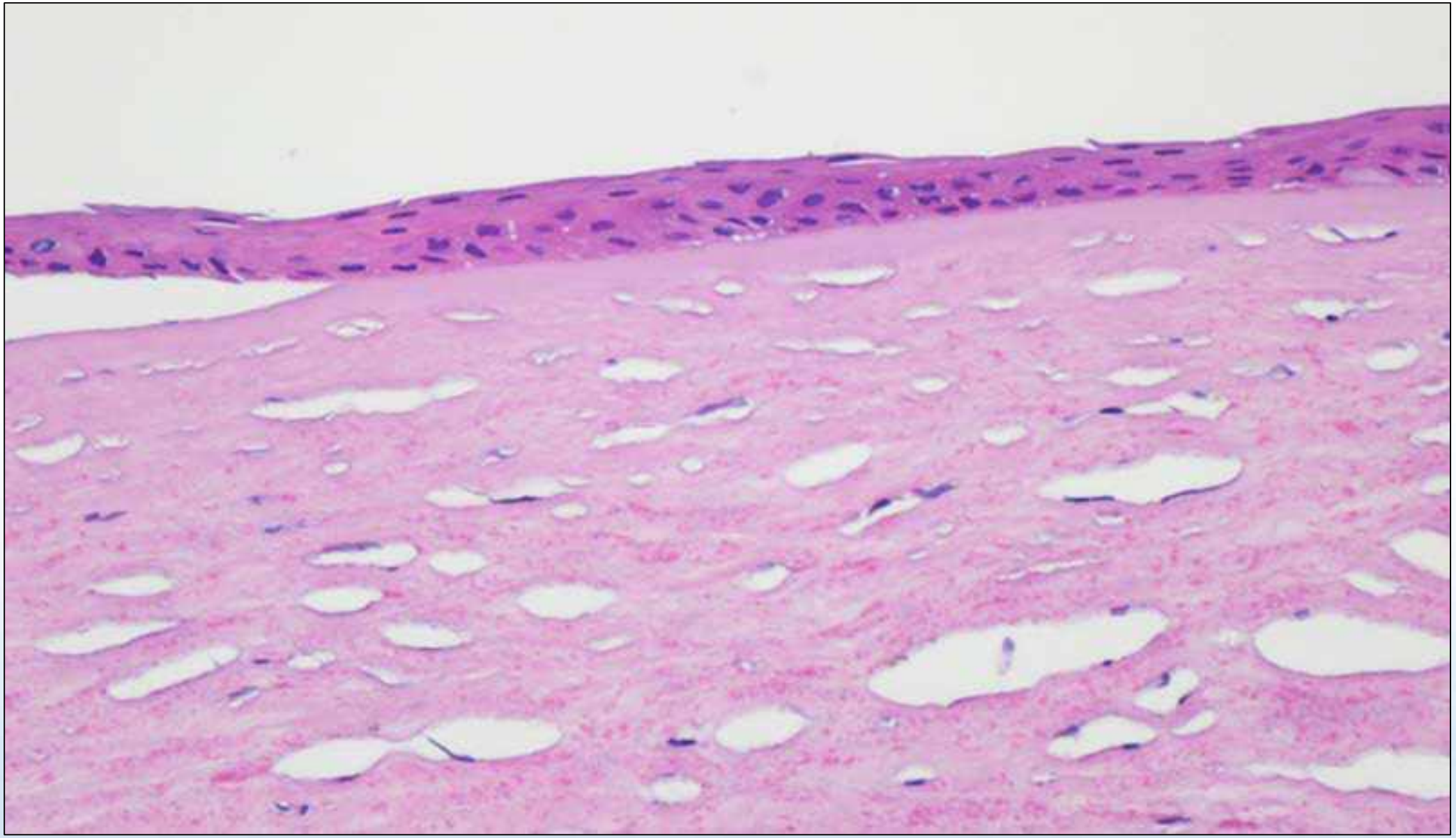
Hyphema



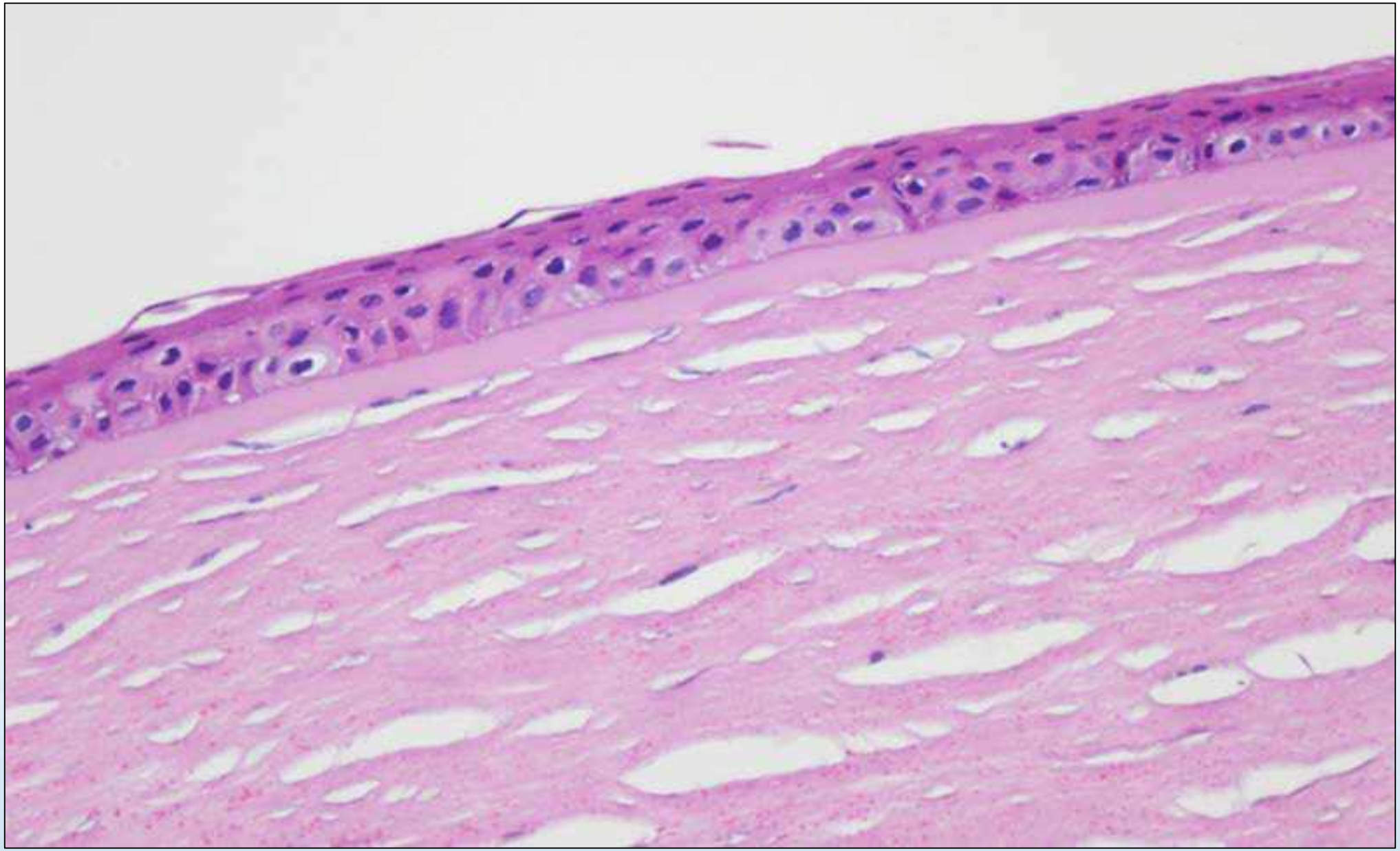




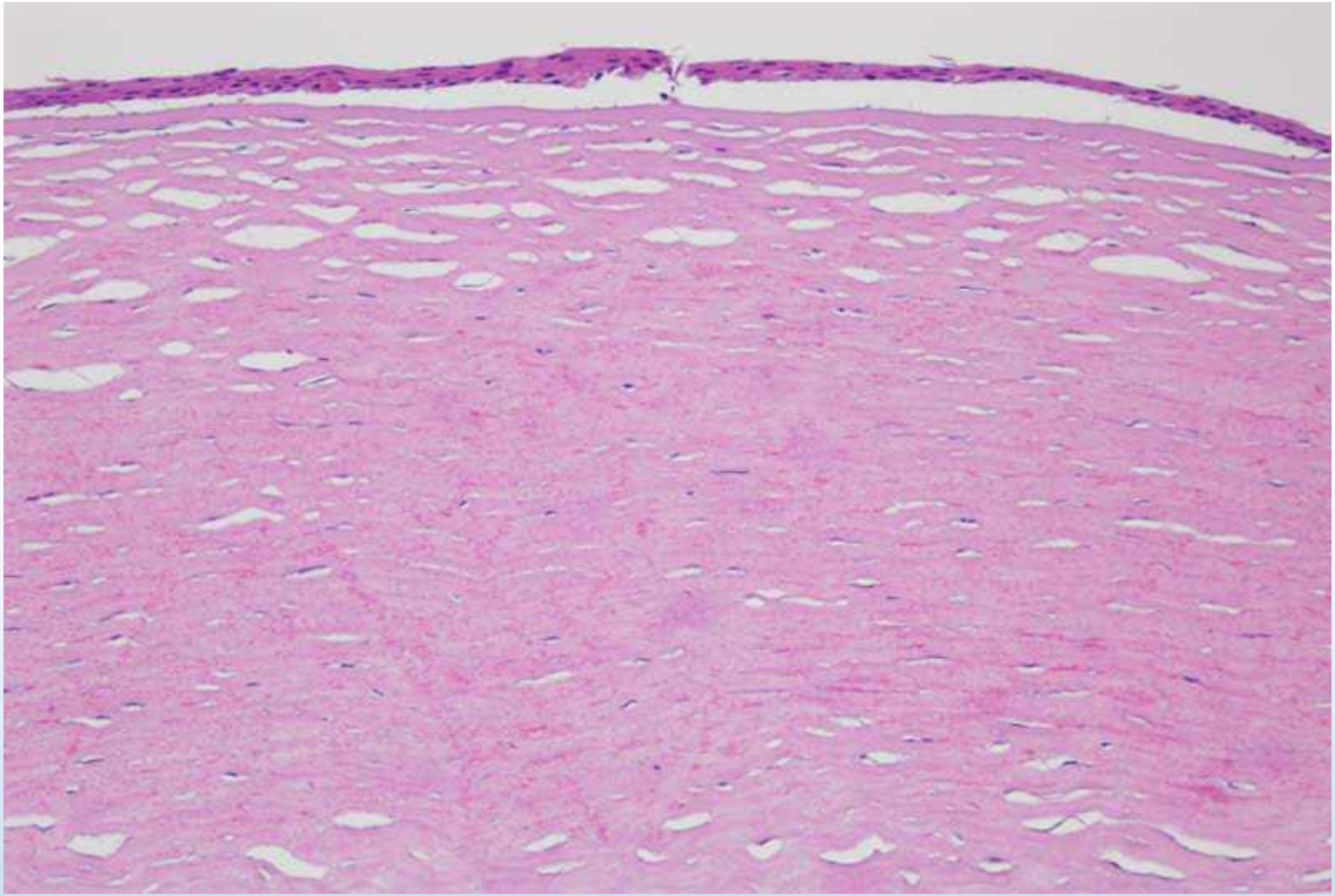
Bullae AANP



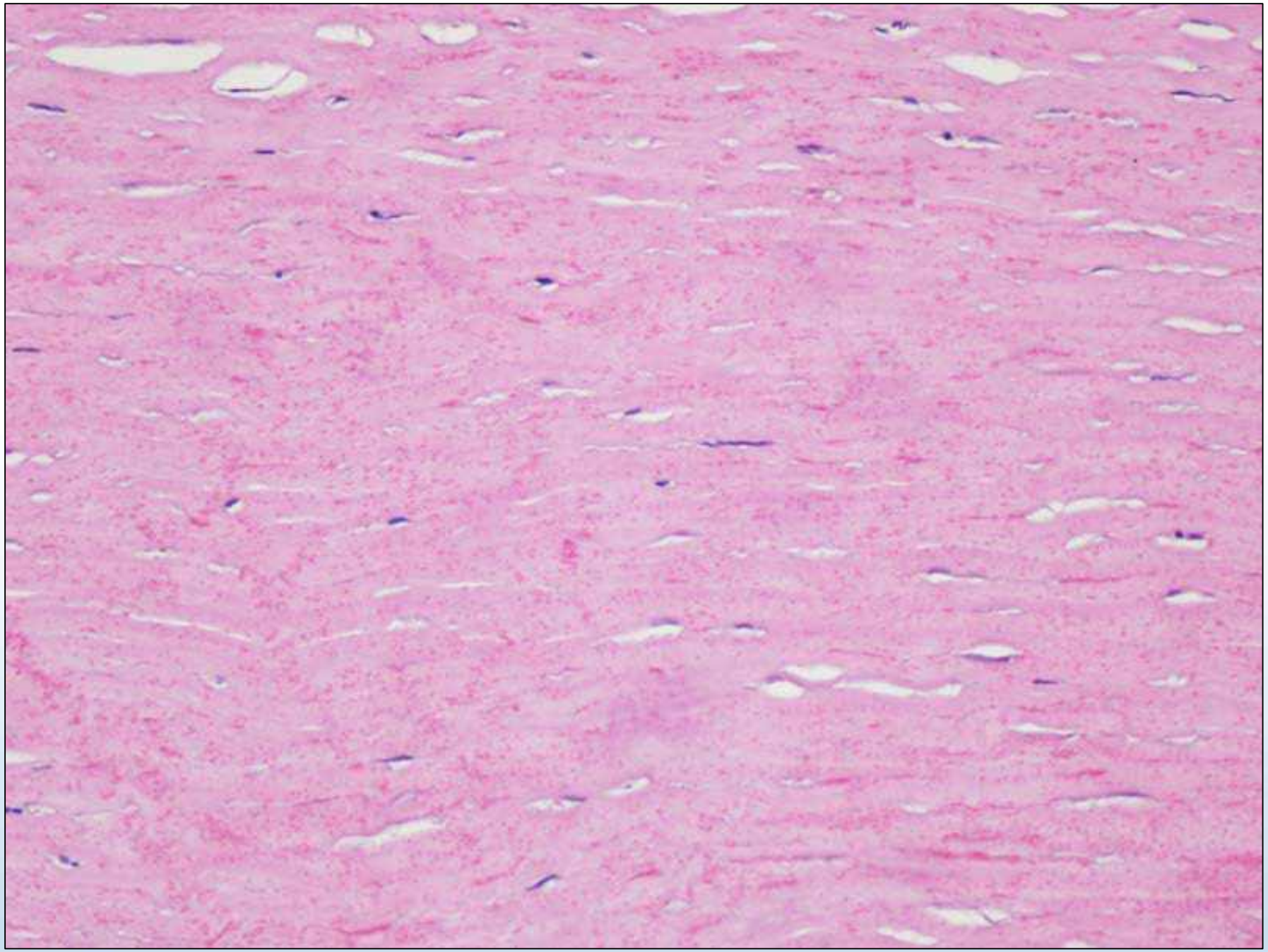
Subepithelial vacuoles

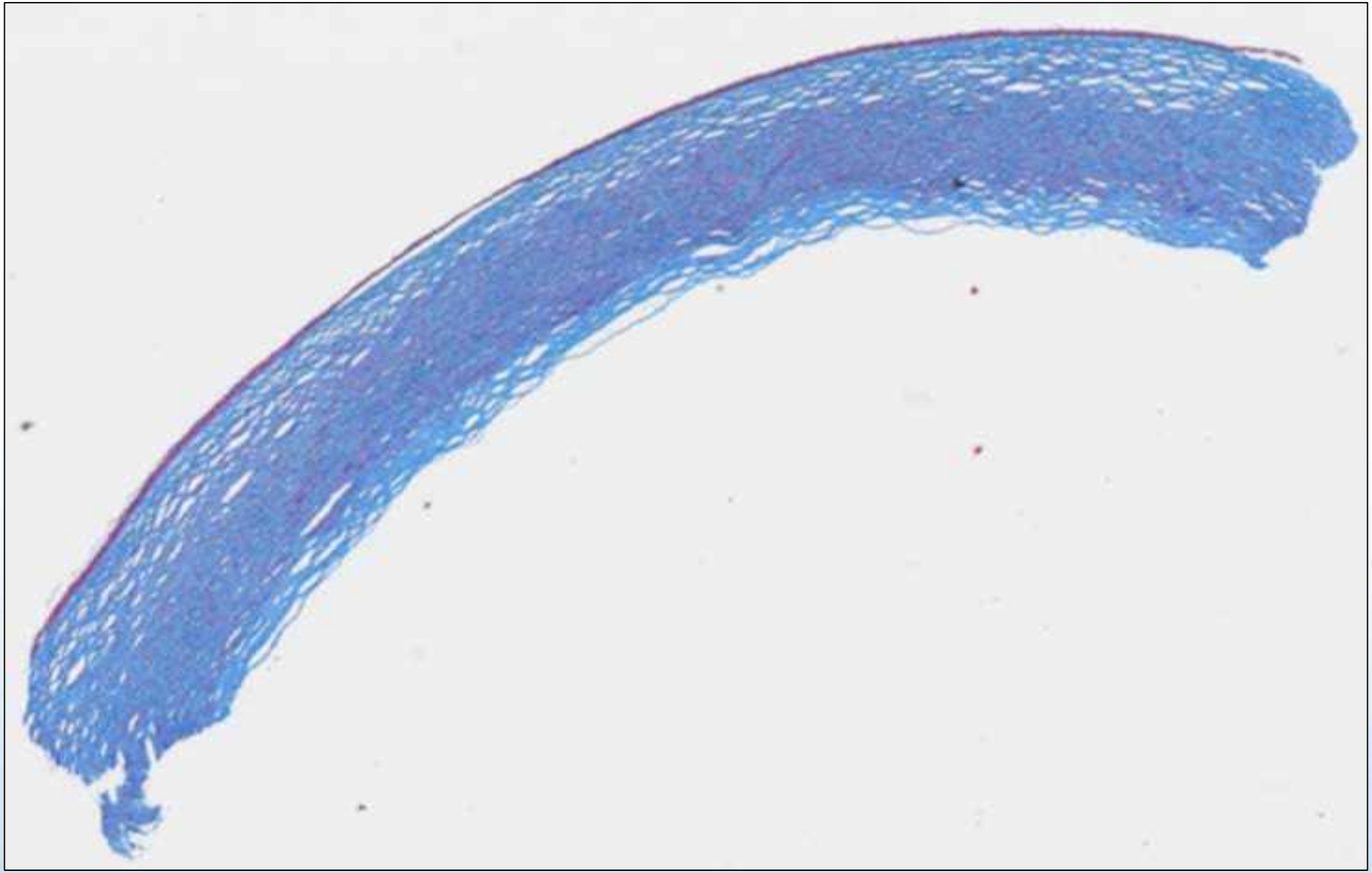


Hydropic change

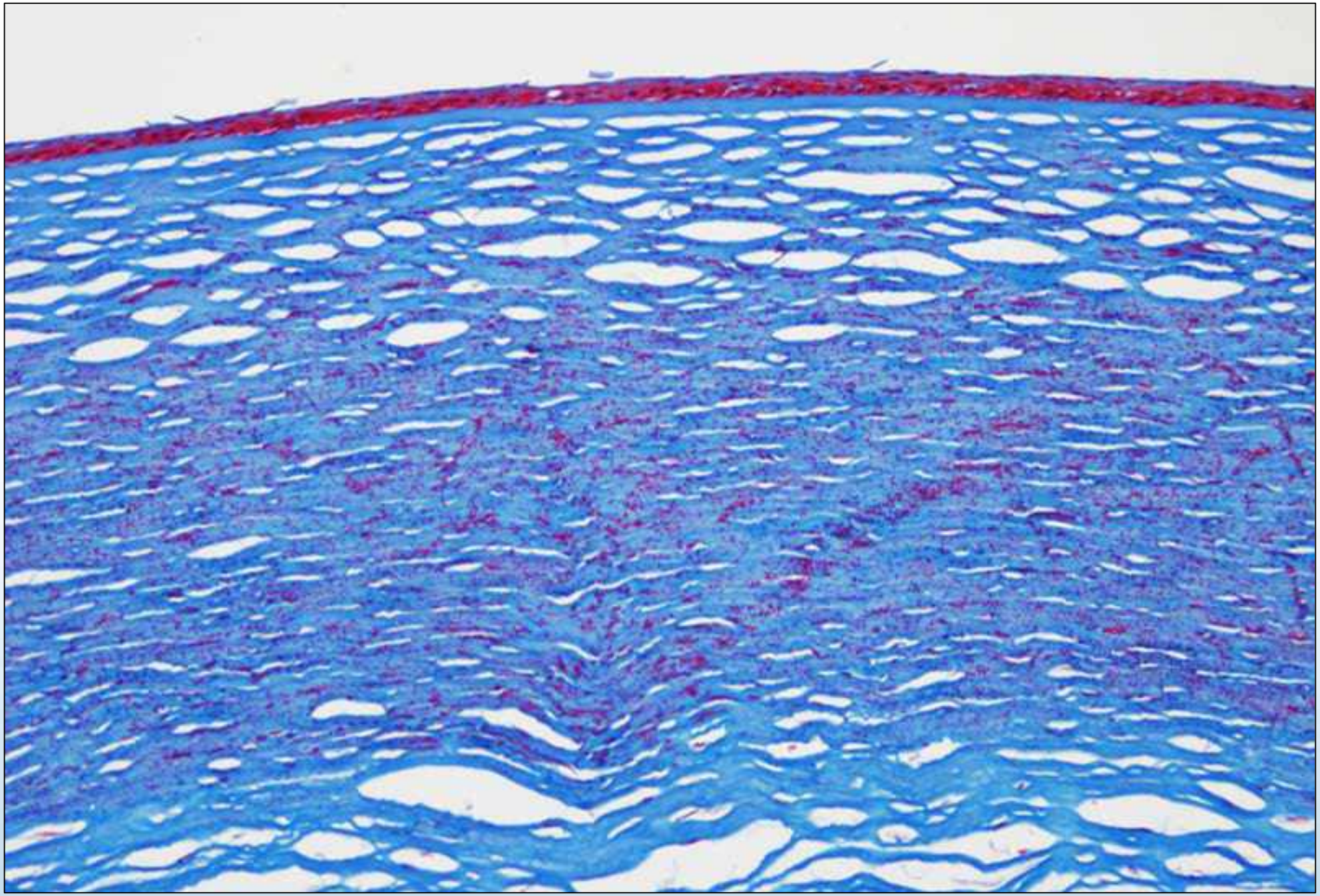


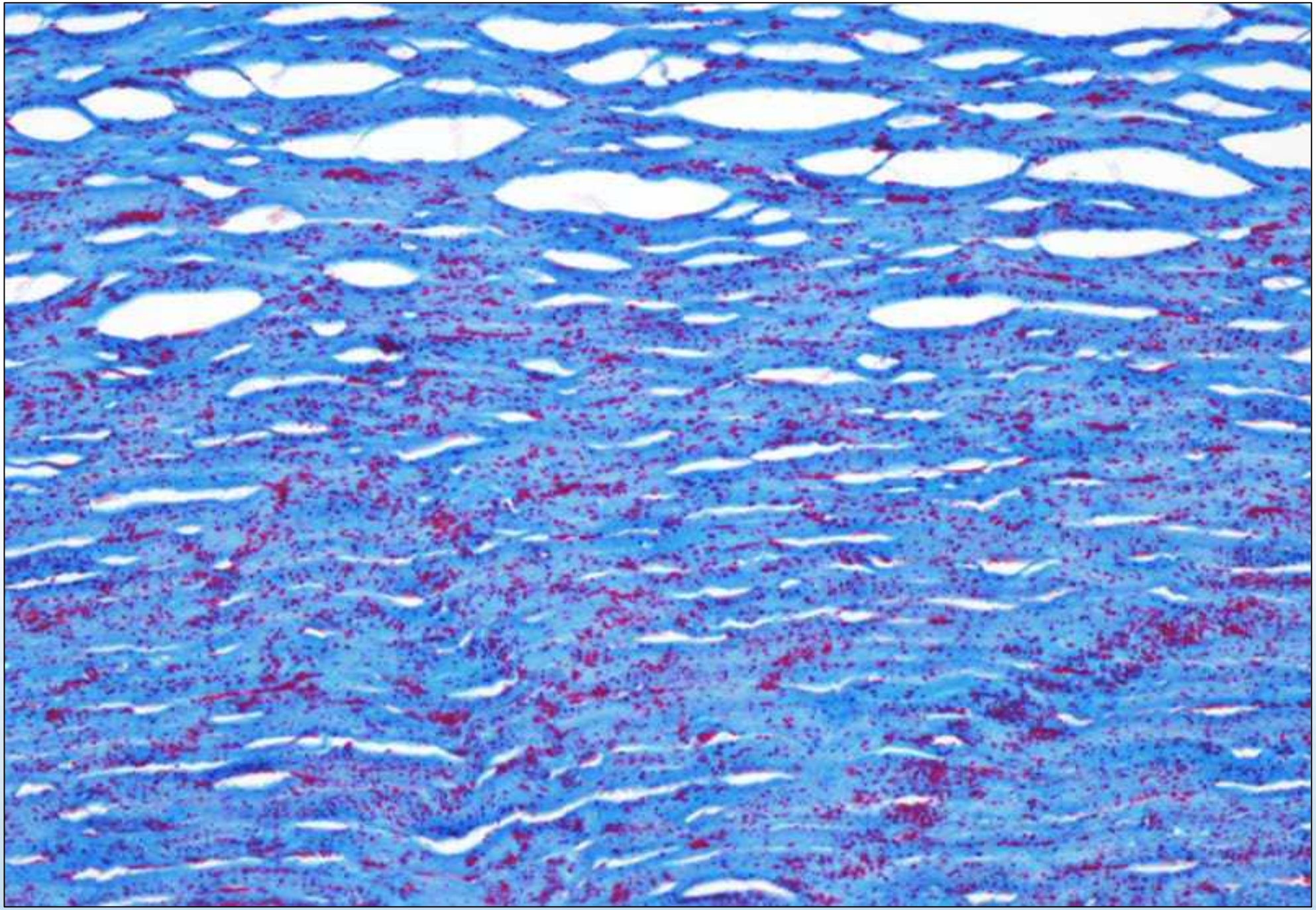
Degenerating RBCs

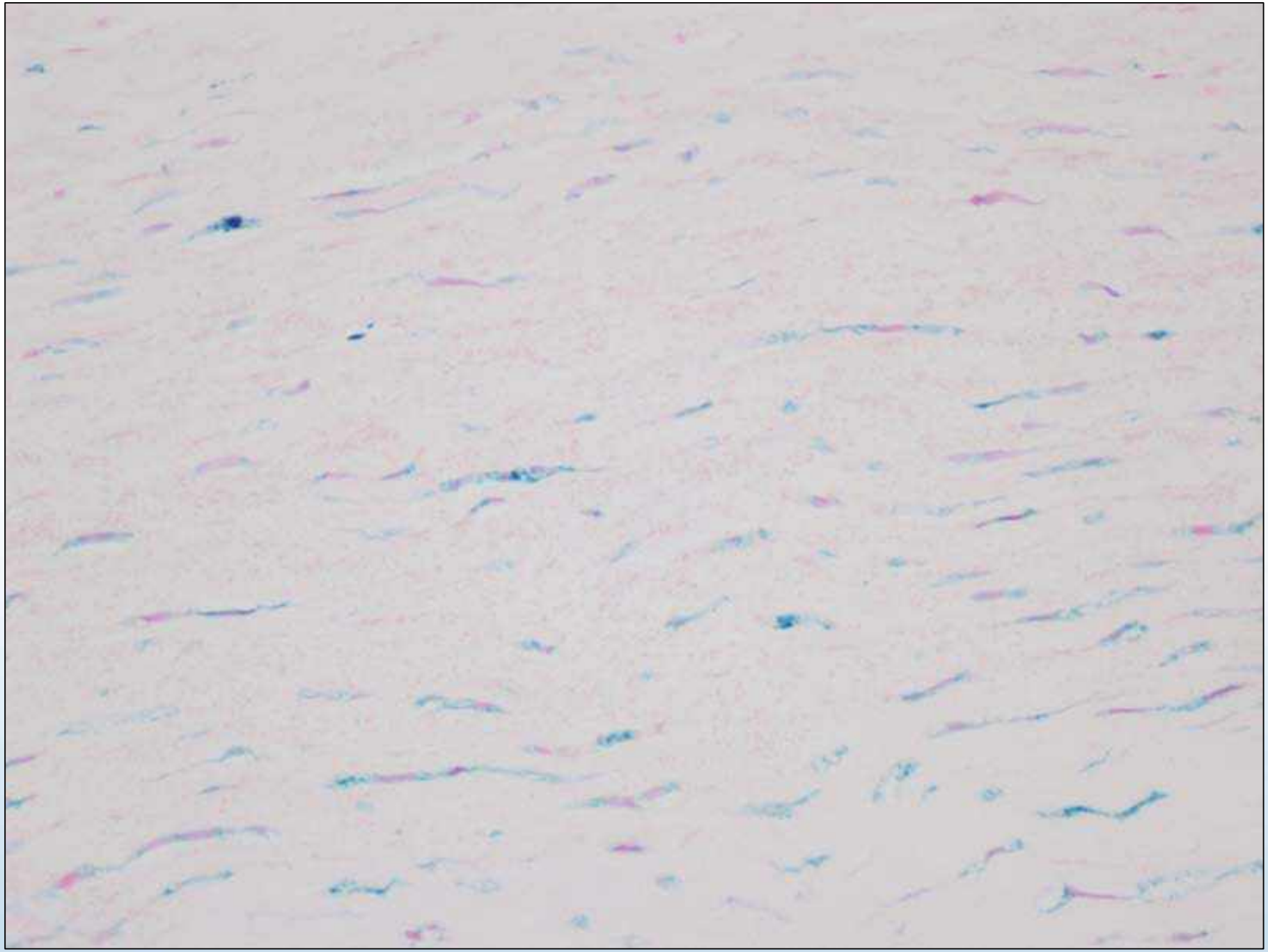




Trichrome







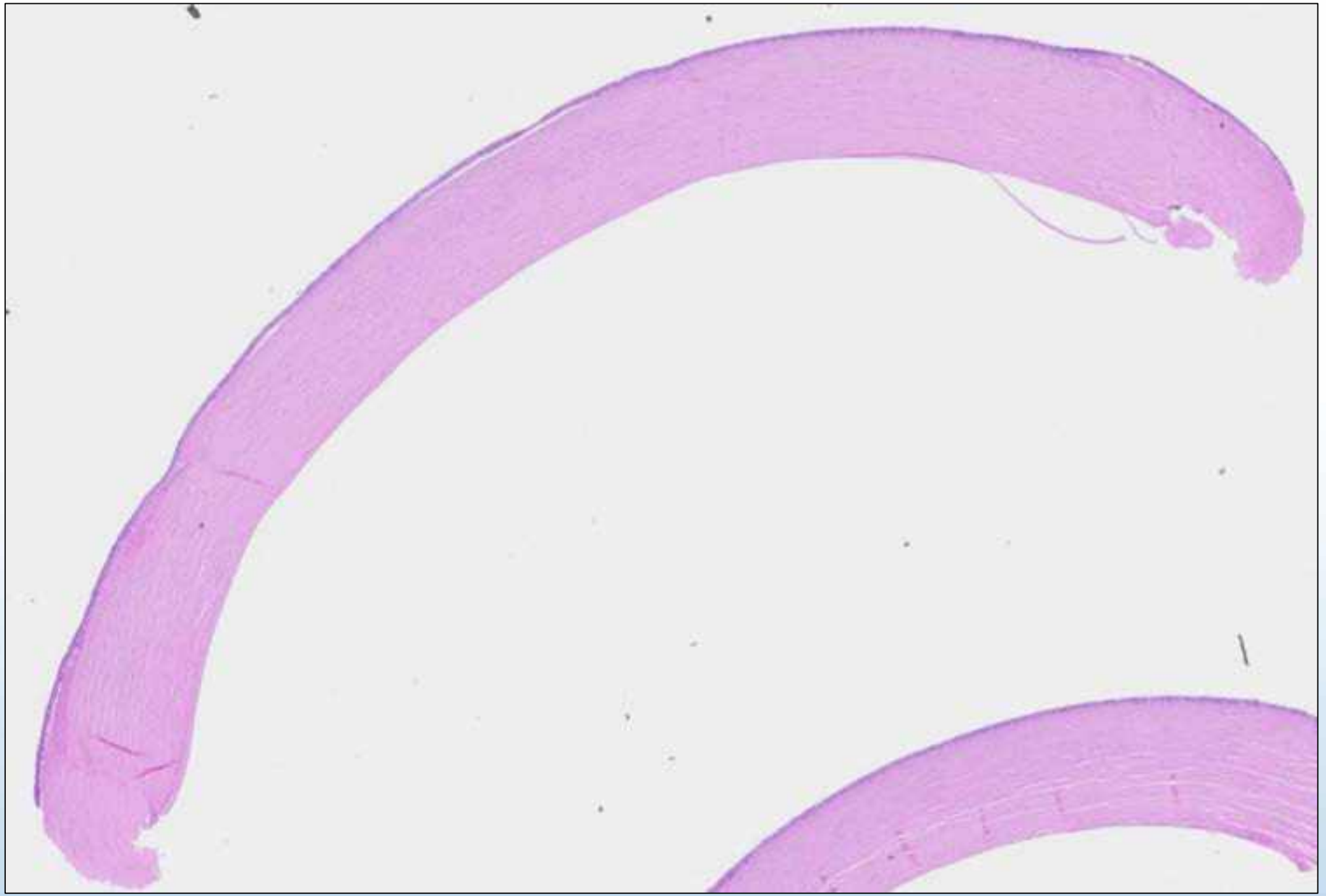
Iron stain

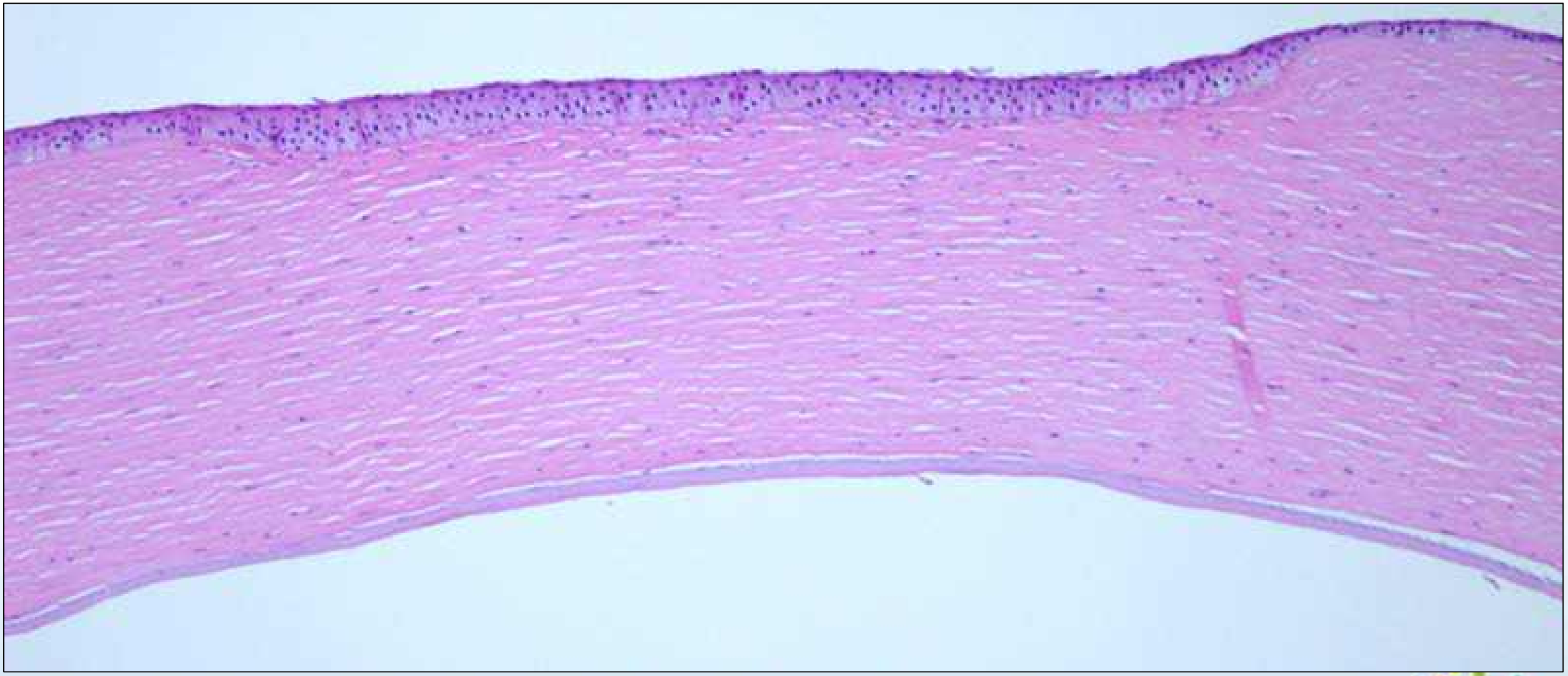
Hyphema

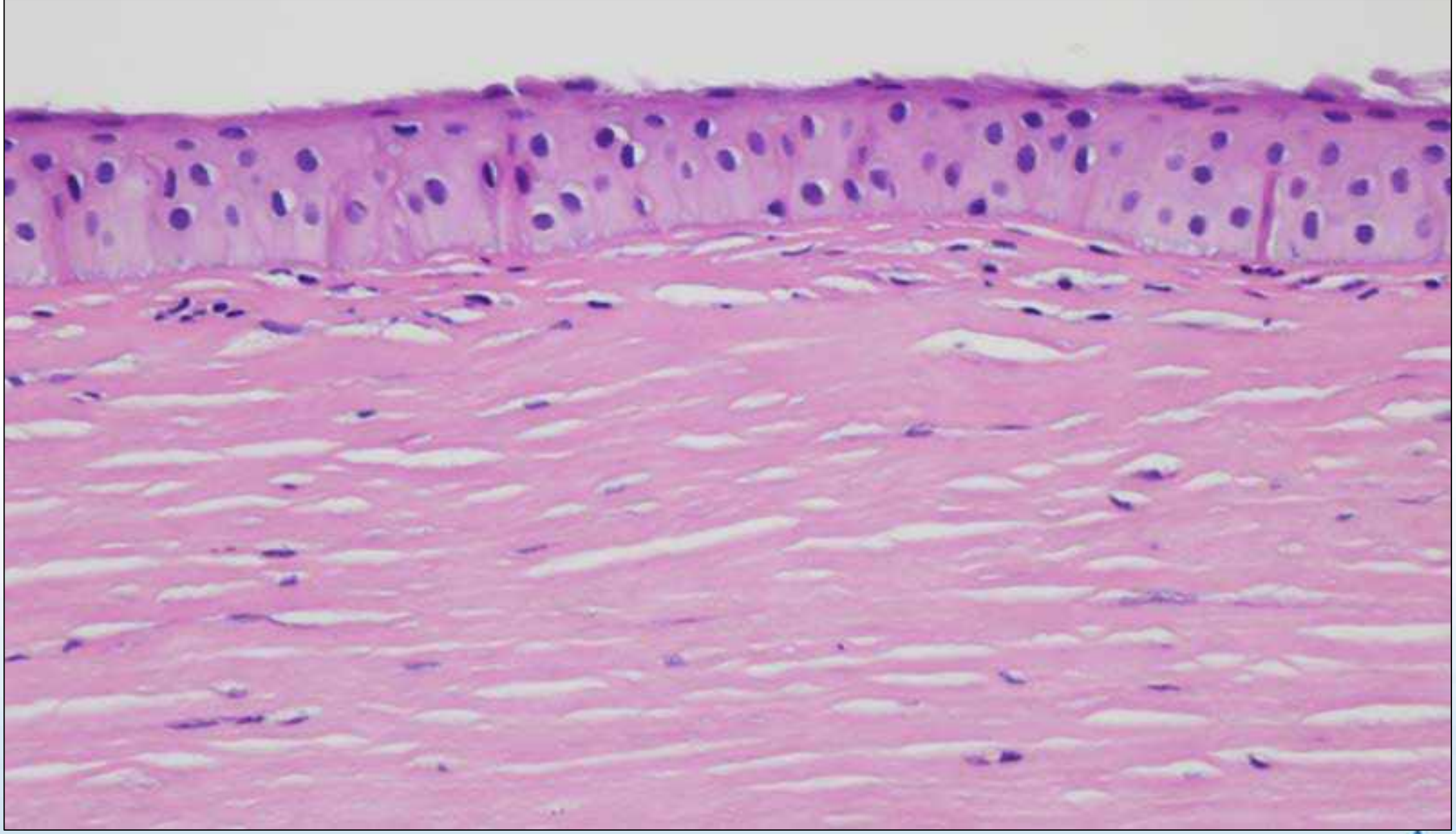
- High IOP can cause blood staining of the cornea
- Can occur at normal IOP if the endothelium is damaged
- Blood cells break into hemoglobin particles

Gottsch JD et al. Arch Ophthalmol 1989;107:1497-500
Fraser C. Et. Al. Spontaneous resolution of corneal blood staining. Clin Experiment Ophthalmol 2006; 34: 279-80.

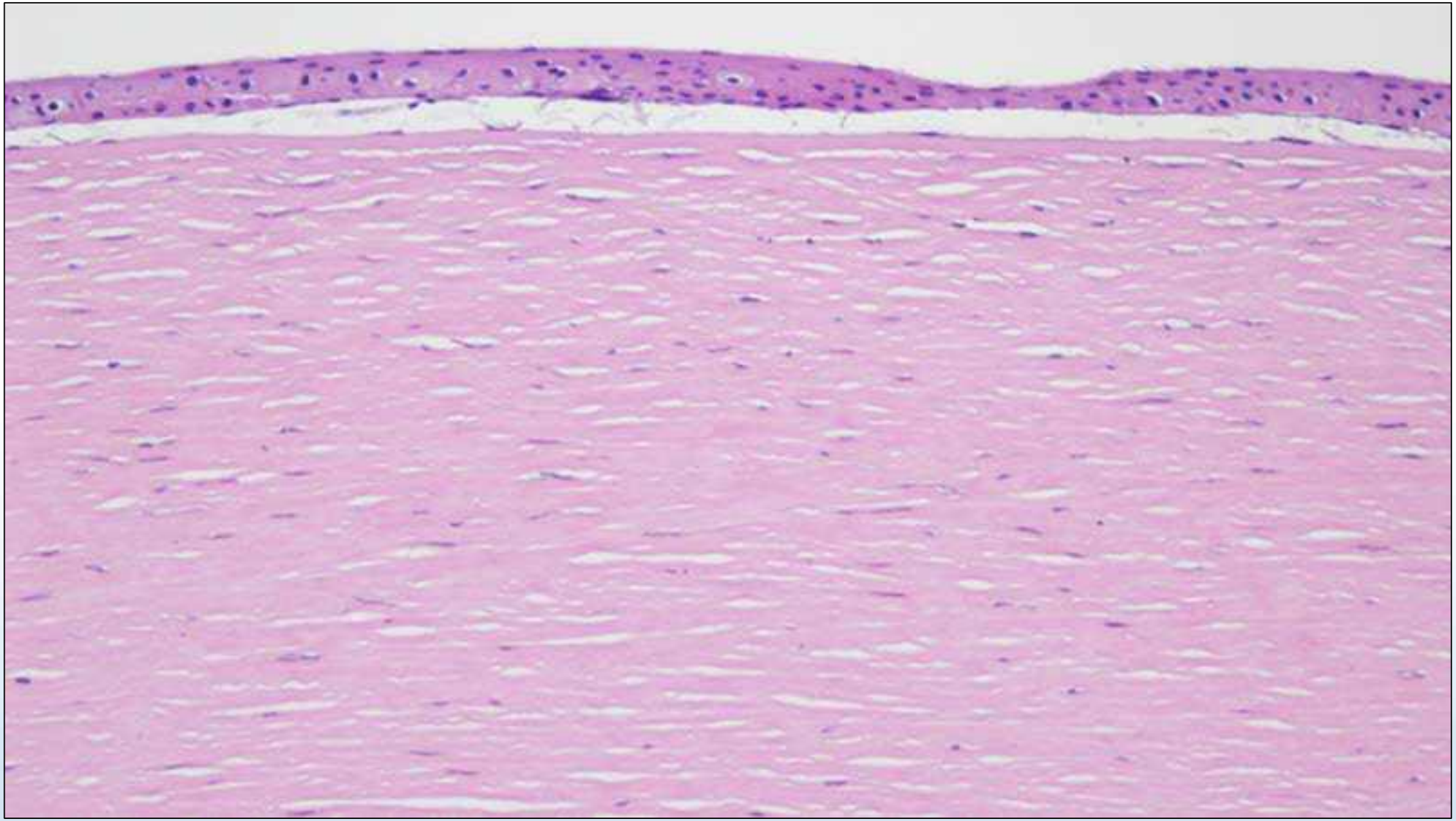
BULLOUS KERATOPATHY



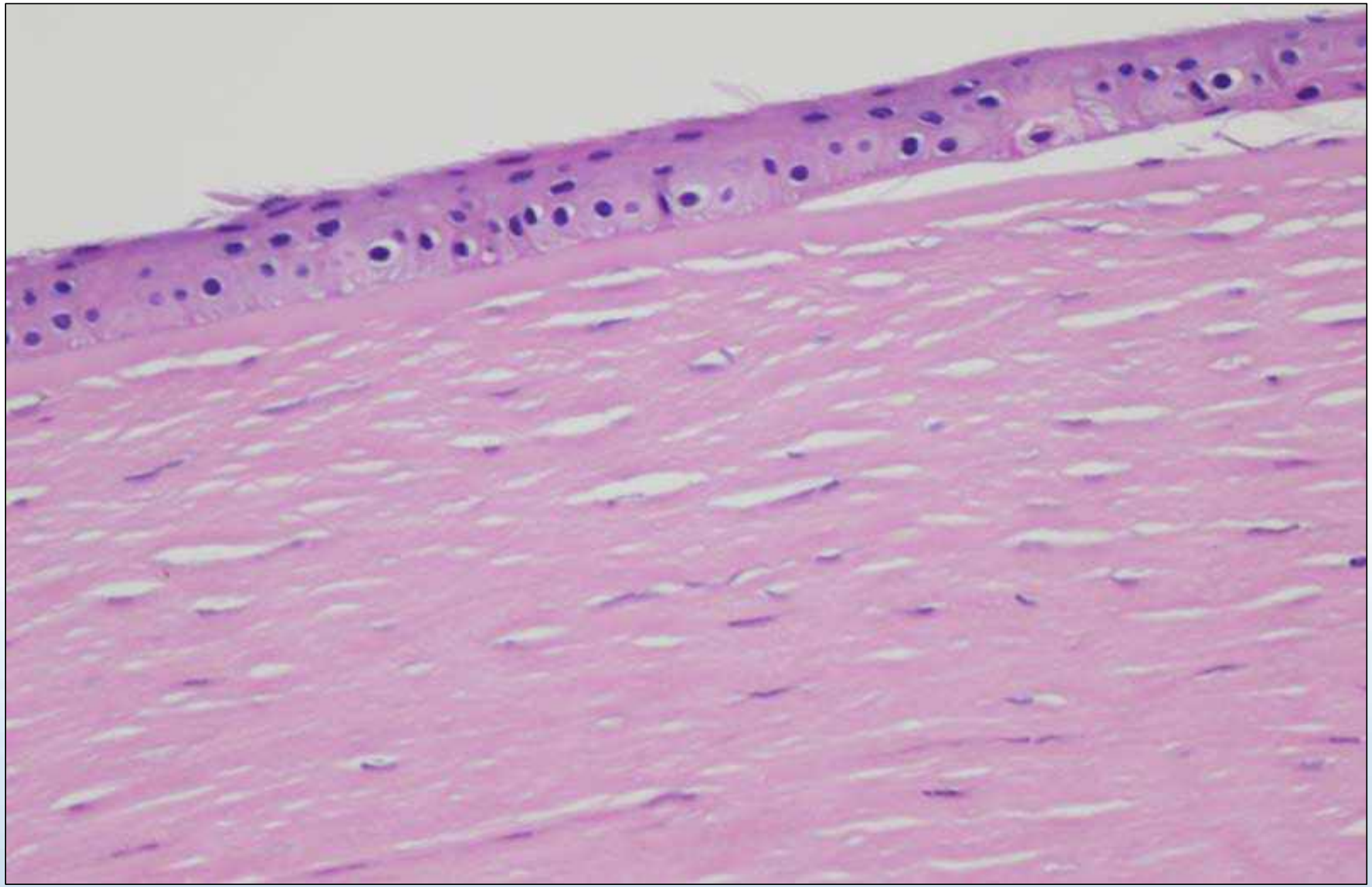




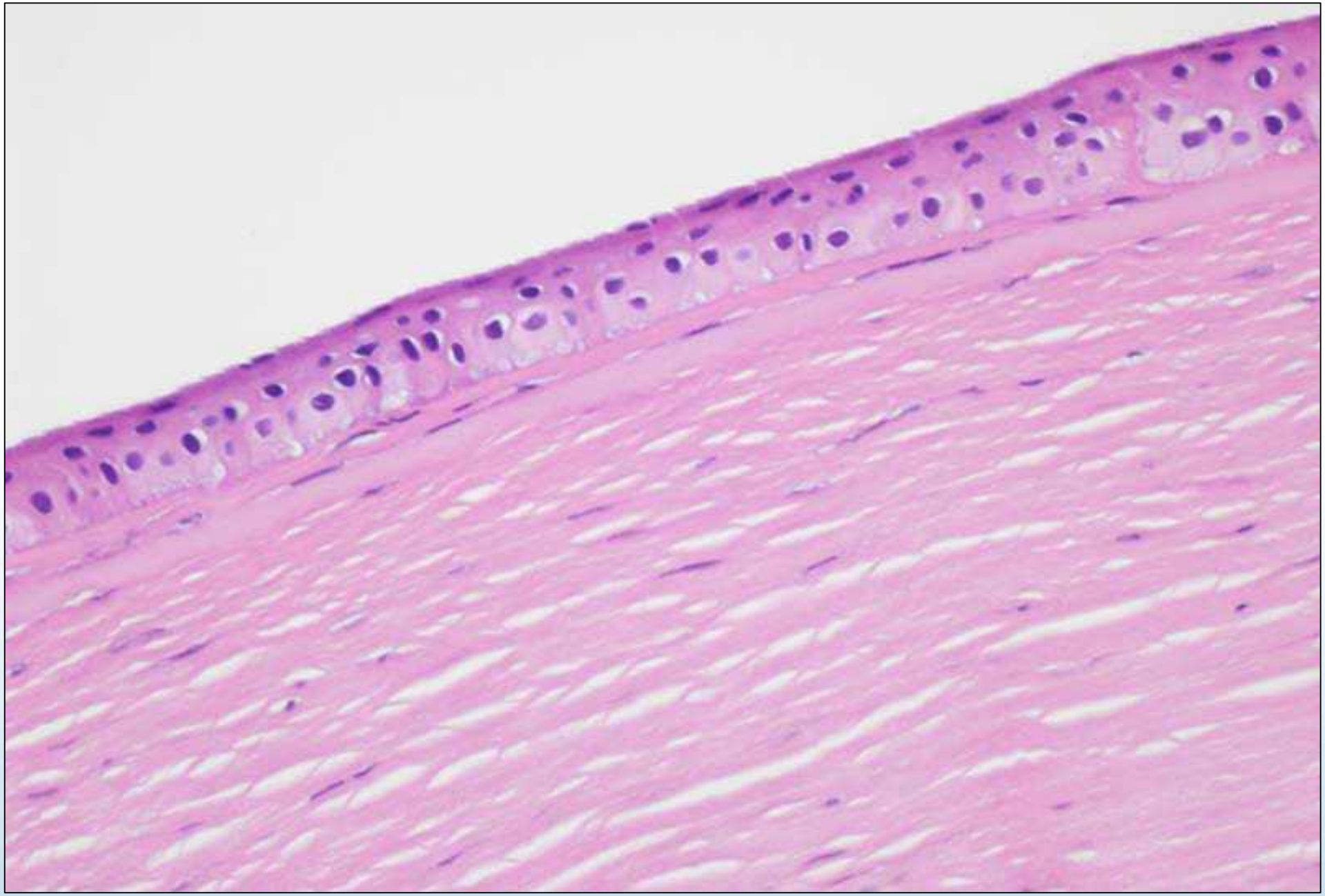
Loss of Bowman's layer



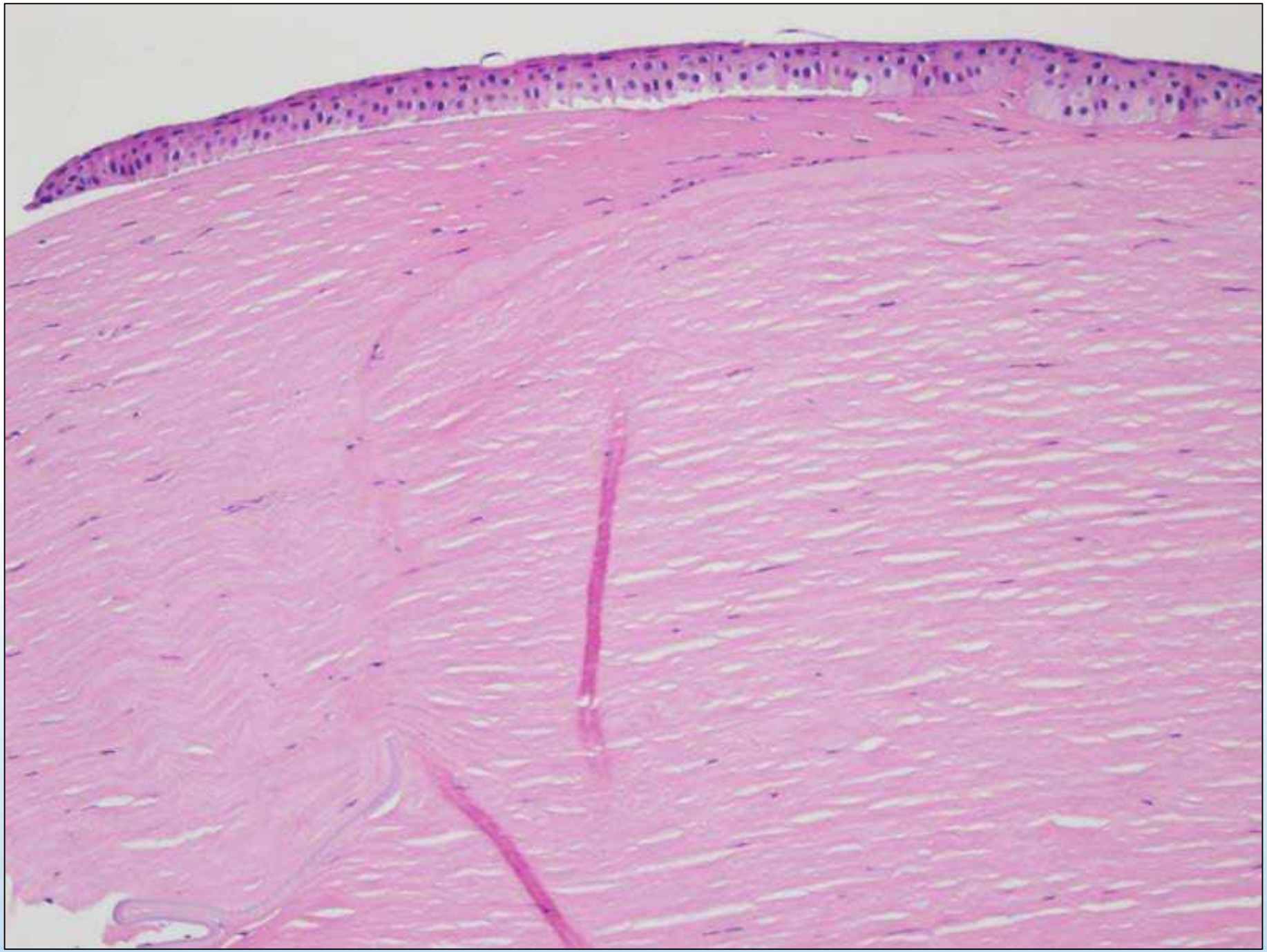
Subepithelial bullae



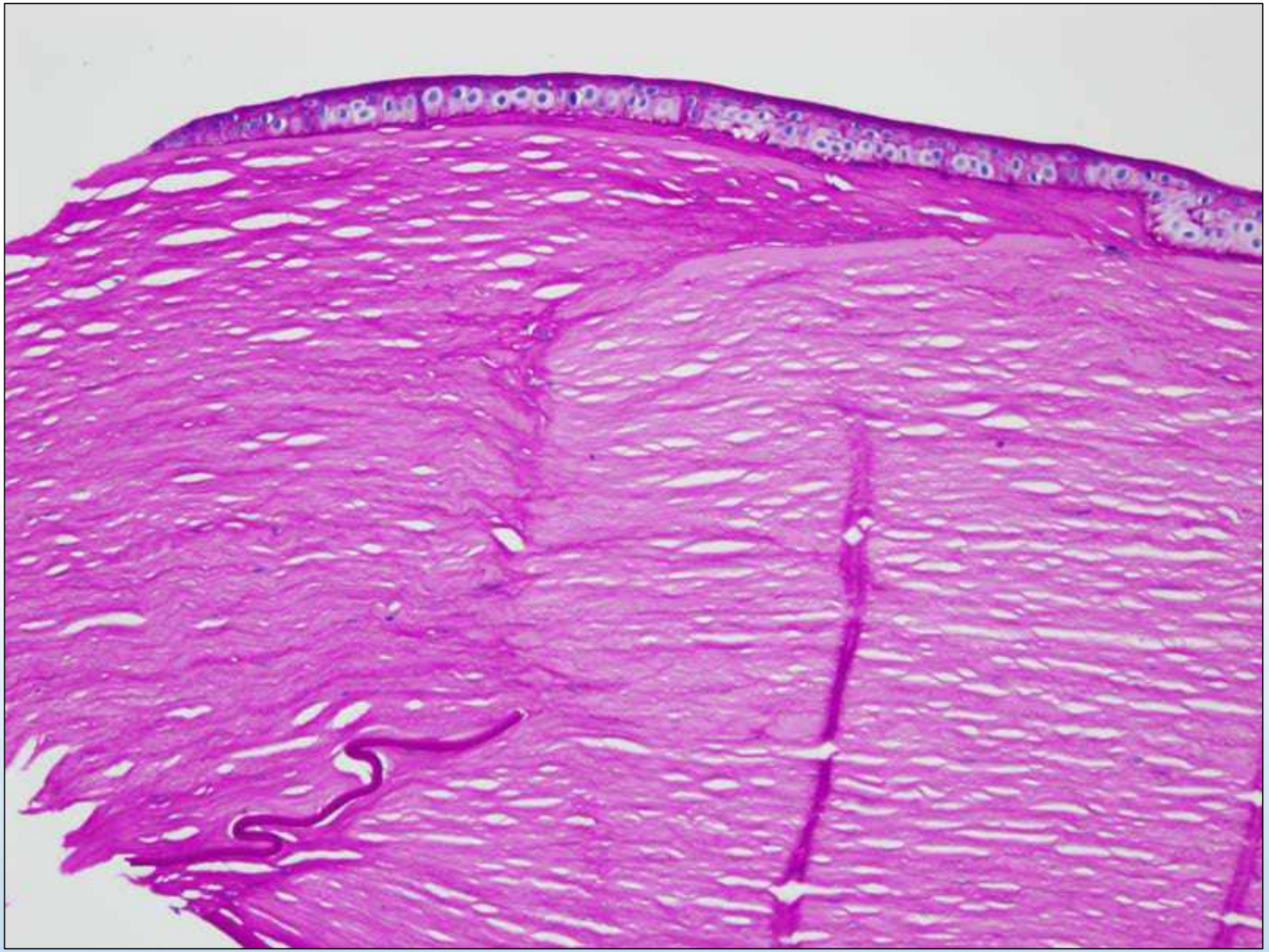
Epithelial basal cell hydropic change



Subepithelial fibrous pannus



Surgical changes

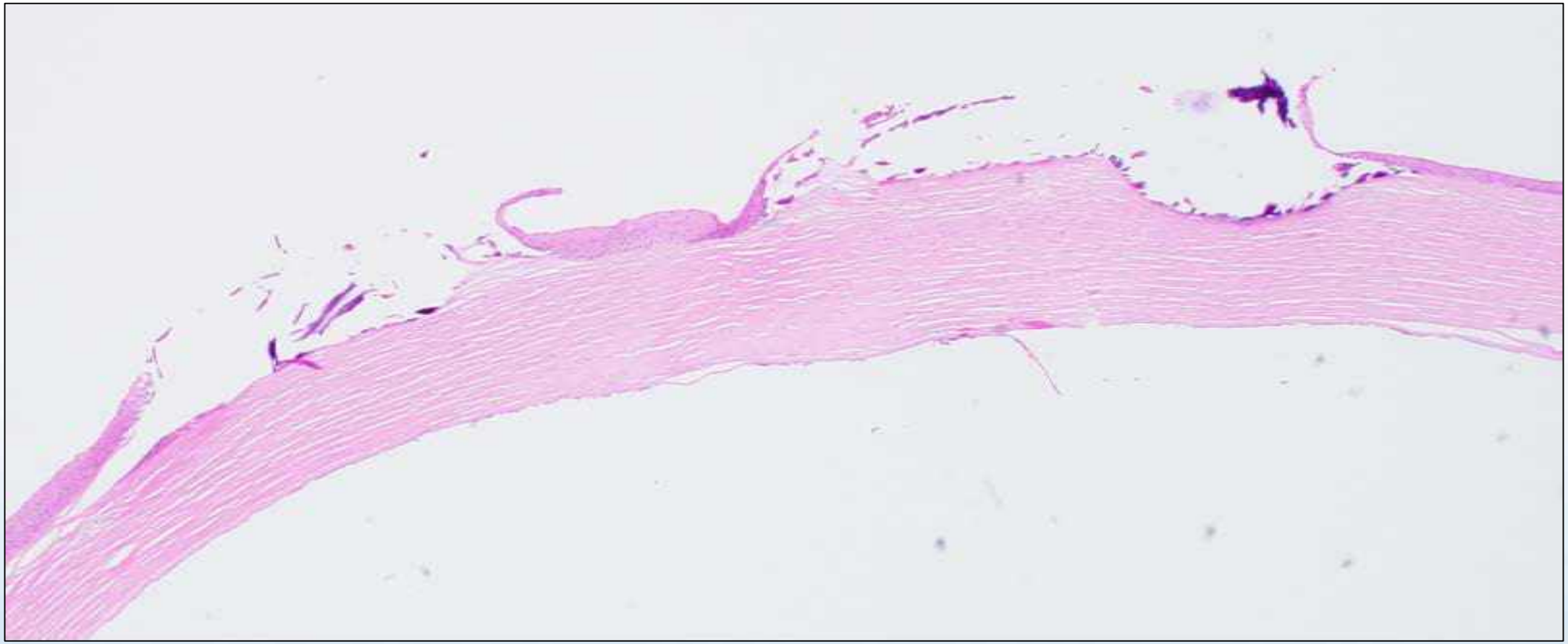


PAS

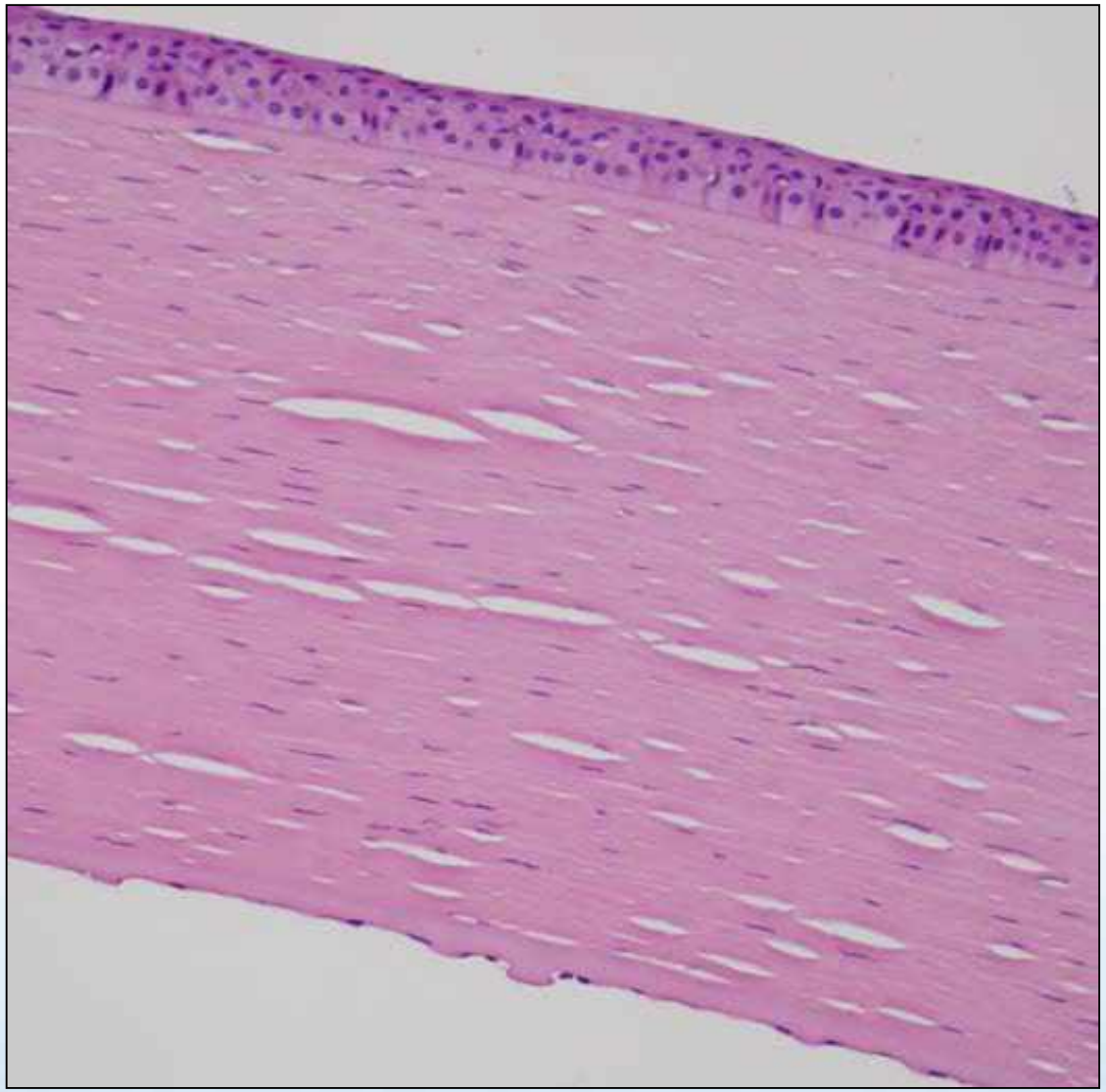
Bullous Keratopathy

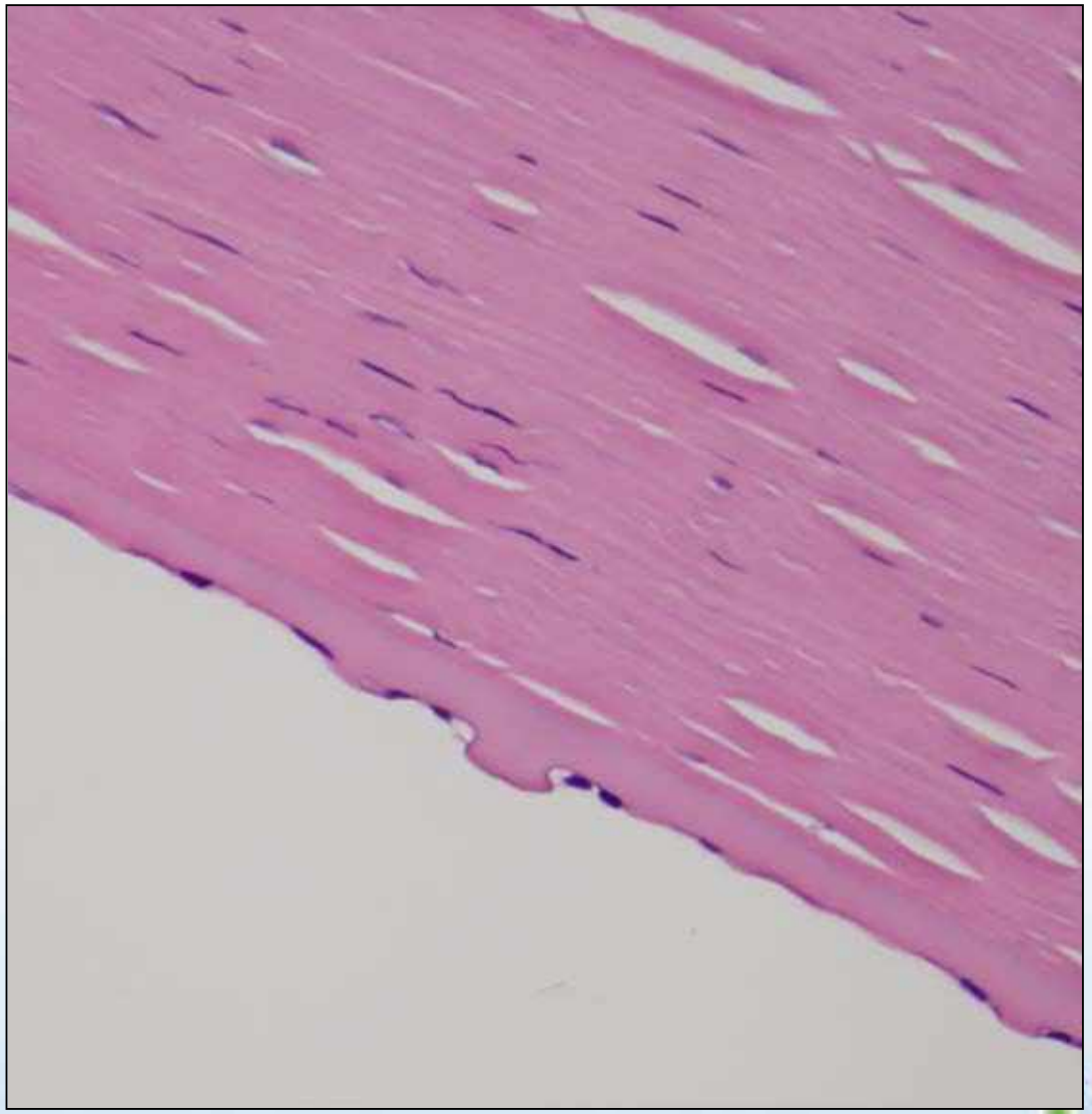
- End result of persistent corneal edema
- Often caused by failure of corneal endothelium
  - Abnormal cell function
  - Decreased number of cells
- Seen following cataract surgery

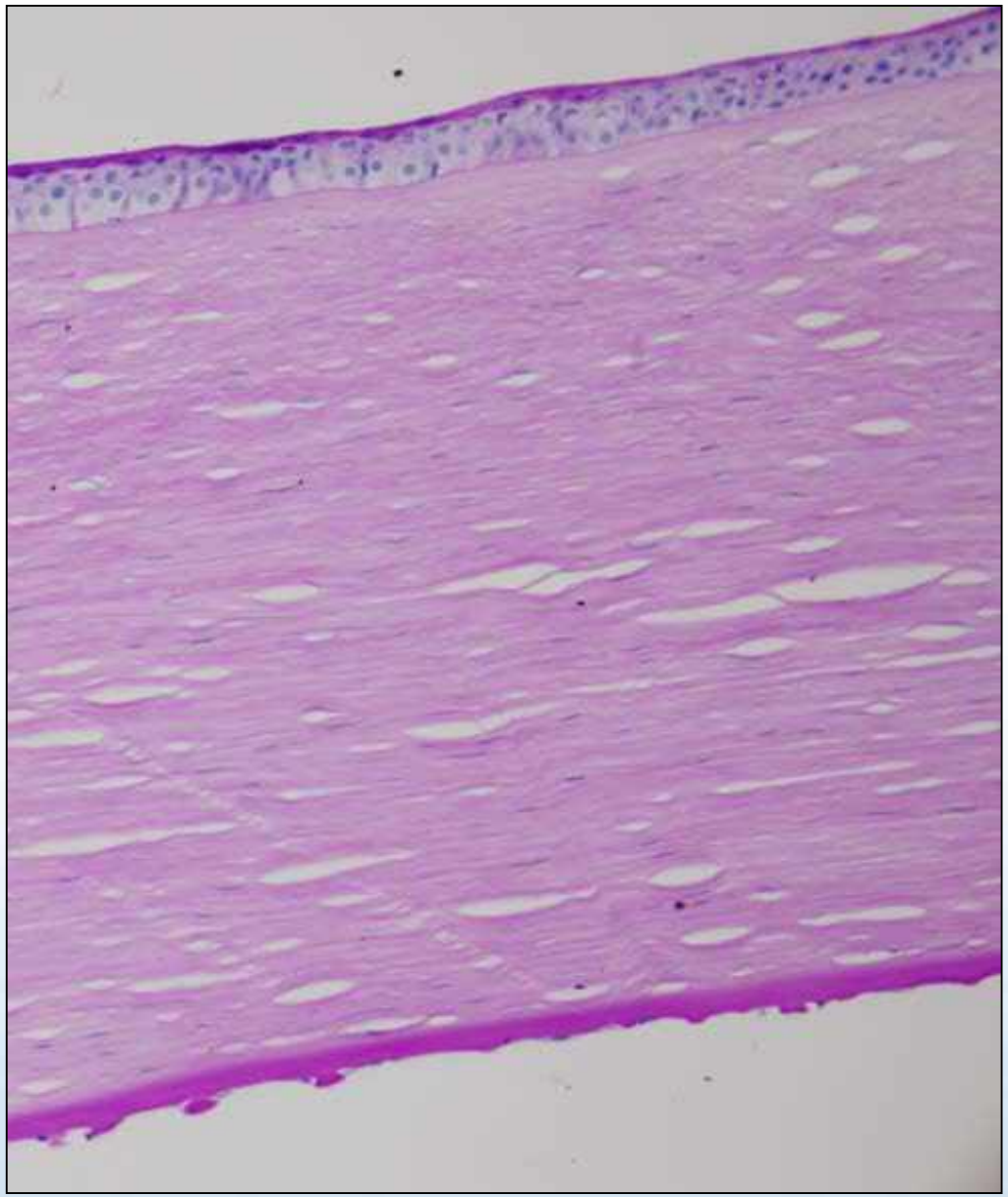
Calcific Band Keratopathy

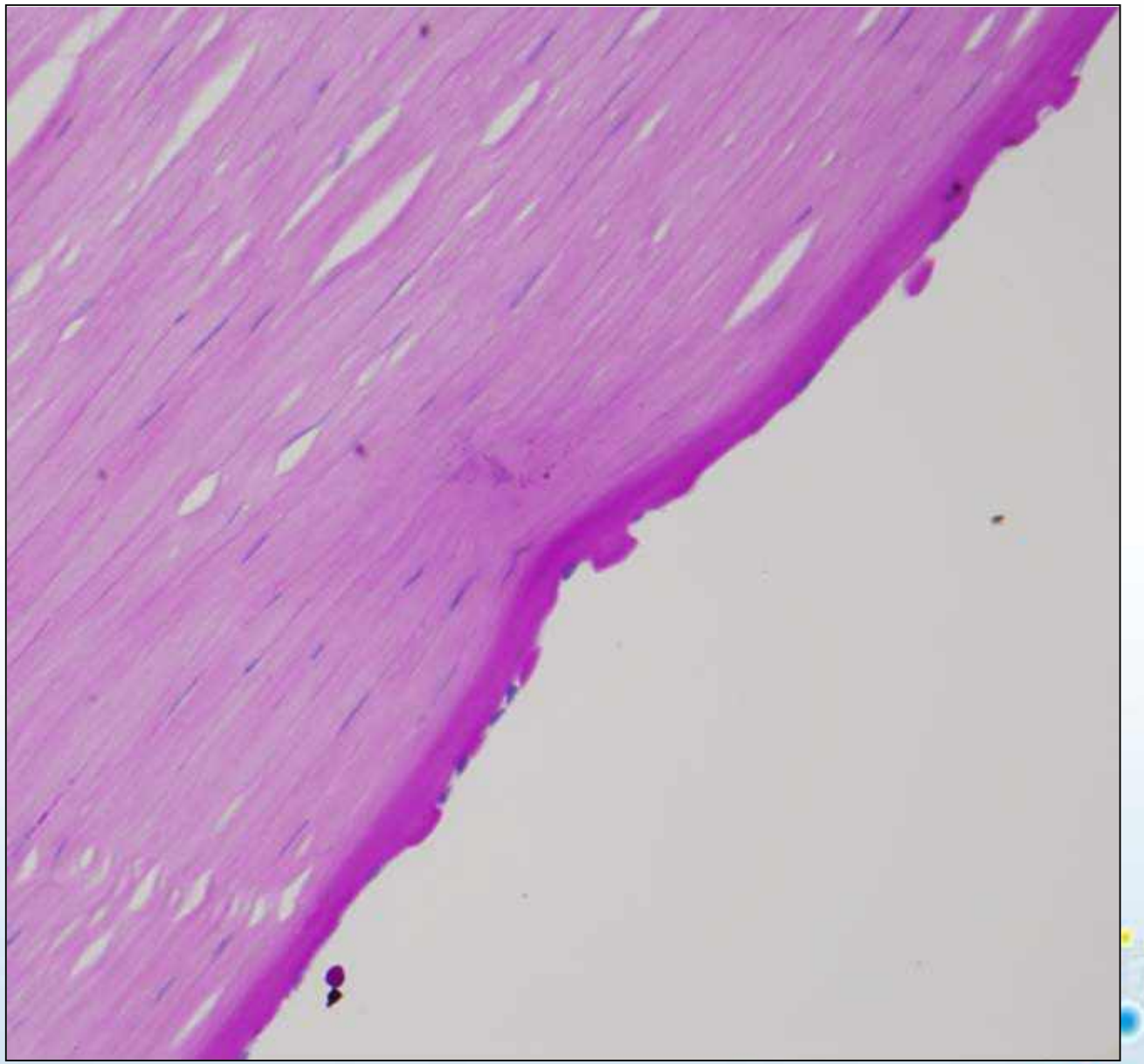


FUCHS DYSTROPHY

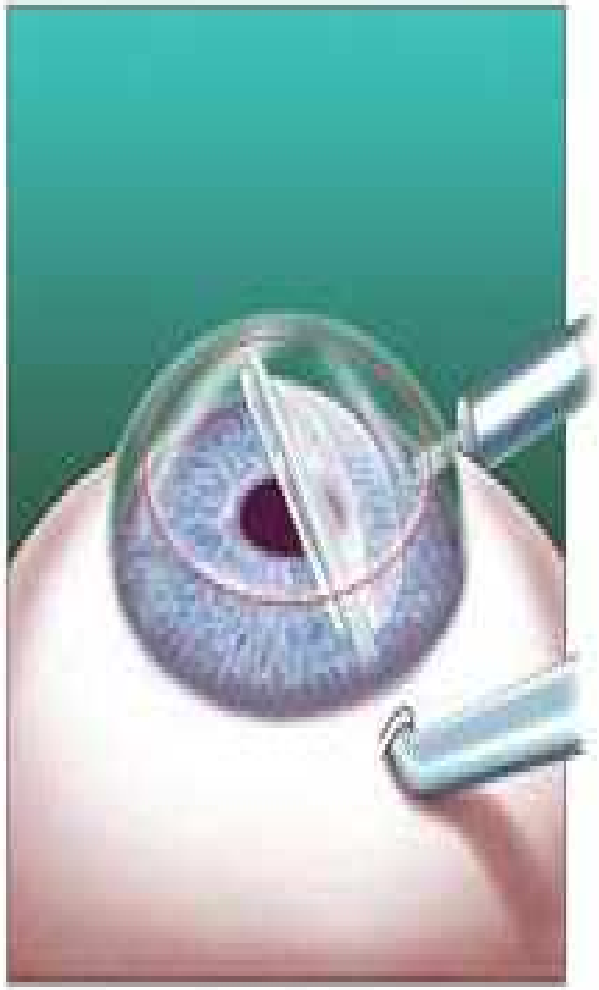


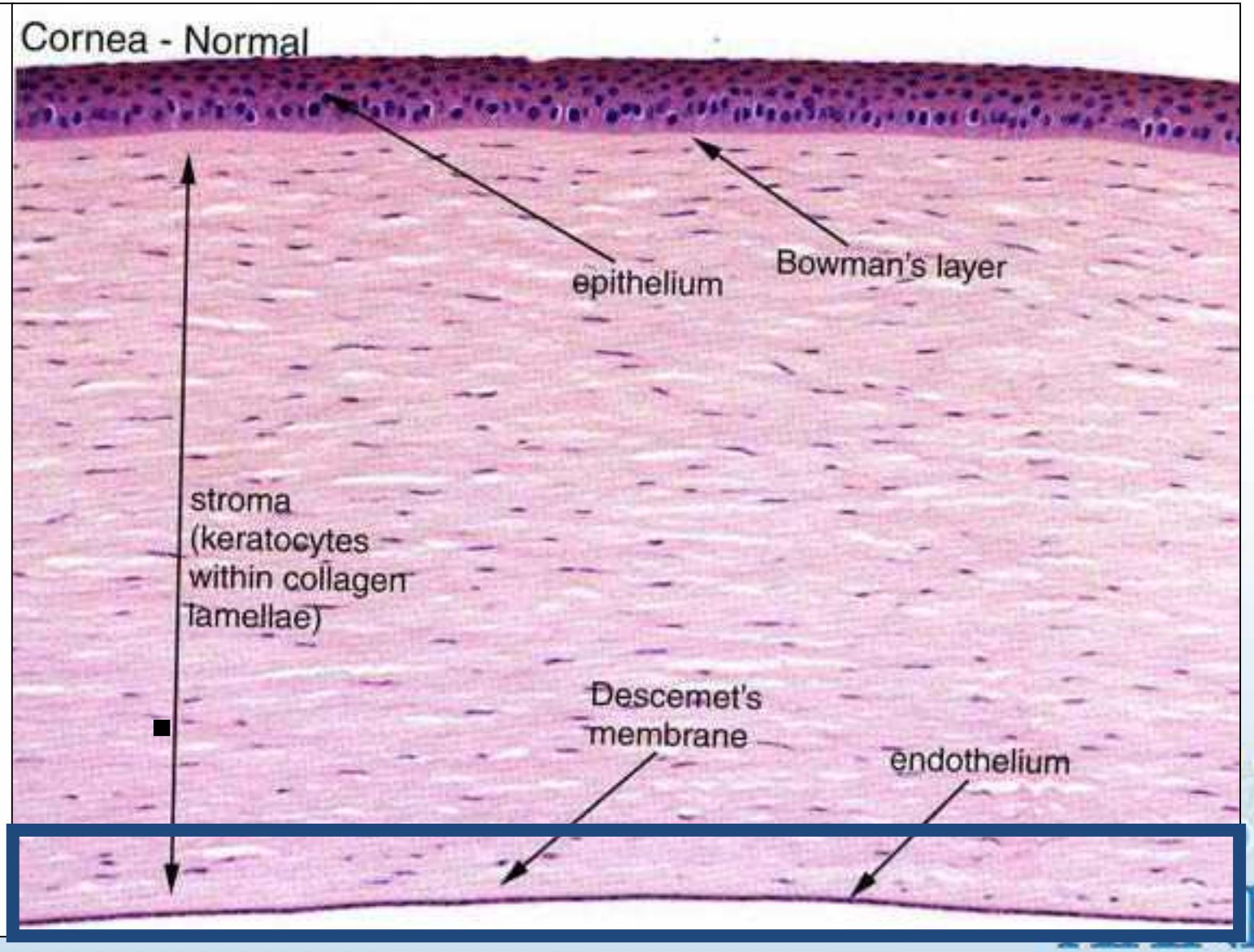




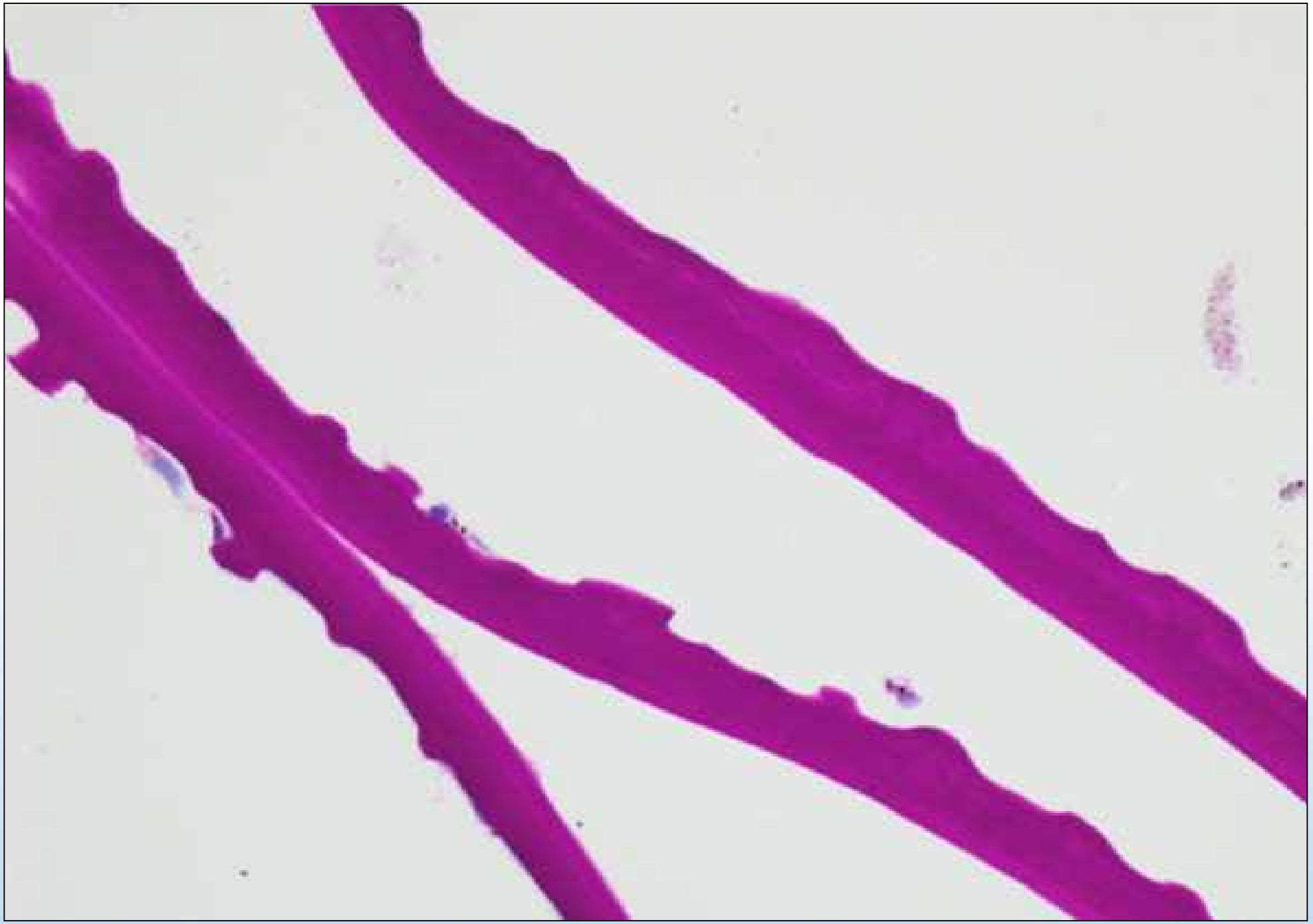


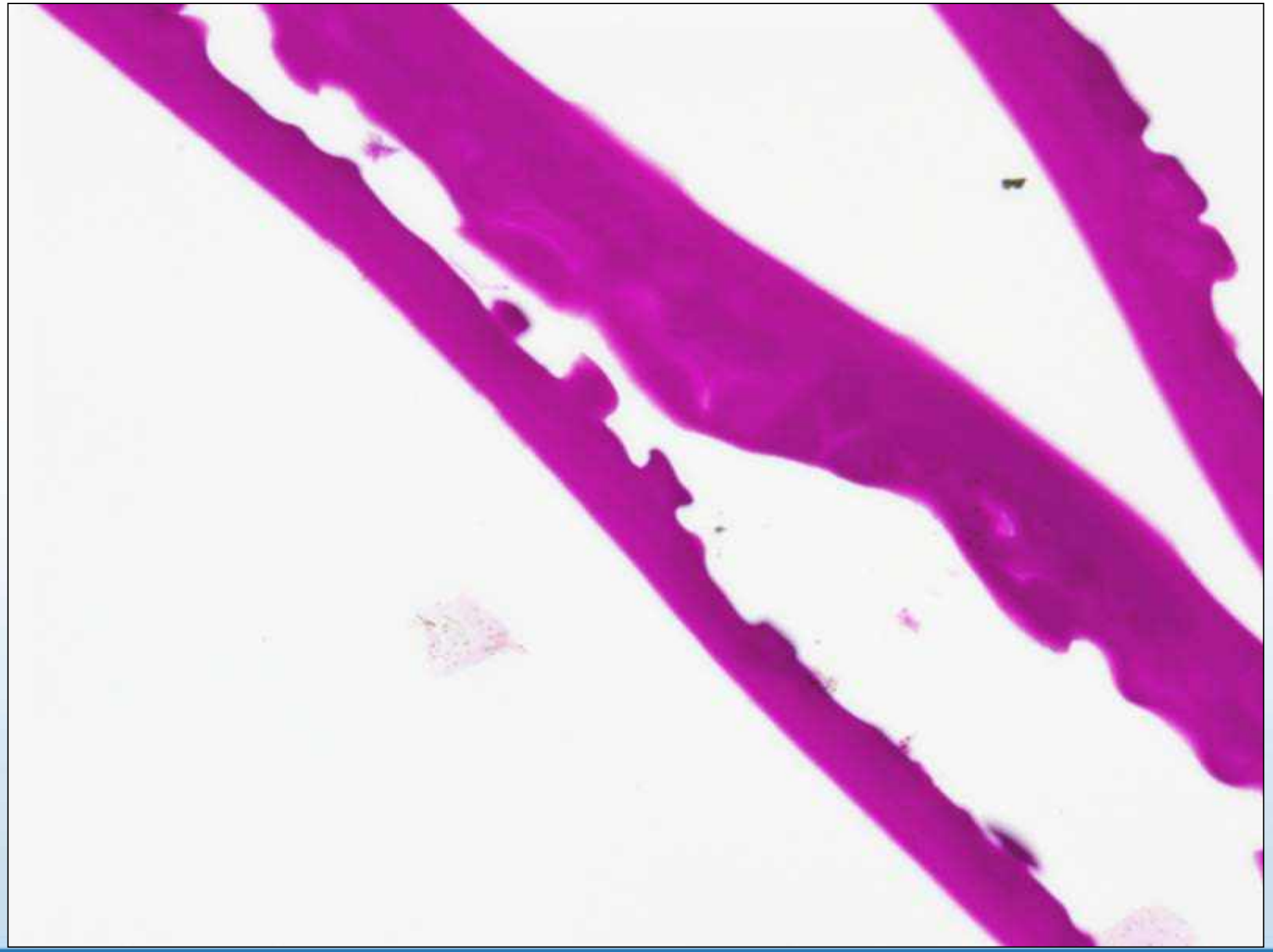
DSAEK -

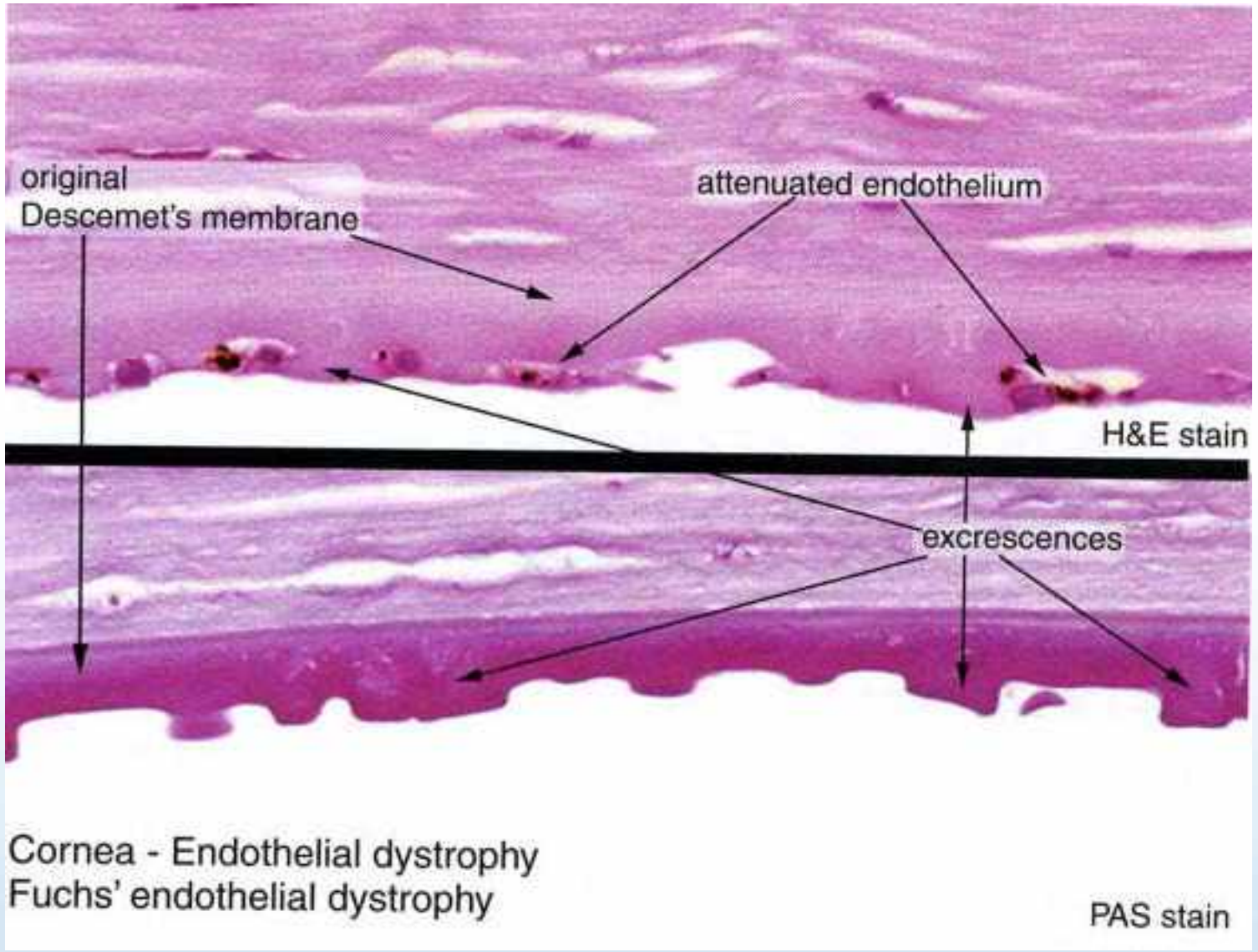




Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer







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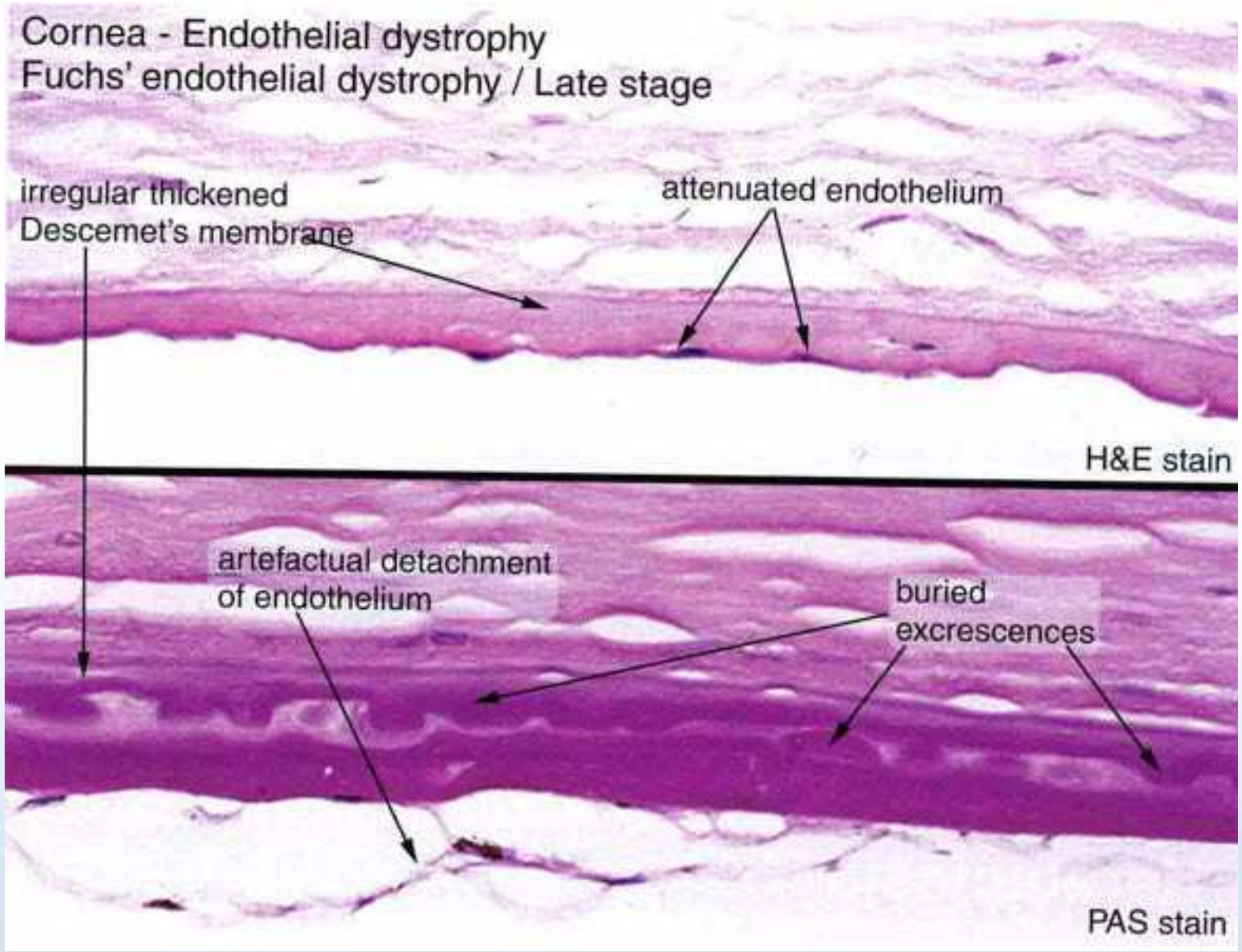

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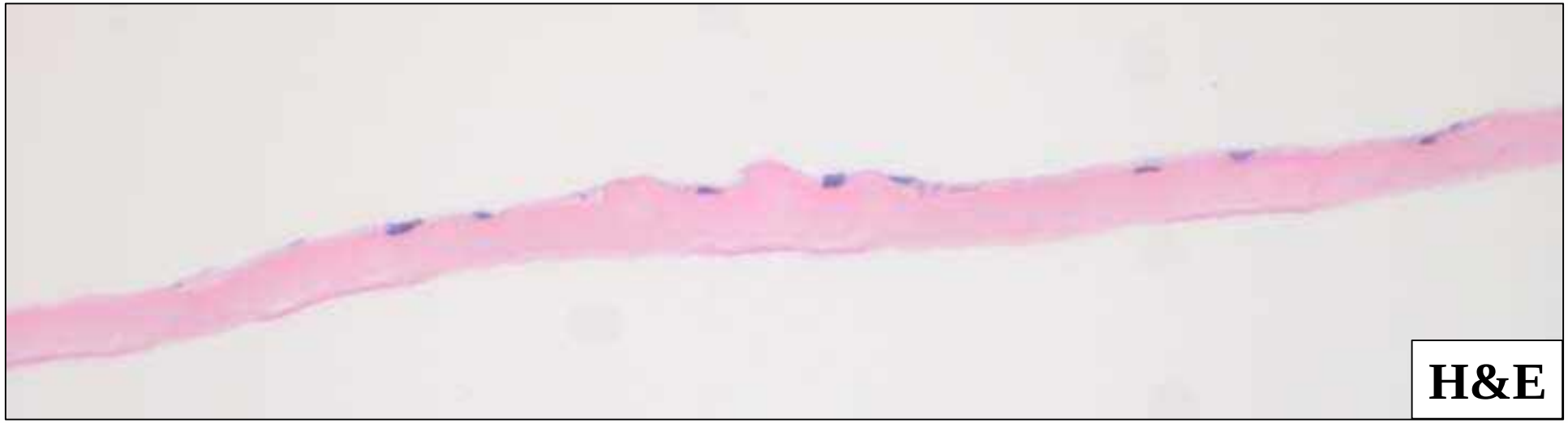
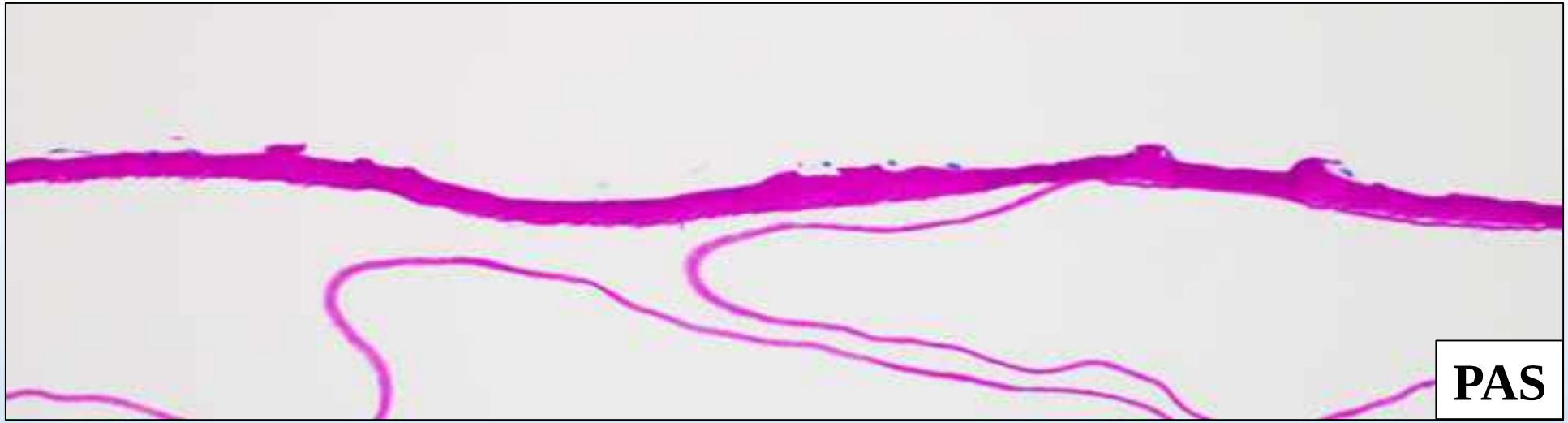
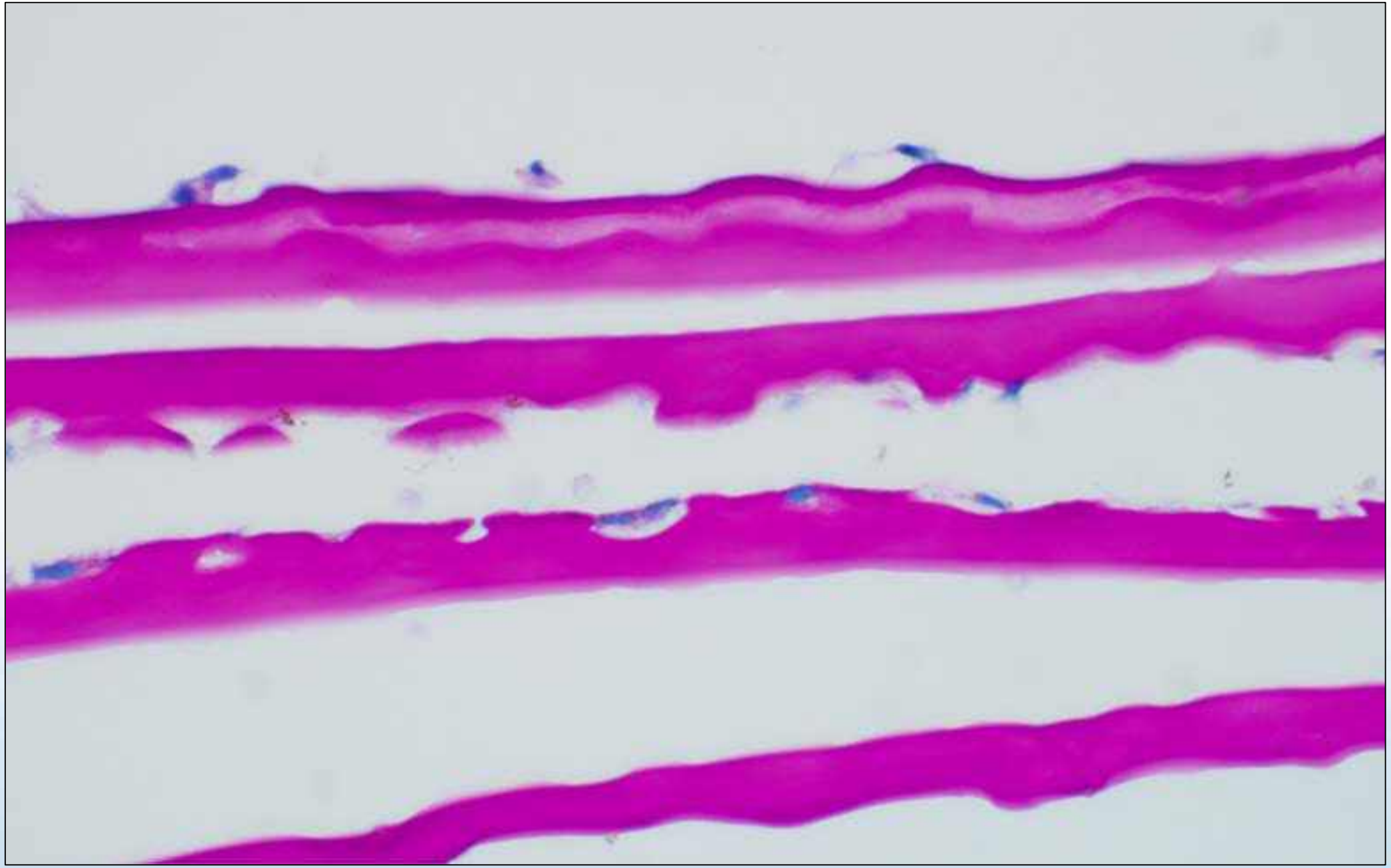

H&E


PAS




Hilary Highfield
8/10/22

Fuchs dystrophy

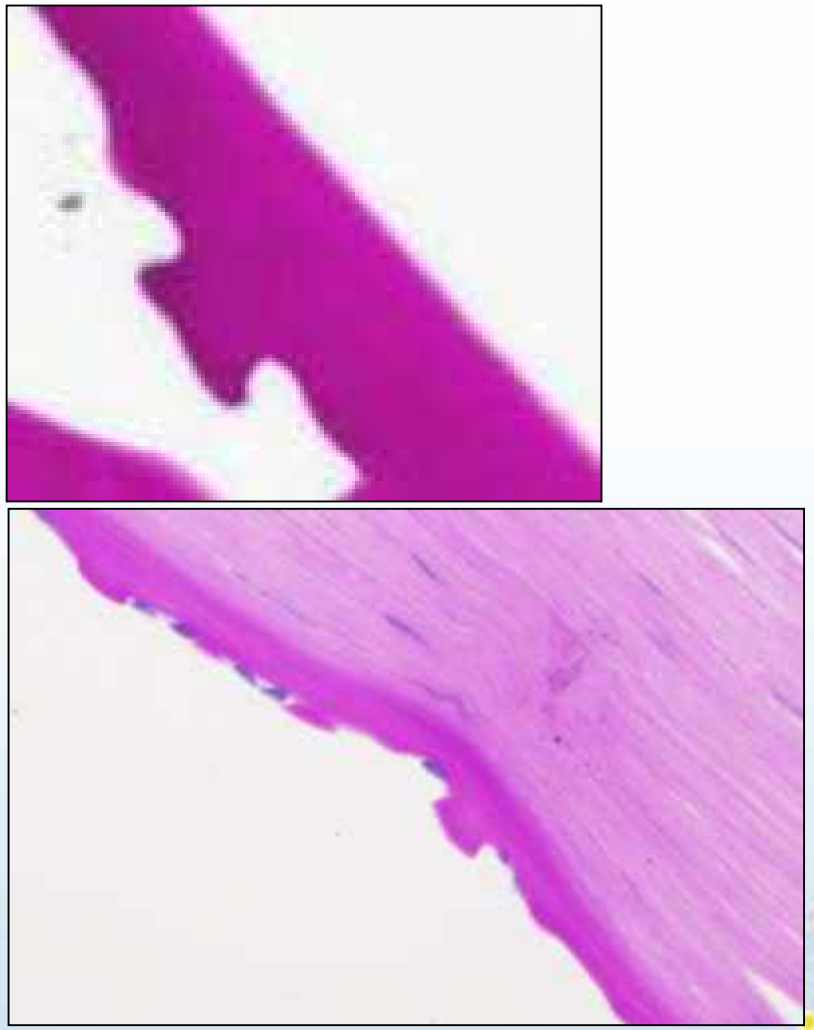
Fuchs endothelial dystrophy

- Affects 5% of Americans over age 40
- Bilateral
- Middle-aged to elderly; (40-50’s)
- Occurs more commonly in women
- Variable inheritance pattern
- Most common indication for penetrating keratoplasty for corneal dystrophy
- One of the leading causes of bullous keratopathy

NEJM 2010; 363: 1016

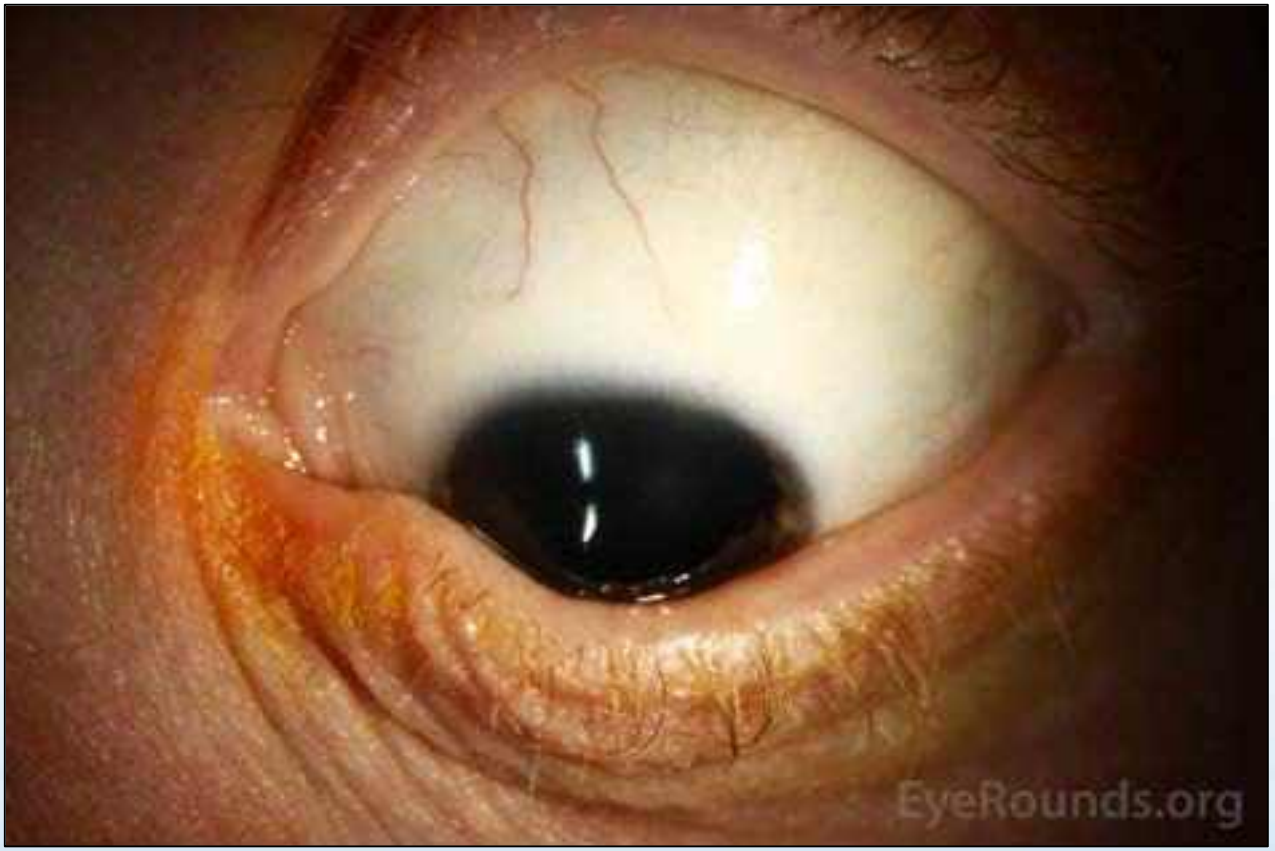
Fuchs endothelial dystrophy

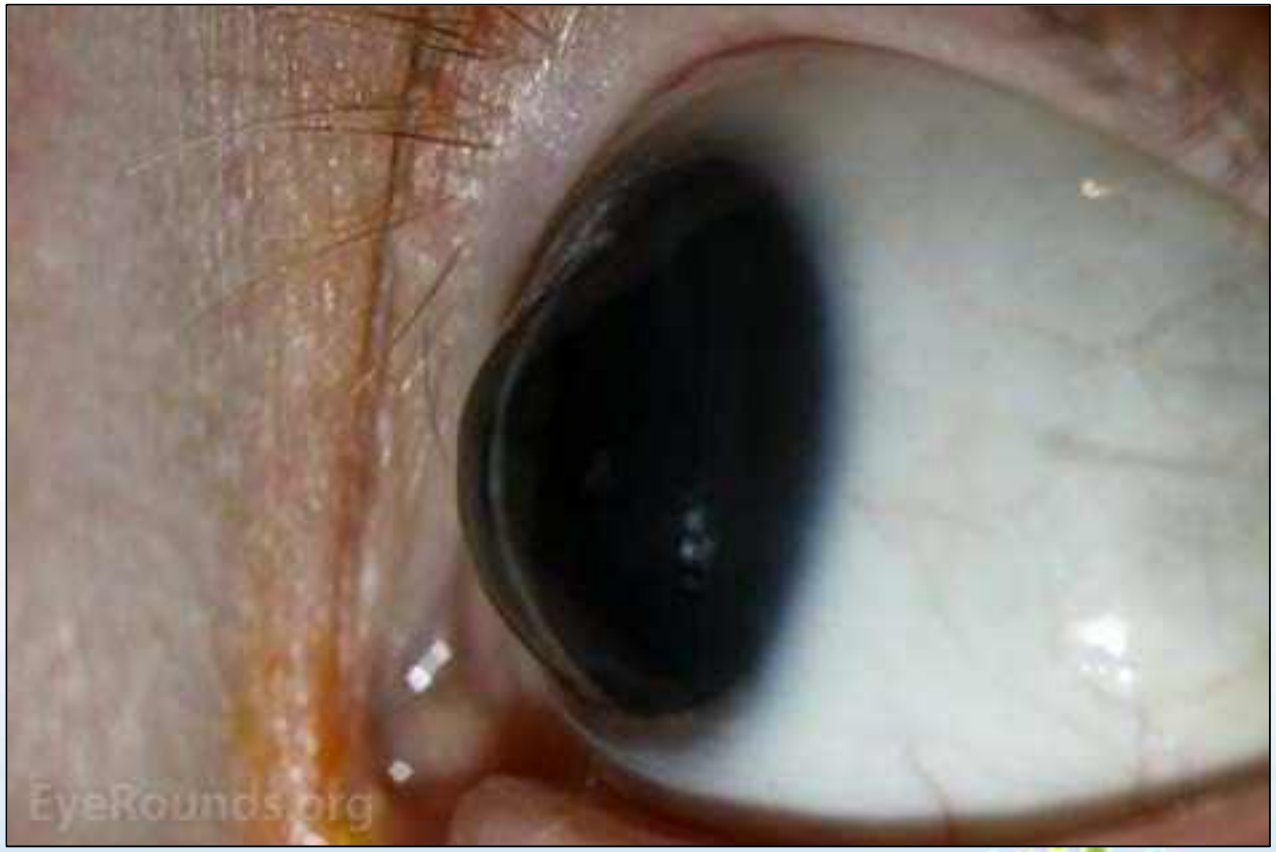
- Anvil-shaped excrescences of Descemet's membrane: Guttae "spotted/speckled"
- Endothelial cells sparse to absent (attenuated endothelium) with basement membrane thickening
- Diffuse edema: corneal epithelium and stroma



KERATOCONUS

Munson’s sign



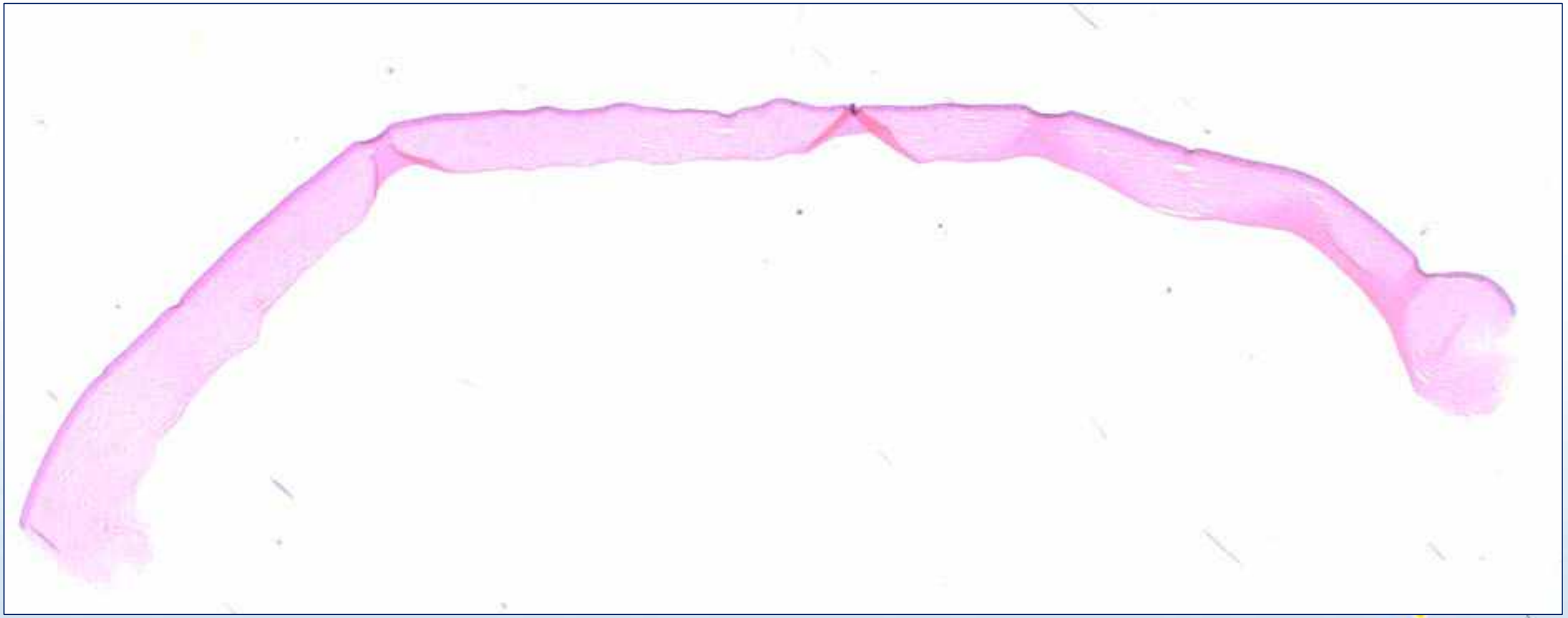


University of Iowa
EyeRounds.org

AANP

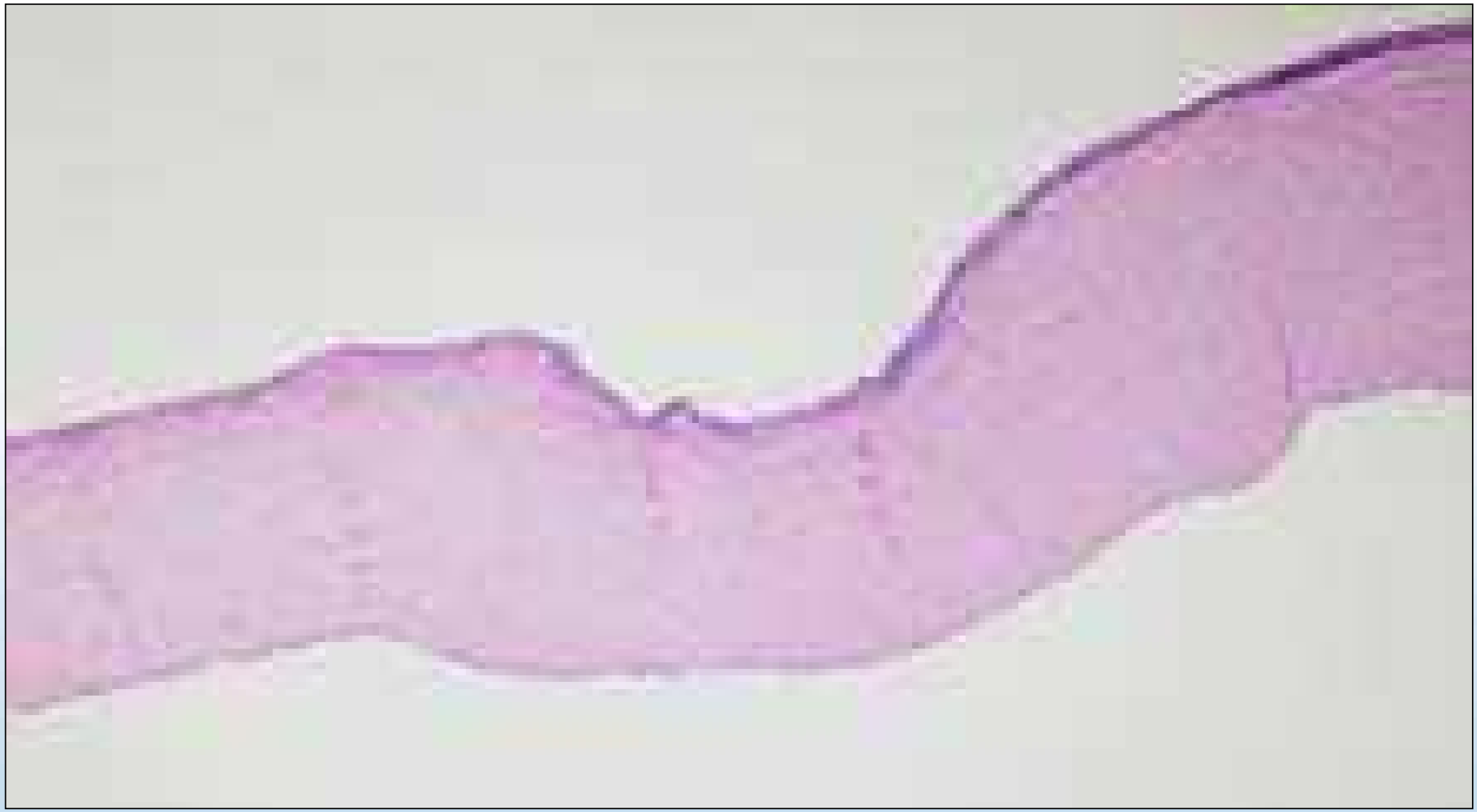
Keratoconus

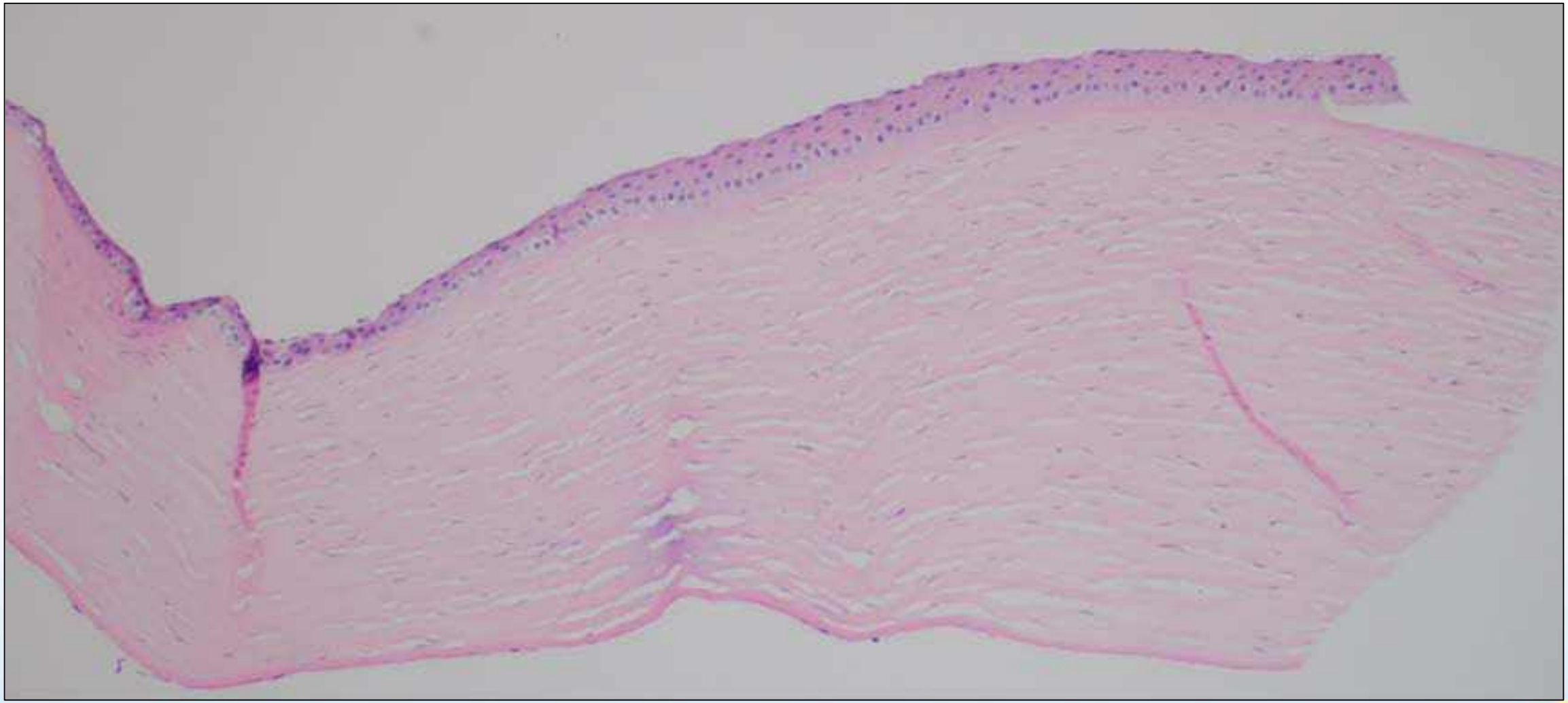
Keratoconus



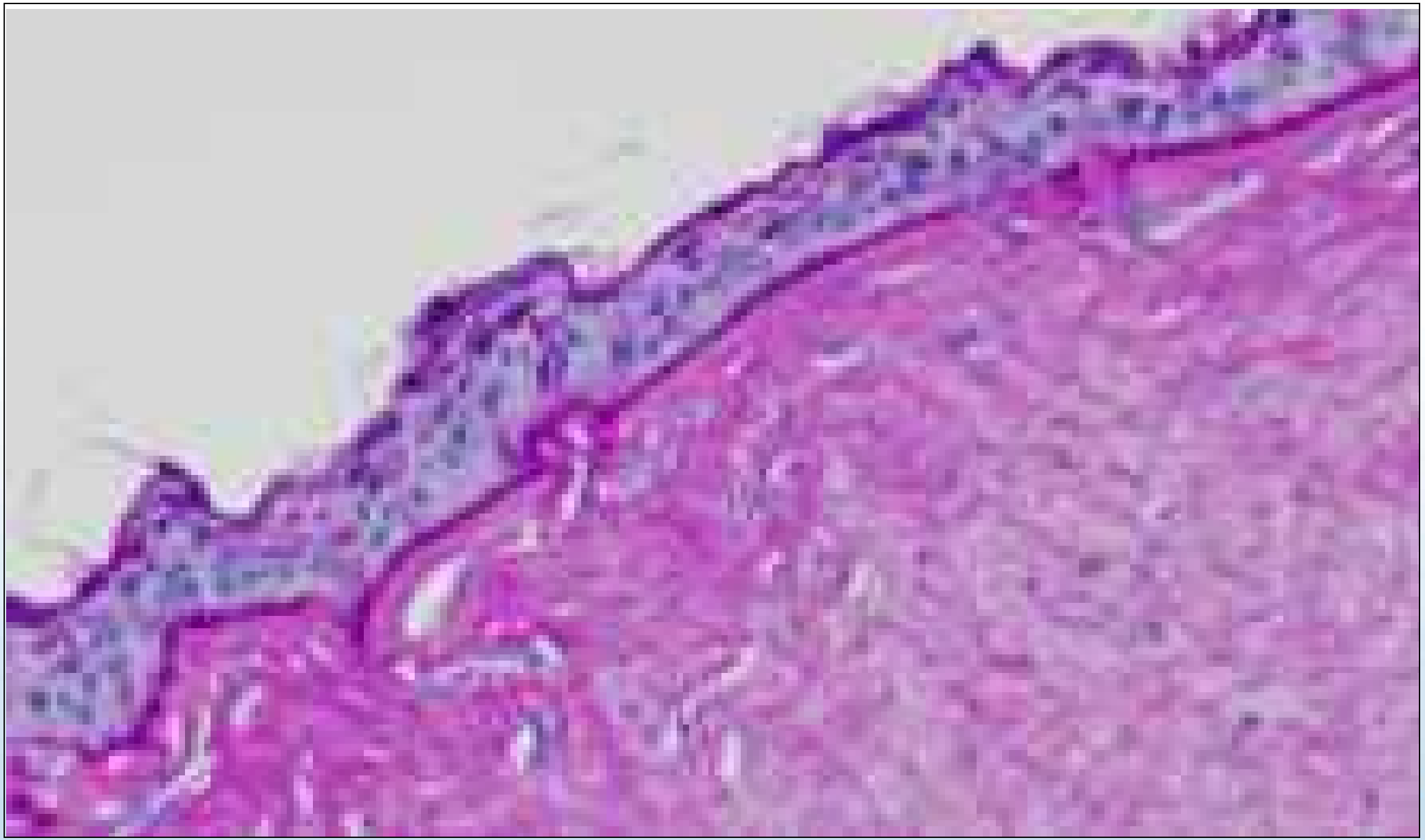
Keratoconus

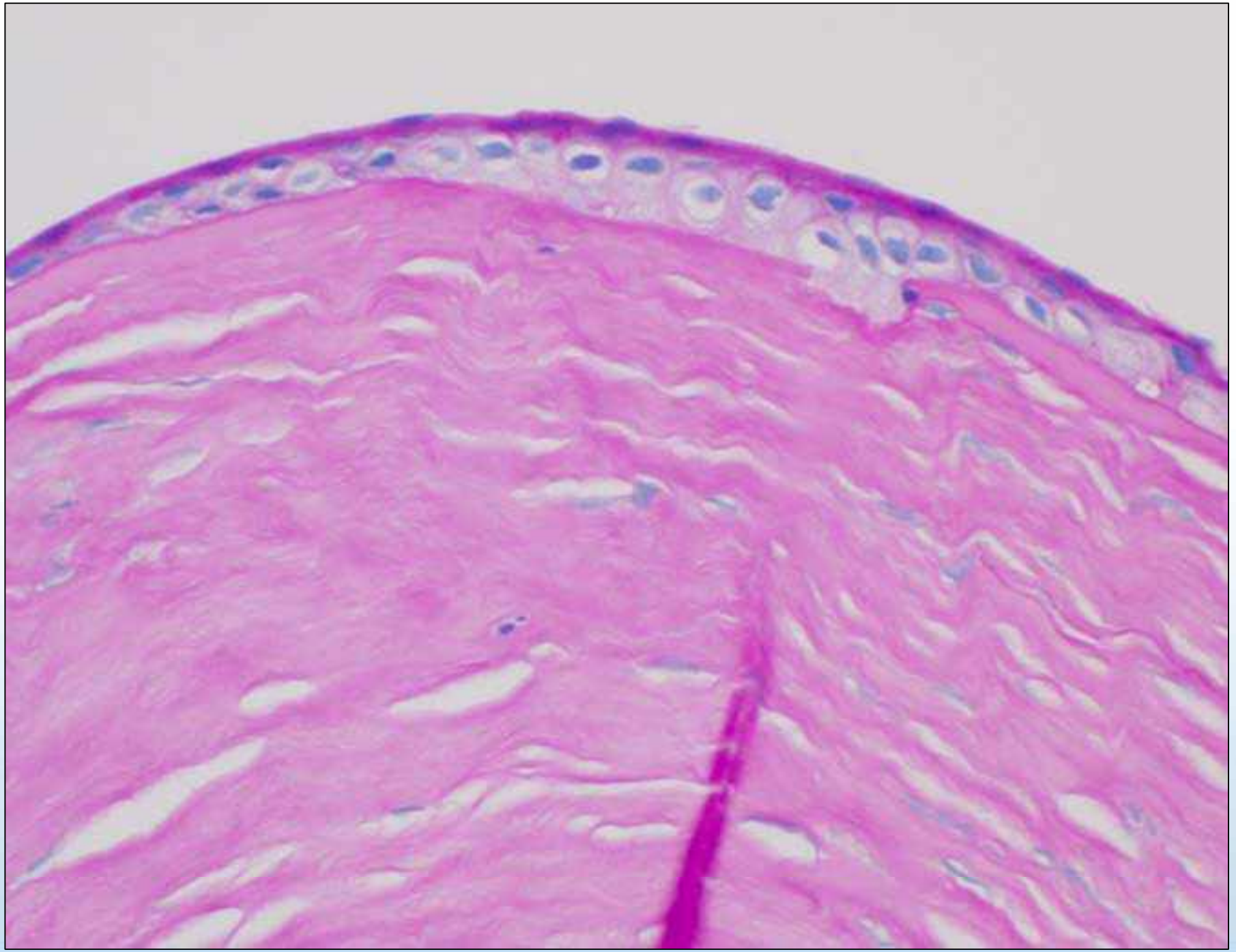
Keratoconus

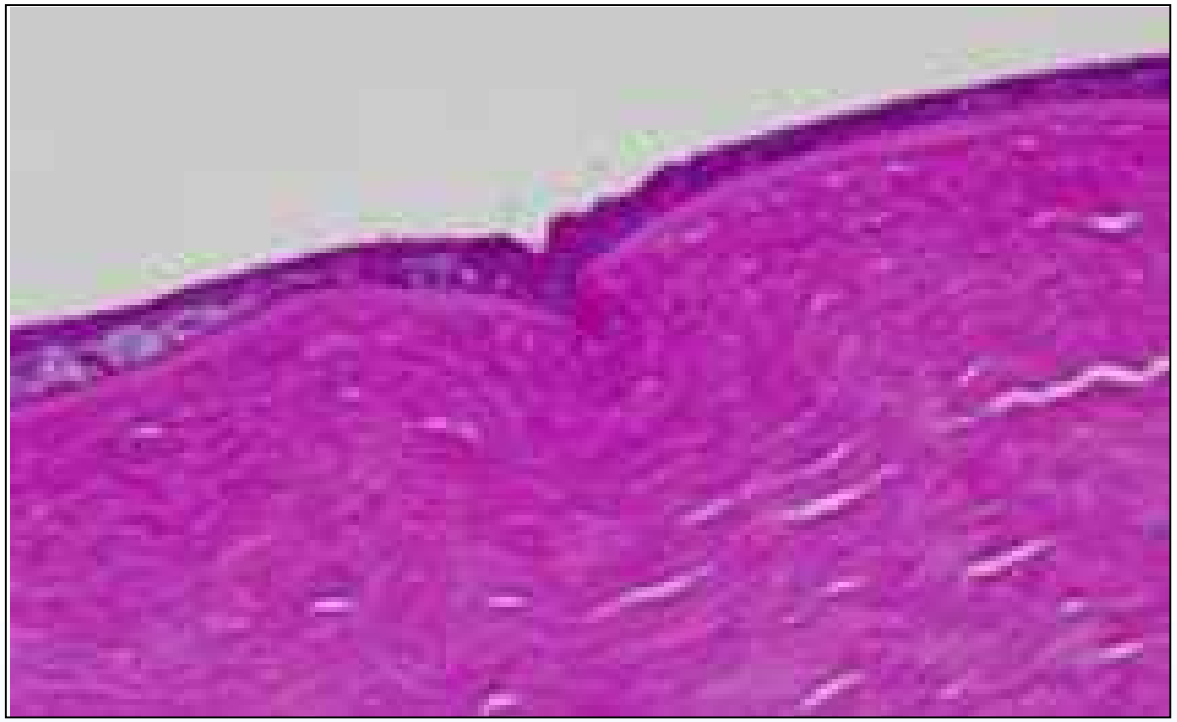


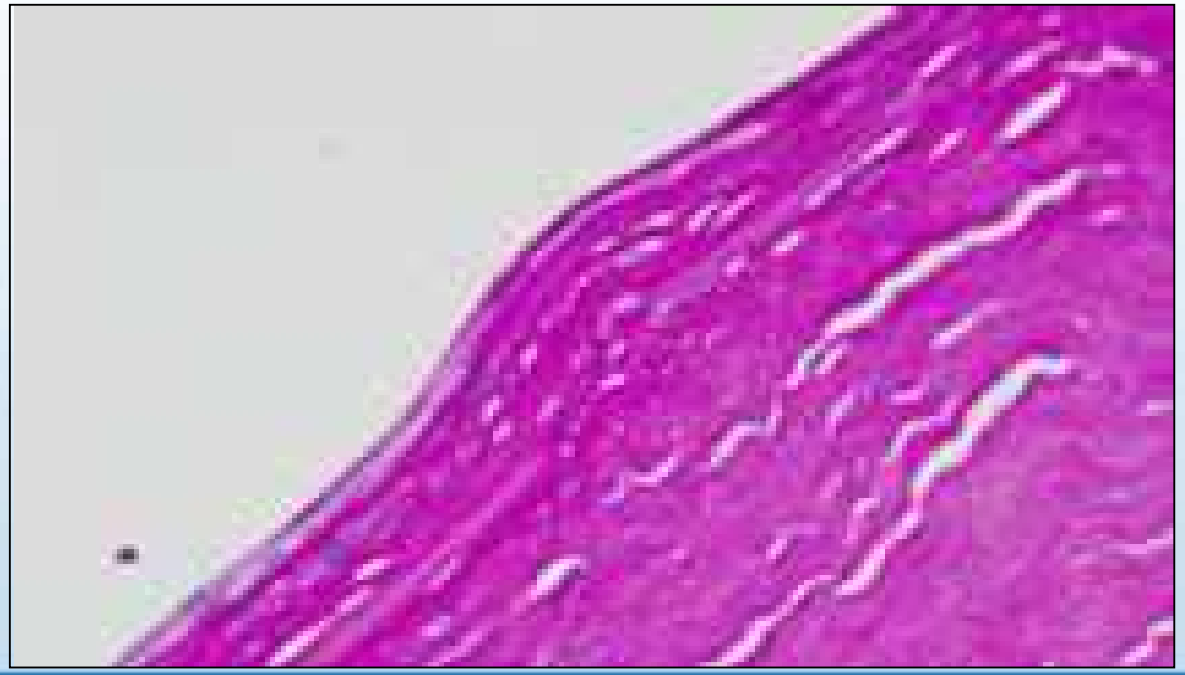


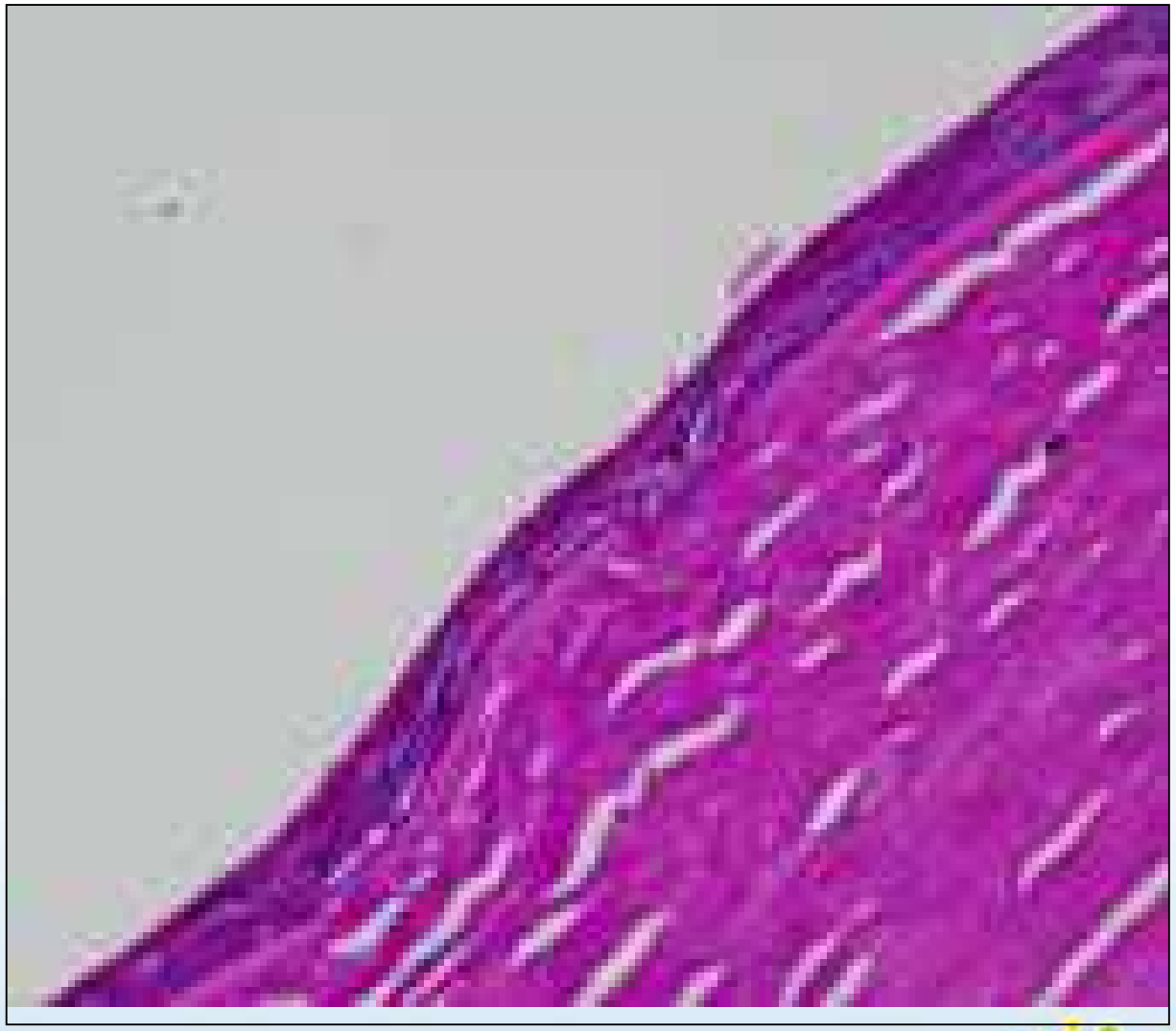
Bowman’s Layer Breaks



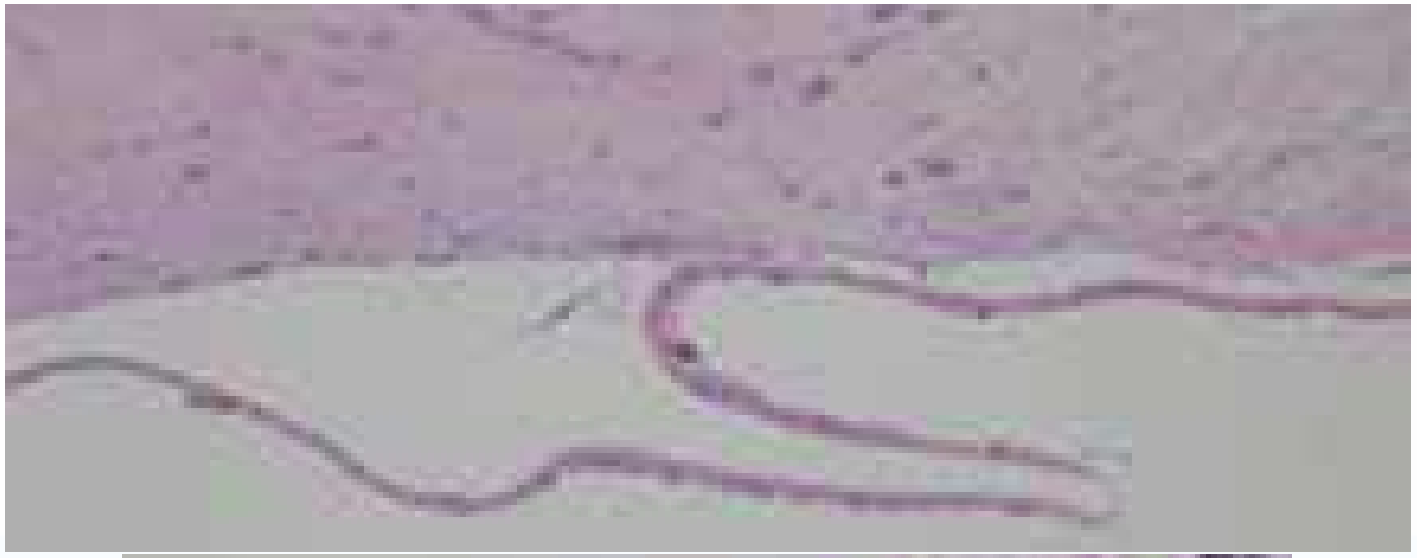


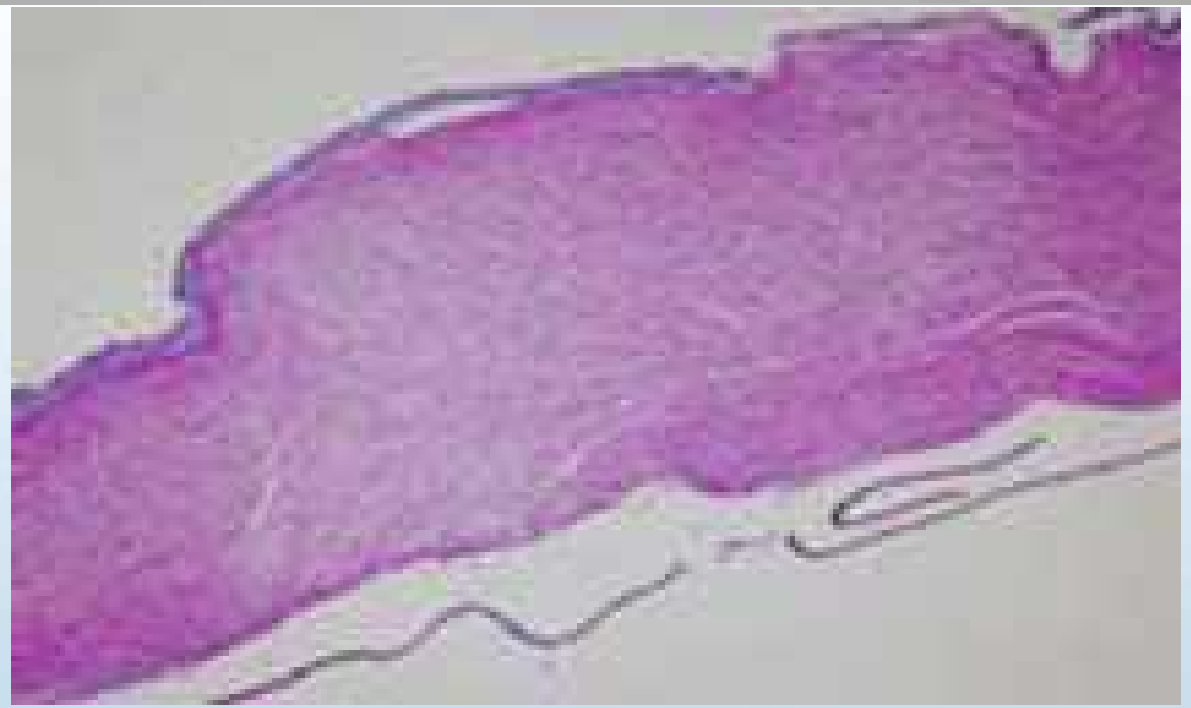






Hydrops





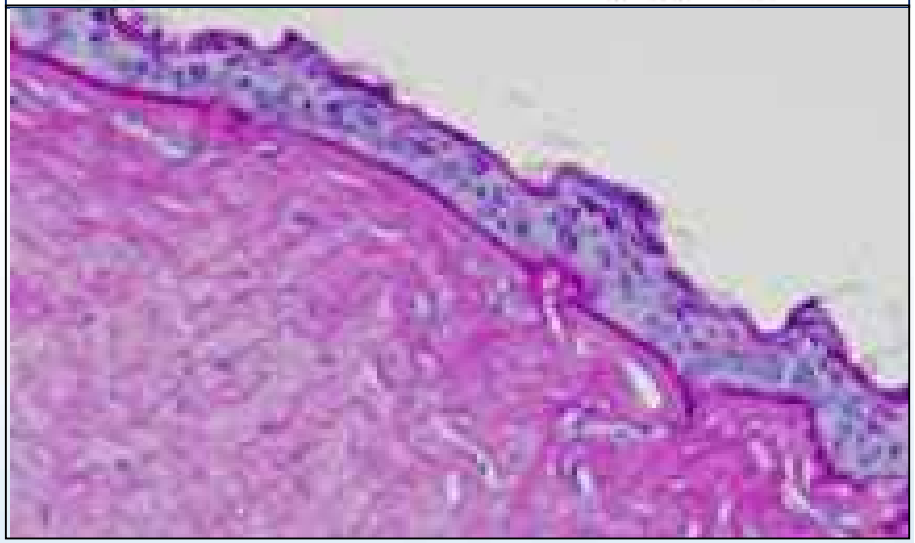
Decemet's membrane breaks

Keratoconus

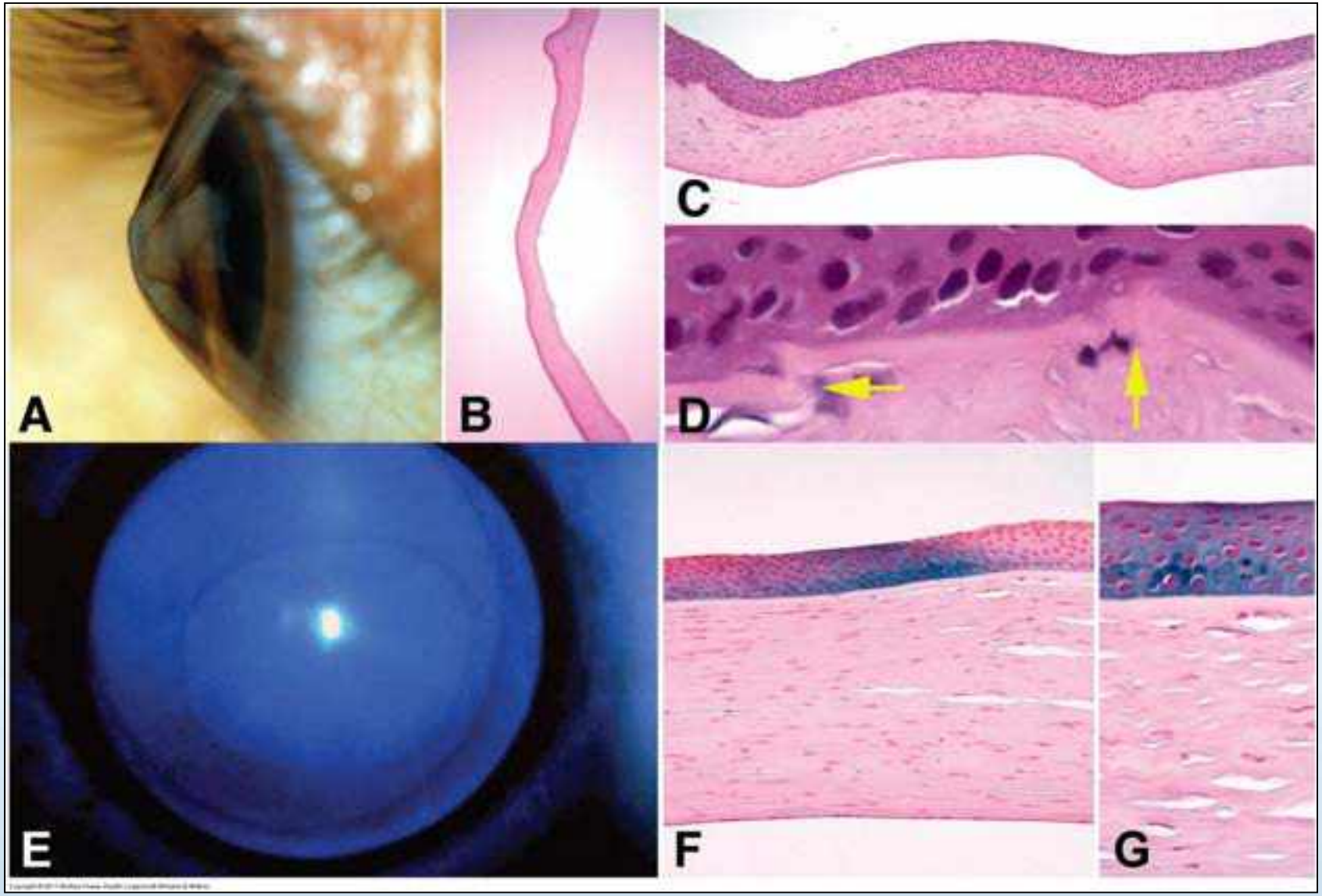
- Non-inflammatory degenerative disorder
- Bilateral central corneal ectasia, with anterior protrusion of cornea (Muson's sign)
- Progressive thinning of central stroma
- Usually presents around puberty
- May be associated with systemic disorders
  - Atopy
  - Down syndrome
  - Marfan syndrome

Keratoconus: Histologic findings

- Focal discontinuity of epithelial basement membrane and Bowman’s layer
- Central stromal thinning
- Anterior stromal scarring
- Breaks in Descemet’s membrane lead to acute stromal edema: hydrops
- Iron staining shows focal iron deposition in basal epithelium (Fleischer ring)



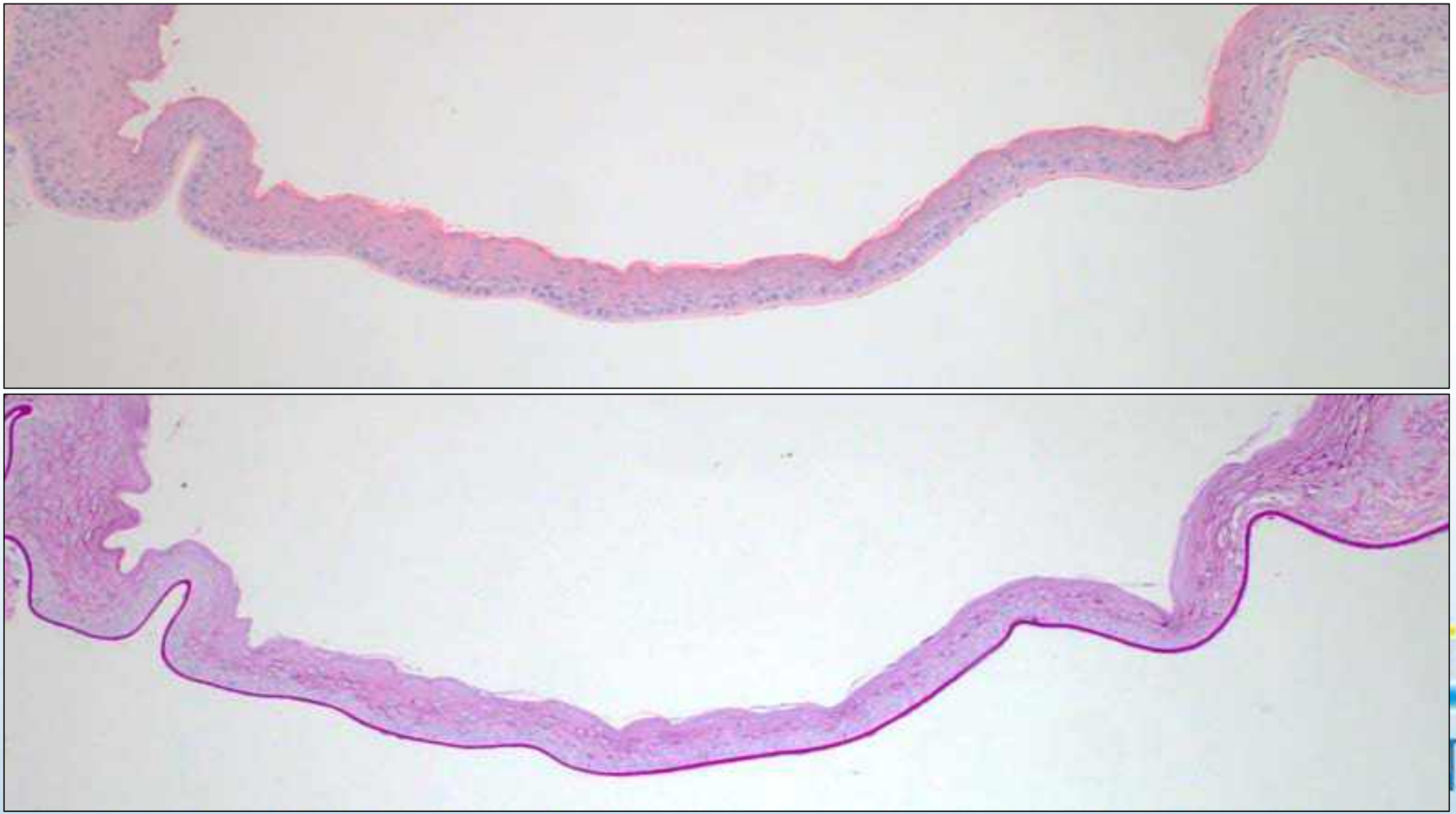
Keratoconus



Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

DESCEMETOCELE

Descemetocele



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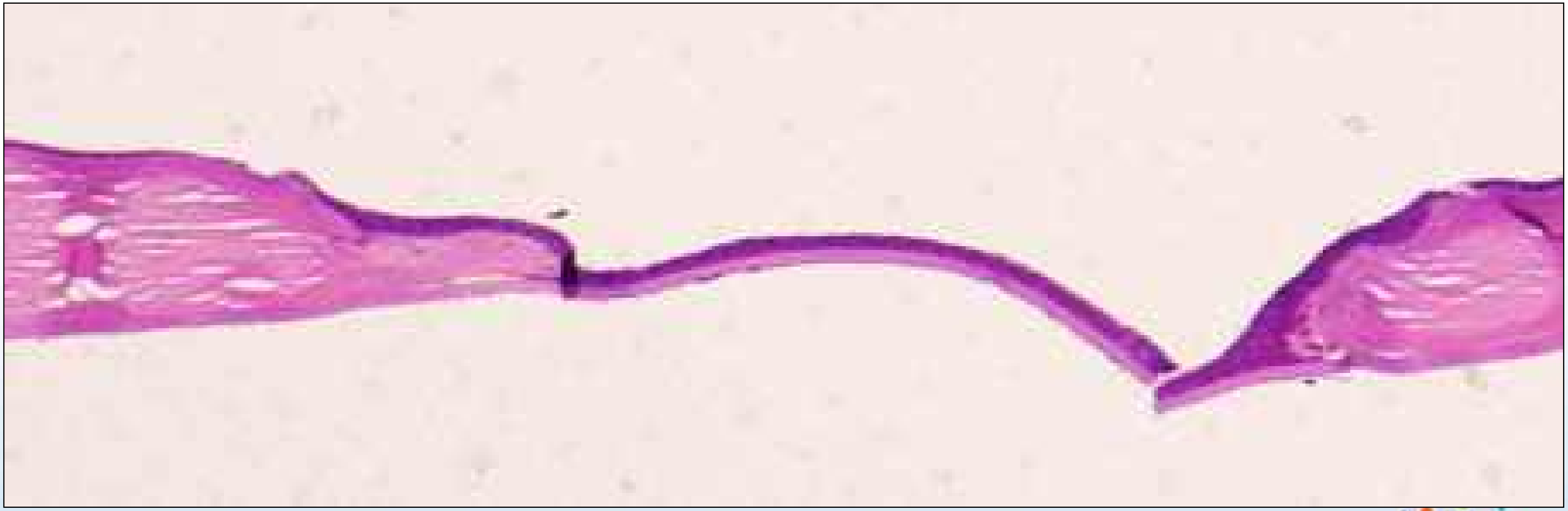

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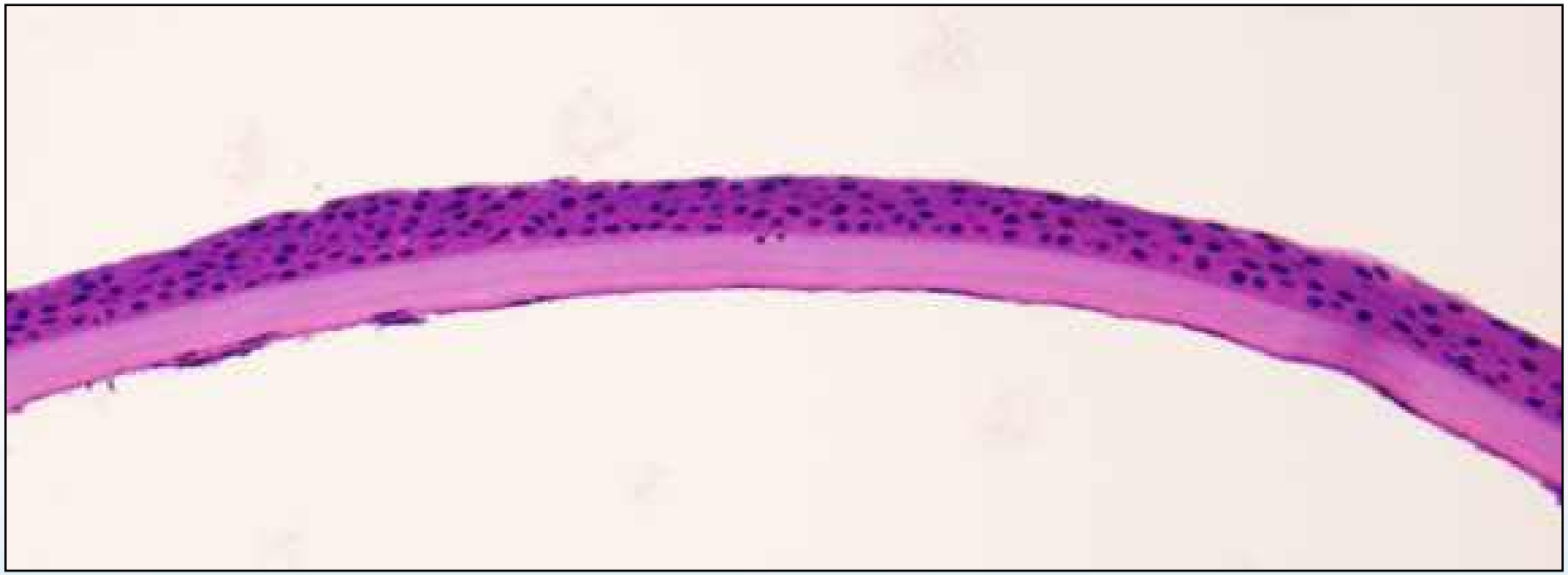
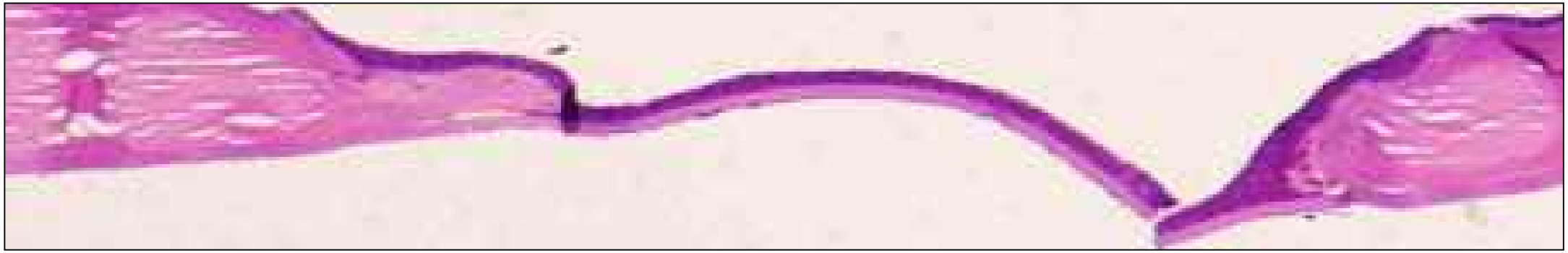


Descemetocele



- An intact Descemet's membrane with an overlying absence of stroma
- Results in anterior corneal herniation.
- Descemet's membrane is the sole corneal layer maintaining the integrity of the eye.
- Often the result of corneal ulceration
- **There is imminent risk of corneal perforation**.
- Clinical scenarios resulting in corneal ulceration include microbial keratitis (bacterial and herpetic), neurotrophic ulceration (cranial nerve injury), dry eye disorders, trauma, and immune-related disorders.

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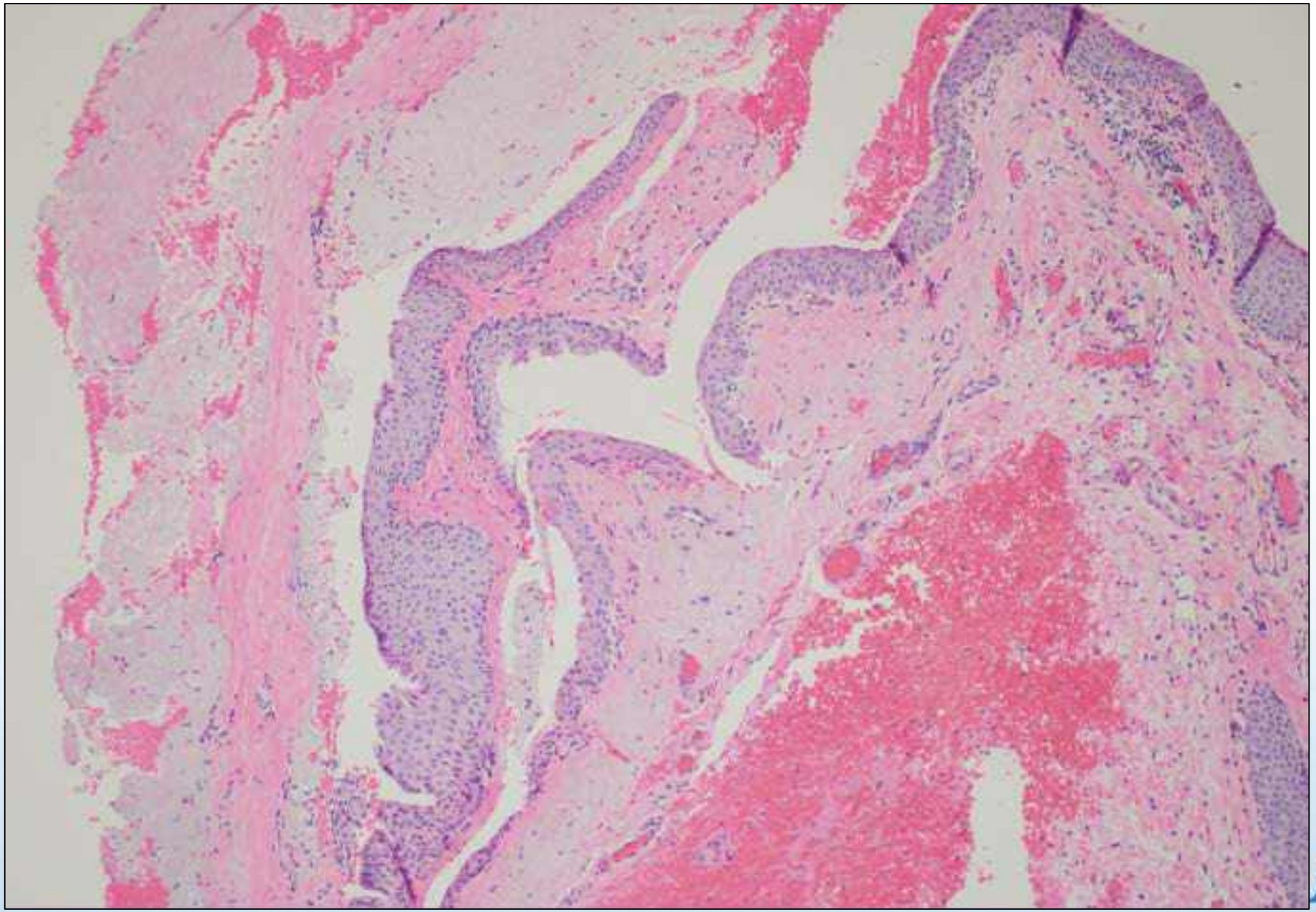
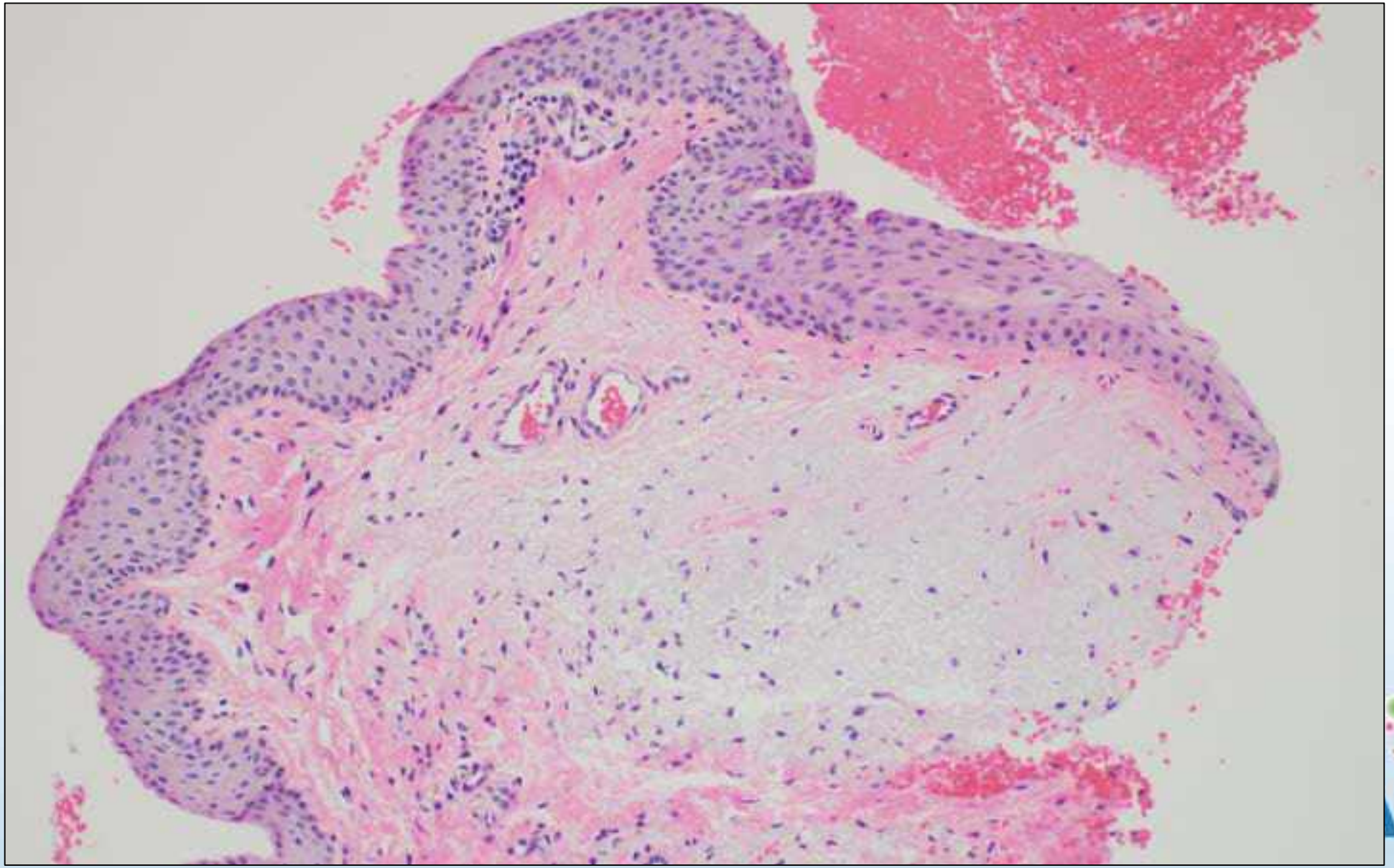
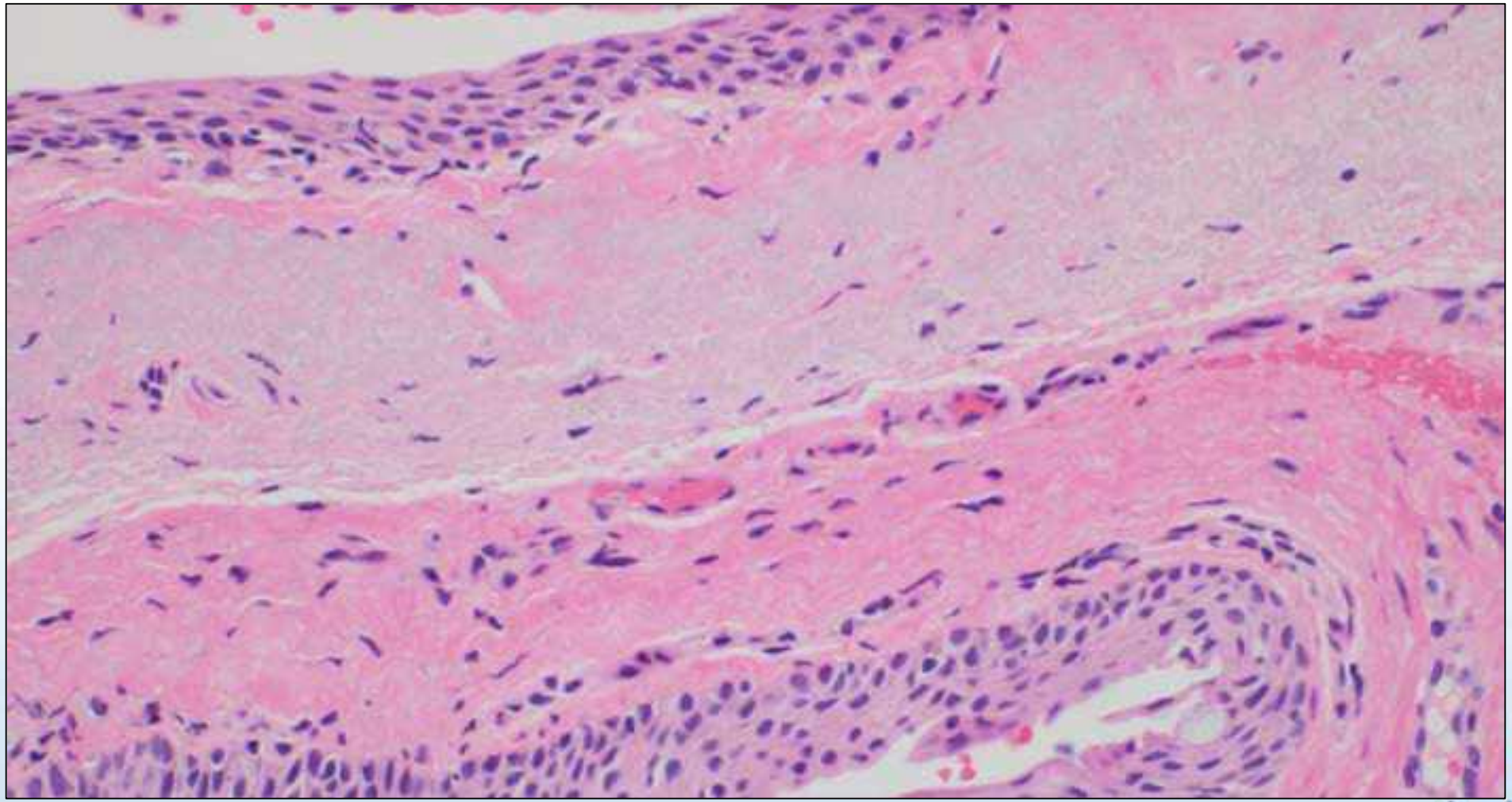
CONJUNCTIVA

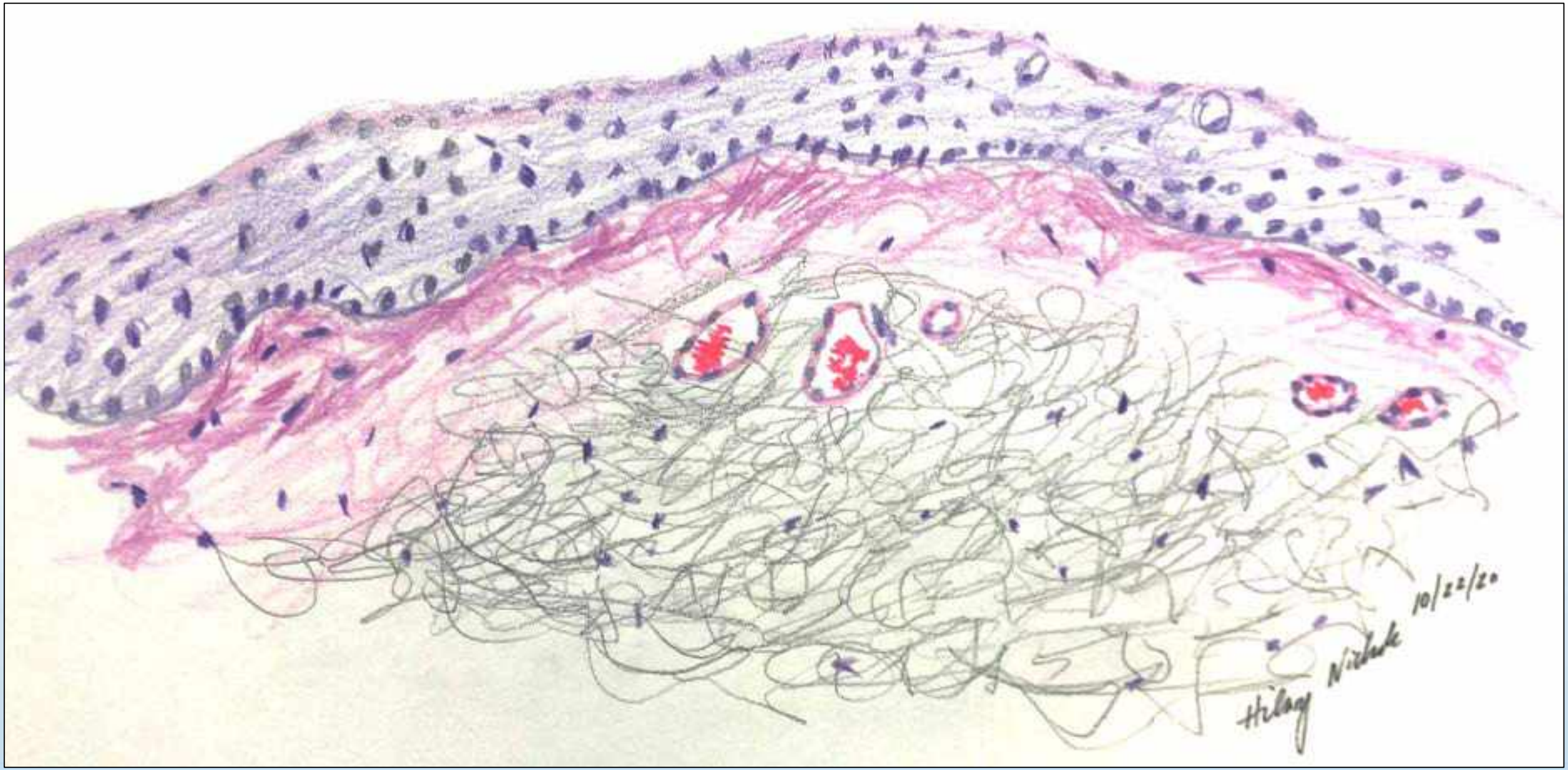
PTERYGIUM

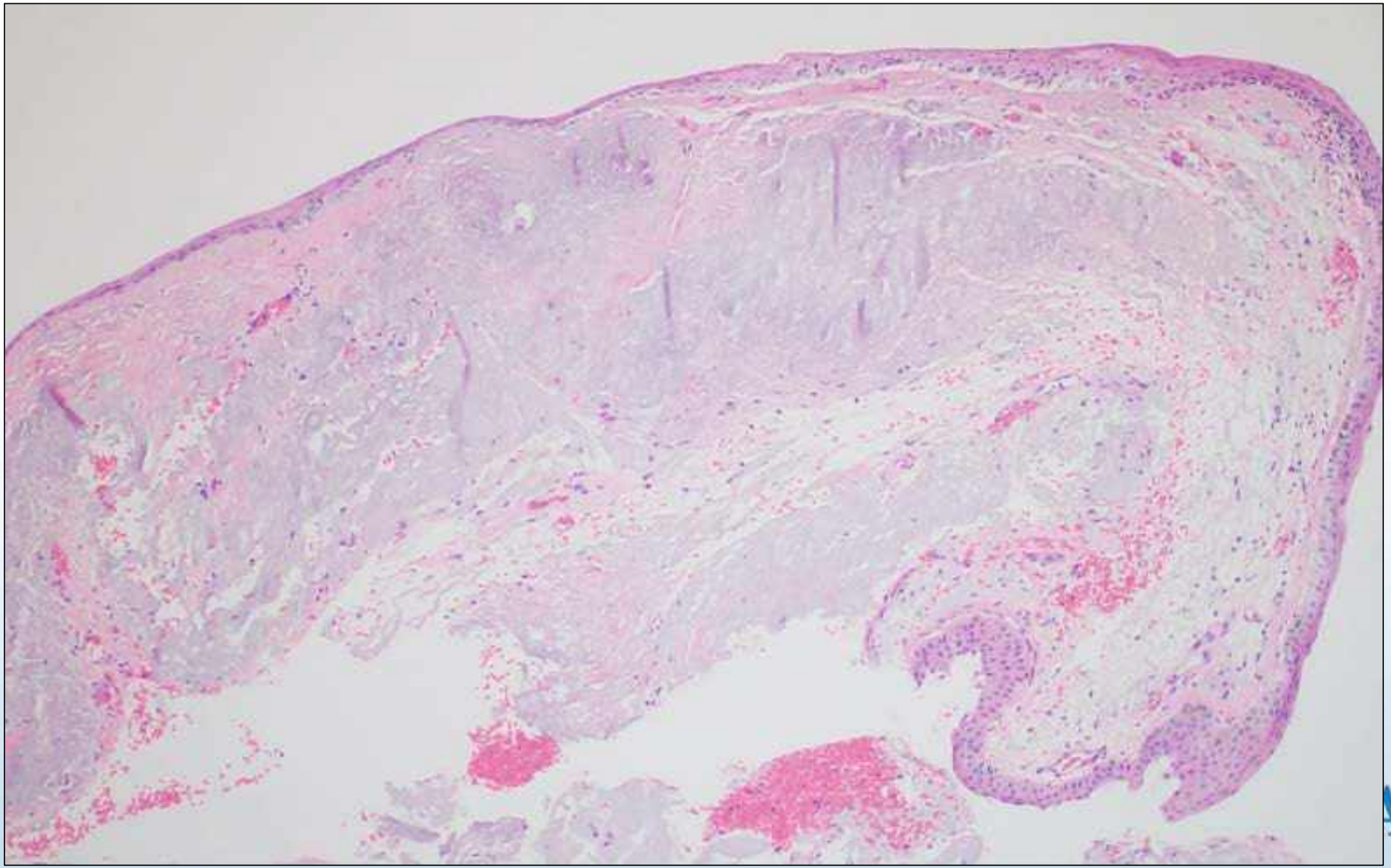


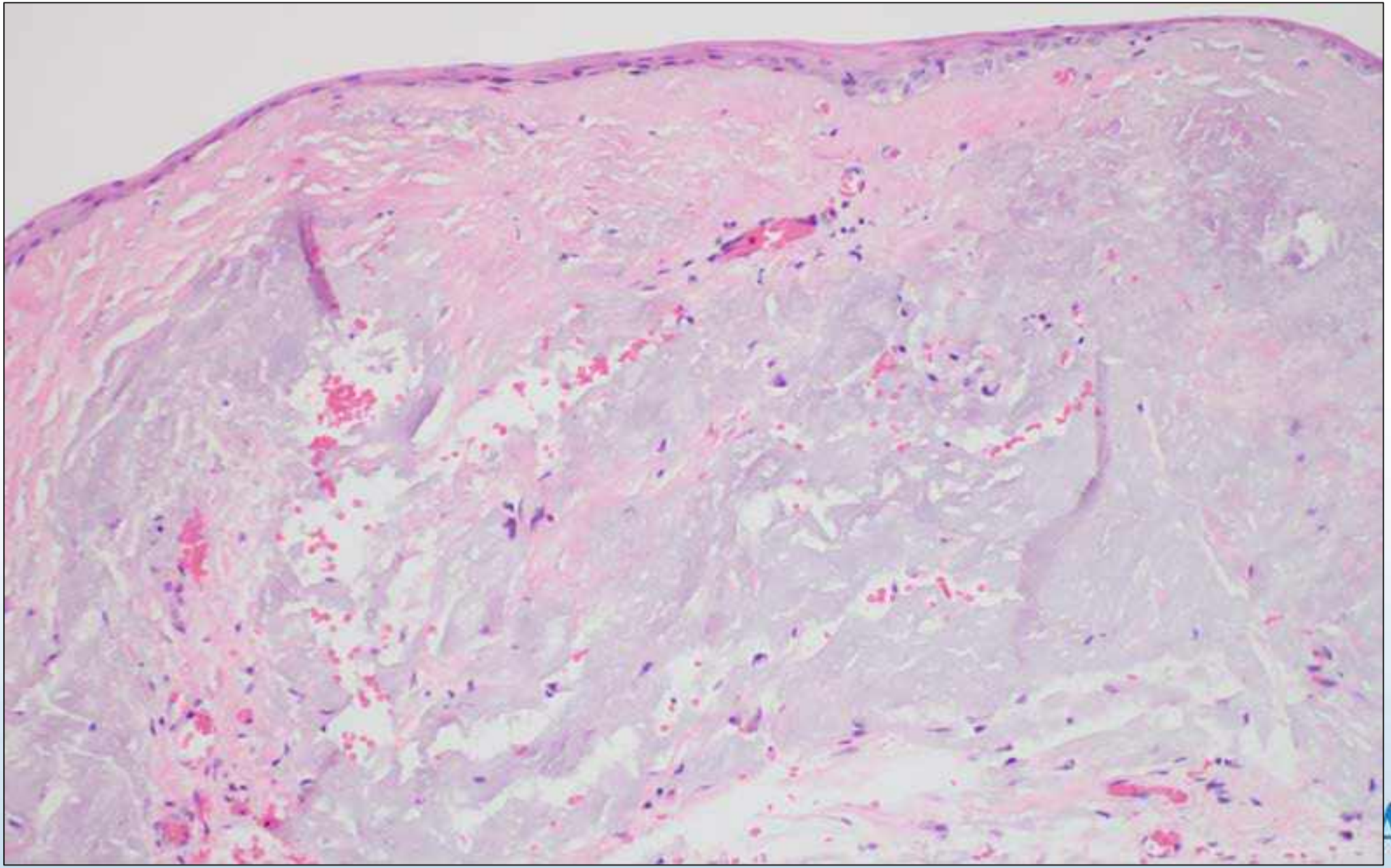




Pterygium







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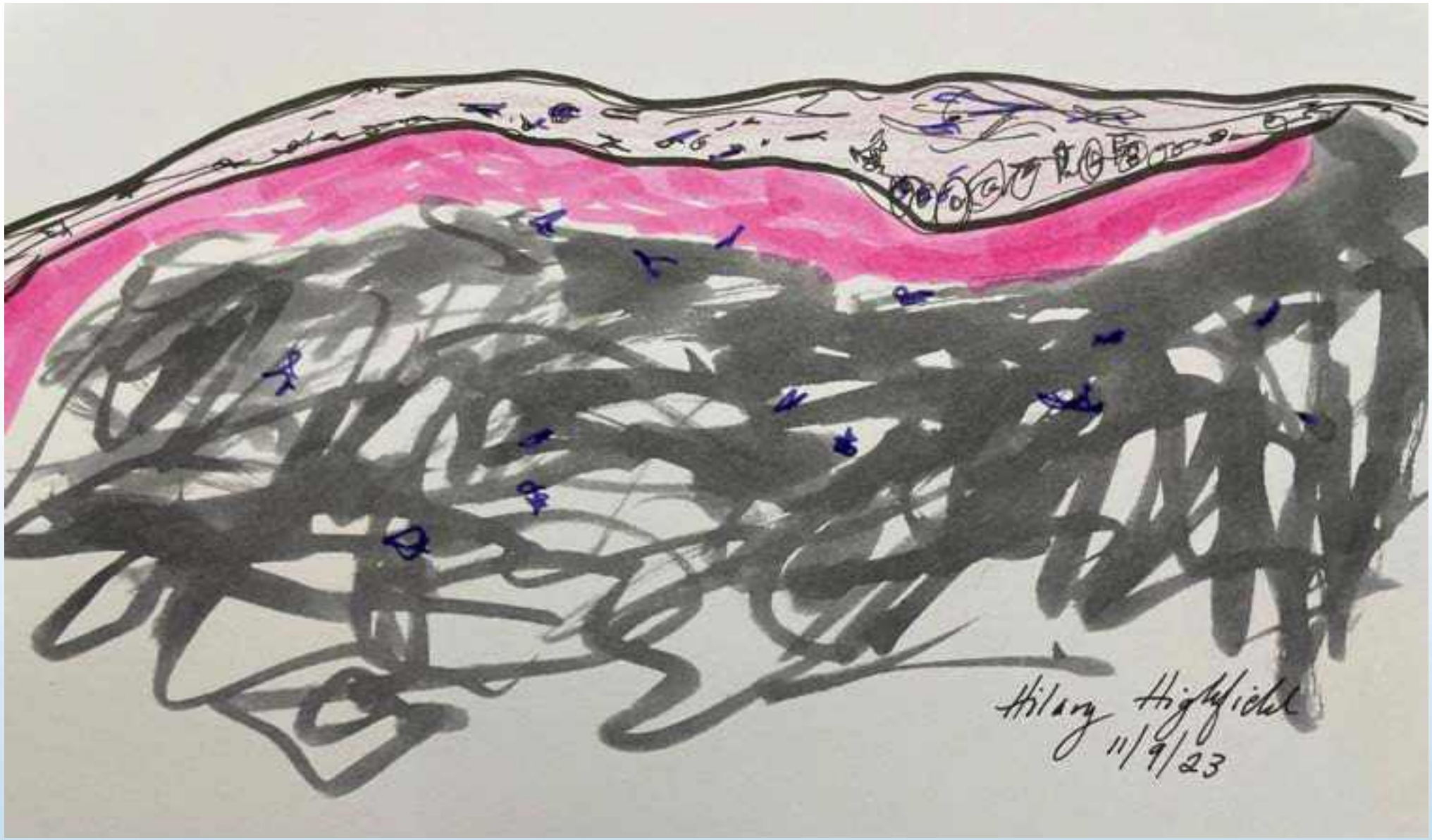

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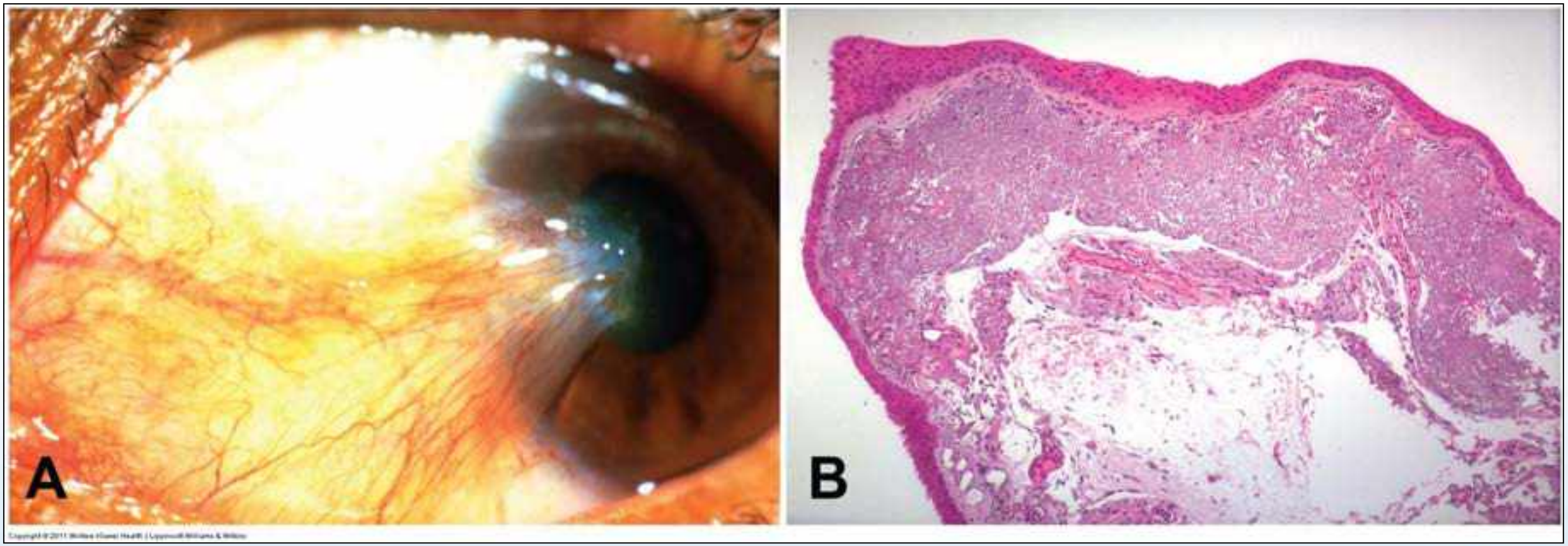
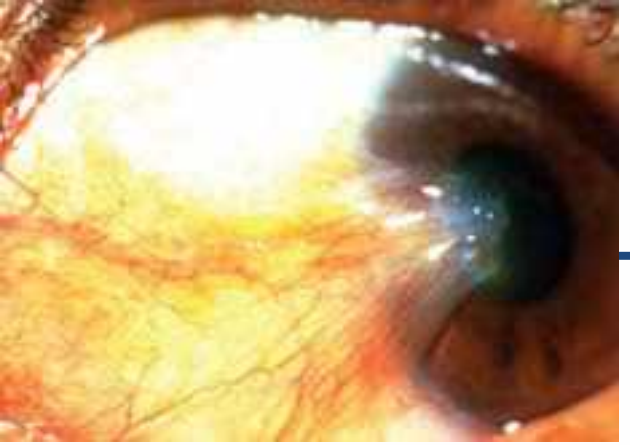
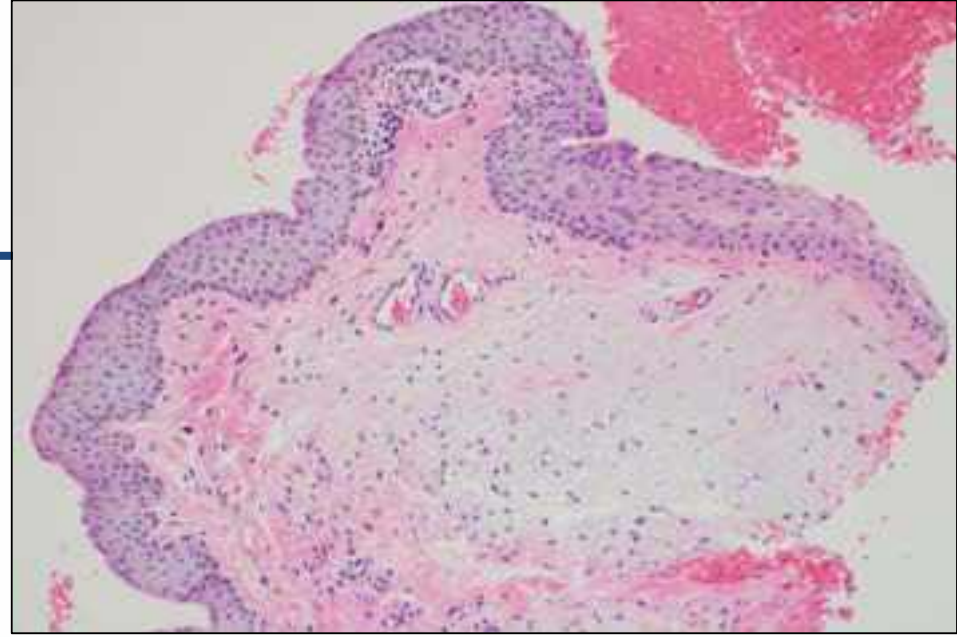


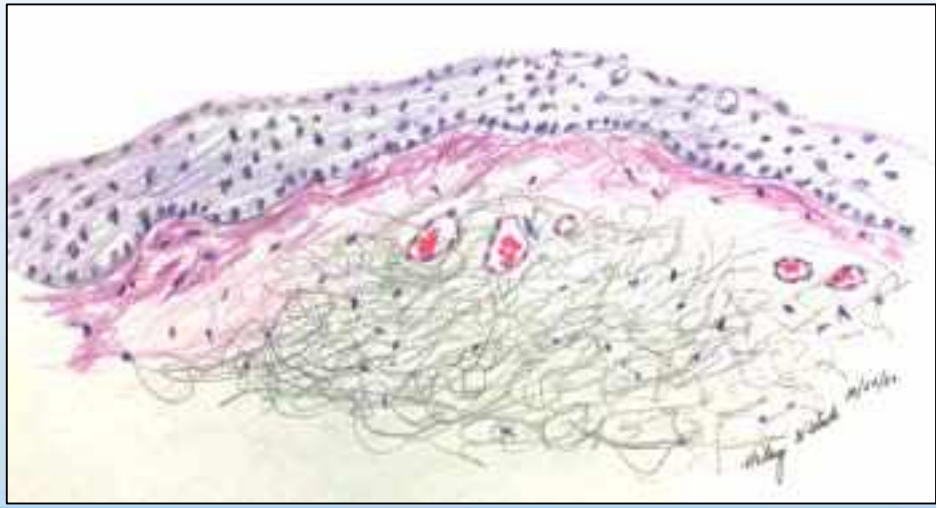
Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

Pterygium



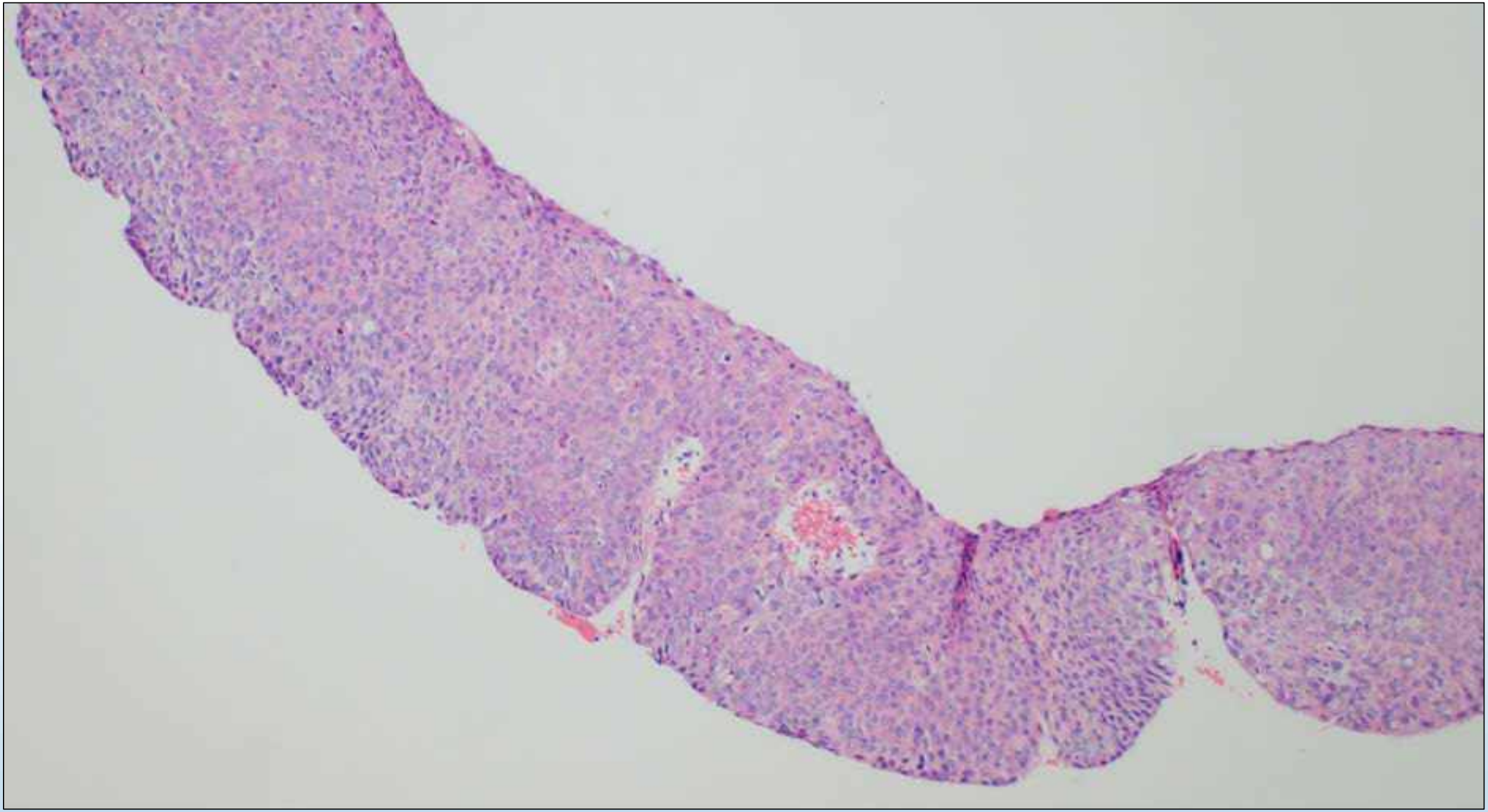


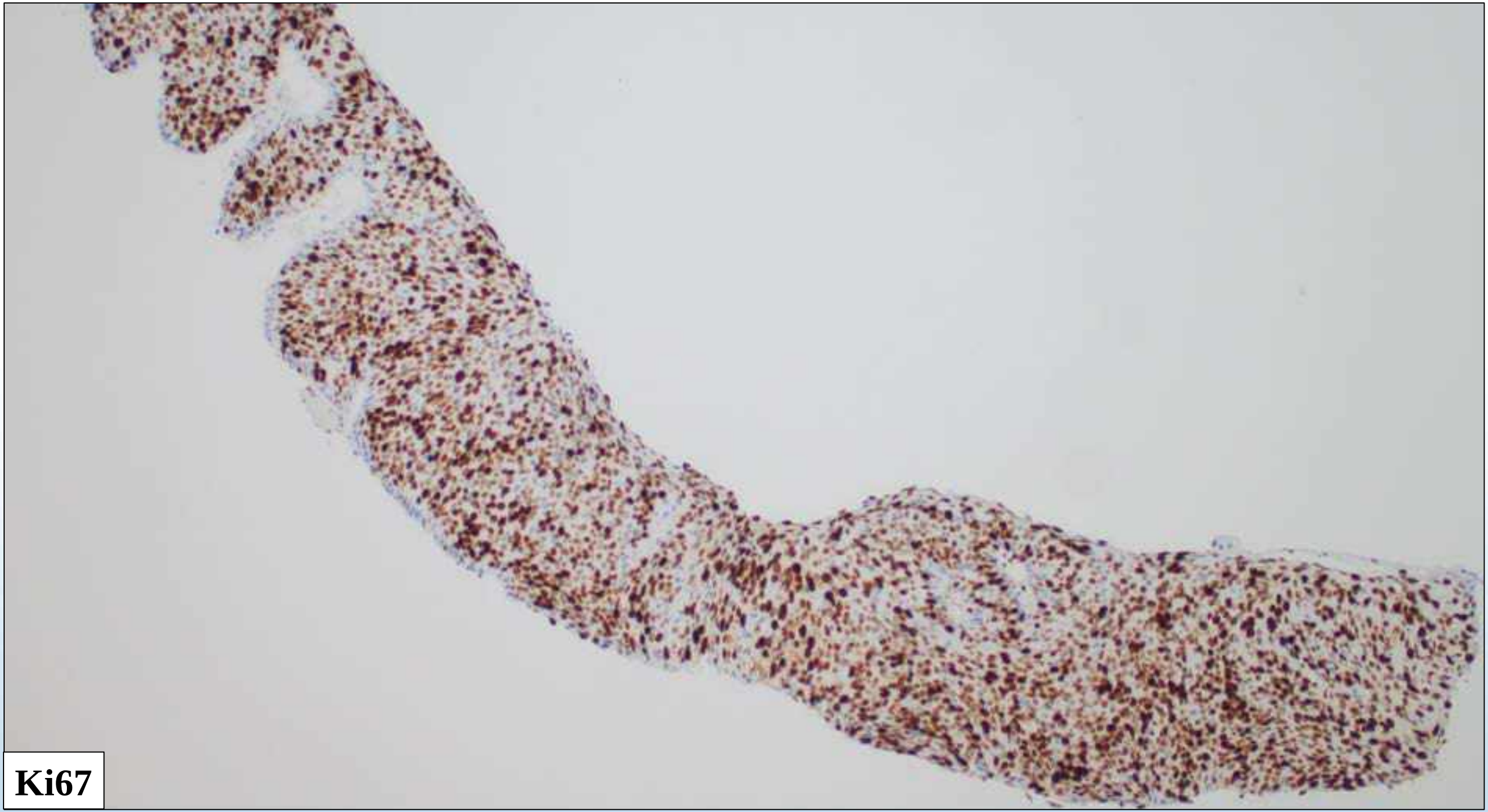
- *pter* is Greek word for wing
- Degenerative
- Wedge-shaped ingrowth conjunctival tissue
- Invades peripheral cornea
- UV/environmental exposure
- Solar elastosis/actinic damage

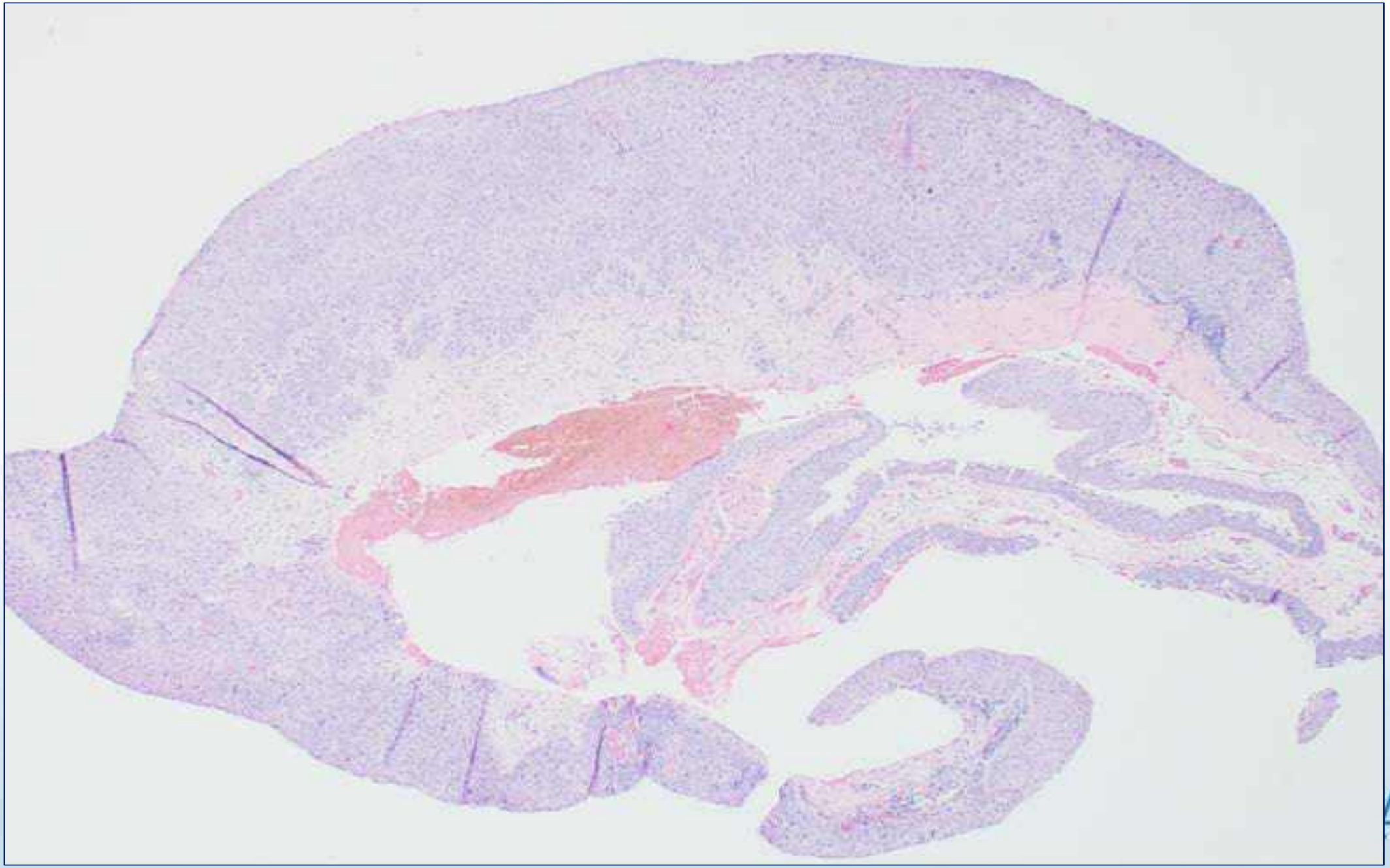


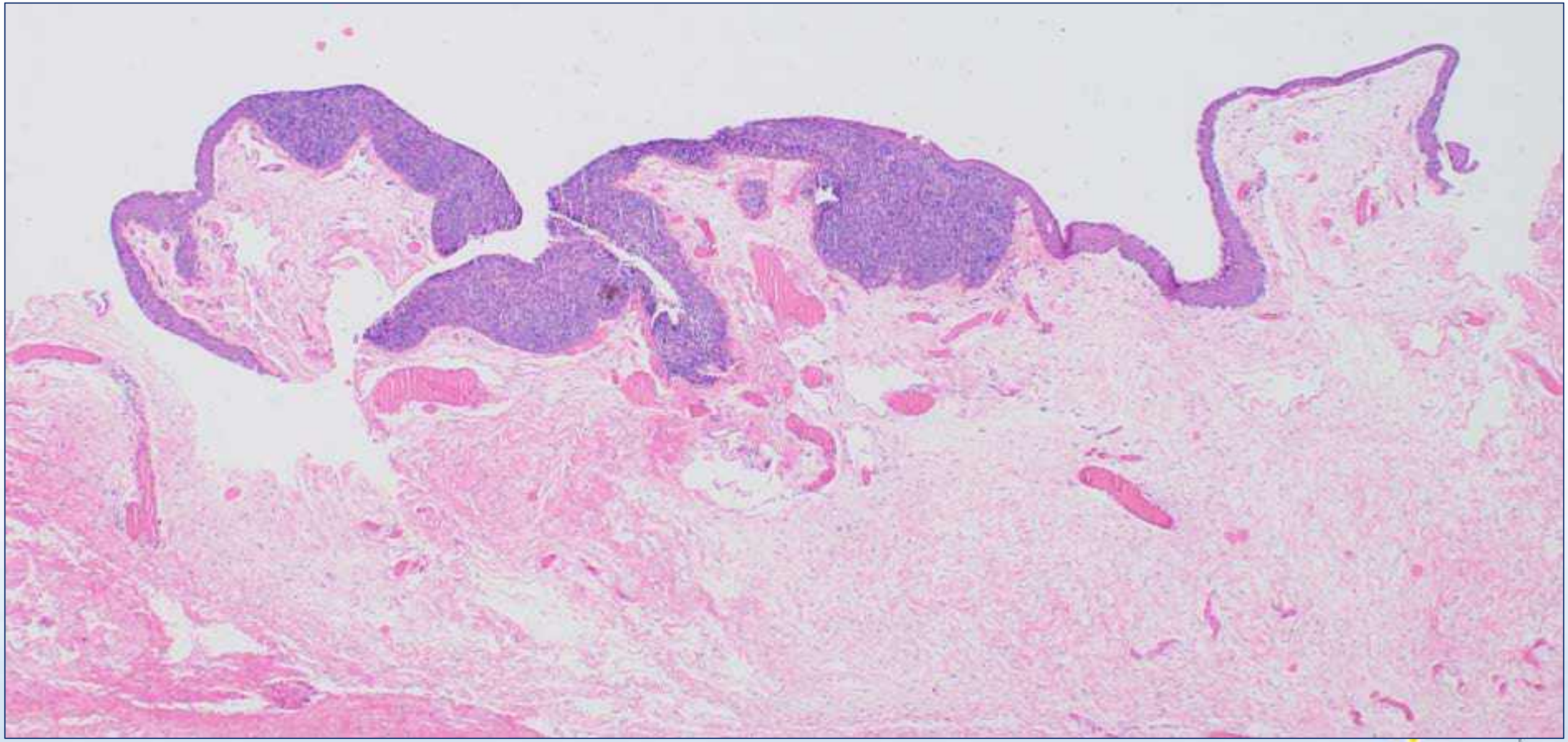
CIN/OSSN

Conjunctival Intraepithelial neoplasia
Ocular surface squamous neoplasia




Ki67





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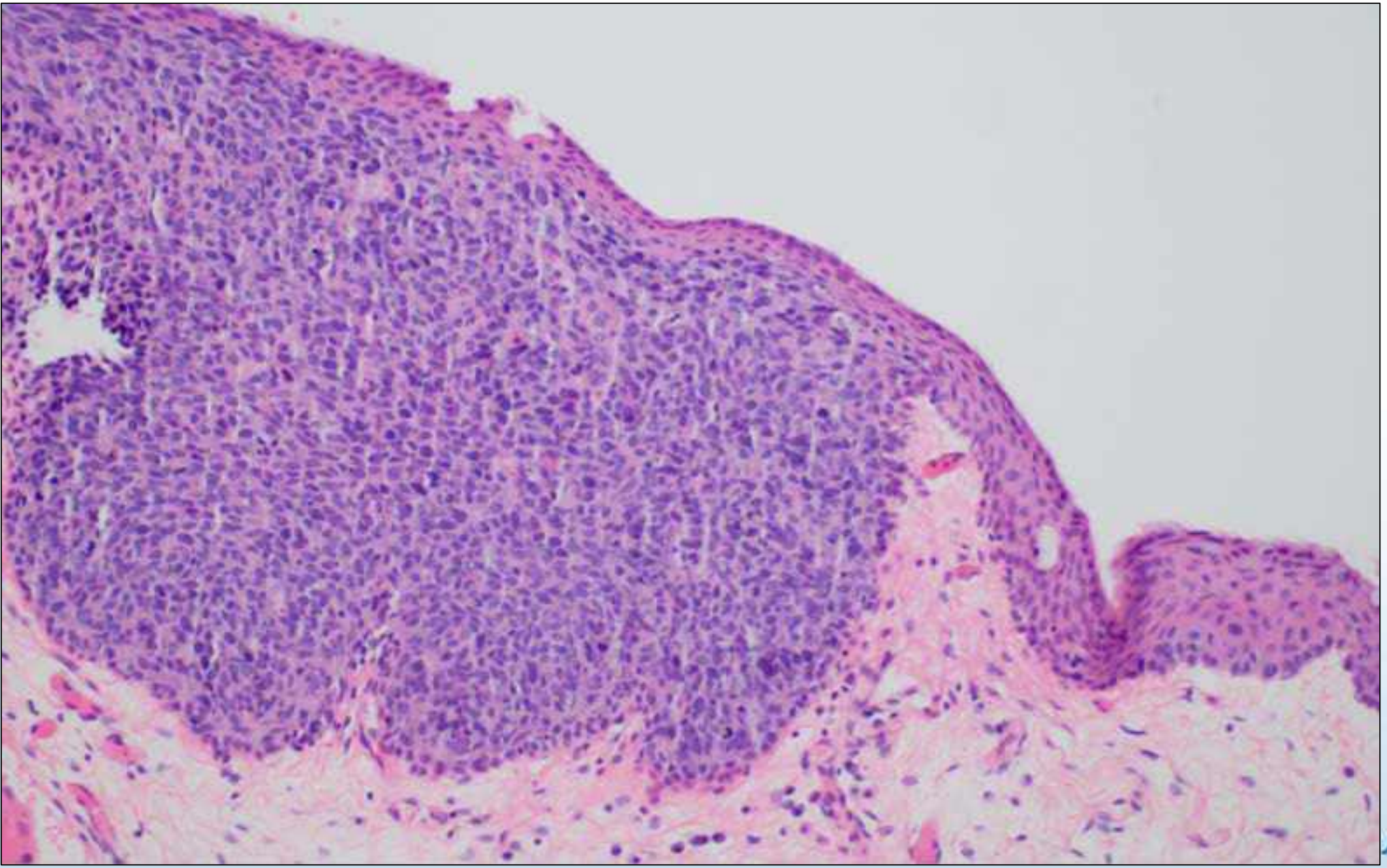
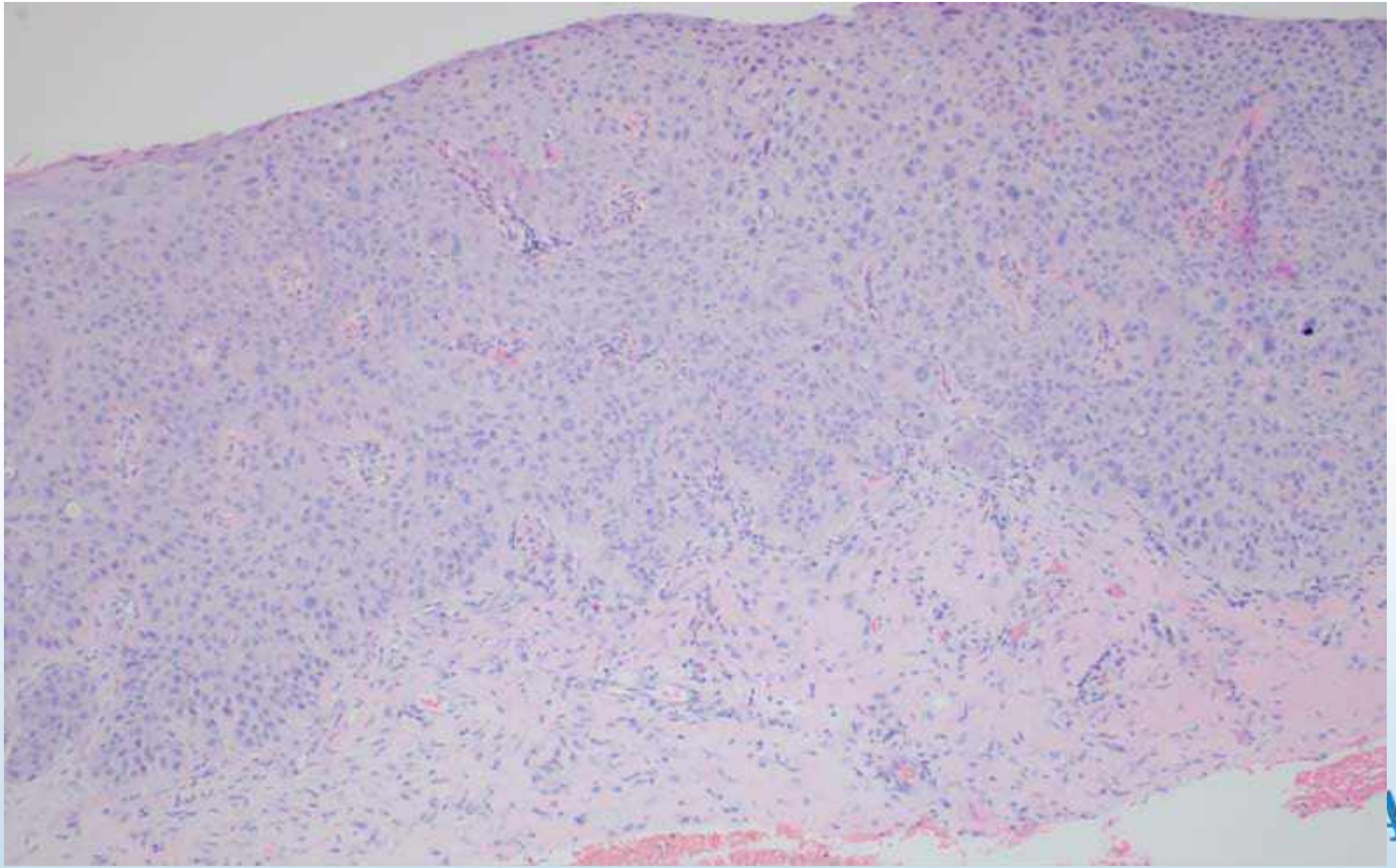
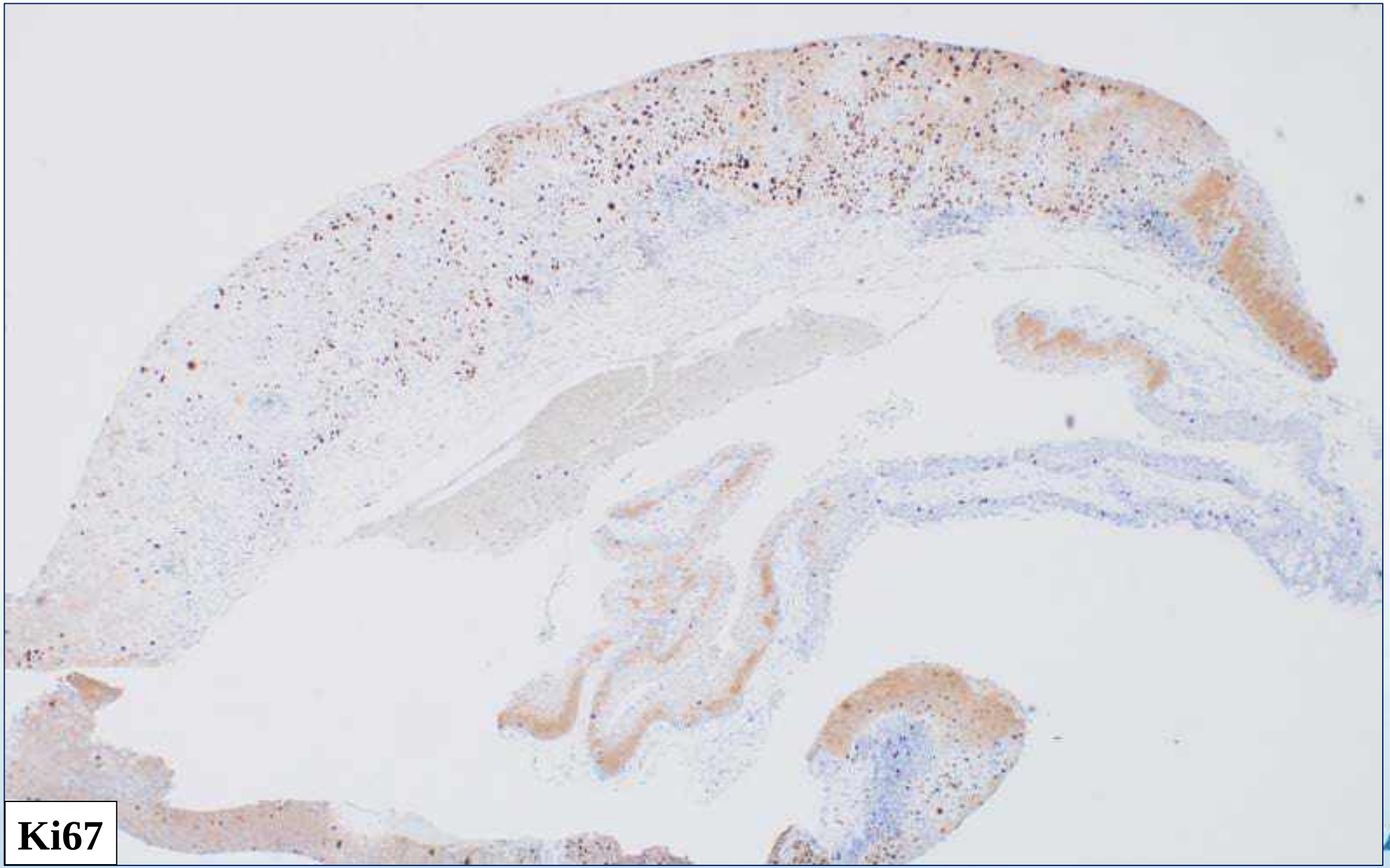






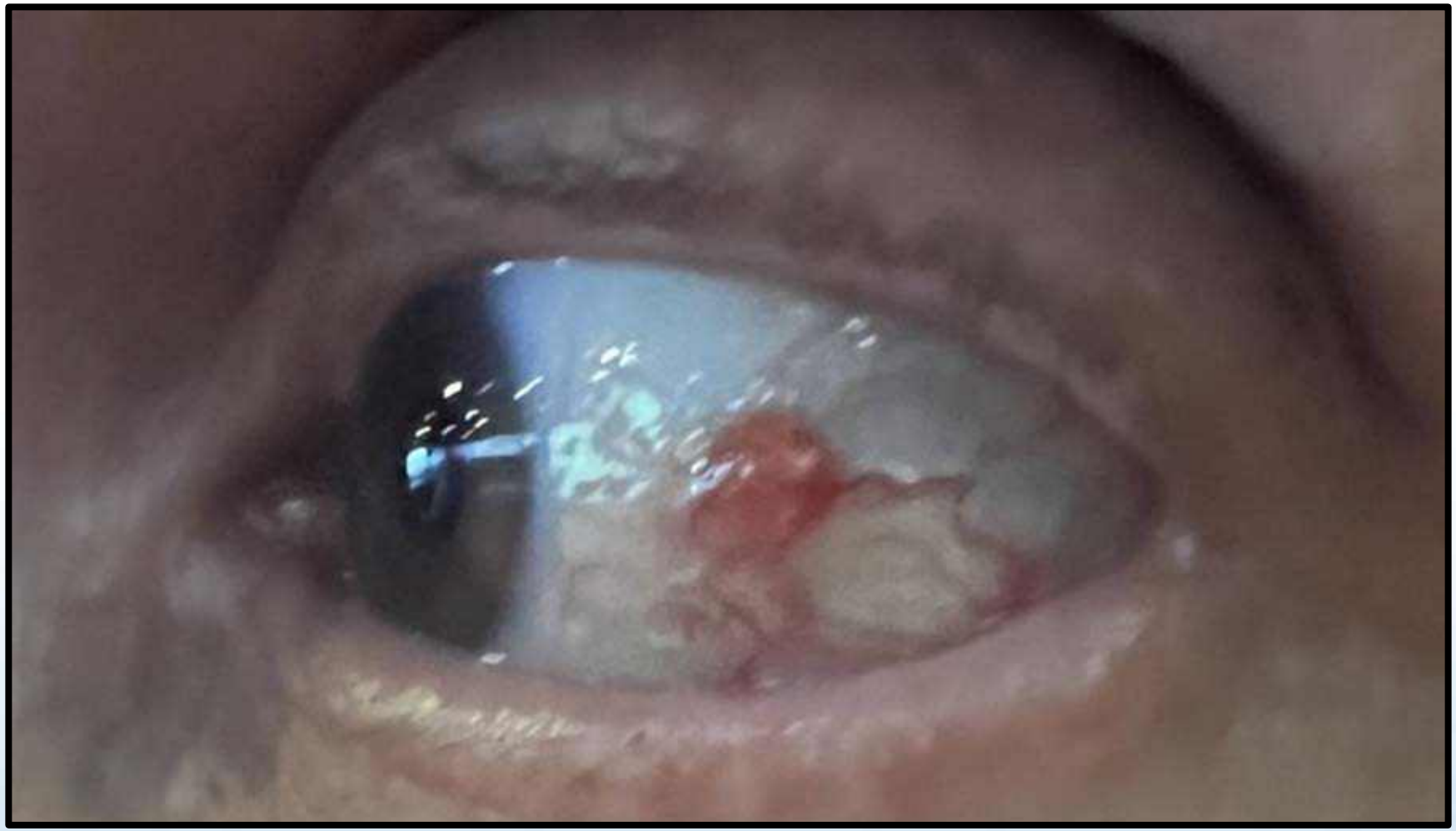
Ki67

CIN/OSSN

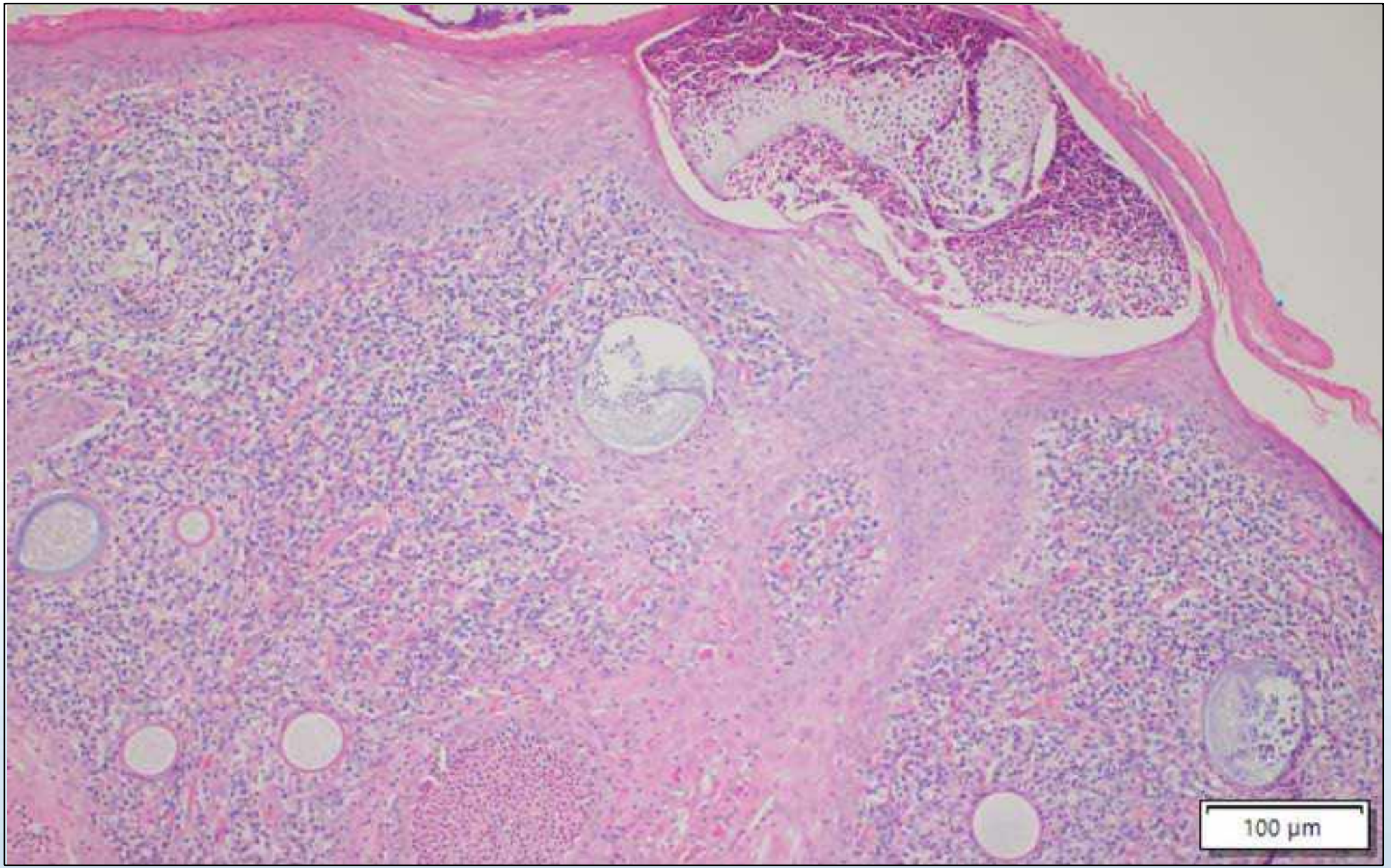
- Conjunctival squamous cell carcinoma (CIN)/ Ocular surface squamous neoplasia (OSSN)
- Typically affects middle aged males, and is slow growing
- Complete surgical excision an effective treatment
- Younger individuals, particularly in equatorial Africa, there is a risk of HIV infection, and these lesions behave in a much more aggressive manner
- Risk factors for the development of CIN include
  - ultraviolet A and B exposure
  - ionizing radiation
  - HPV infection (6,11,16,18)
  - immune suppression (HIV, medication, organ transplant)
  - ocular injury
  - vitamin A deficiency

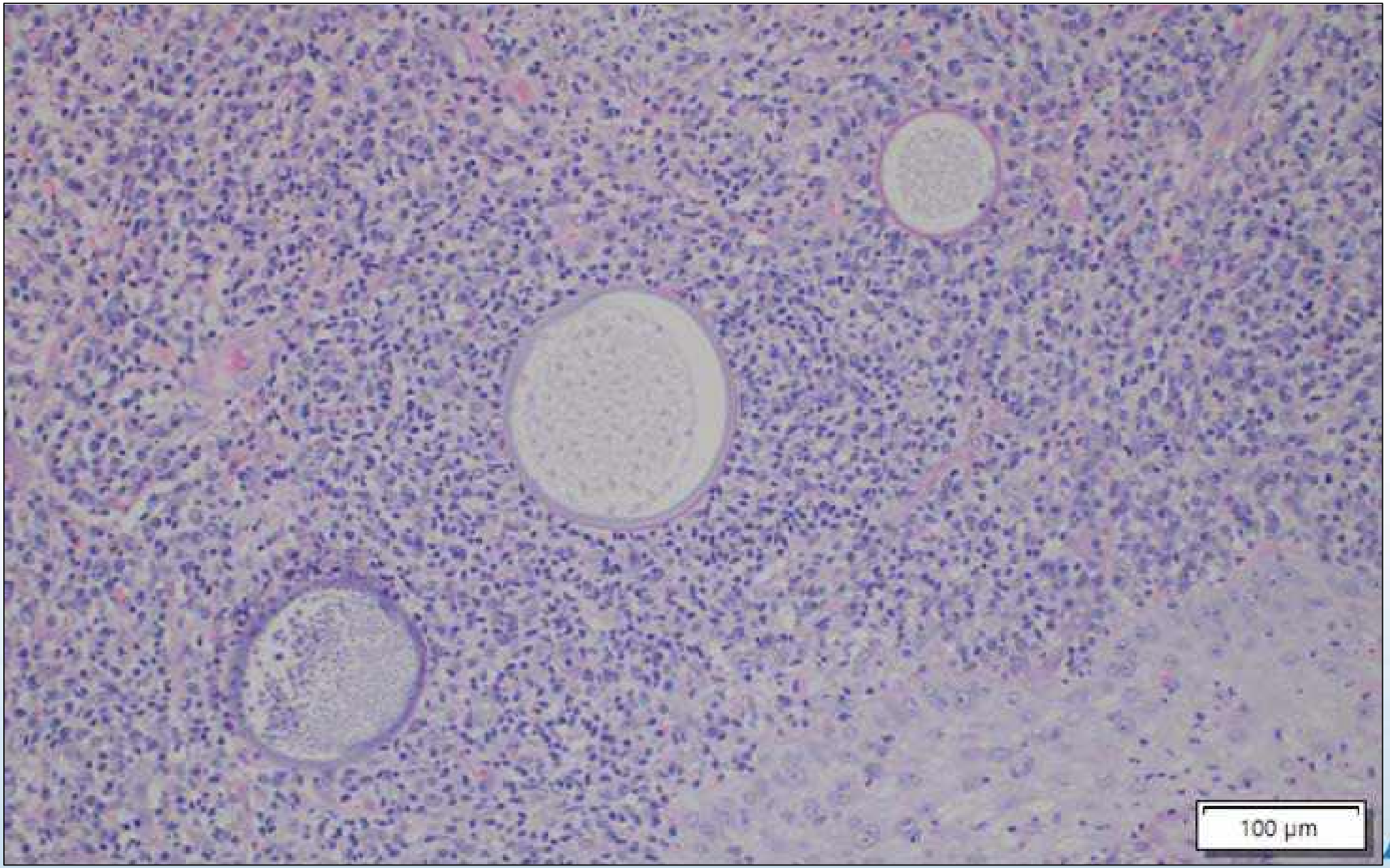
Sun, J. et al. Hum Path, 2017: 64-68.
Shields, C. et al. 2011: 118 (11) pp 2133-2137.

Case presentation



Bulbar conjunctival mass in a 62 year old man, clinically consistent with pyogenic granuloma.


100 µm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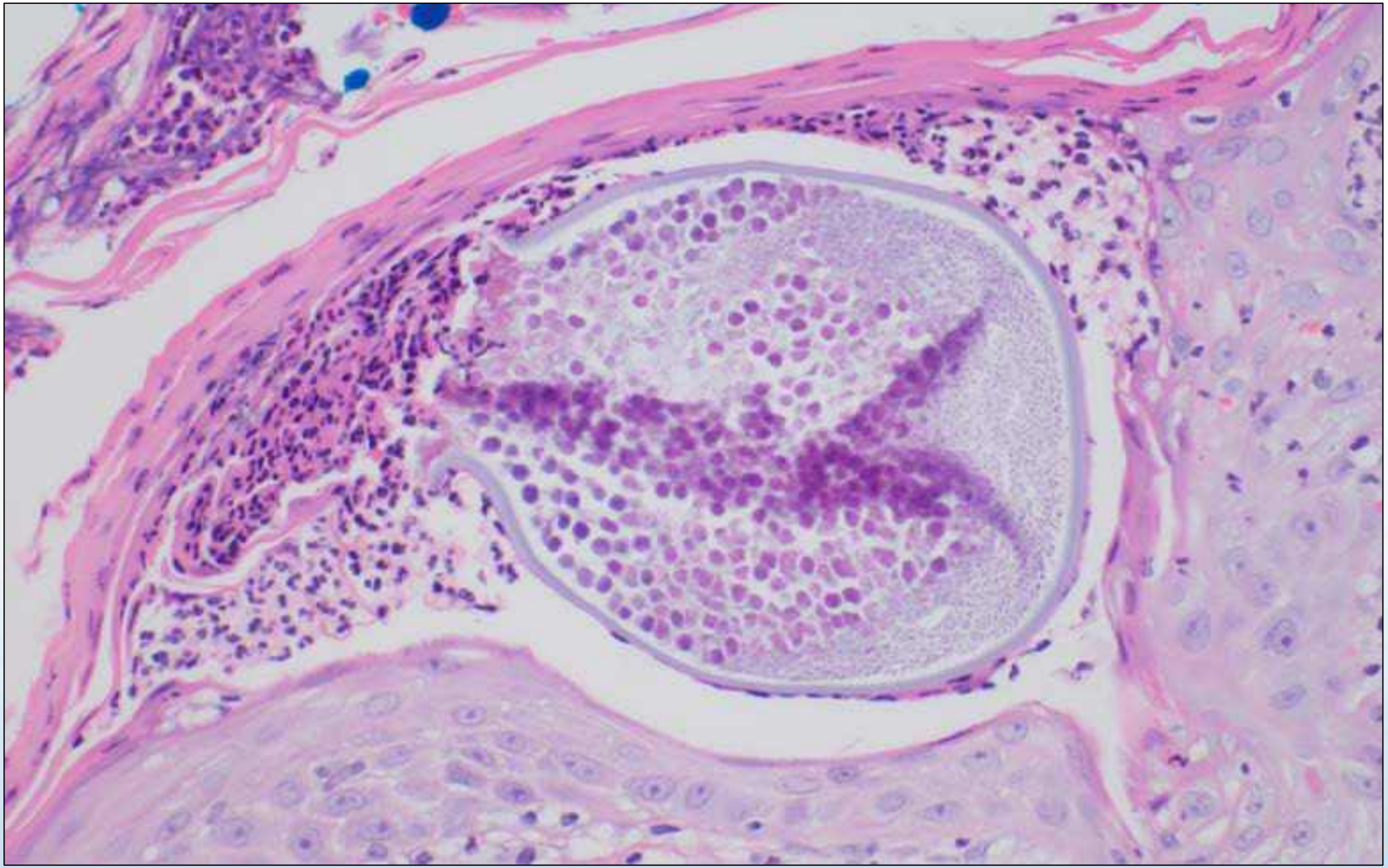

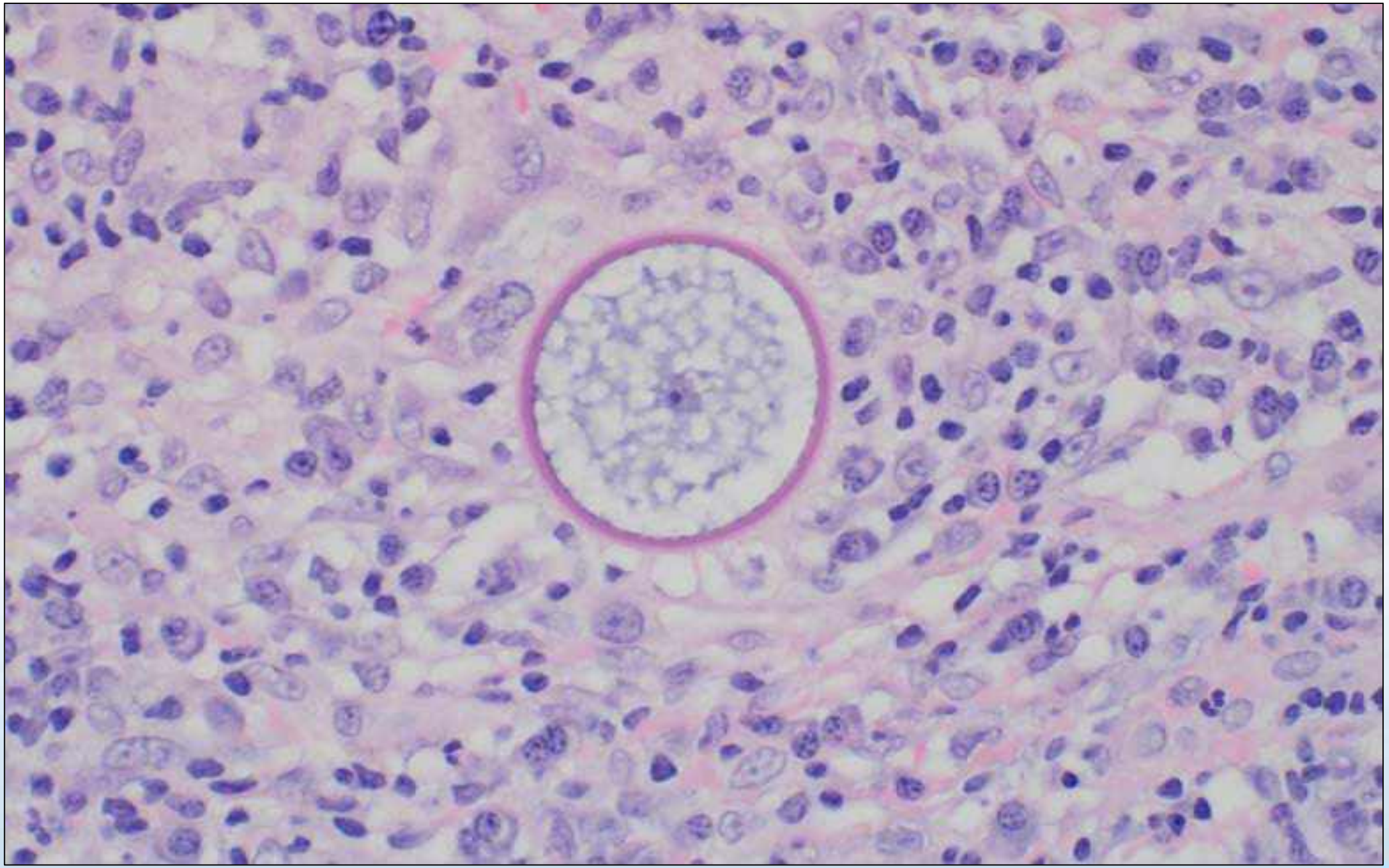

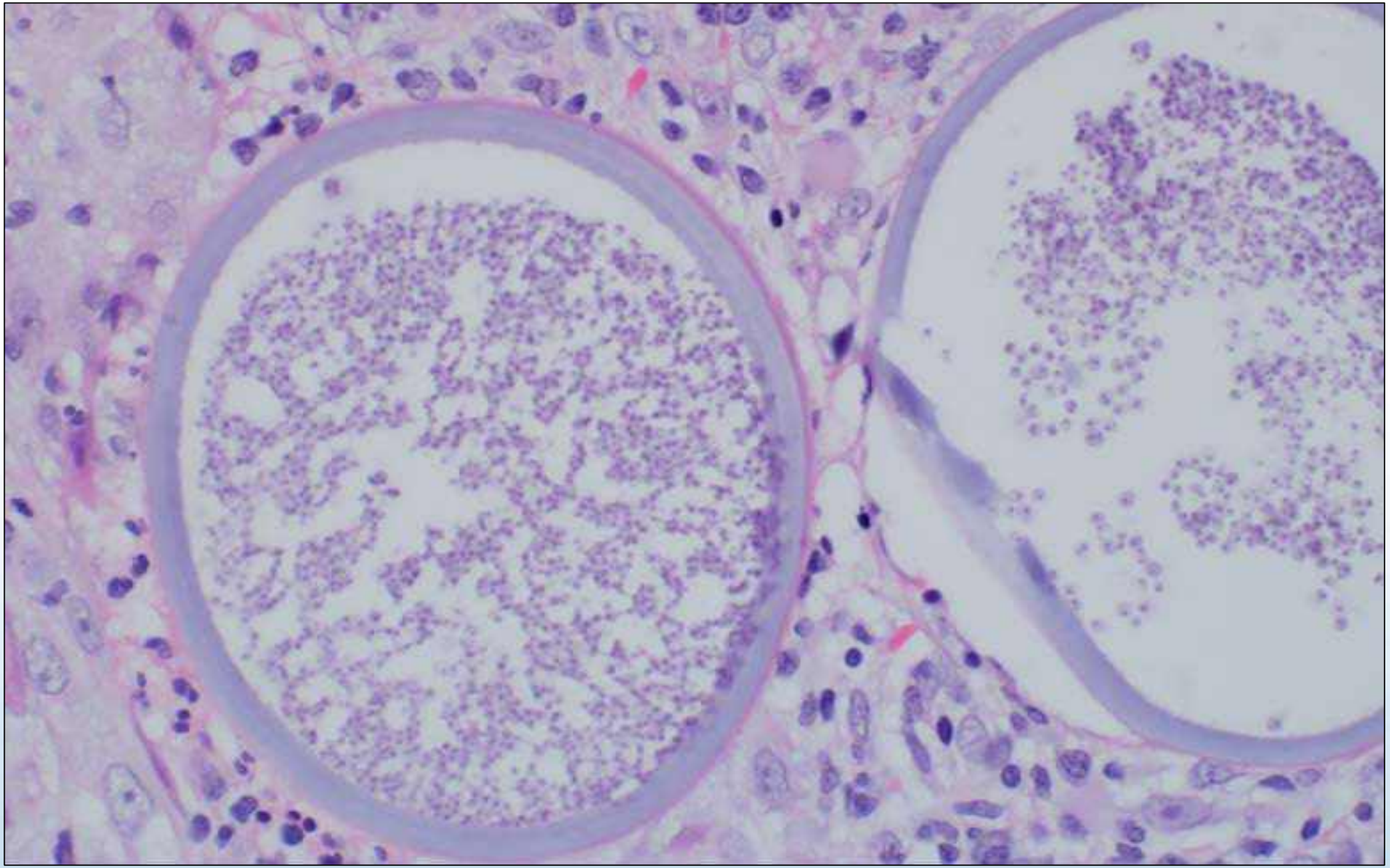

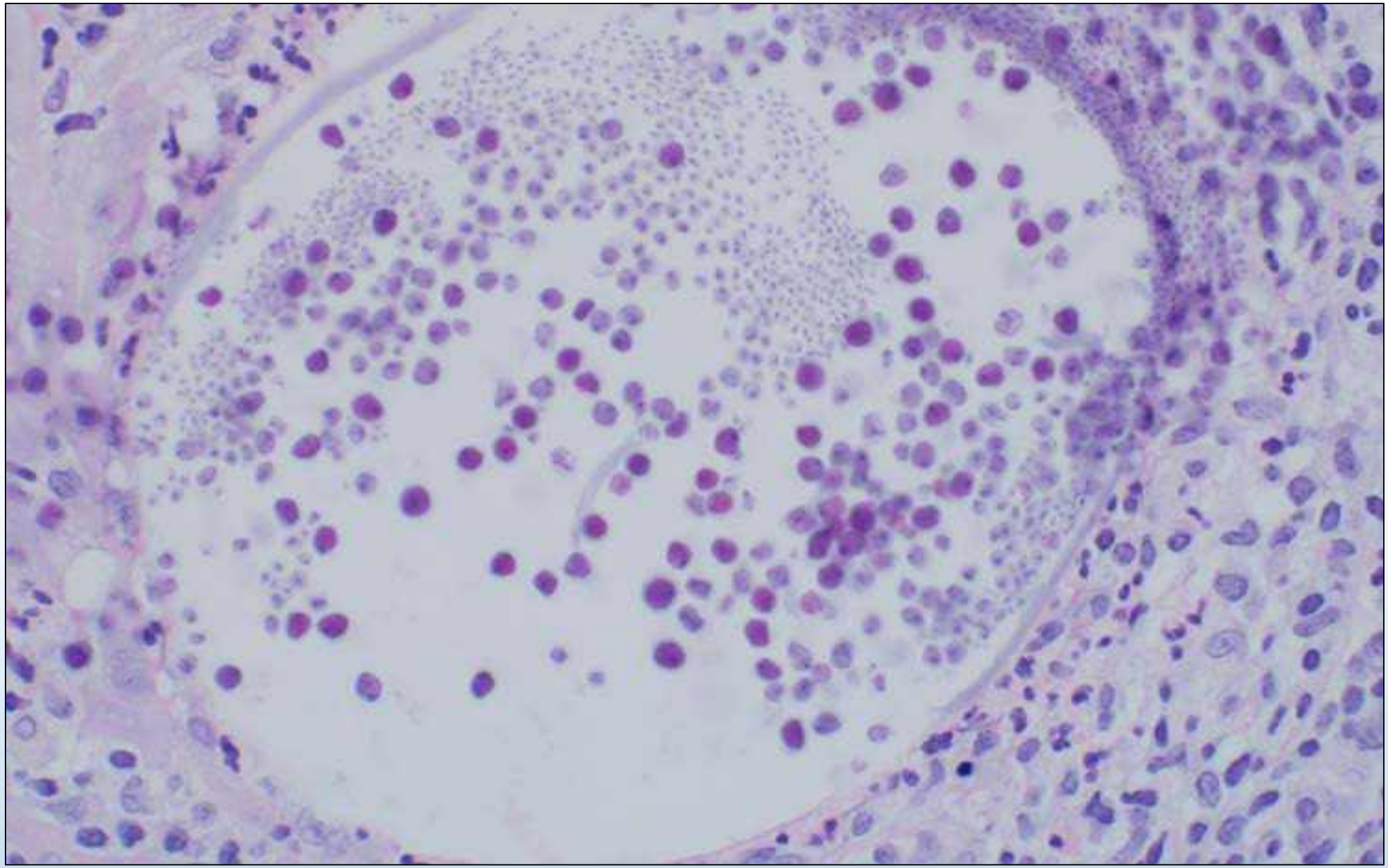

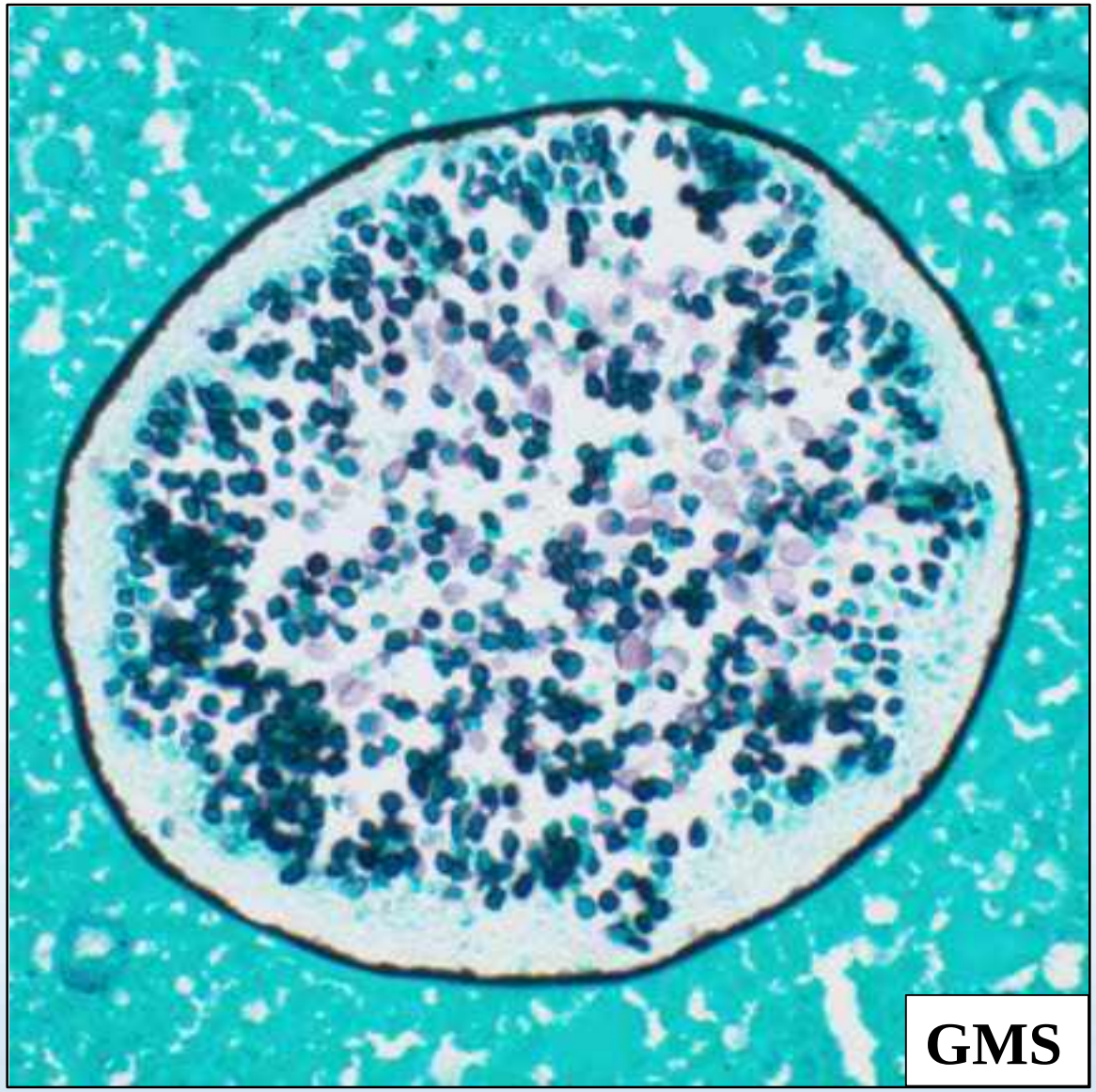

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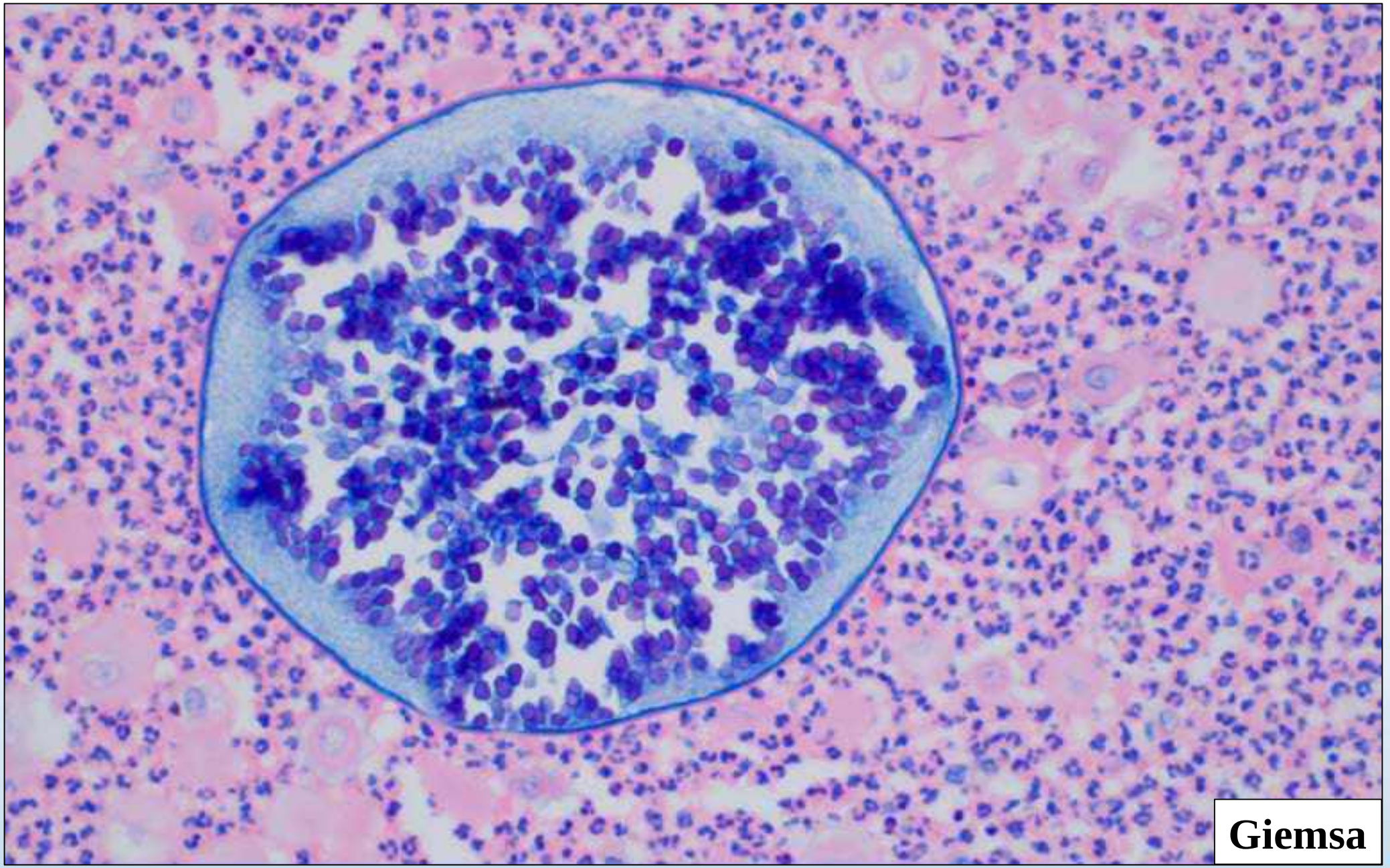

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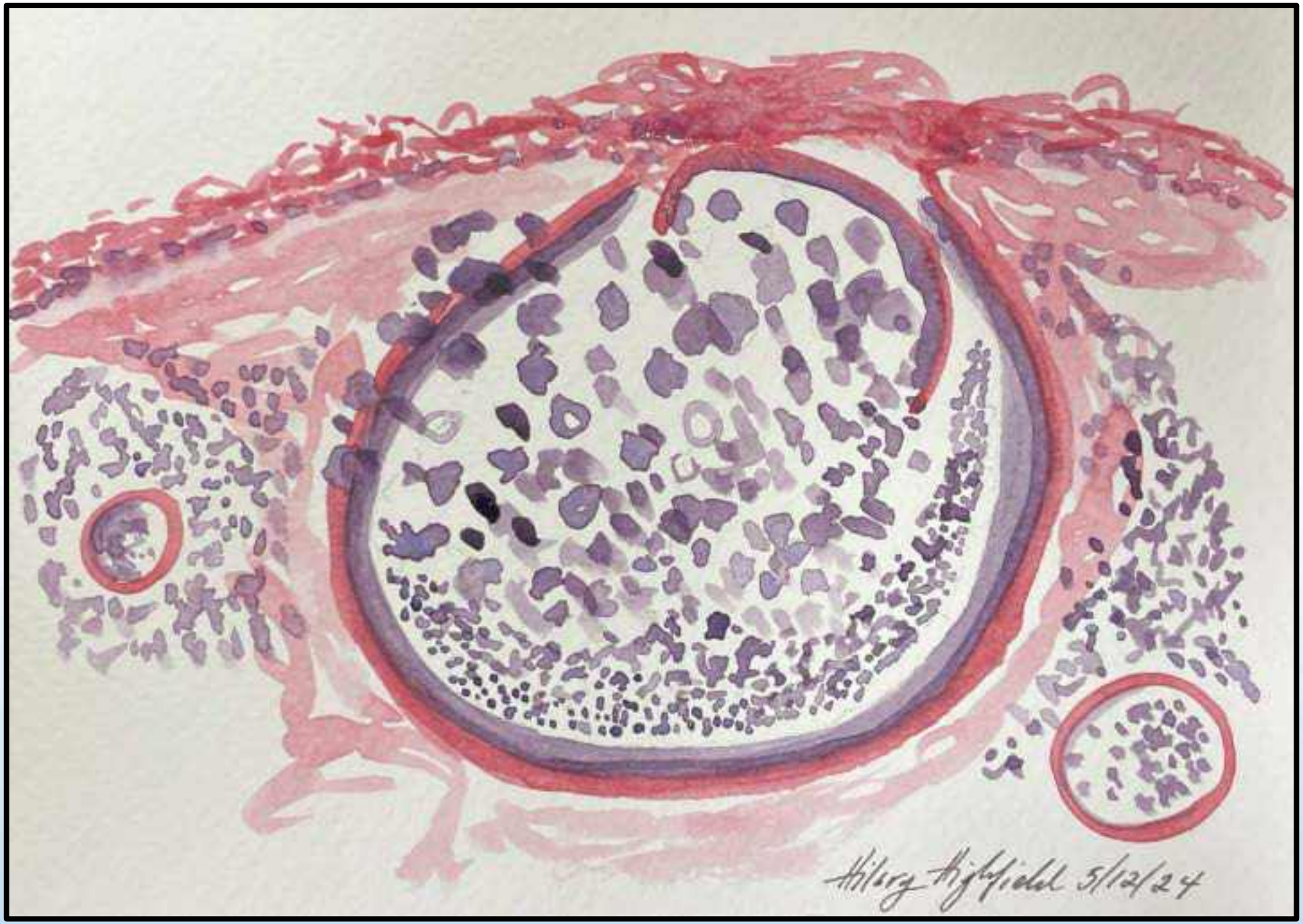

Hilary Highfield 5/12/24

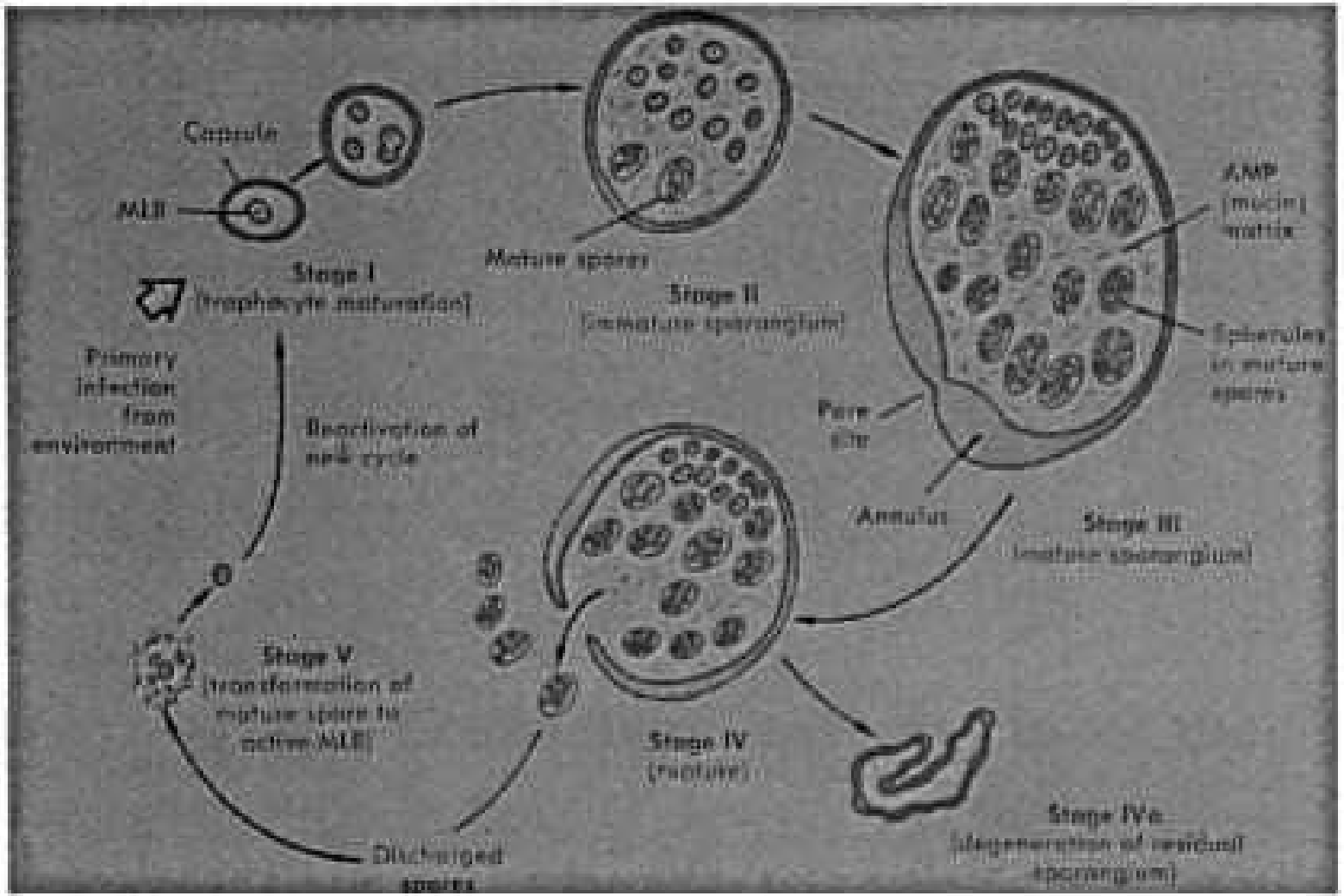
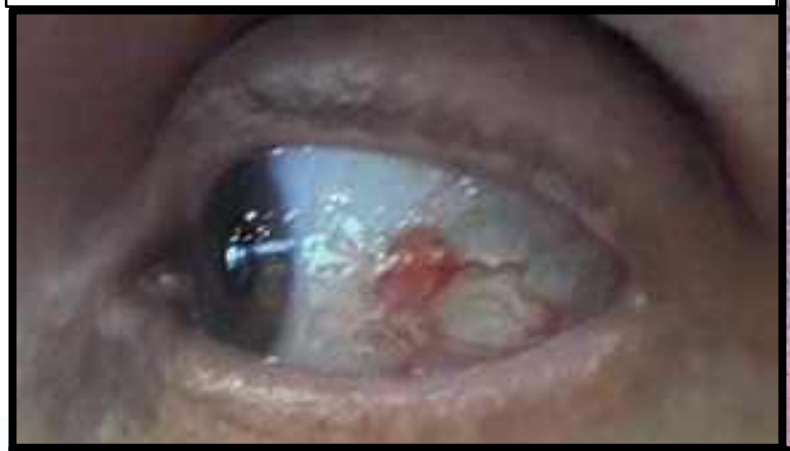
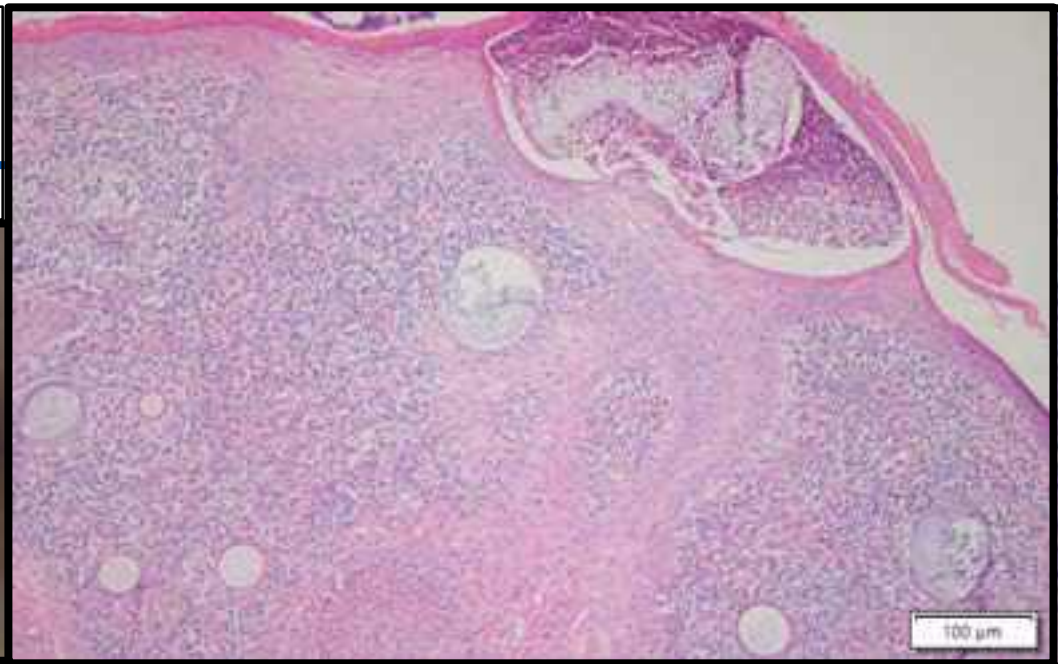
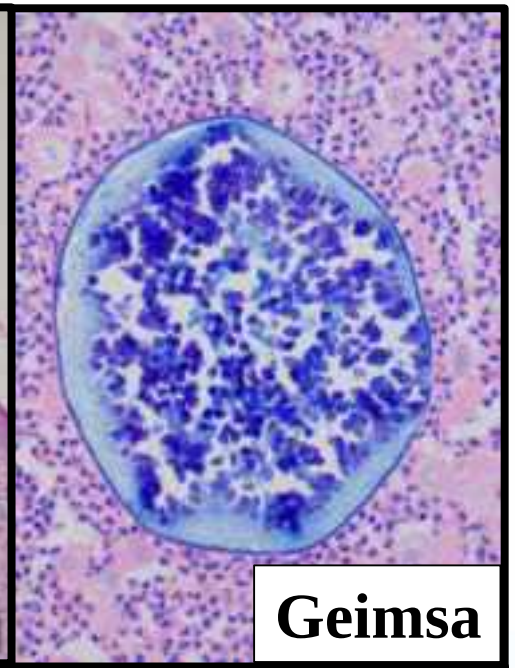


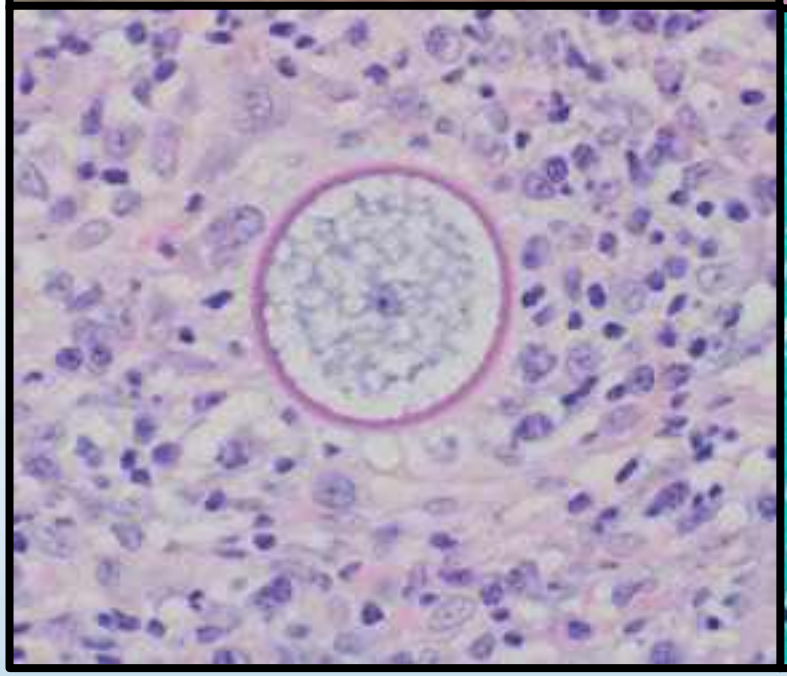
Fig 1. Life cycle of rhinosporidiosis. MLB- multilamellar body, the nucleic acid core of the organism. (Reprinted from Apple DJ, Rabb, MF: Ocular Pathology: Clinical Applications and Self-Assessment. St Louis, CV Mosby, 1991, ed 4, with permission of the author and publisher.)

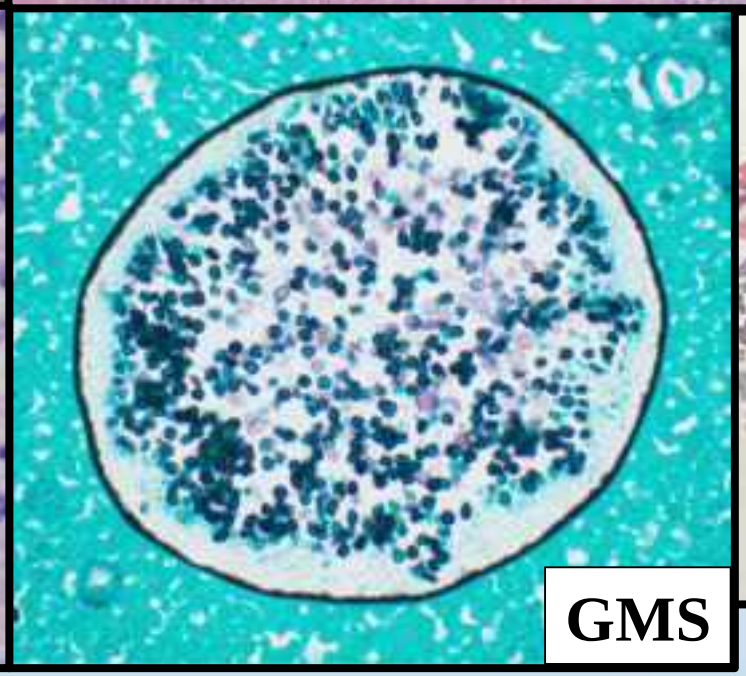
Rhinosporidiosis

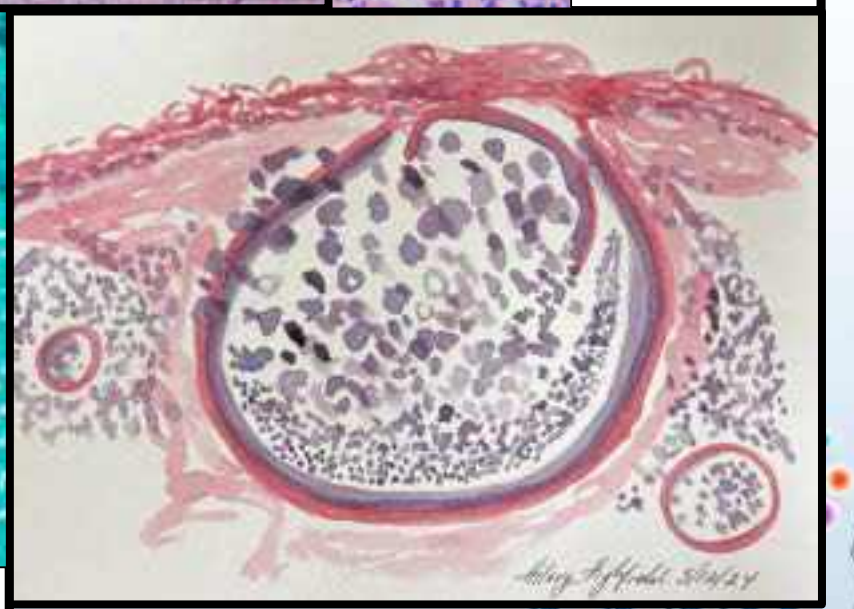












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Rhinosporidiosis

- Rhinosporidiosis is a rare infection caused by the organism ***Rhinosporidium seeberi***.
- This endosporulating microorganism affects mucous membranes, causing a slow growing chronic granulomatous disease.
- The organism is in the class **Mesomycetozoea**, which includes microorganisms with features of both animals and fungi.
- Contact of damaged epithelium with contaminated water or inhalation of spore contaminated field dust are the proposed mechanisms of infection.
- The majority of reported cases are from India, followed by endemic parts of South America, with additional cases in tropical and subtropical areas of North America and Europe.
- Rhinosporidiosis is considered an emerging infectious disease.

Rhinosporidiosis: Clinical Spectrum

- Localized vascularized masses with chronic granulomatous reaction in the sinonasal cavity or eye.
- Can involve the genitourinary tract, anal canal, lung, liver, spleen, bone, and brain.
- Disseminated skin disease is a rare presentation.
- Endemic in tropical and subtropical areas, specifically South Asia (3).
- Diagnosis is via tissue biopsy demonstrating mature sporangia containing endospores.
- Treatment is by surgical resection with careful examination of mucous membranes.

Rhinosporidiosis: Summary

- Rhinosporidiosis typically presents as a chronic mucosal infection caused by ***Rhinosporidium seeberi***.
- Rhinosporidiosis should be considered in patients with painless conjunctival or sinonasal lesions clinically resembling pyogenic granuloma.
- Exposure risk factors include contact of damaged epithelium with contaminated stagnant water or inhalation of spore contaminated field dust.
- Complete surgical excision and examination of sinonasal mucous membranes are recommended to assess for additional lesions.

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Rhinosporidiosis: References

1. Fredricks, DN et al. Rhinosporidium seeberi: A human pathogen from a novel group of aquatic protistan parasites". Emerg Infect Dis. 2000; 6(3): 273-282.
2. Gopinathan, A et al. "Rhinosporidiosis of the tarsal conjunctiva". Indian J of Ophthal. 2015; 63(5): pp. 462-3.
3. Pengos S et al. "Rhinosporidiosis in the Americas: A Systemic Review of Native Cases". Am J Trop Med Hyg. 2021; 105(1): 171-175.
4. Arias, A et al. "Case report: Rhinosporidiosis literature review". Am. J. of Trop. Med Hyg. 2021; 104(2): pp. 708-711.
5. Sood, N et al. "Ocular rhiosporidiosis: a case report from Delhi". J Infect Dev Ctries. 2012; 6(11): 825-827.

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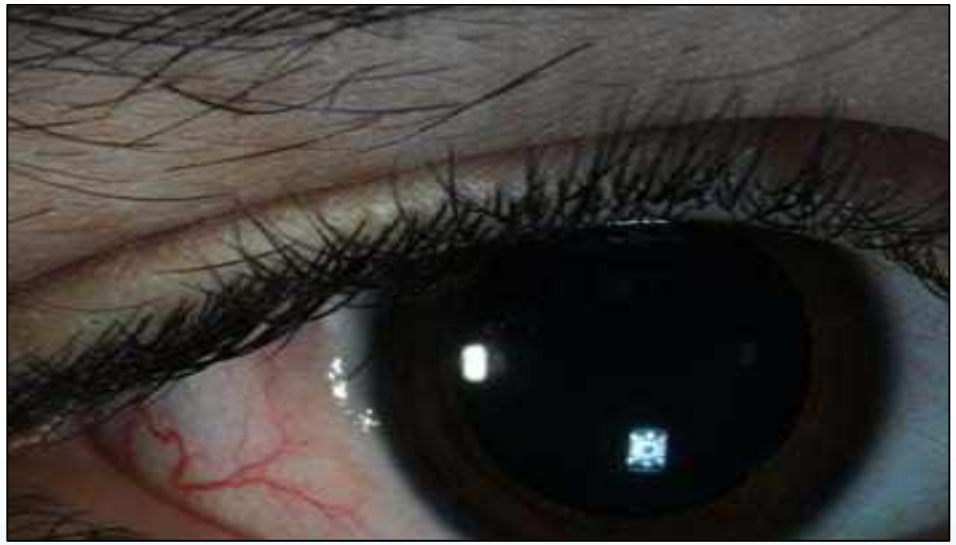
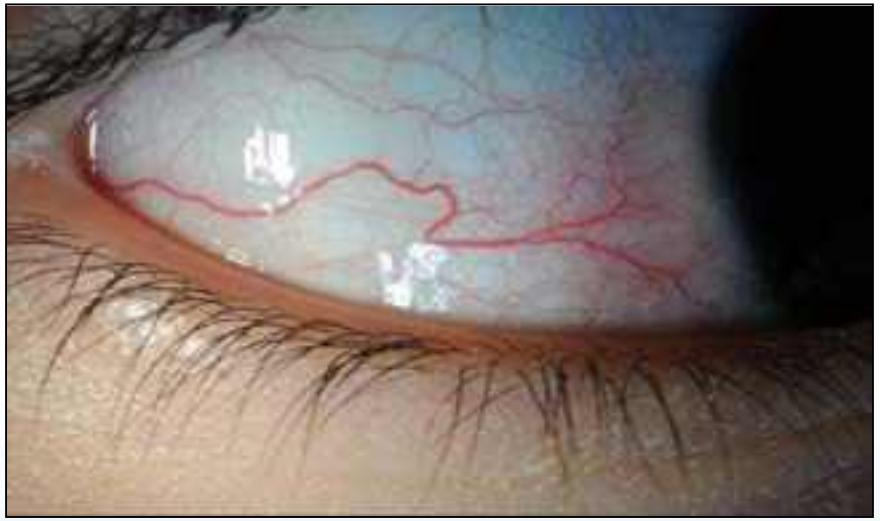
Pigmented Conjunctival Lesions

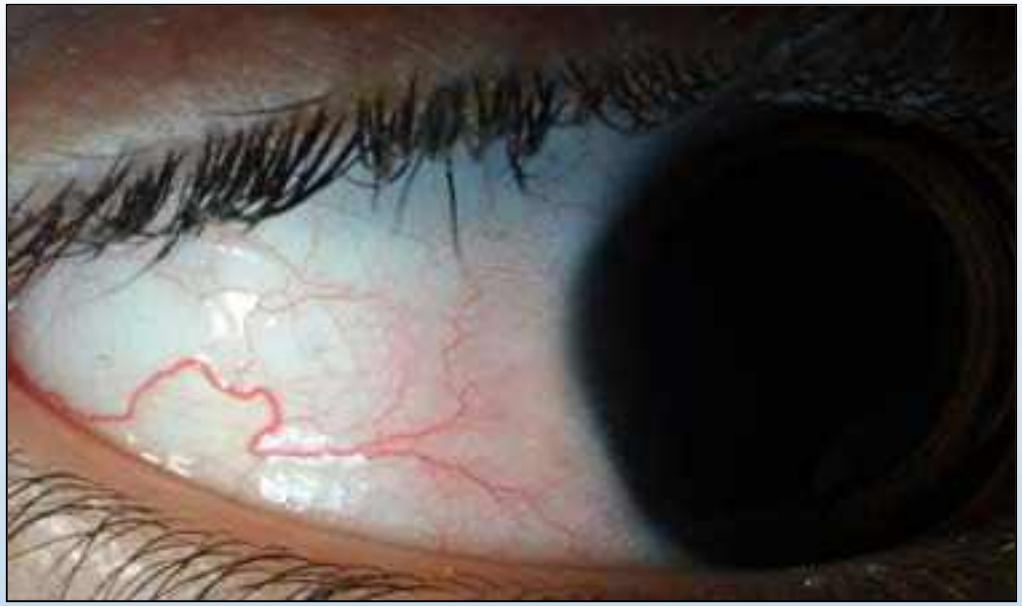
Temporal conjunctival lesion

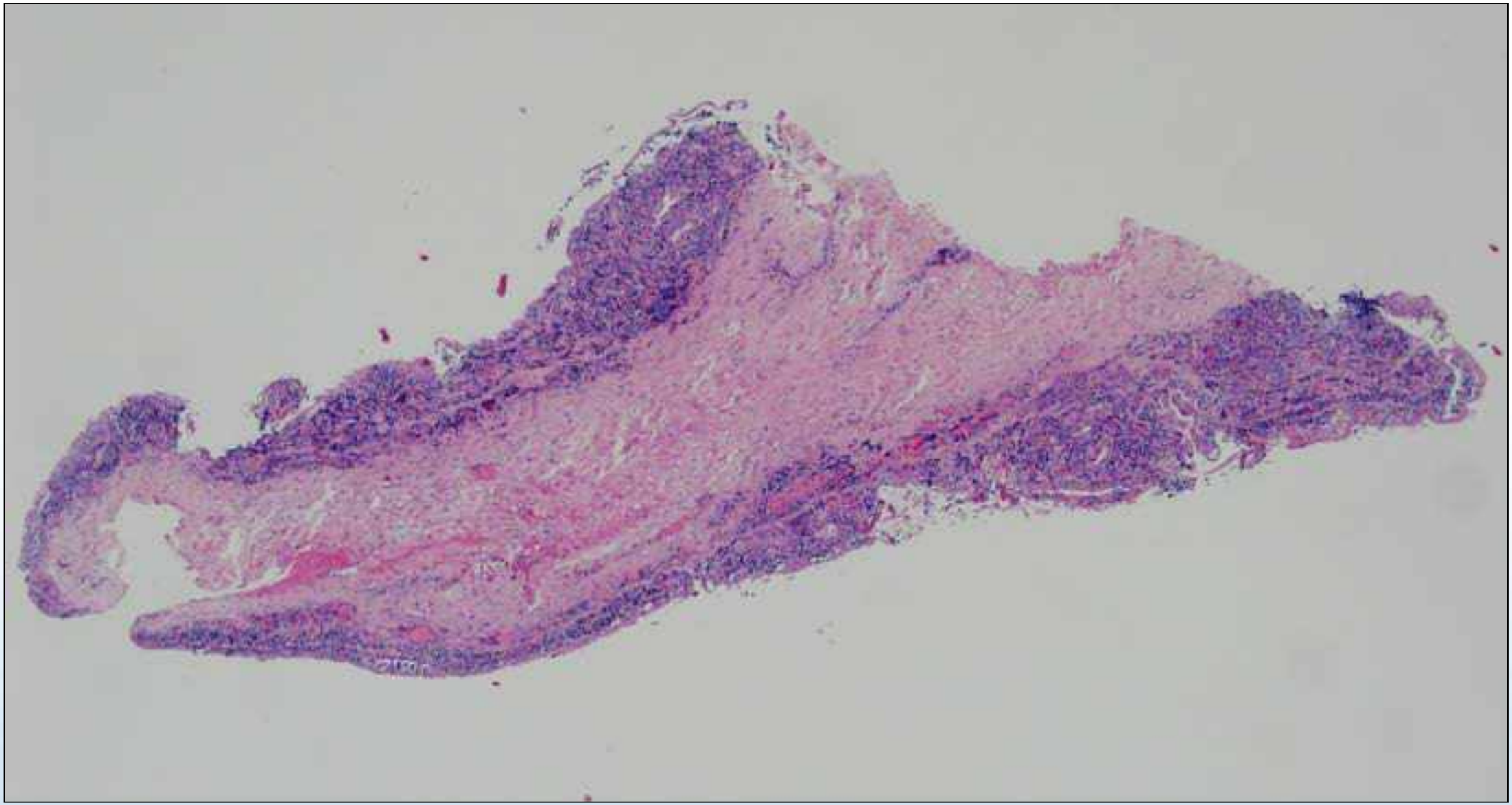
- 10 yo Caucasian male presents with 2 year history of temporal conjunctival lesion OD.
- Associated with occasional redness, blurry vision and eye irritation OD.
- Pt. evaluated by multiple eye doctors who diagnosed pt. with pinguecula, allergic conjunctivitis and a “dry spot.”
- Pt. prescribed Ciprofloxacin, Pataday, Alrex, PredForte and Lotemax in alternating concentrations and schedules.
  - Drops make the redness and irritation go away, but symptoms resume when drops are stopped.

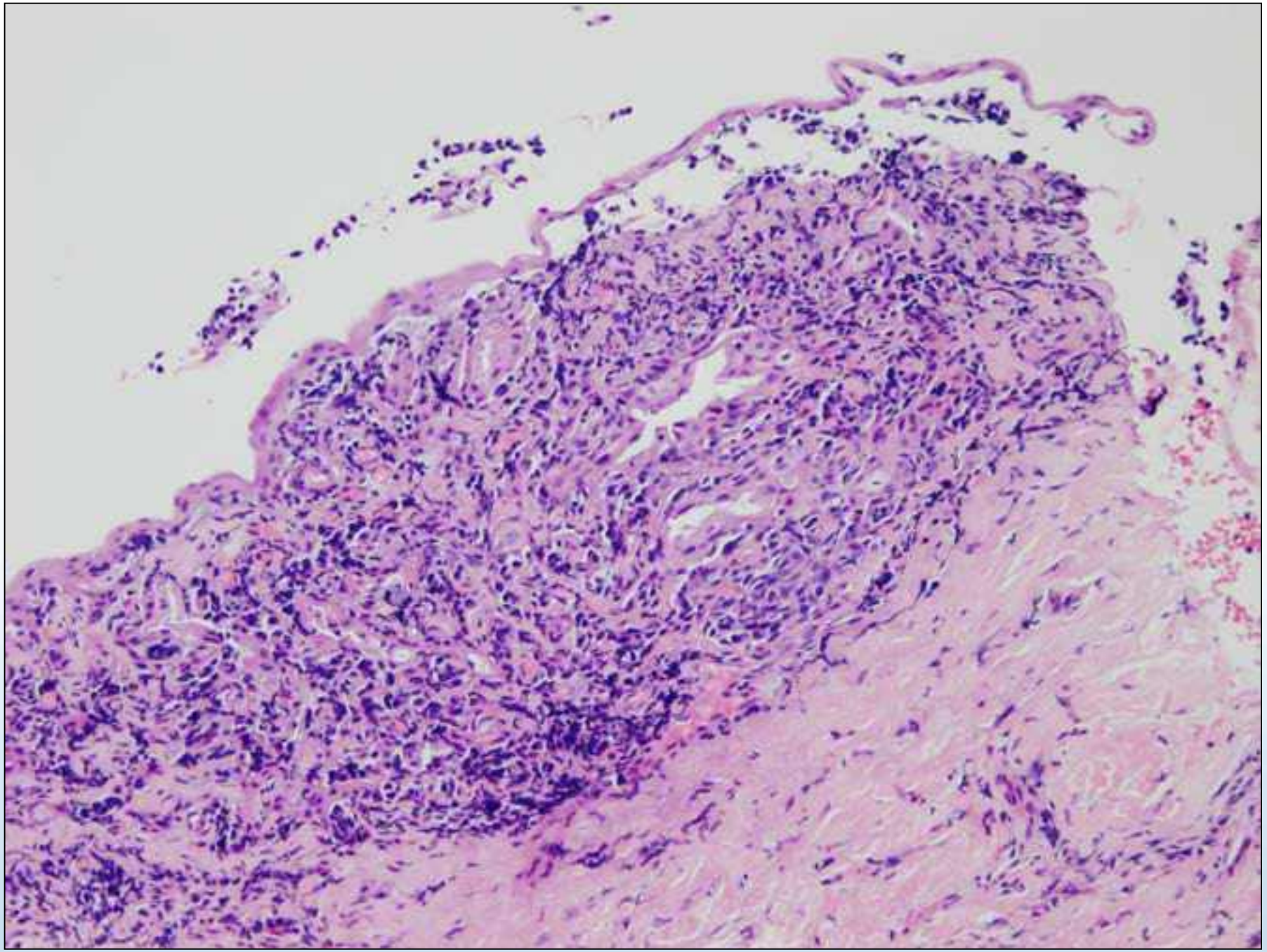
Slit Lamp Photos

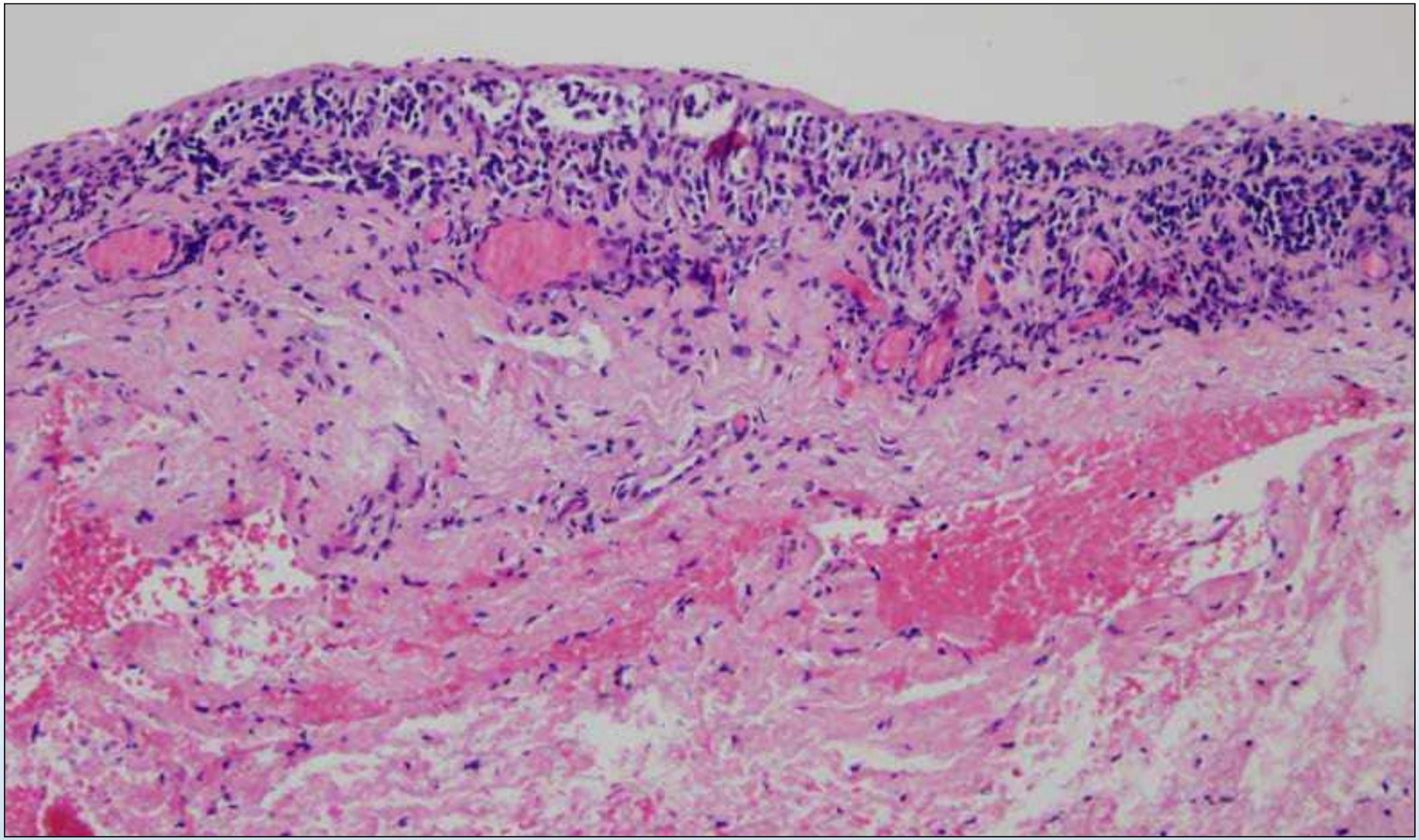


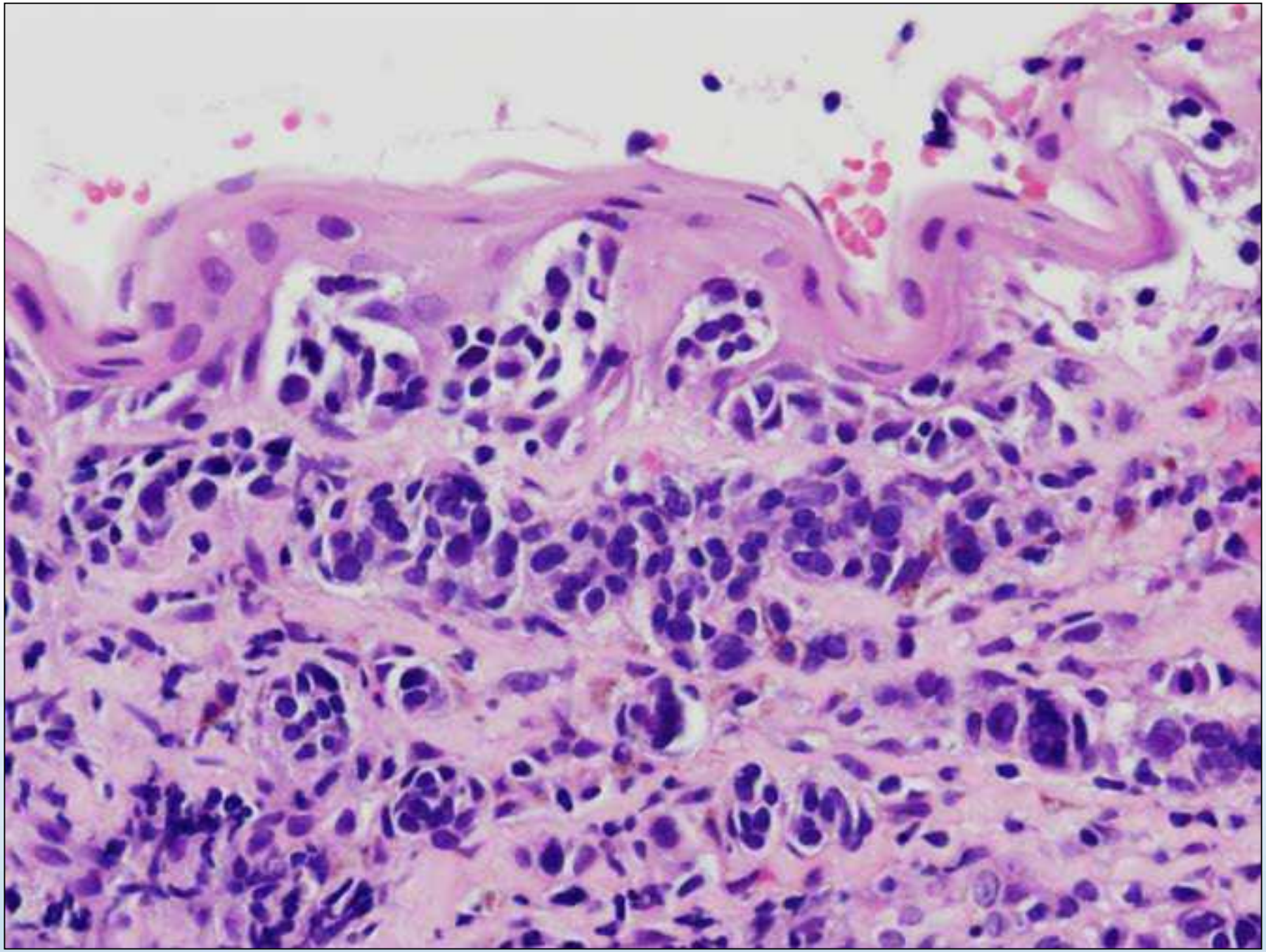












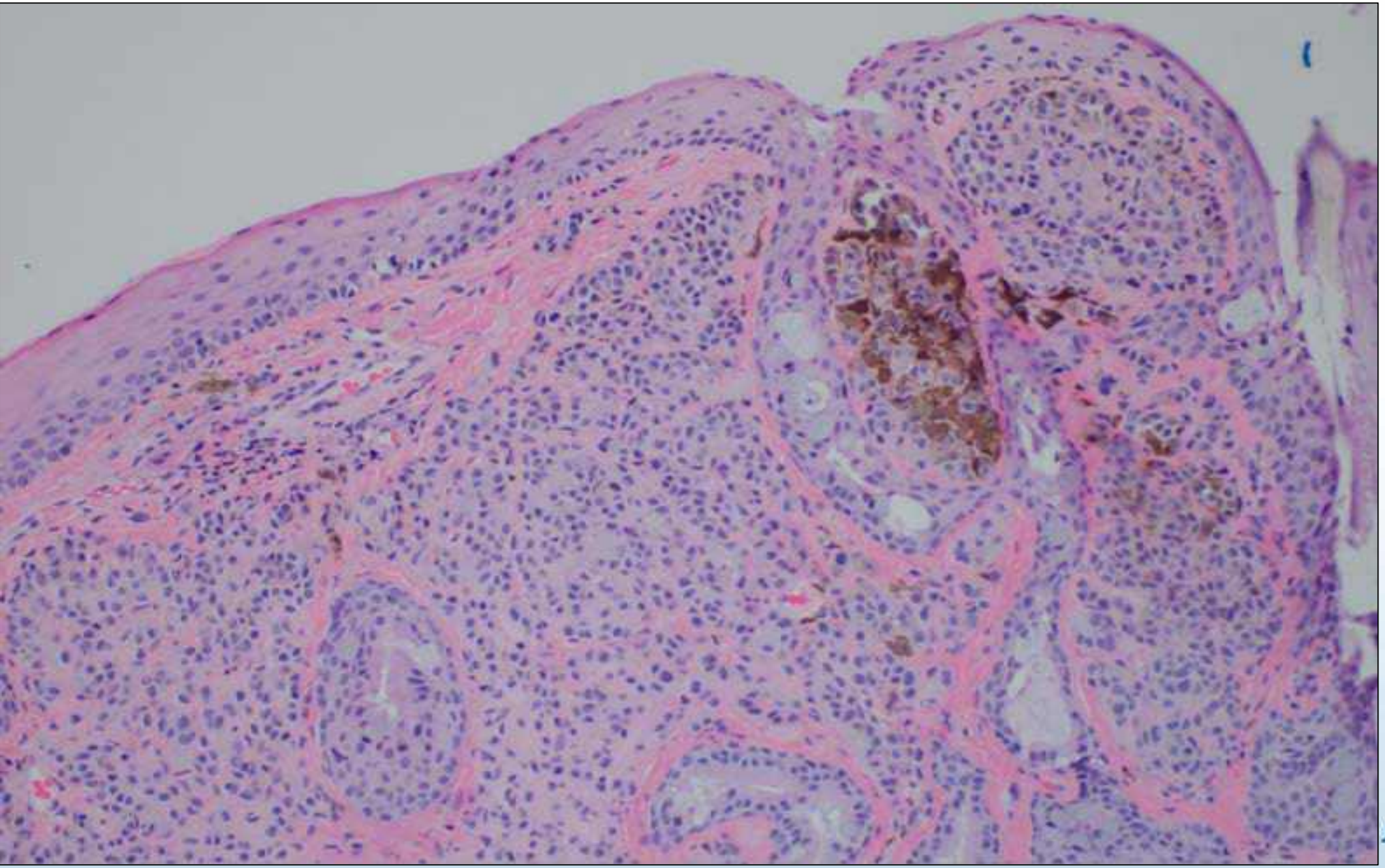
Conjunctival Nevus

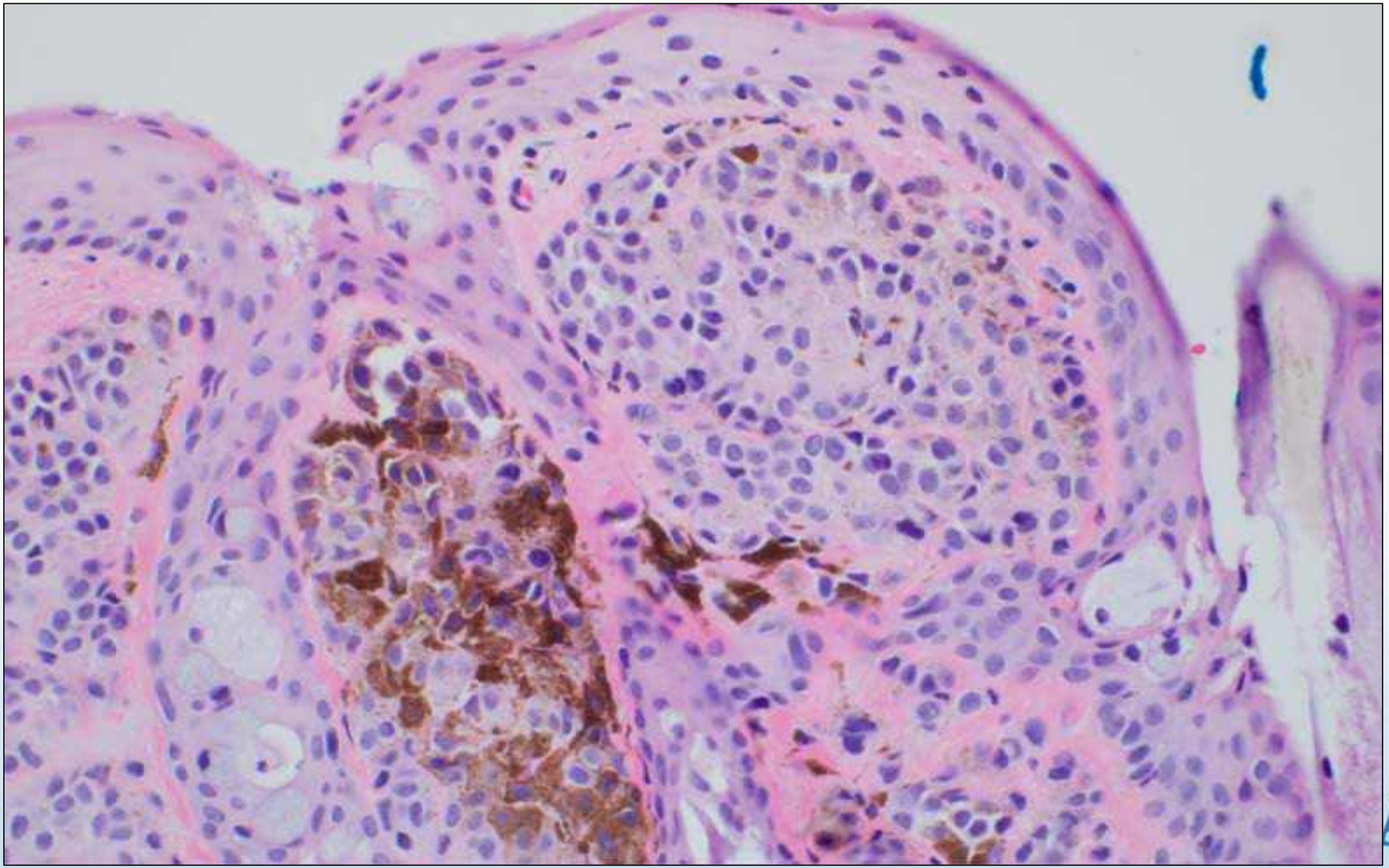
- Typically present at birth, cystic and located near limbus.
- Mostly are brown, but rarely red.
- Can become enlarged and affected by hormonal changes such as puberty.
- Benign

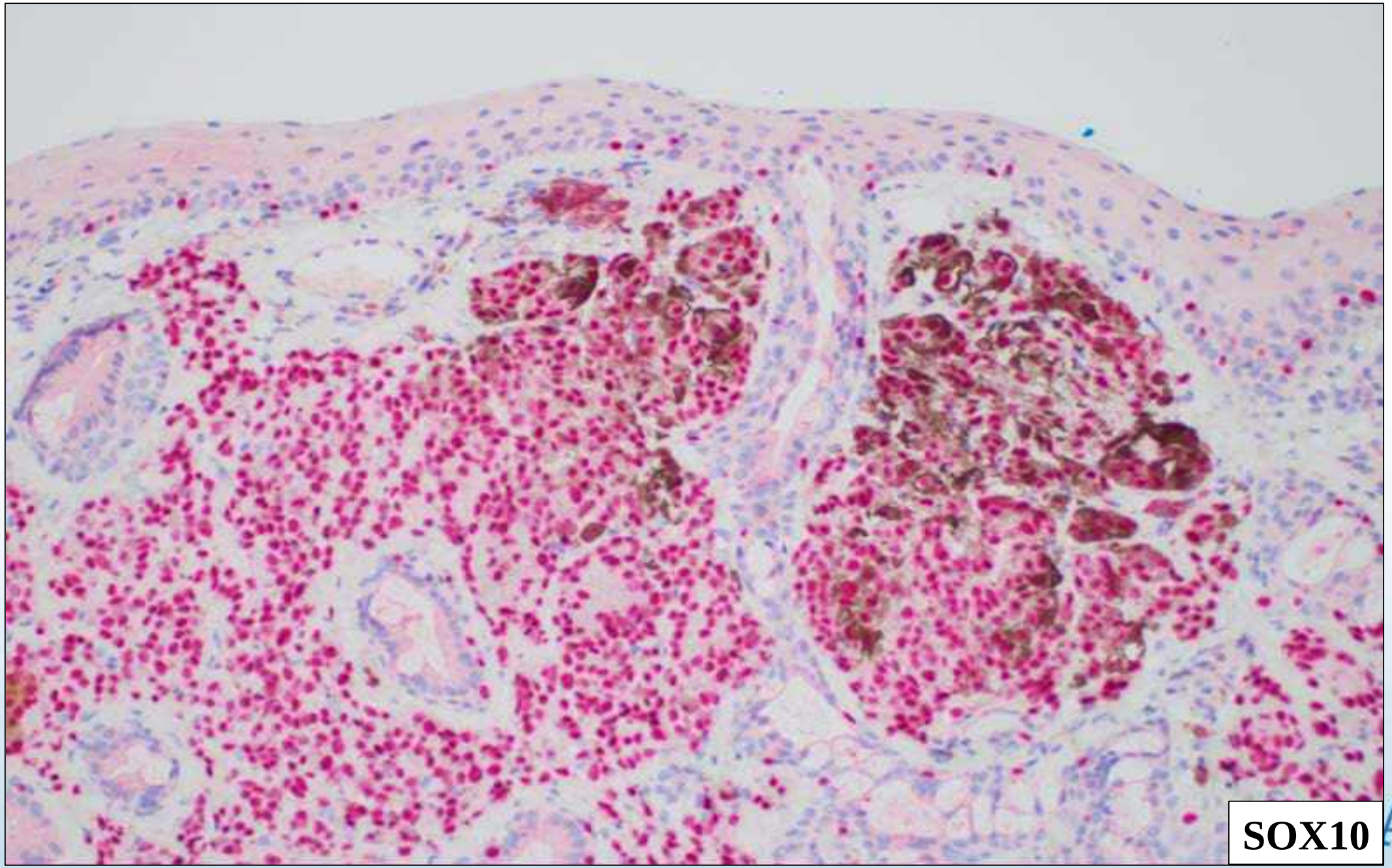
Conjunctival Nevi

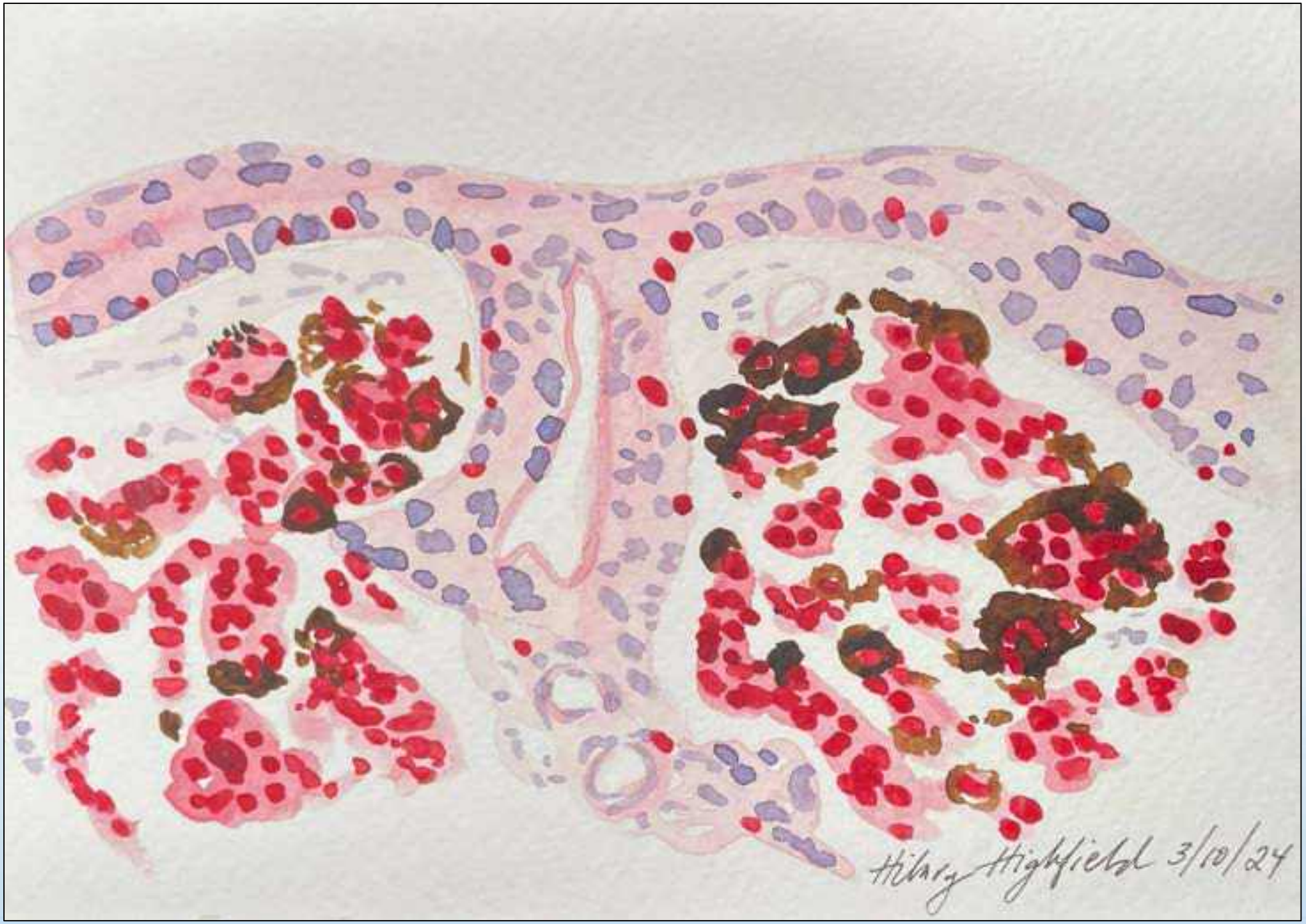
- Benign hamartomatous tumors
- Modified melanocytes = nevus cells (neural crest) Often detected towards end of 2nd decade
- Growth and increased pigmentation caused by elevated hormones in puberty and pregnancy
- Most common conjunctival tumor in children
- Fewer than 1% result in melanoma
- Classification based on nevus cell localization (junctional, compound, subepithelial)

Compound cystic melanocytic nevus (Conjunctiva)

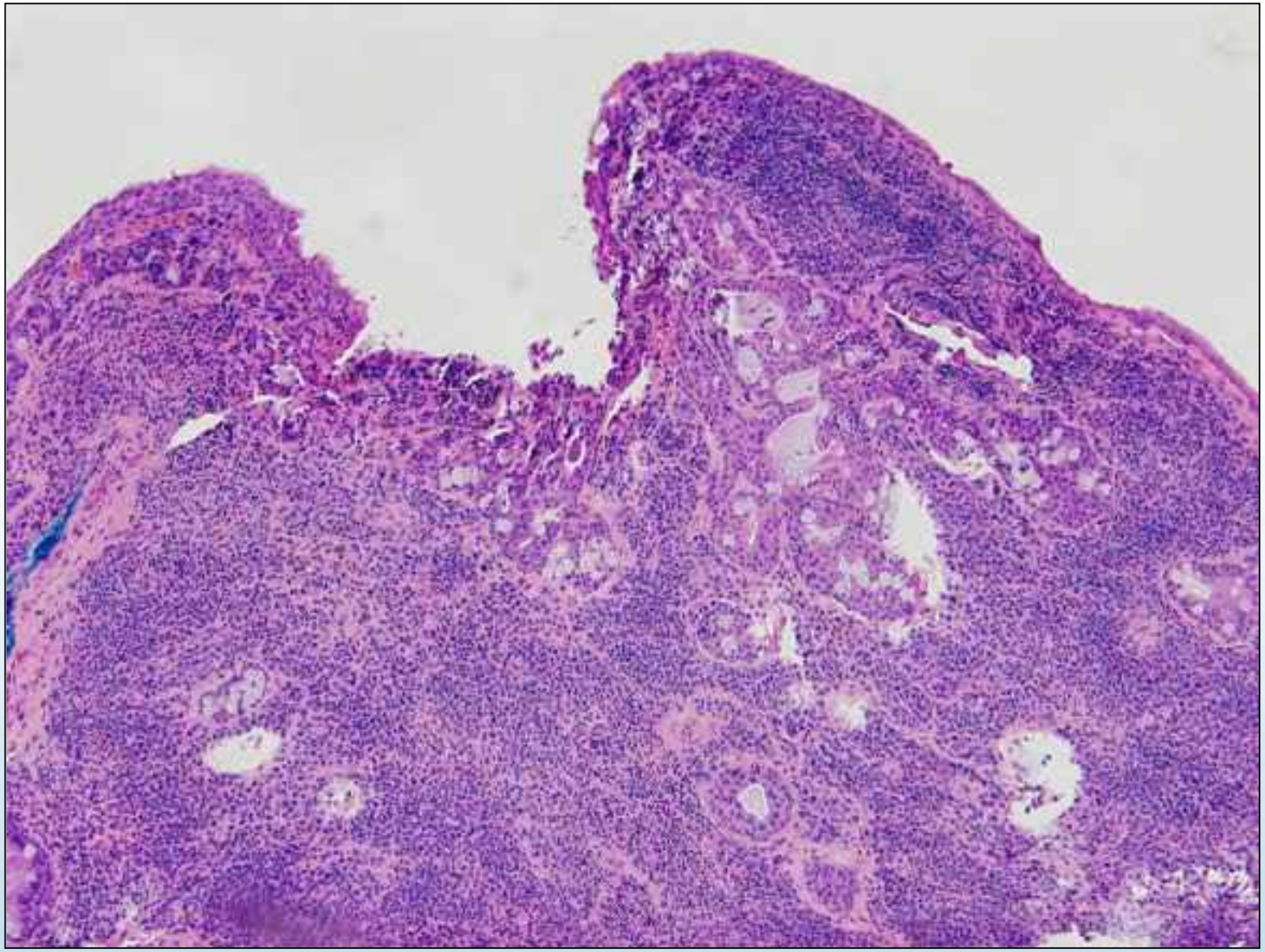




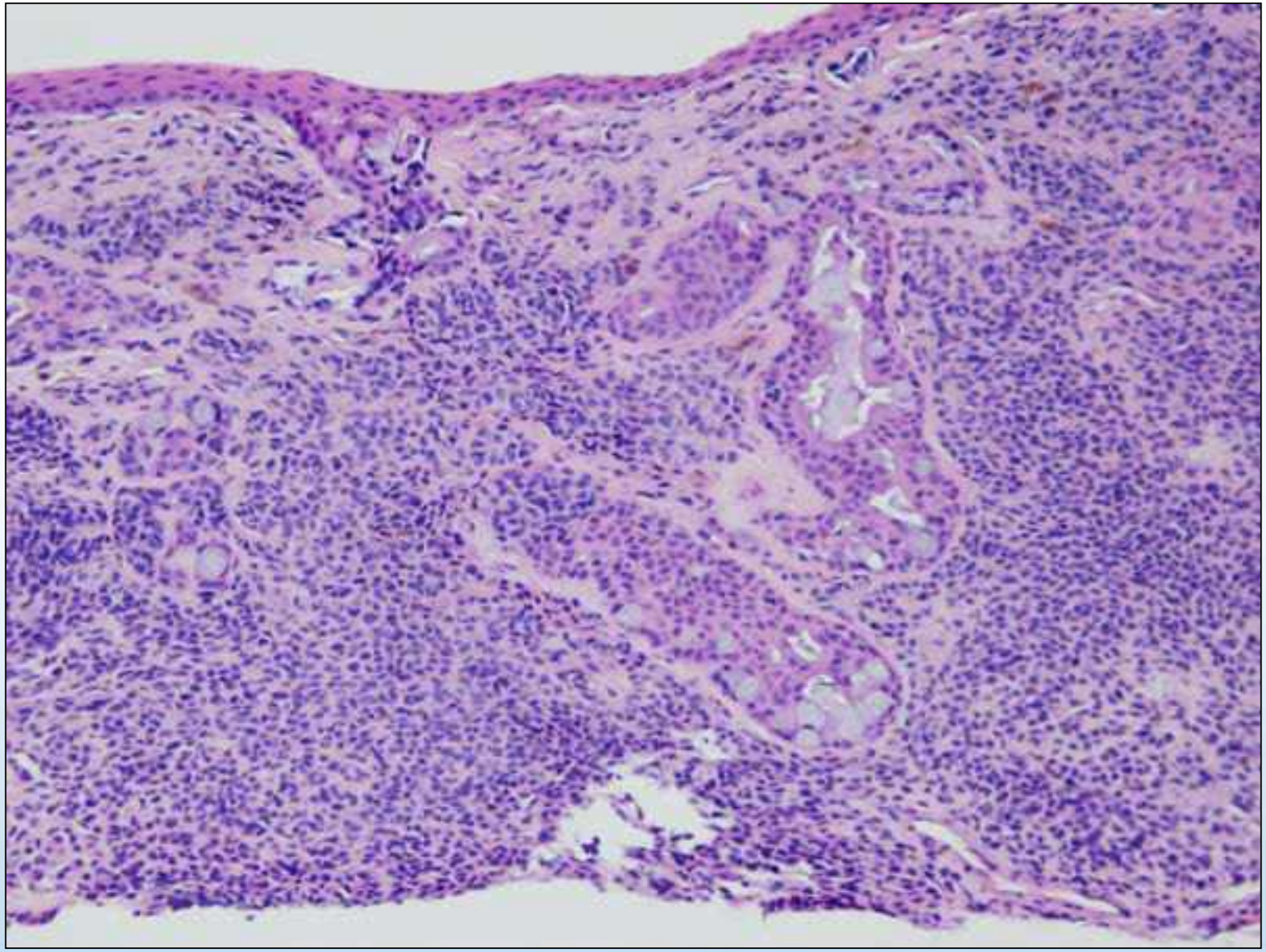

SOX10


Hilary Highfield 3/10/24

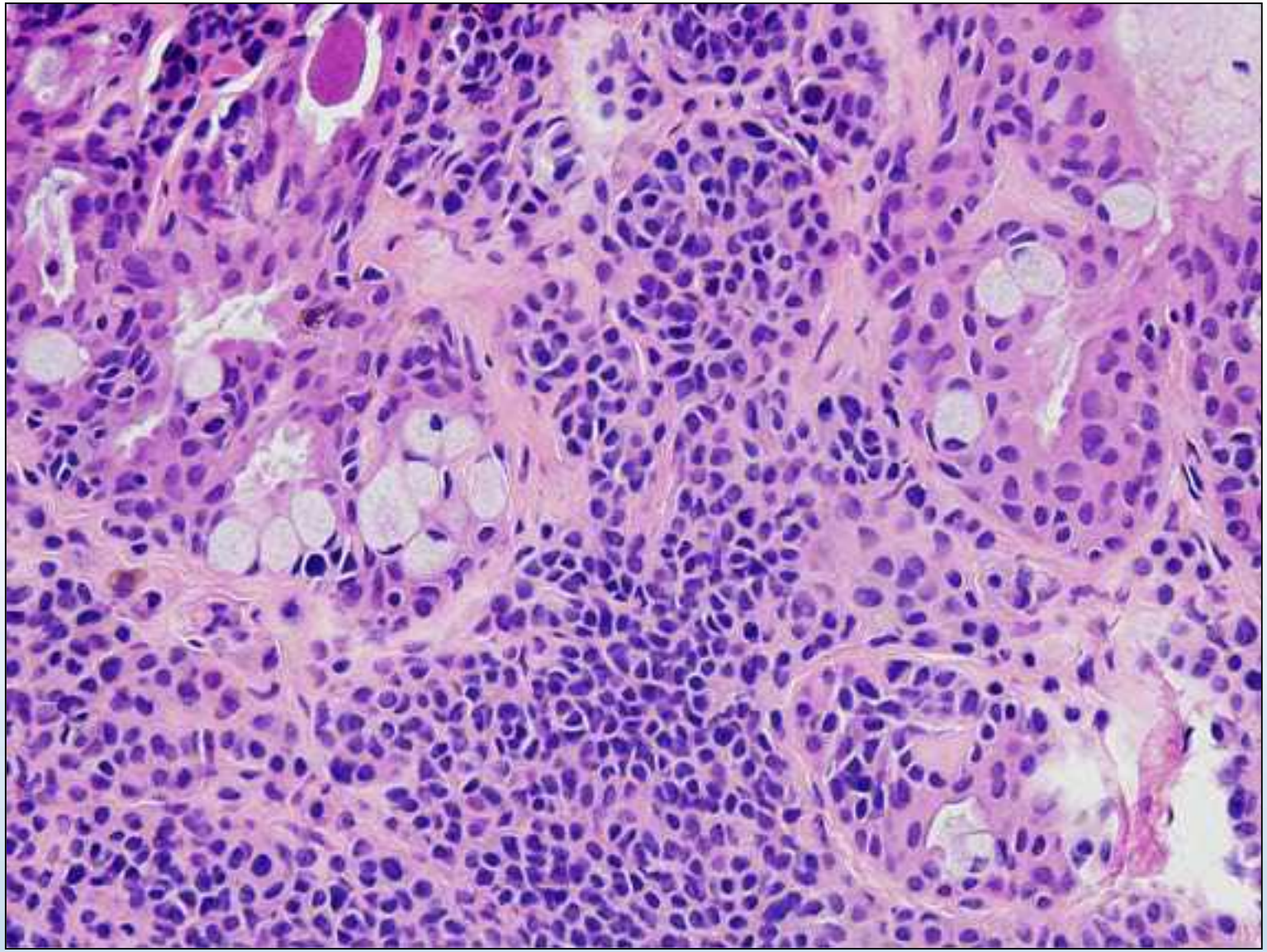
Compound nevus

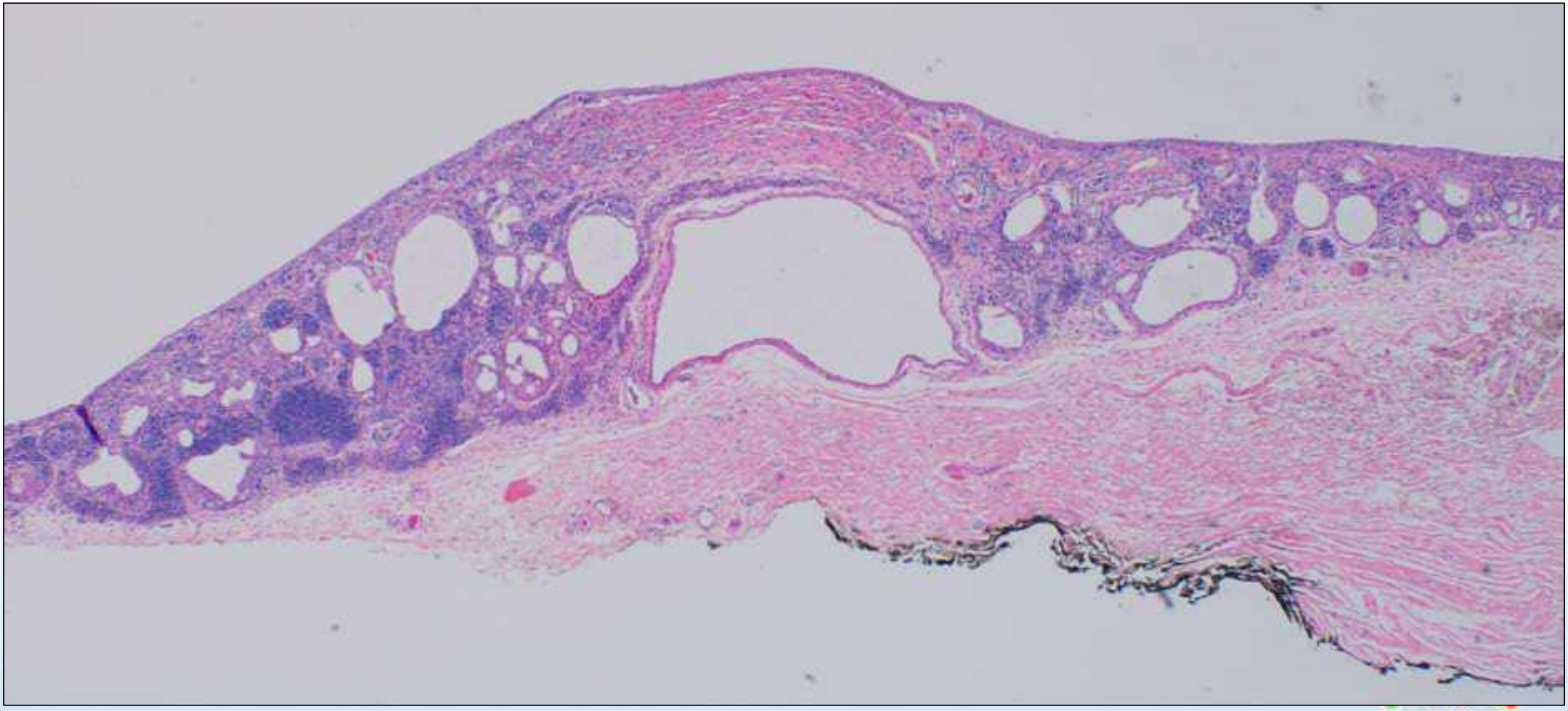


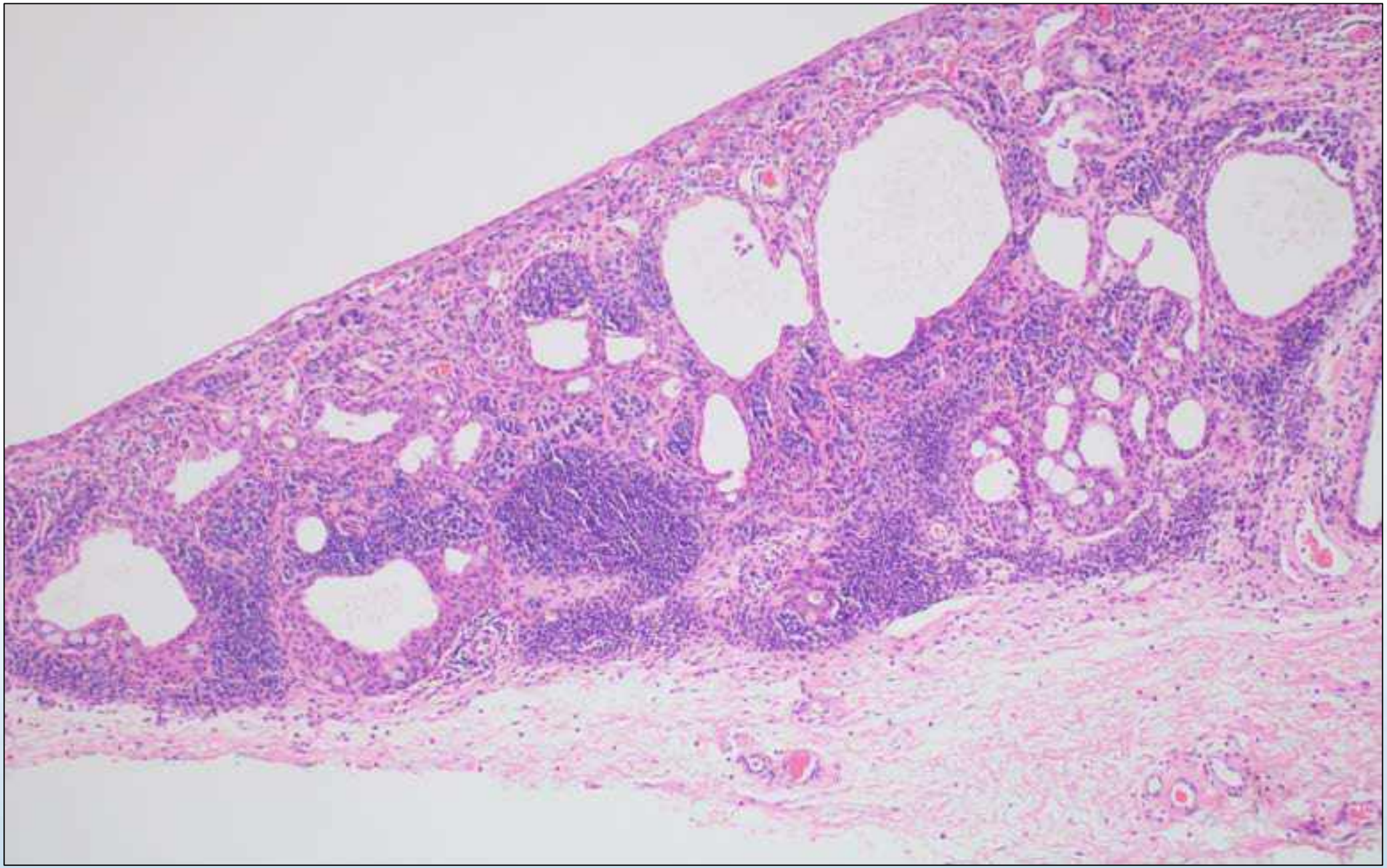
Compound nevus

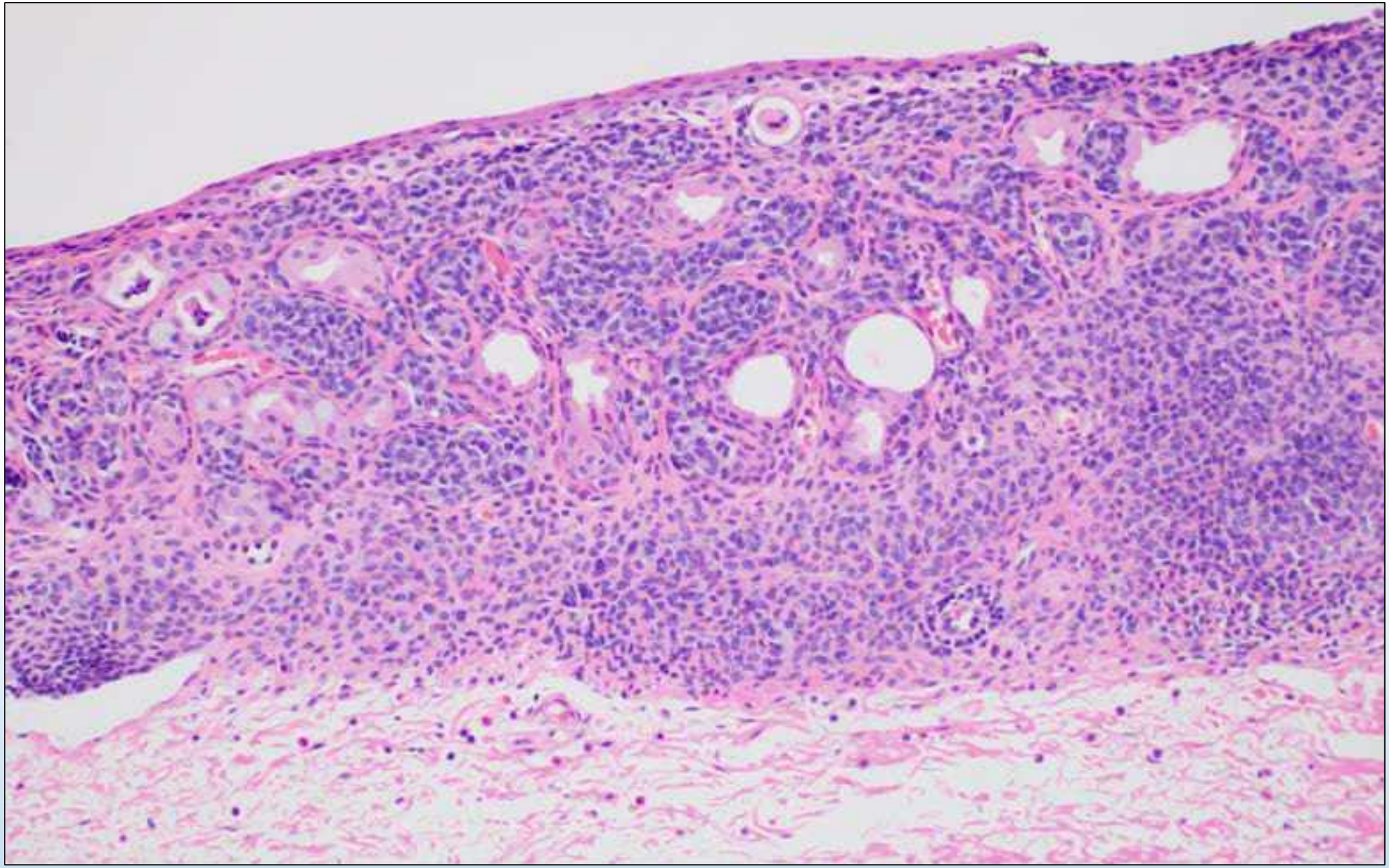


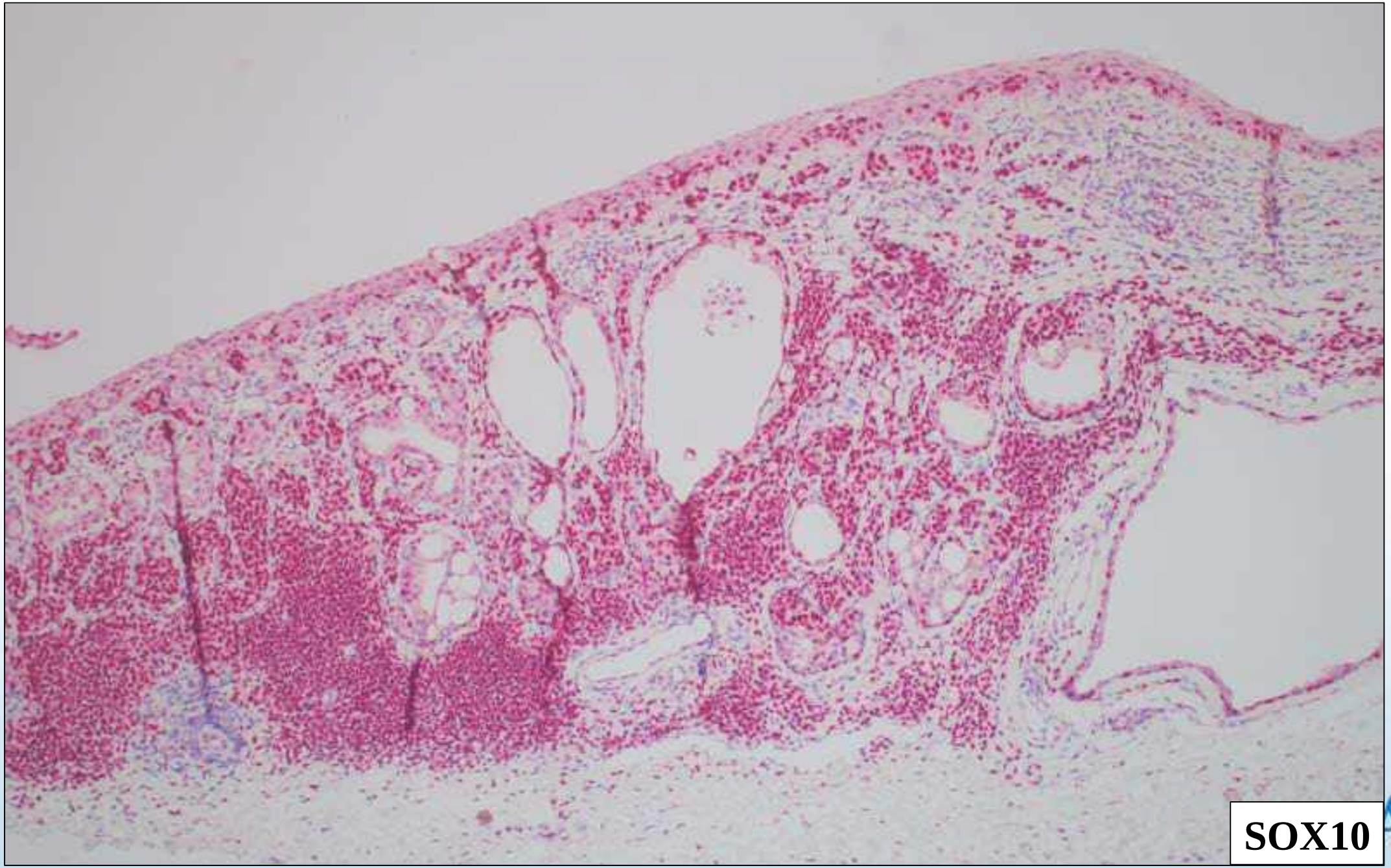
Compound nevus









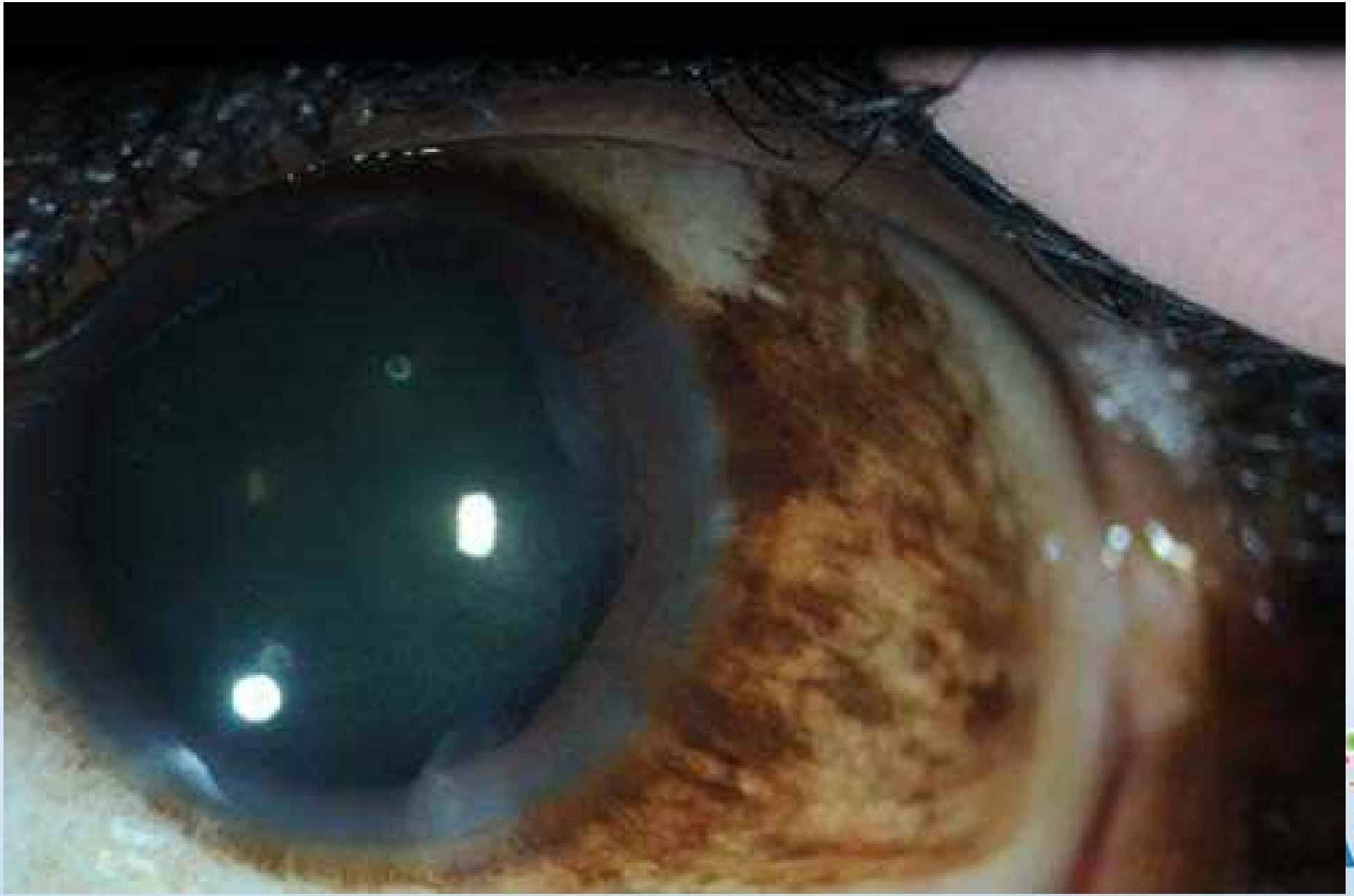

SOX10

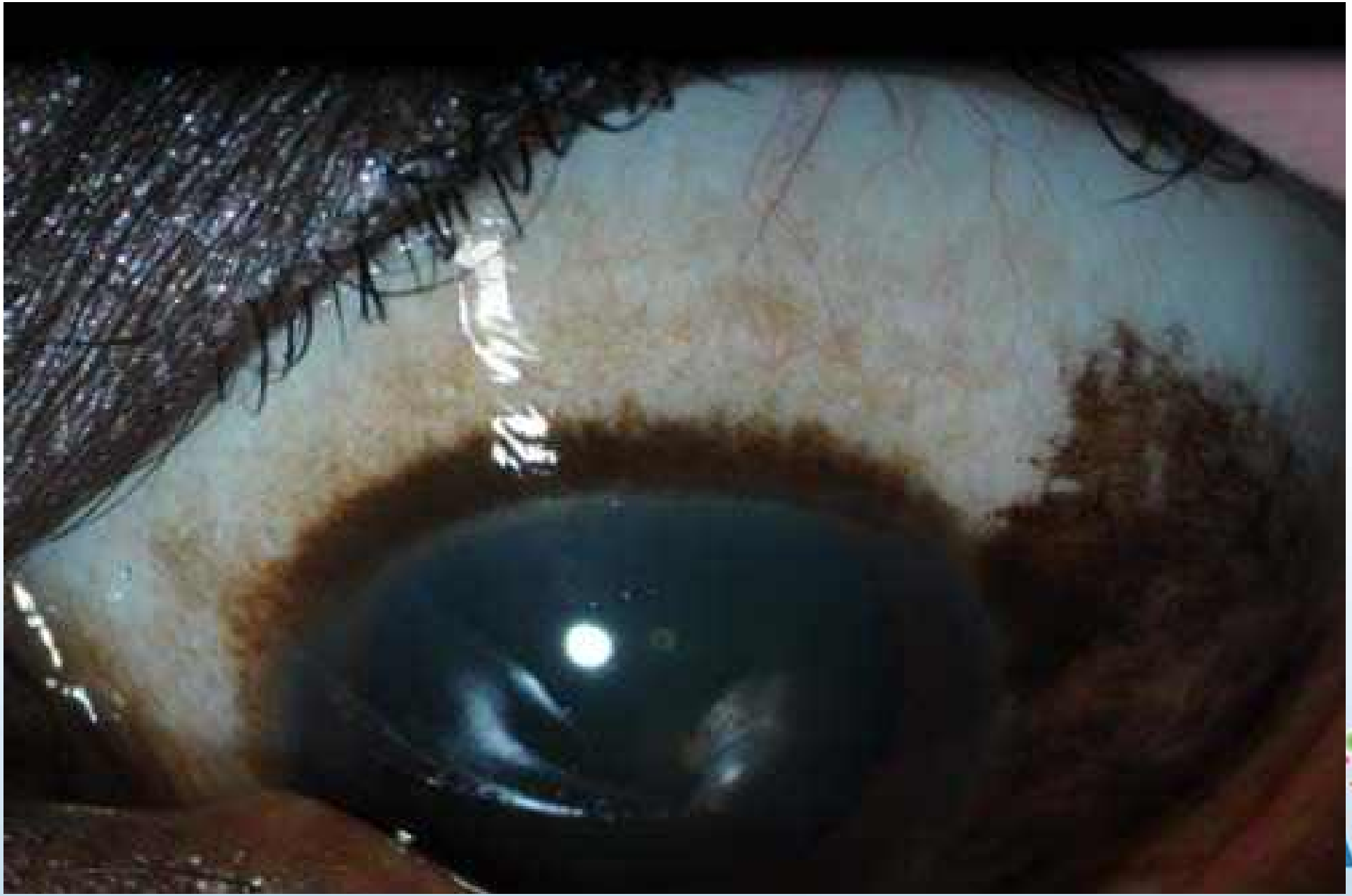
Compound nevus (conjunctiva)

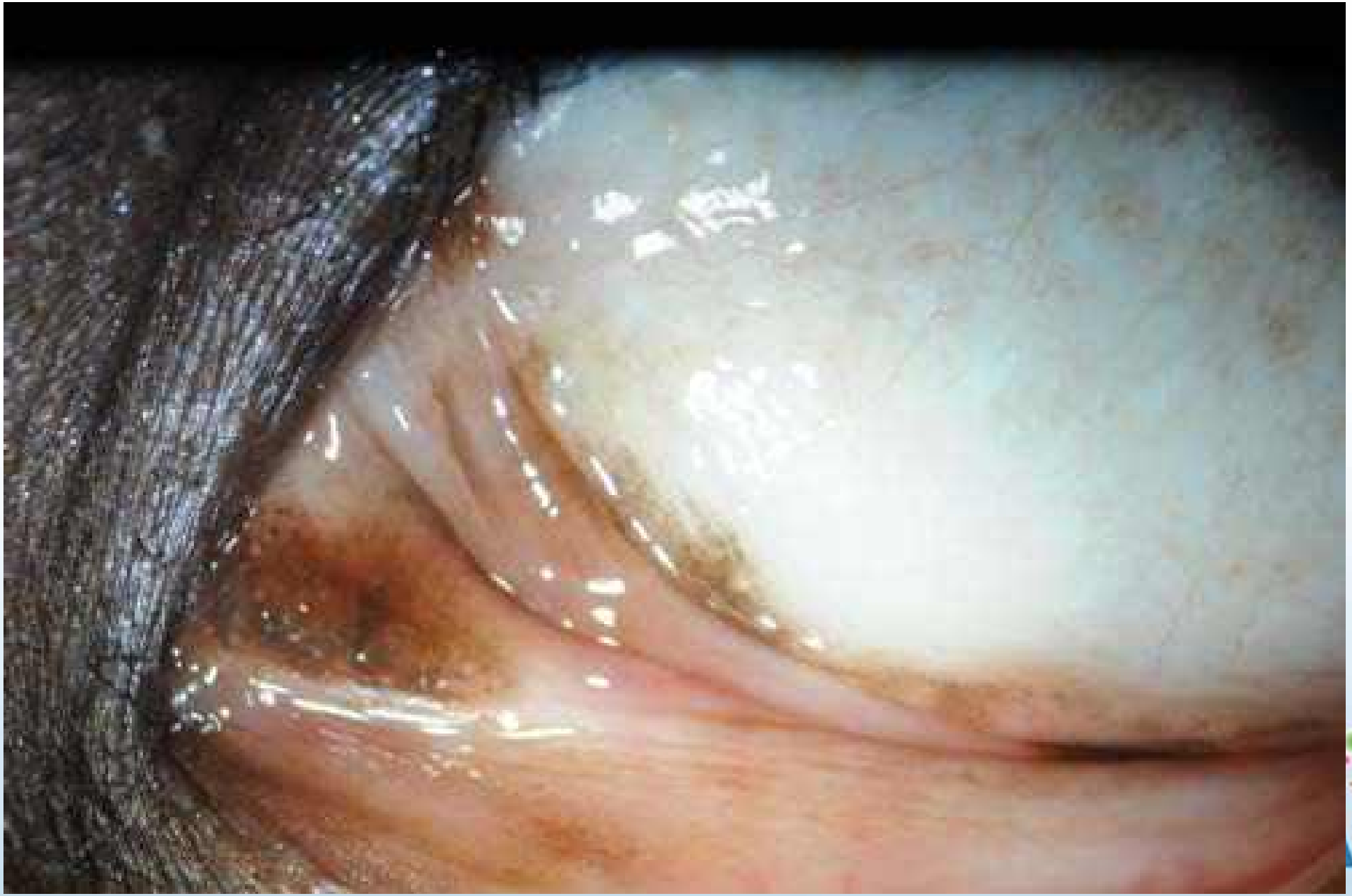
- Benign melanocytic nevi
- Composed of modified melanocytes: nevus cells (derived from neural crest)
- Most common nevus type
- Median age 21-23 years
- Nevus cells within the epithelium and substantia propria
- Maturation towards the deeper layers
- Solid and cystic epithelial rests common

Conjunctival pigmented lesion

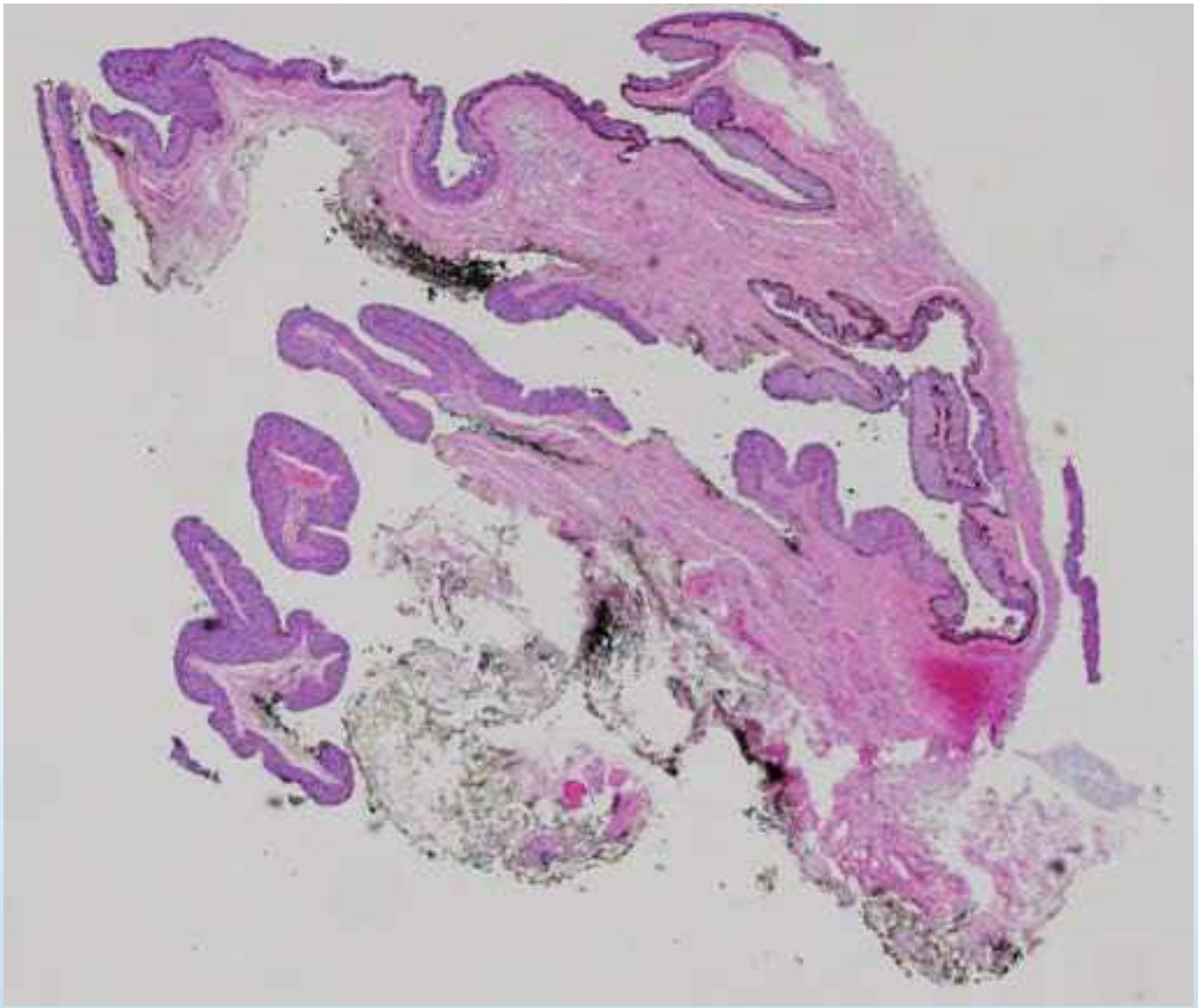
- HPI: 44 YOF
- Referred for evaluation of conjunctival pigmented lesion OS.
- Present since birth and stable until growth over past 5-6 weeks.
- No pain, bleeding, or injection.



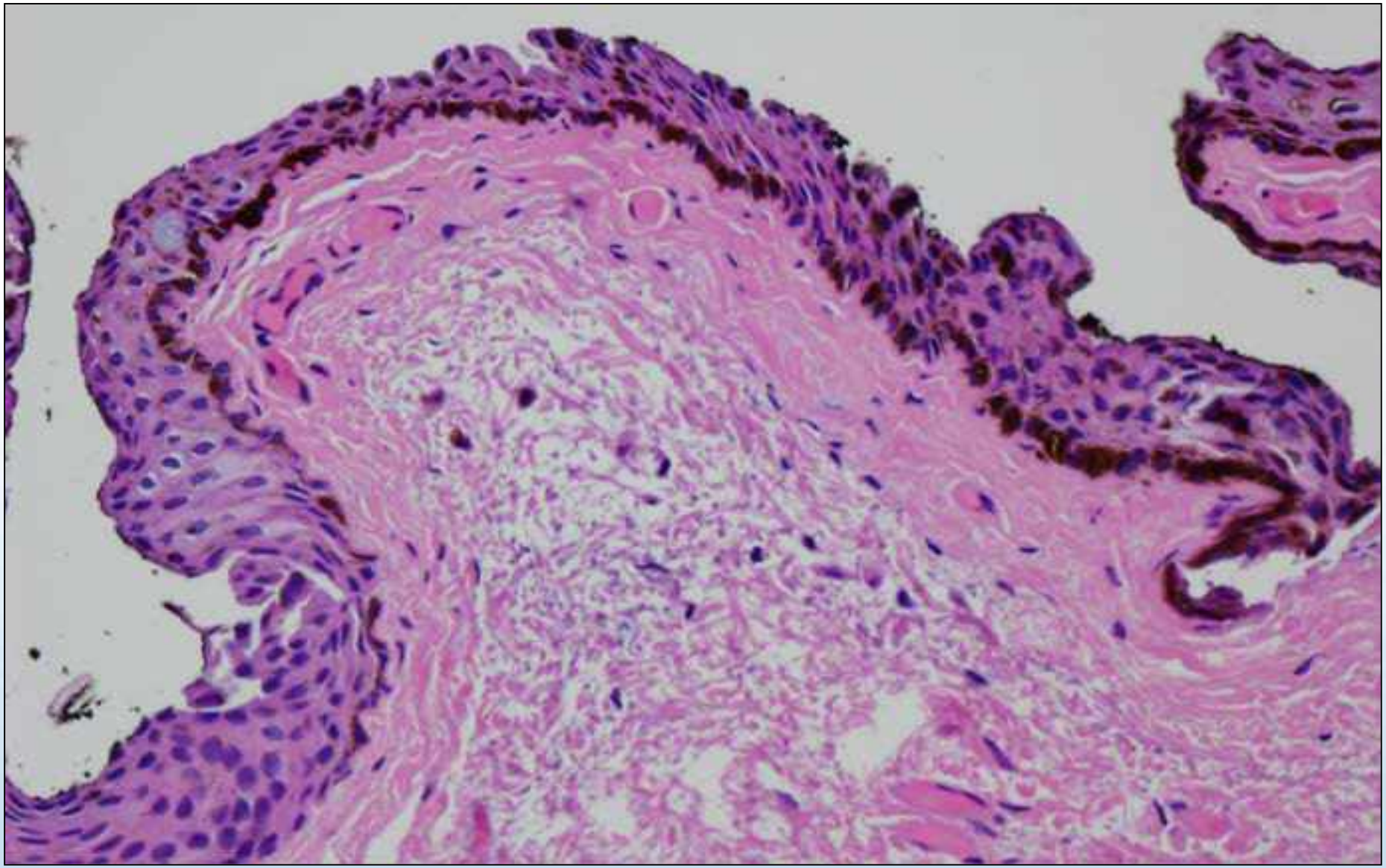




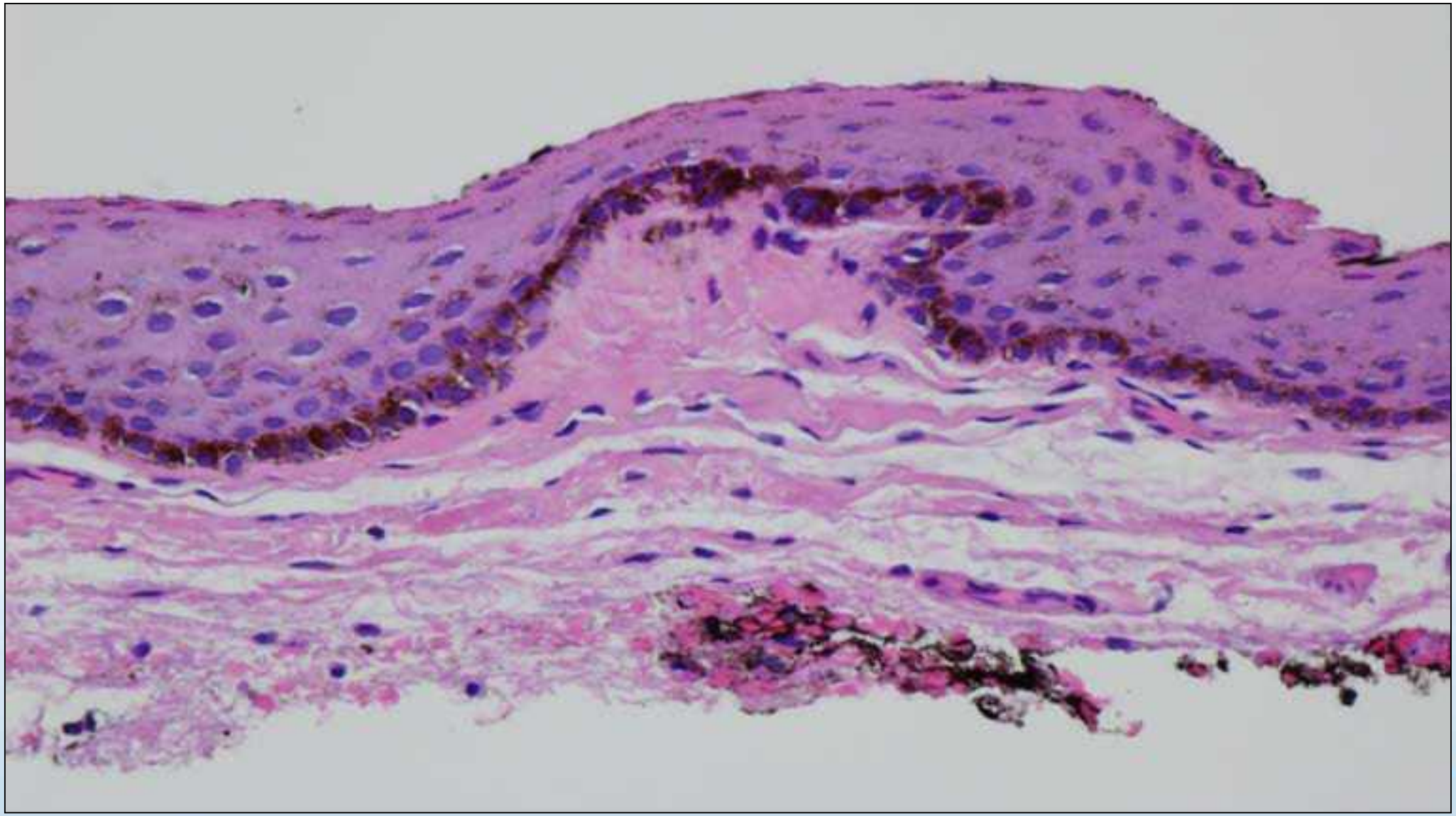
Conjunctival pigmented lesion



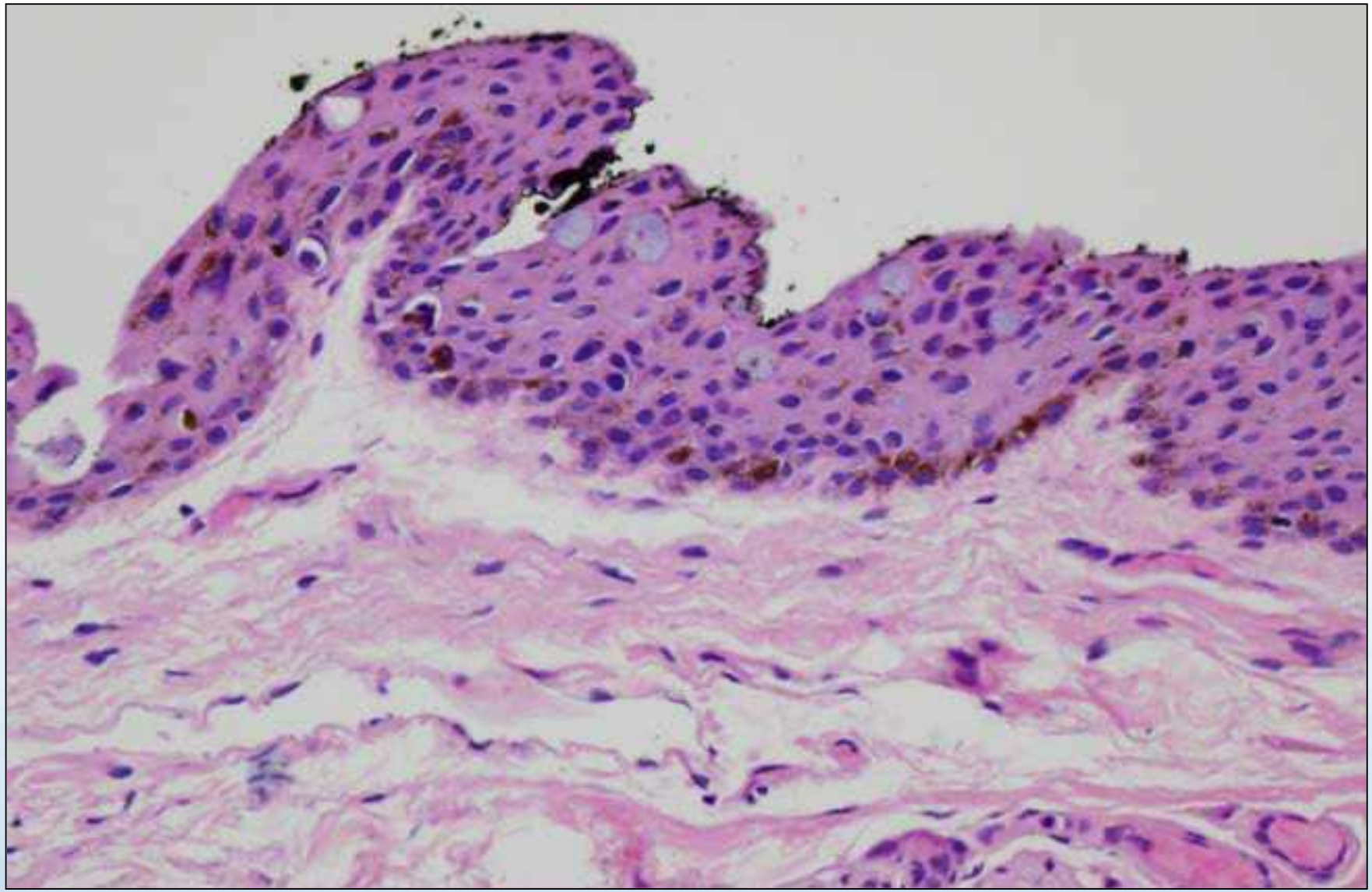
Conjunctival pigmented lesion



Conjunctival pigmented lesion



Conjunctival pigmented lesion

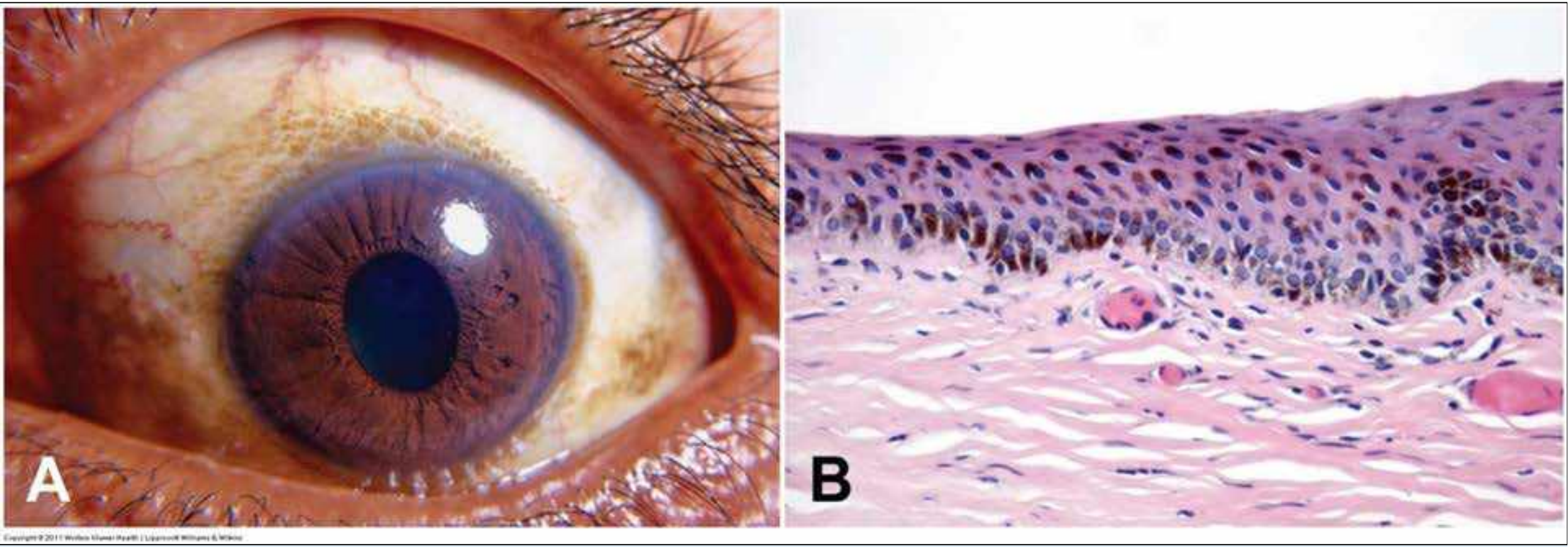


Secondary (Pigment-associated) Melanosis

Conjunctival Skin-Tone Associated Melanosis (C-STAM)

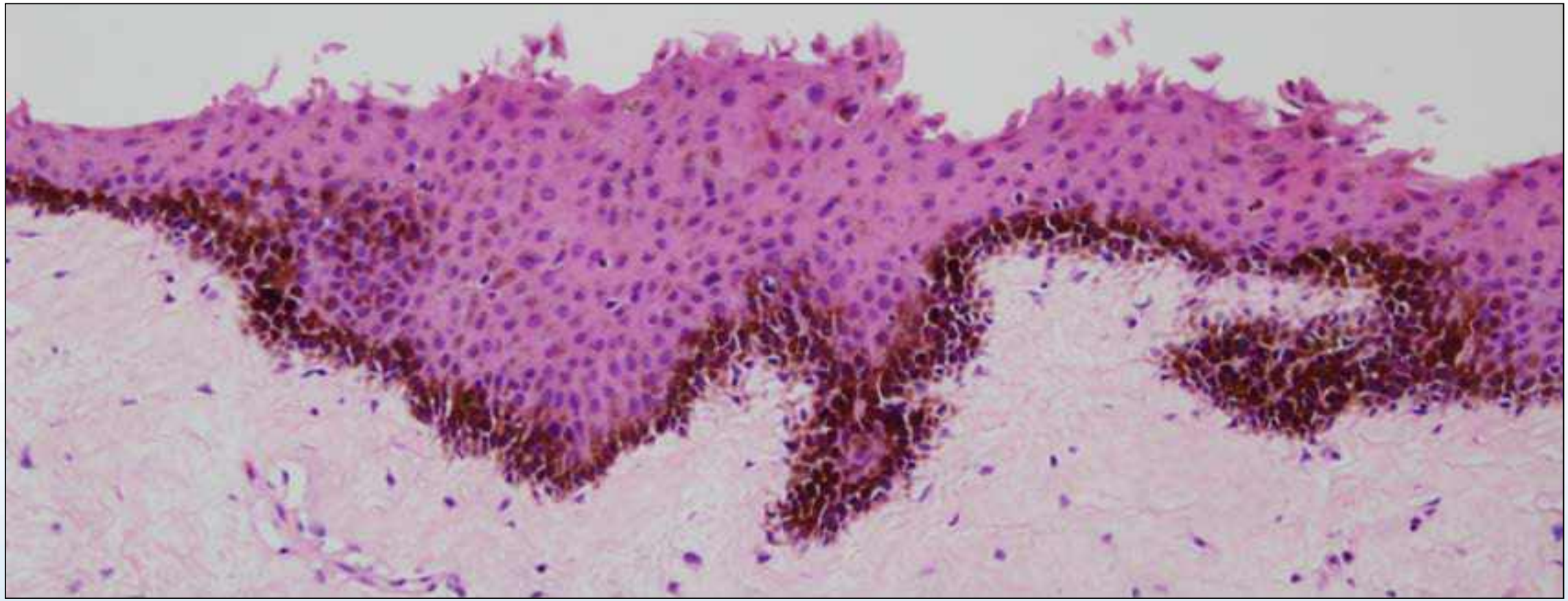
- Constitutional melanosis, complexion-associated conjunctival pigmentation, benign epithelial melanosis
- 92.5% Blacks, 36% Asians, 28% Hispanics, 4.9% Caucasians
- Bilateral pigmentation, denser at junction between peripheral cornea and limbus

Constitutional melanosis



Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

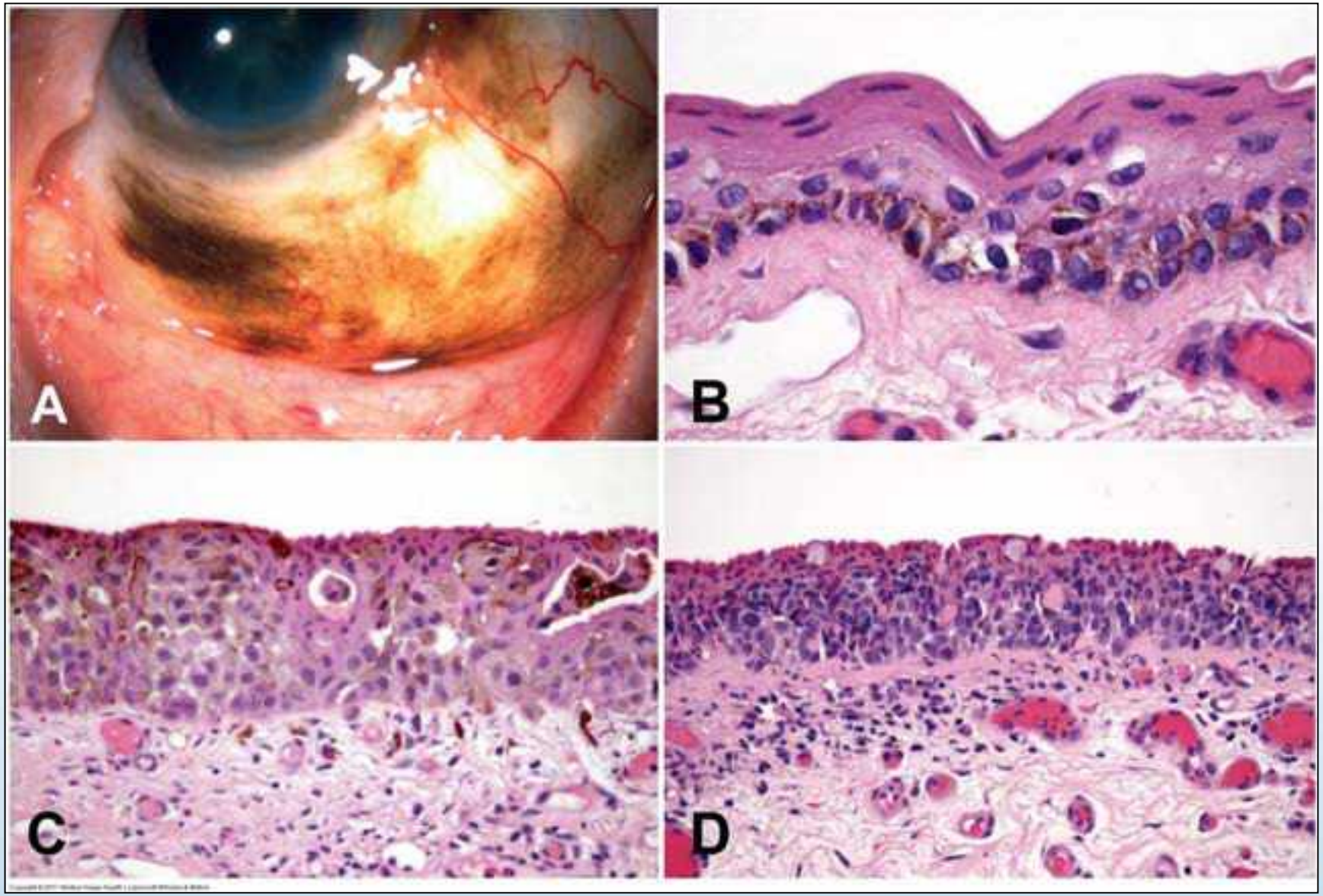
Epithelial Basal Layer Pigmentation



- 40s Asian female
- Conjunctival pigmentation; growing
- Flat brown mobile lesion

Primary Acquired Melanosis

Primary Acquired Melanosis



Eagle,Ralph C. (2017), *Eye Pathology: An Atlas and Text,* 3rd ed. Wolters Kluwer

Primary Acquired Melanosis (PAM)

- Precursor of conjunctival melanoma
- 75% of cases of malignant melanoma arise in cases of PAM with atypia
- Patchy acquired unilateral pigmentation older
- Most important risk factor for recurrence and progression – extent of pigmentation in clock hours

Primary Acquired Melanosis (PAM)

- **PAM without atypia**
  - Pigment confined to conjunctival epithelial cells
  - No evidence of melanocytic hyperplasia
  - Indistinguishable from complexion melanosis/freckle

- **PAM with mild atypia**
  - Atypical melanocytes confined to epithelial basal layer
  - Single cell lentiginous pattern
  - Low risk for progression

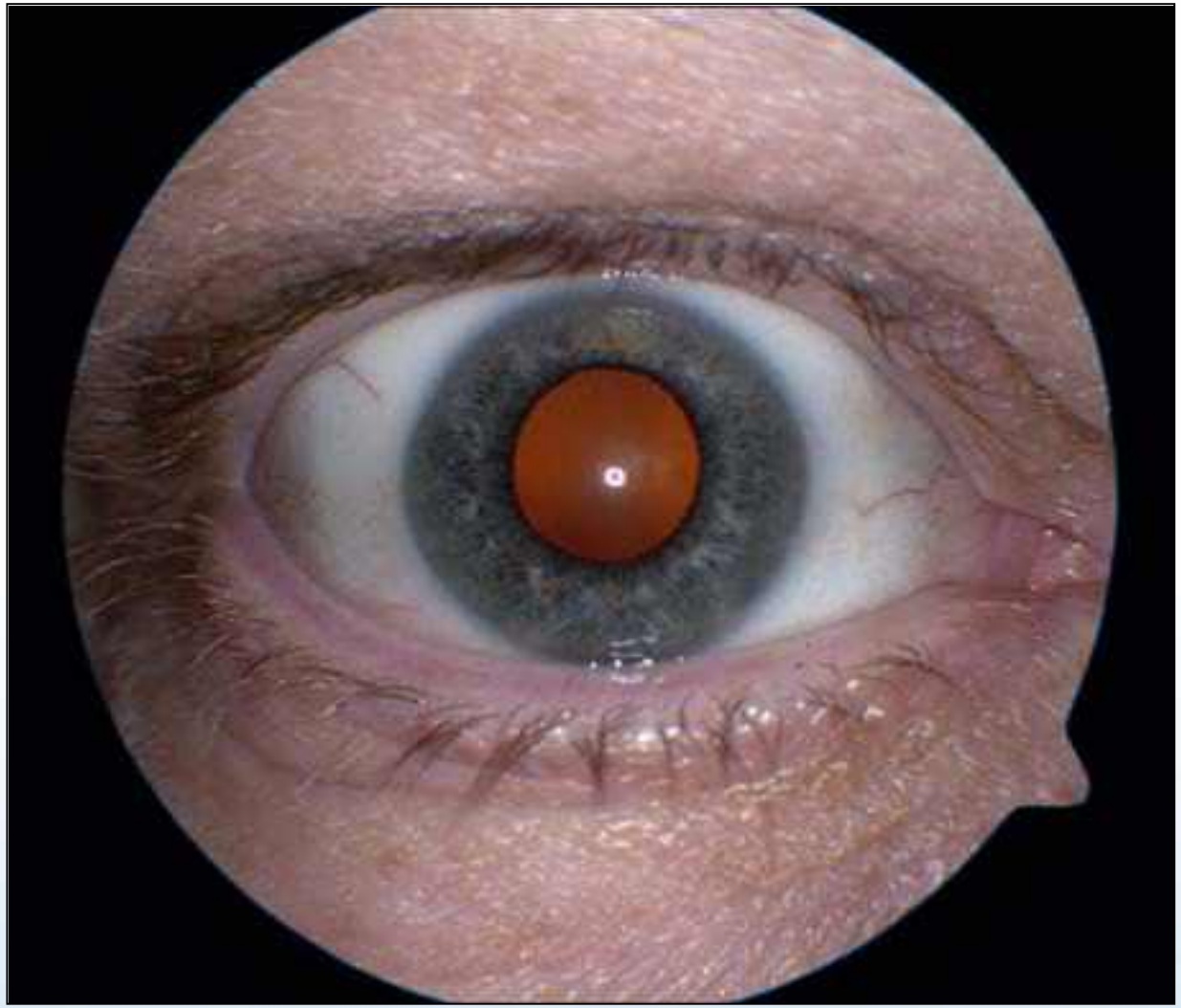
Primary Acquired Melanosis (PAM)

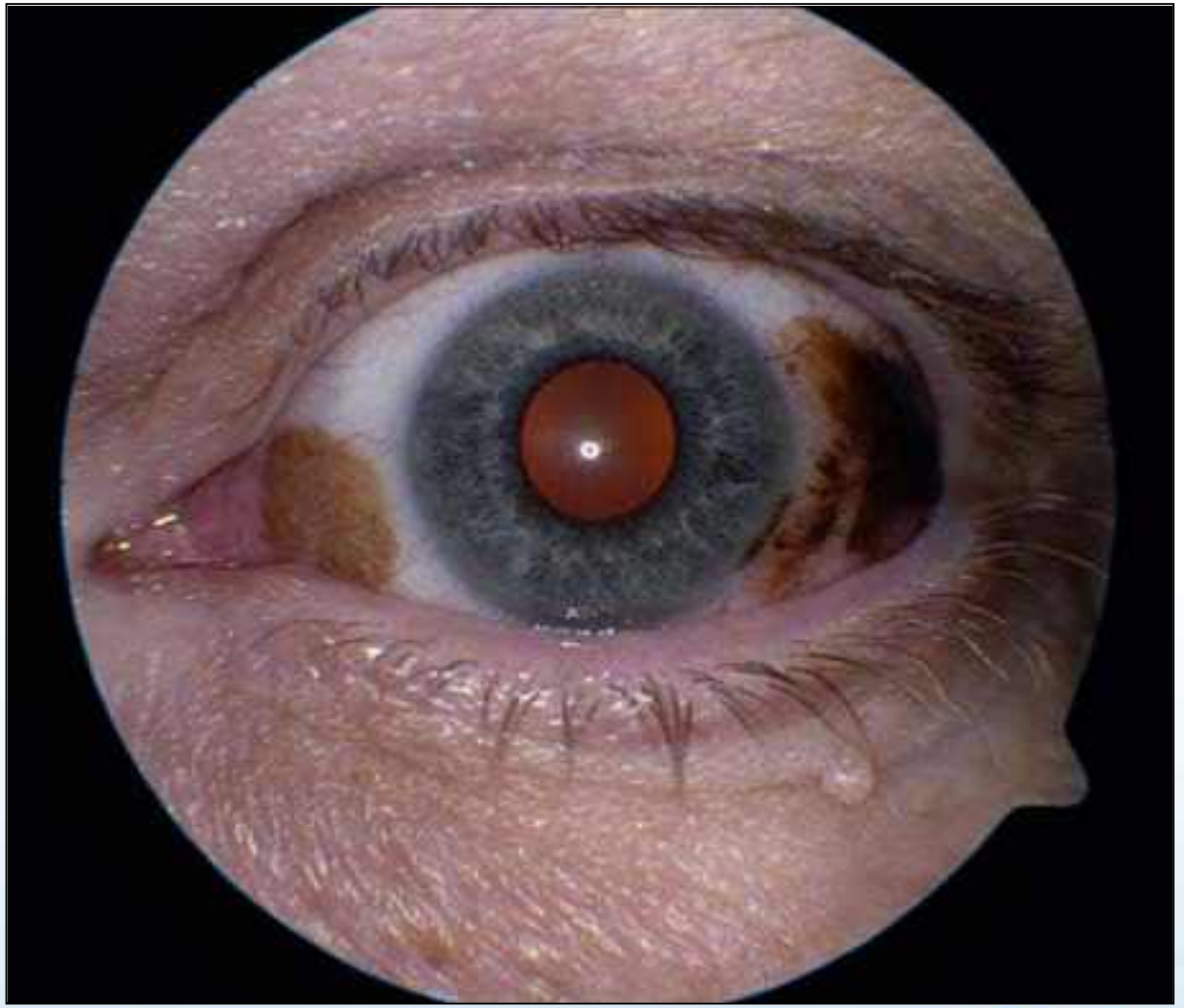
- **PAM with severe atypia**
  - Melanocytes involve more superficial layers
  - Form pagetoid nests
  - Pagetoid involvement associated with 95% risk of progression

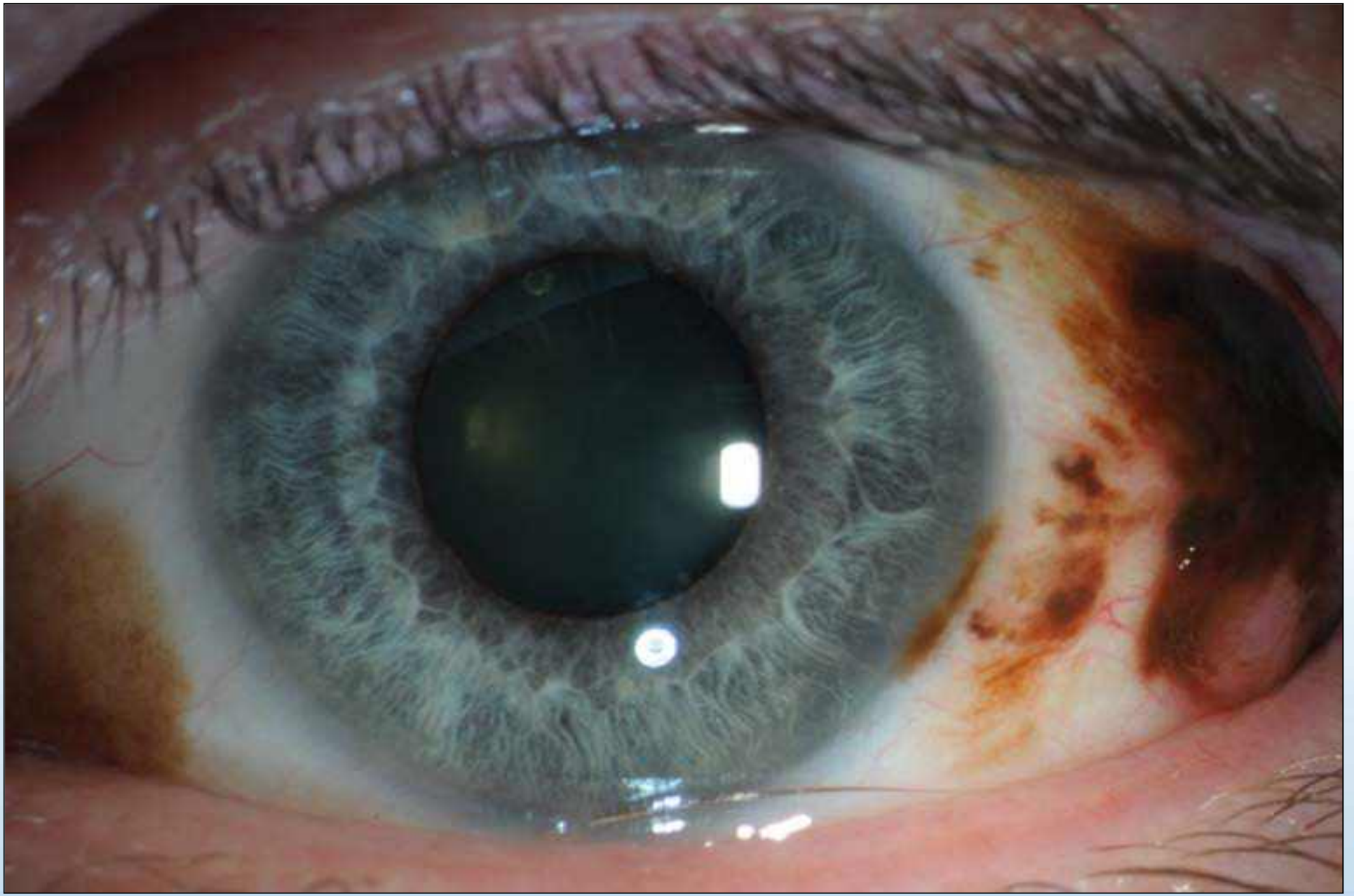
- **Invasive melanoma**
  - Extension through epithelial basement membrane
  - Vertical growth into substantia propria

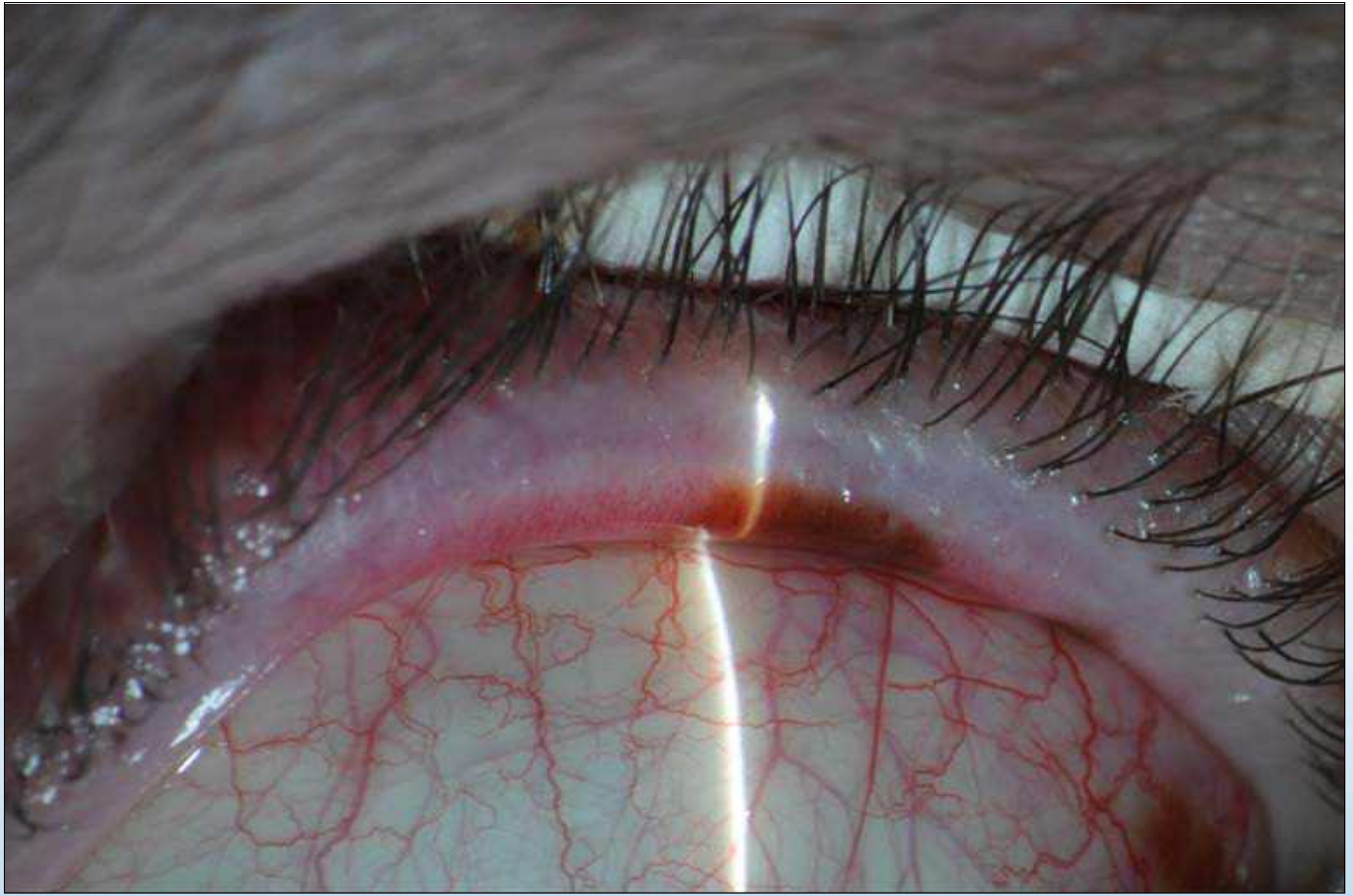
Pigmented spot on OS

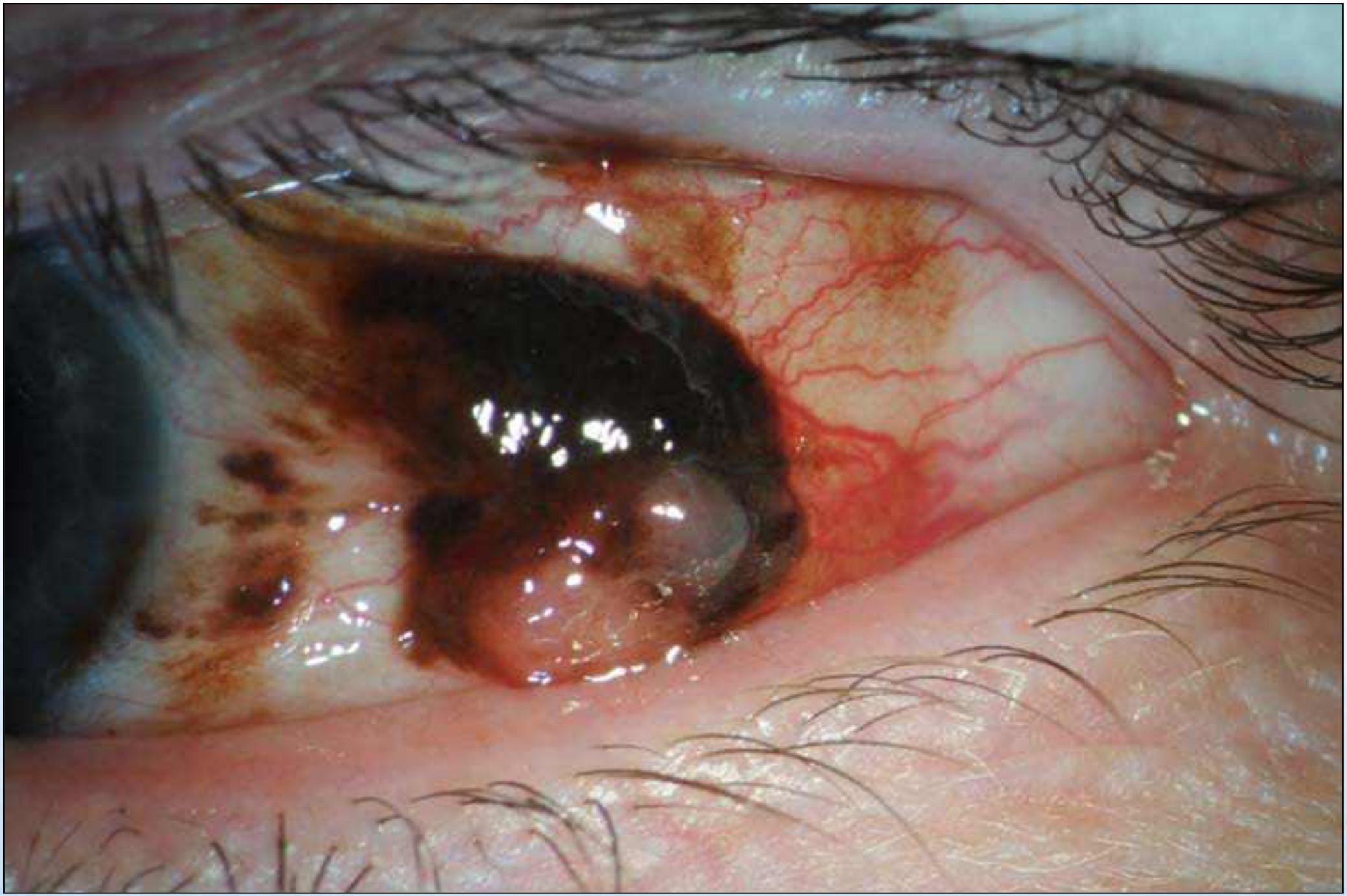
- 54yo M referred from local ophthalmologist
- CC: Pigmented spot on OS x 1 ½ years
- Growing larger in past several weeks
- + Sore, blurred VA, photophobia, tearing OS

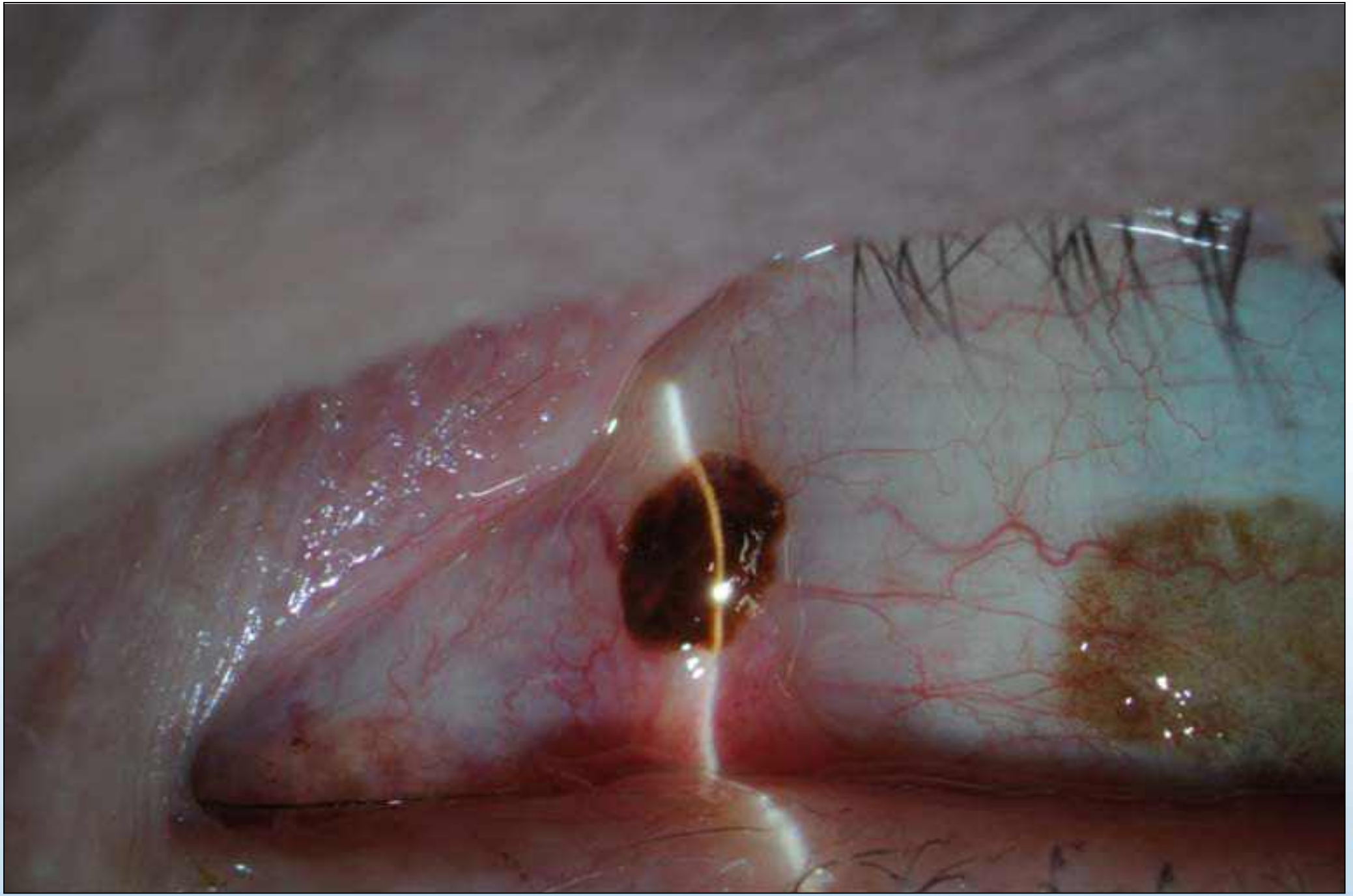


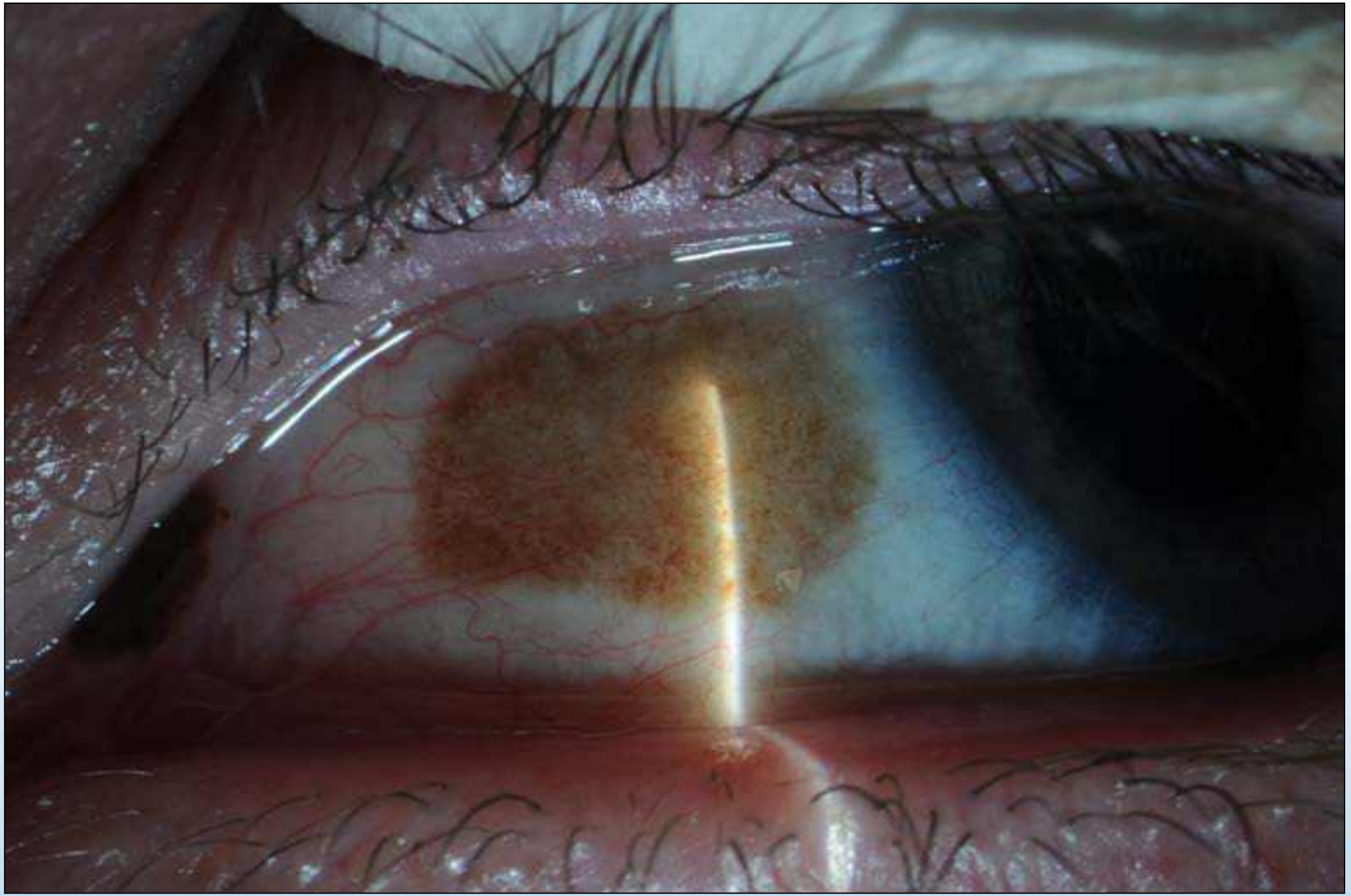


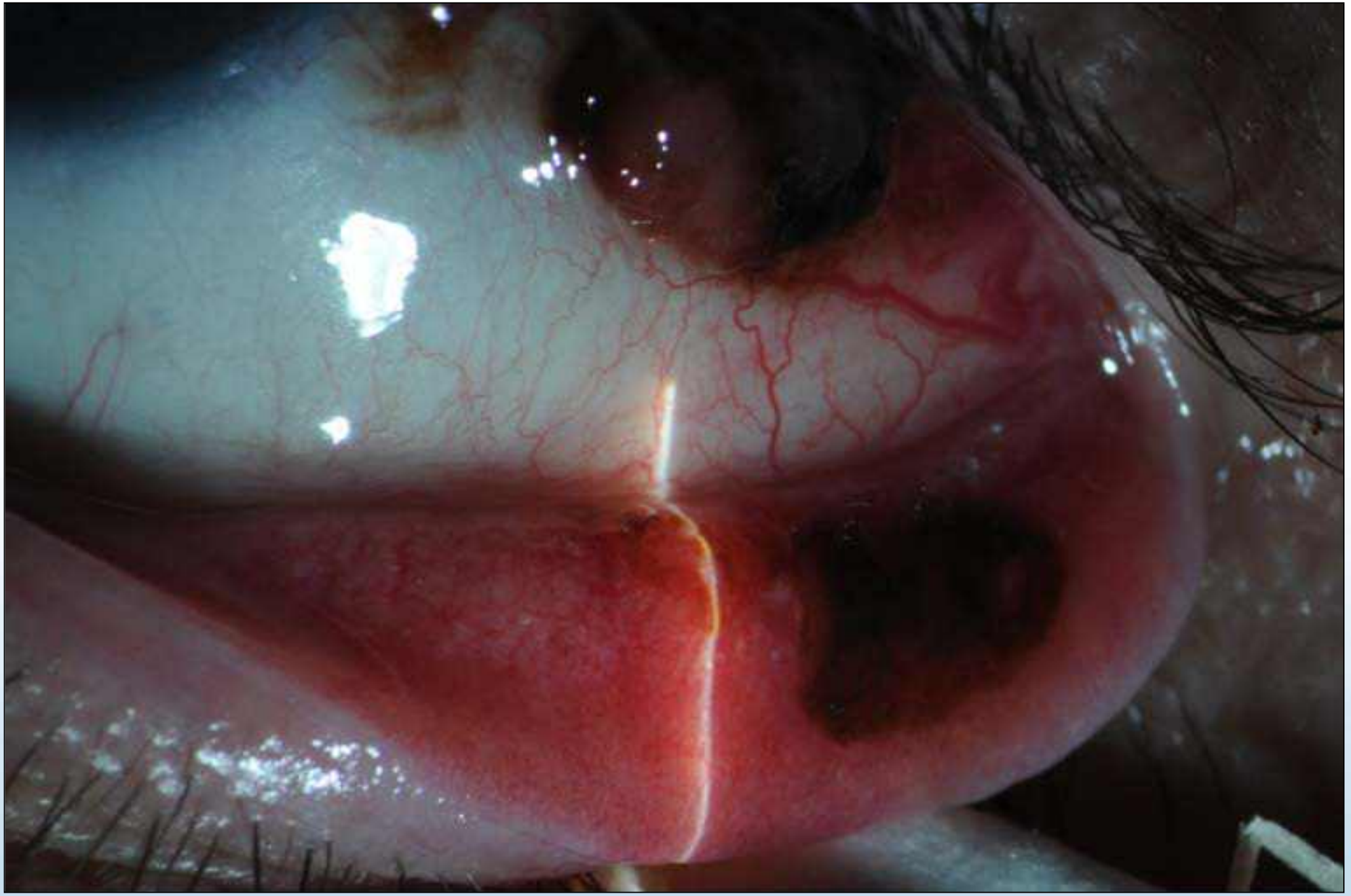




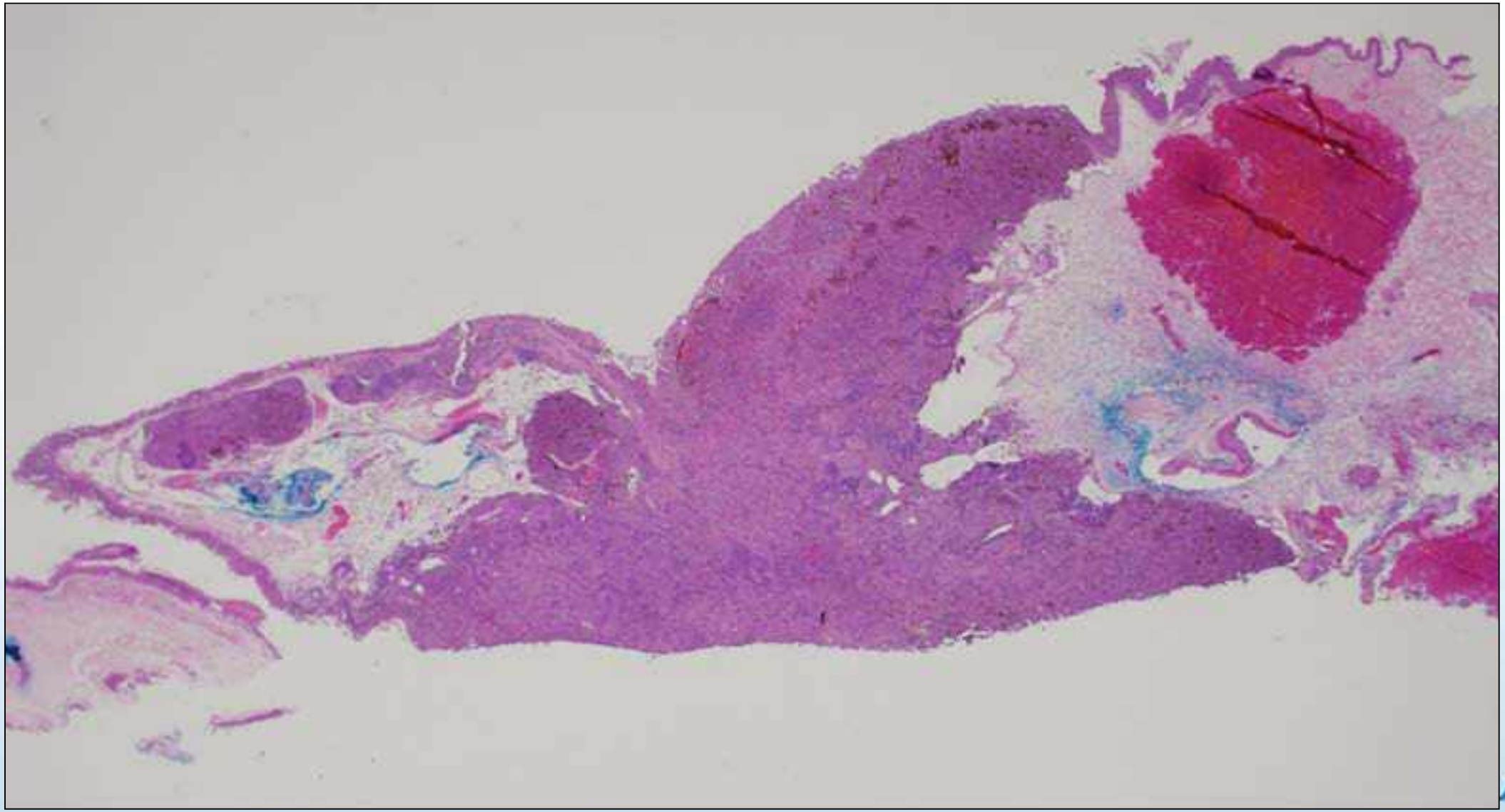








Left Temporal



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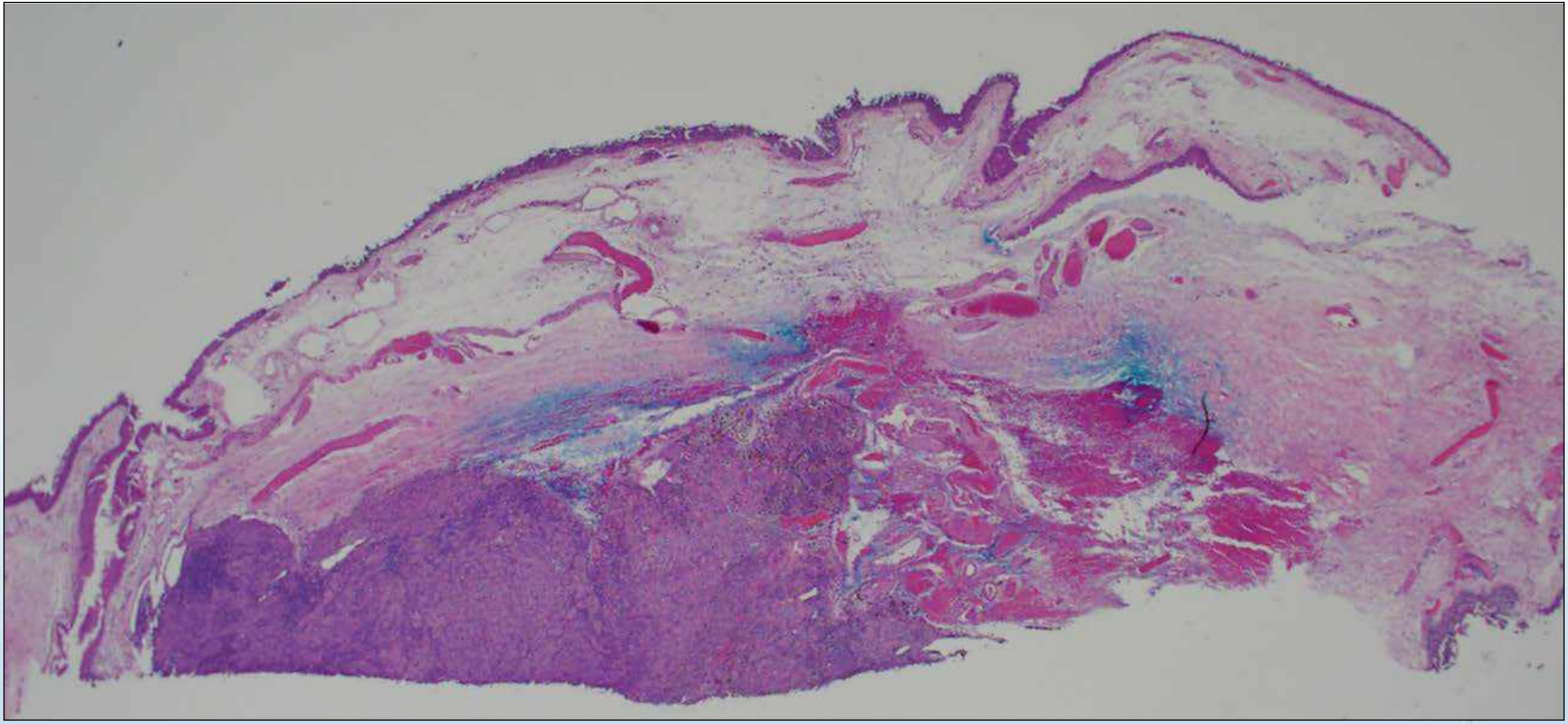

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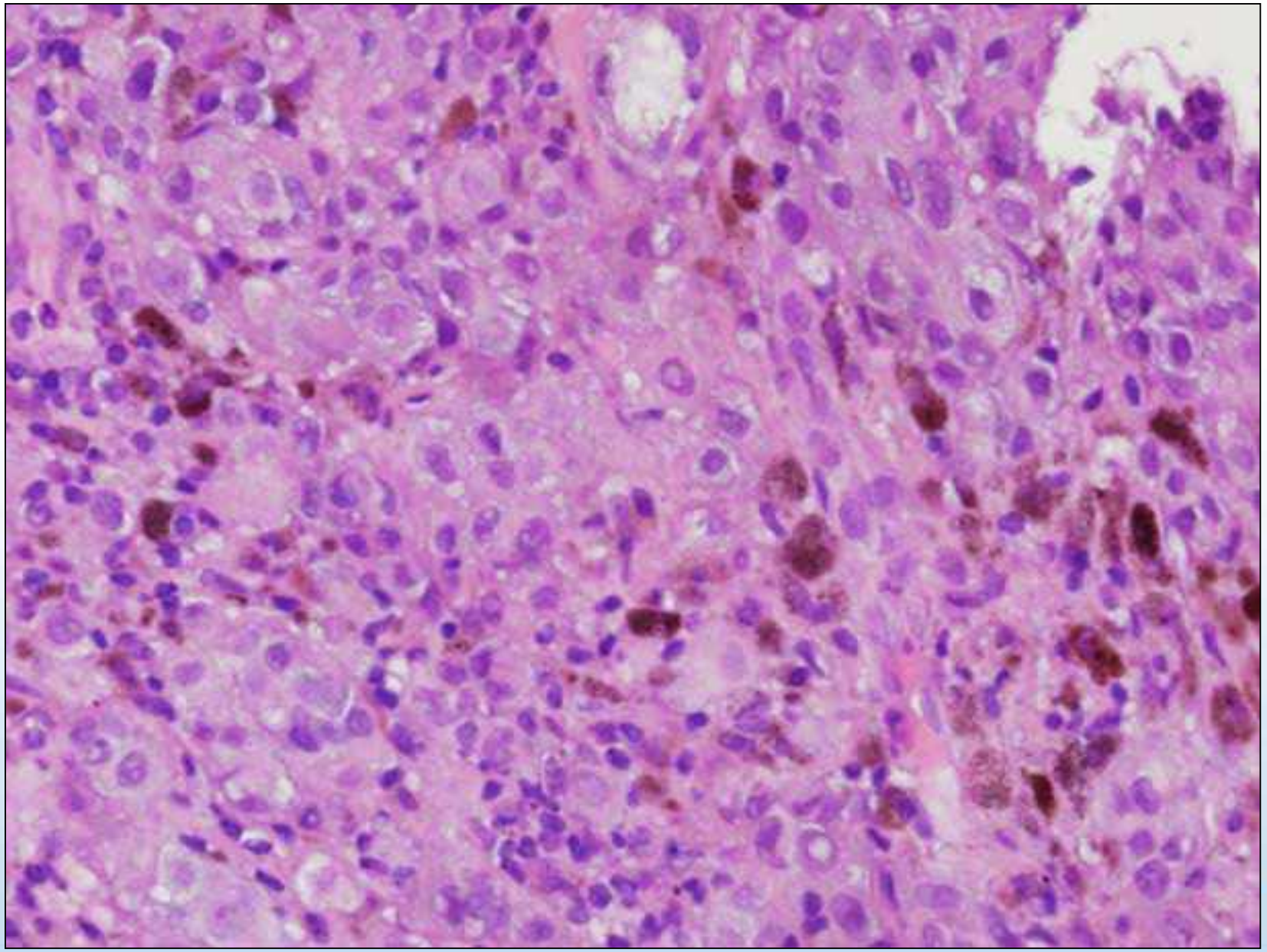
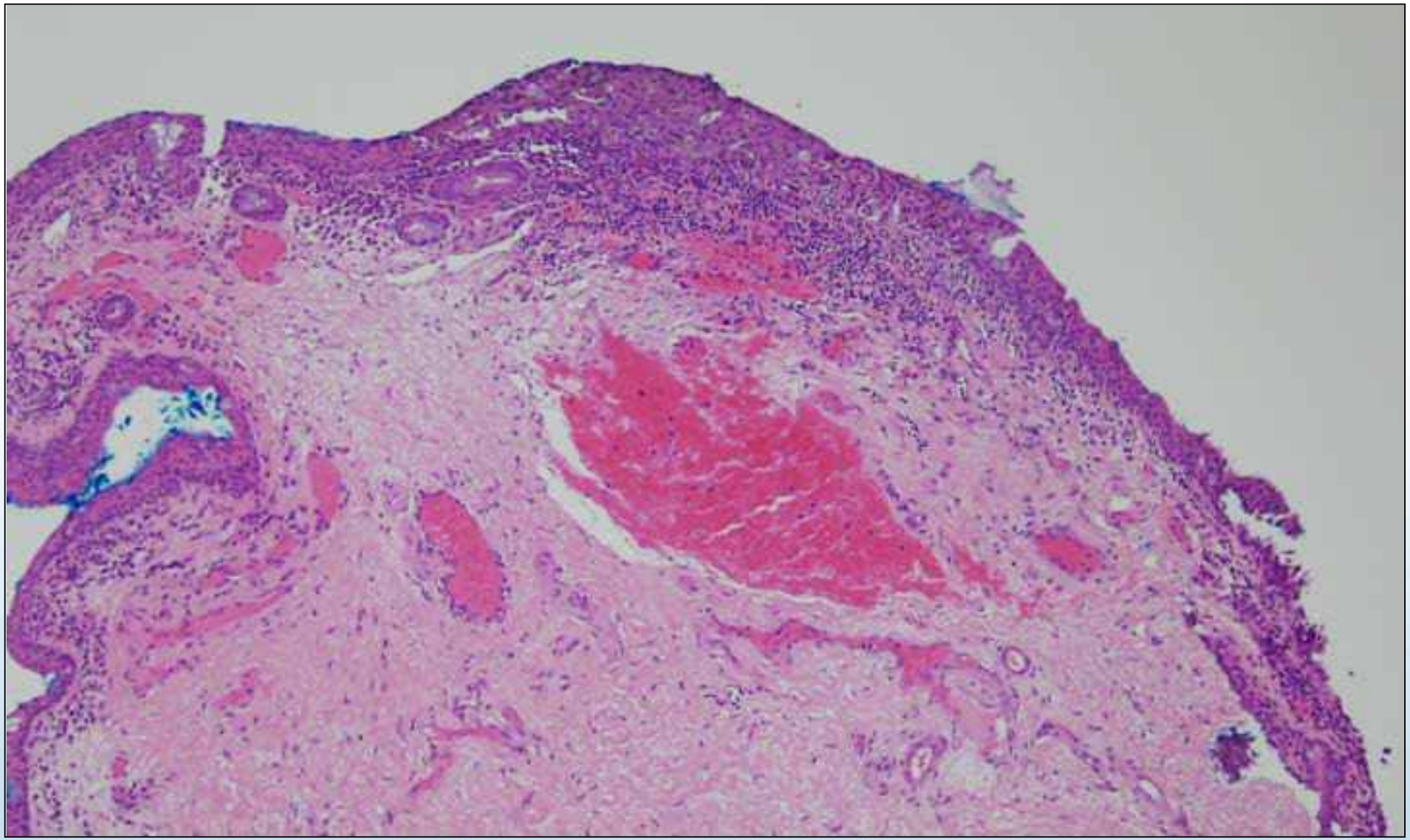


Left Nasal



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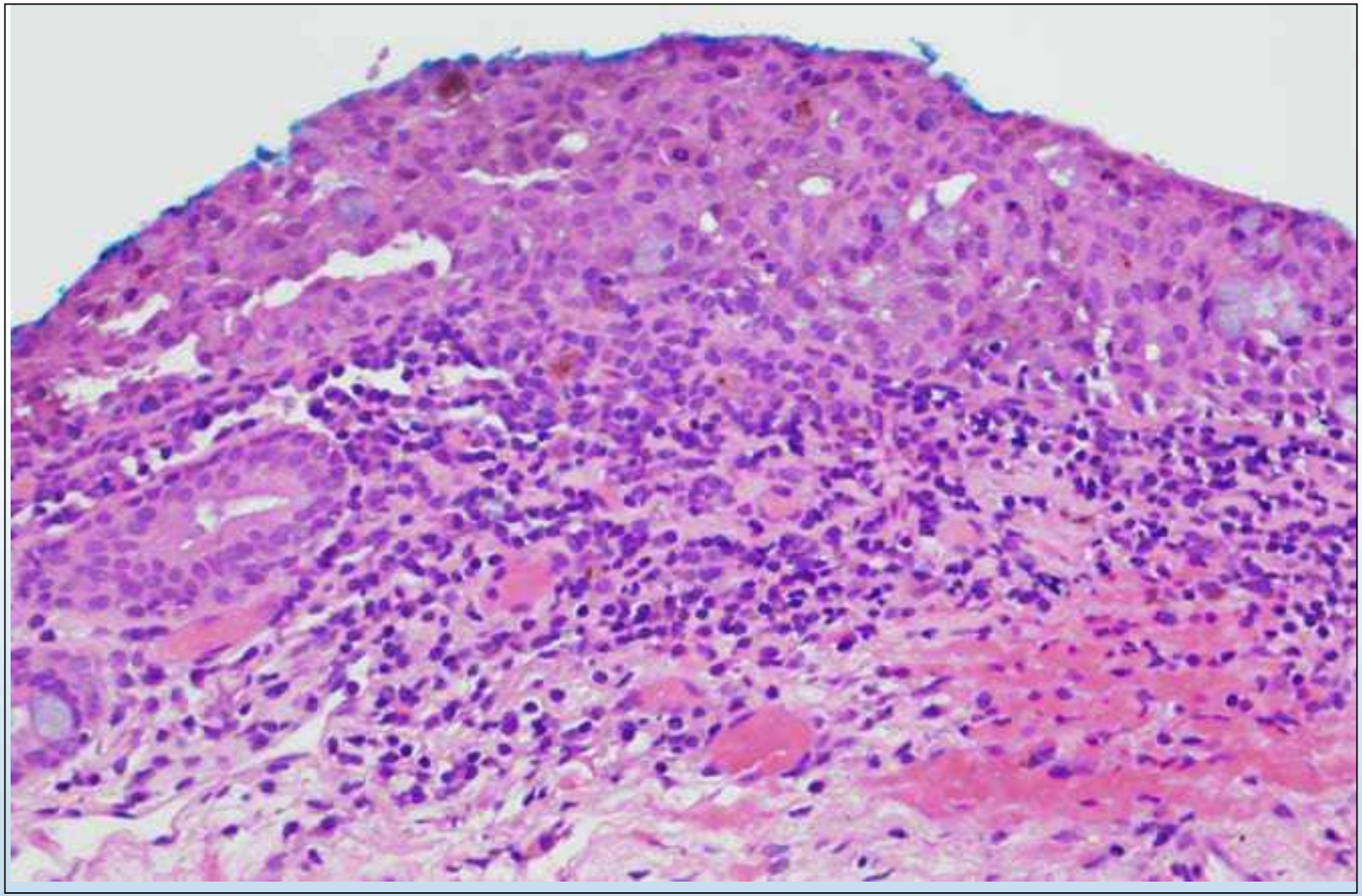
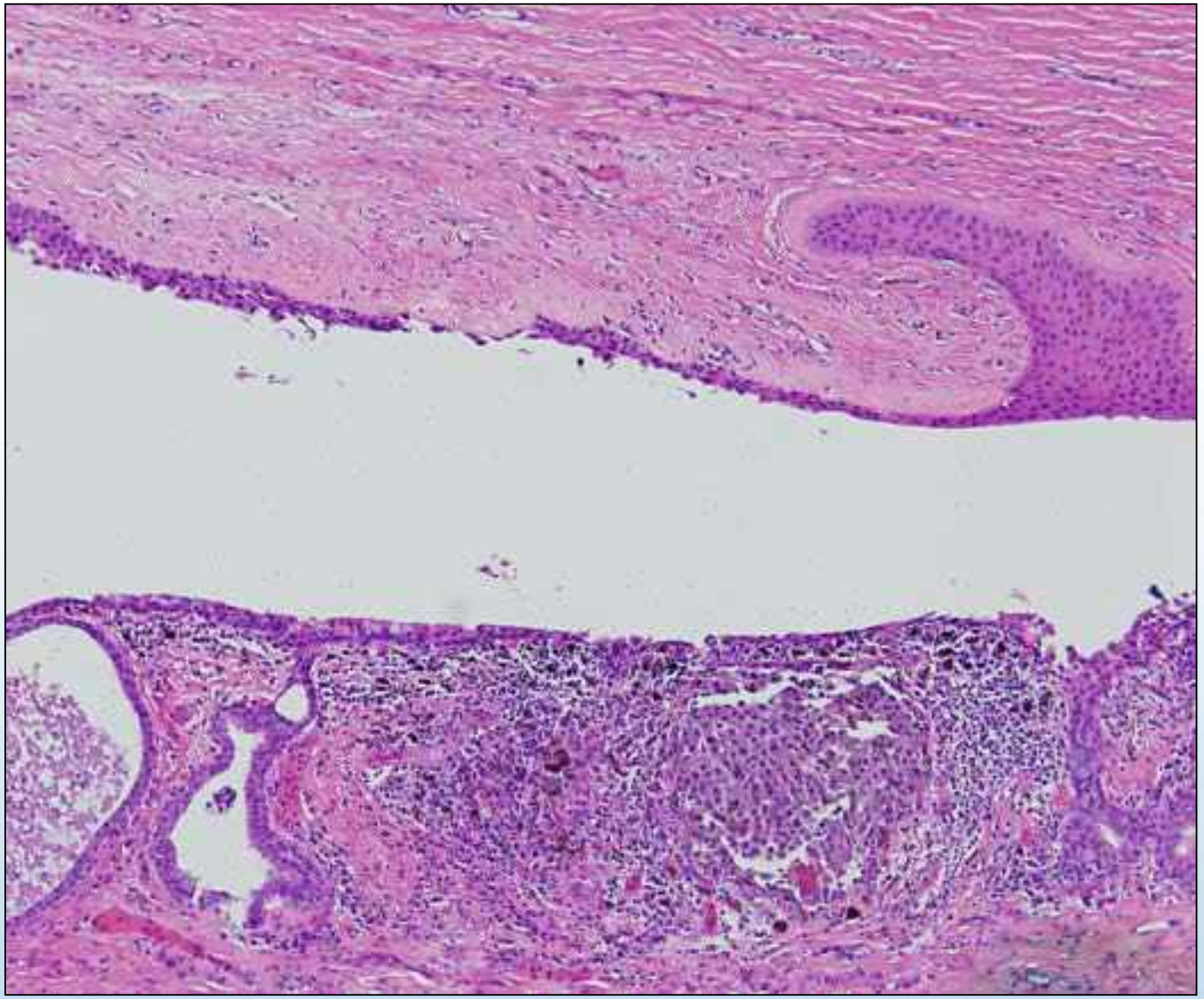
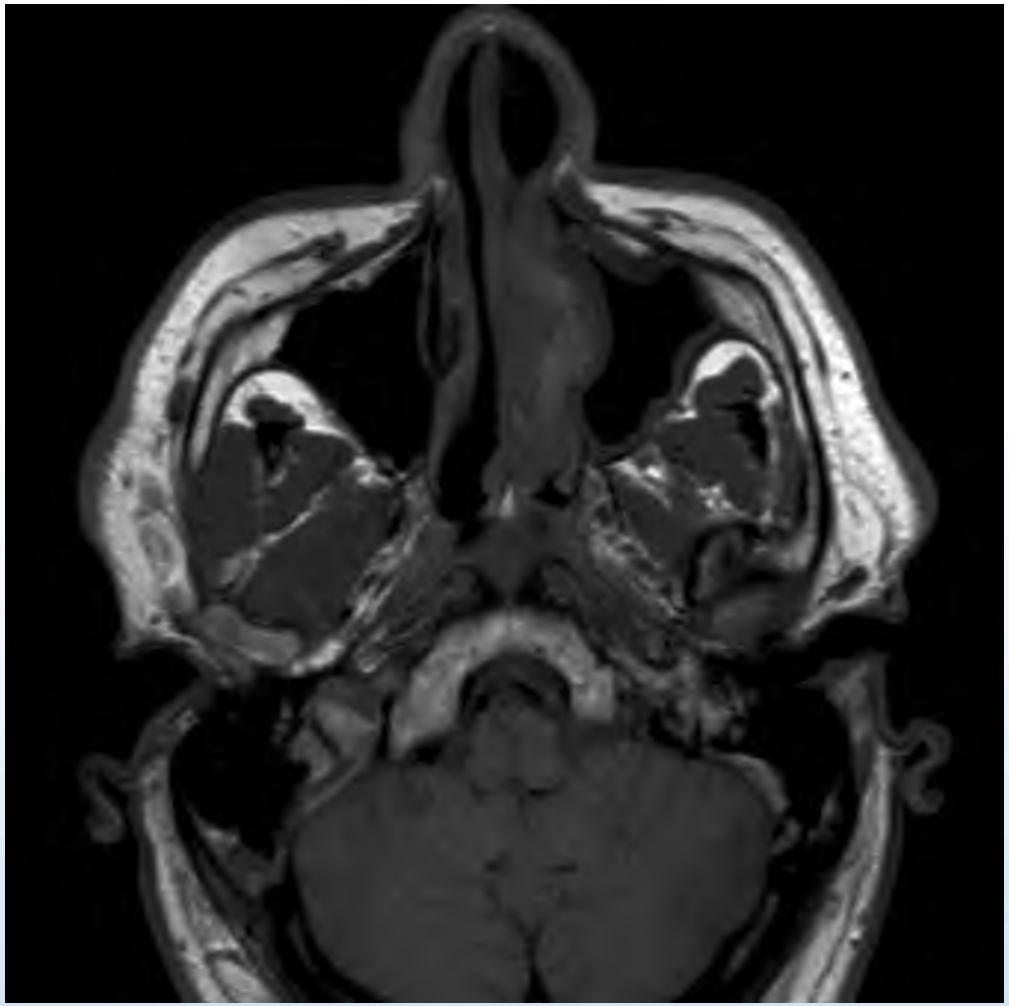
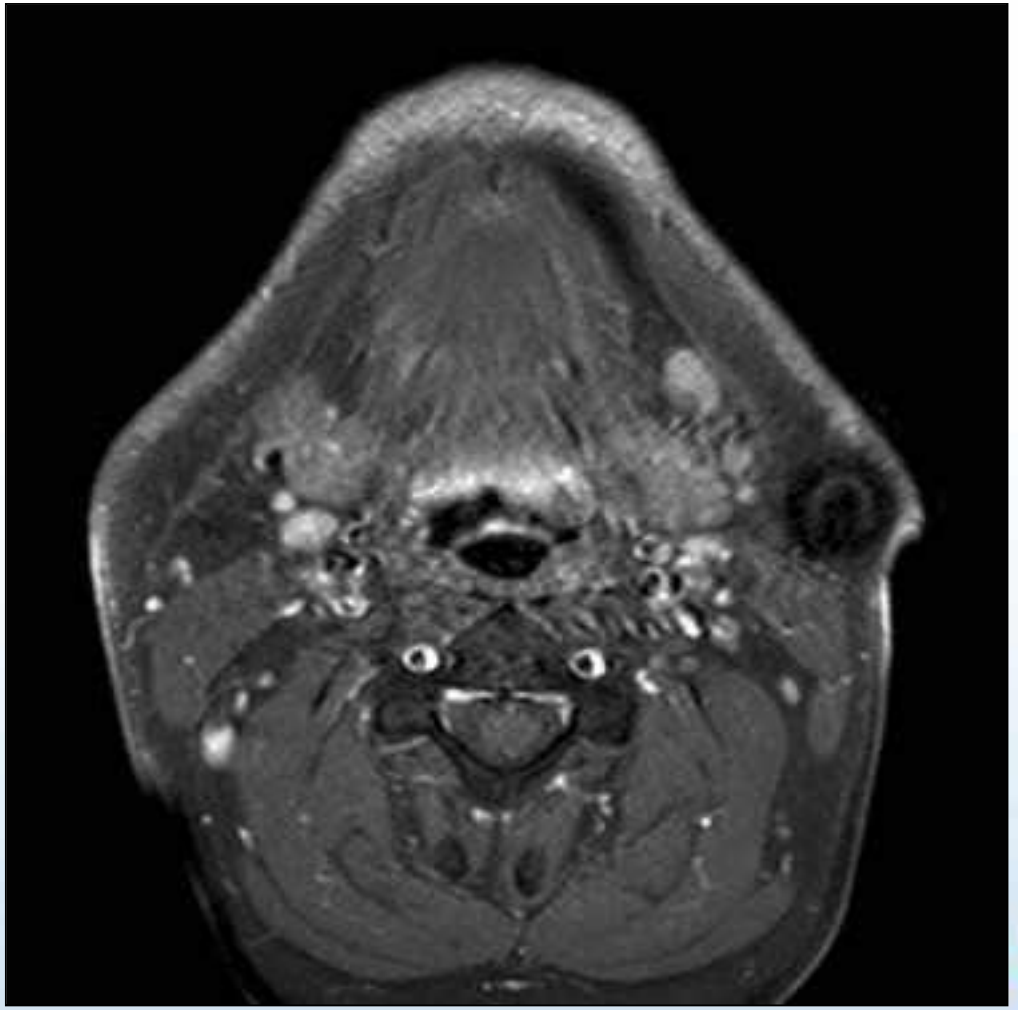


Palpebral conjunctiva



MRI/PET

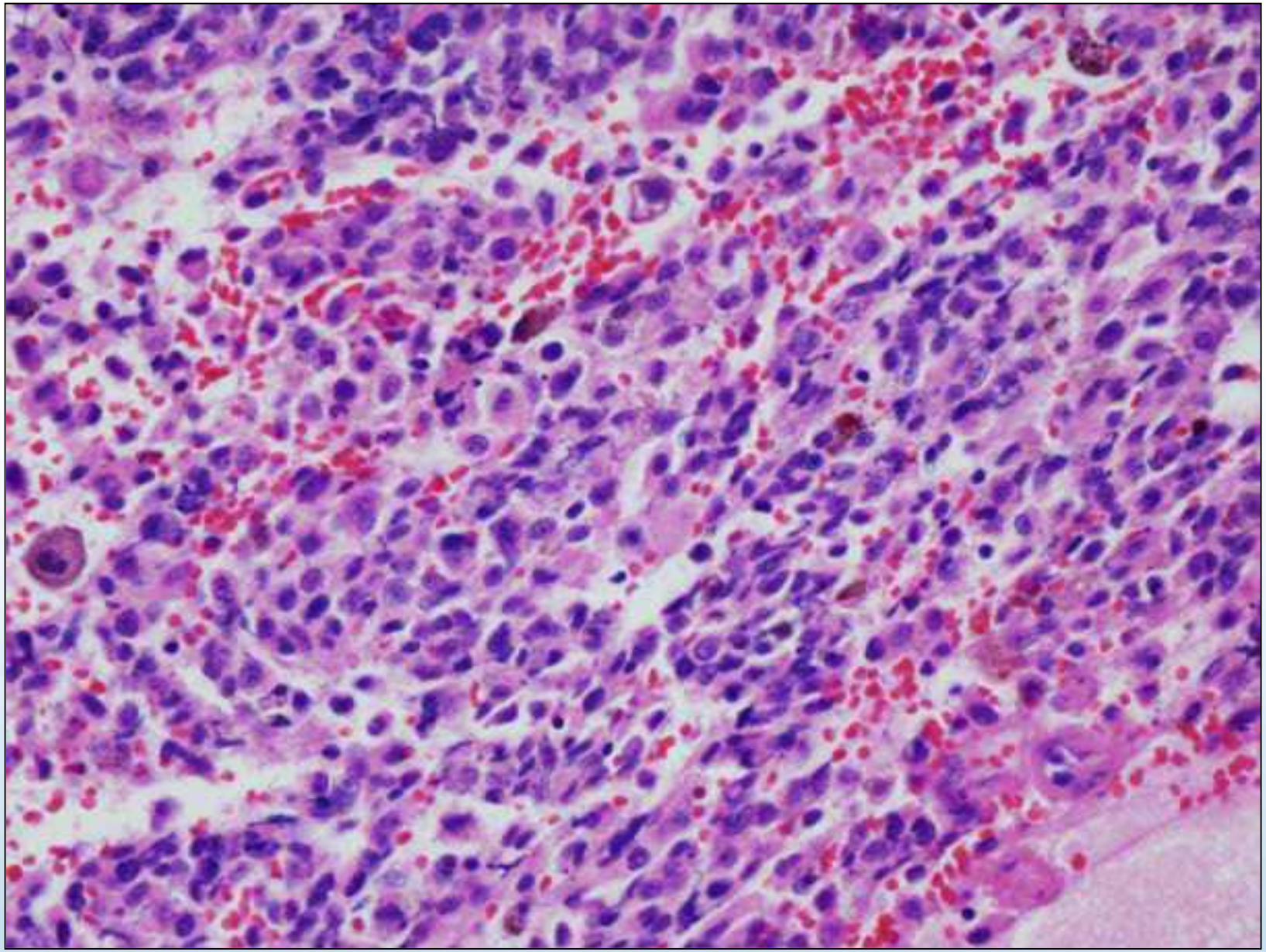




Clinical progression

- 6mo after extenteration:
  - CC: epistaxis
  - Referred to ENT – soft tissue mass in left nasal cavity
    - Biopsied in office
- Underwent endoscopy with tumor removal
- Continued radiation
- Died 6 mo later

Nasal sinus



Conjunctival Melanoma

- Rare lesions: 5% of ocular melanomas
- Better prognosis than uveal melanoma
- Mortality 26%
- Most (75%) arise from PAM with atypia
- May arise from nevi or de novo
- Spread to regional lymph nodes (preauricular, intraparotid)

Malignant Melanoma
Arising in PAM with Atypia

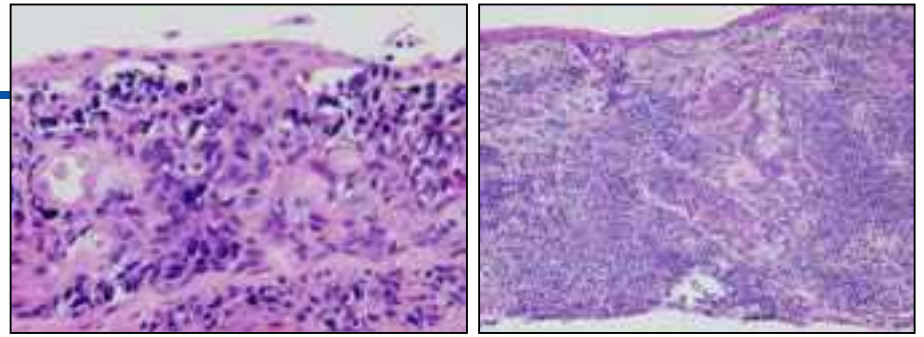
AANP

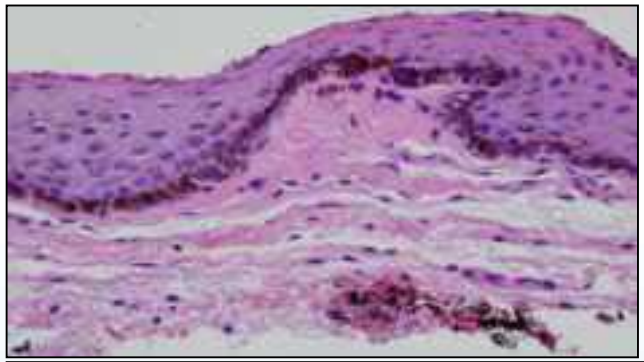
Conjunctival melanocytic intraepithelial lesions

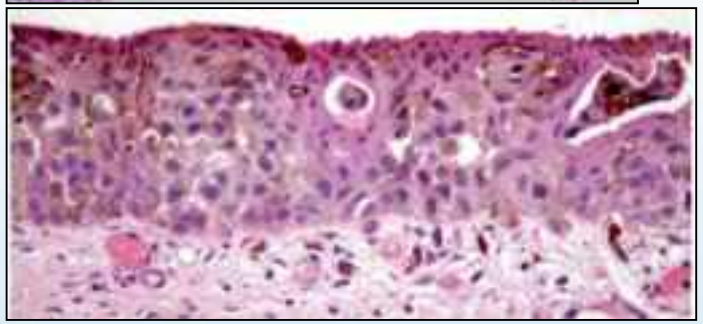
- Conjunctival pigmented lesions
- Primary acquired melanosis (PAM)
- Conjunctival melanocytic intraepithelial neoplasia (CMIL) – WHO classification
  - Benign melanosis, PAM w/ mild atypia = low grade CMIL
  - PAM w/ mod/severe atypia = high grade CMIL

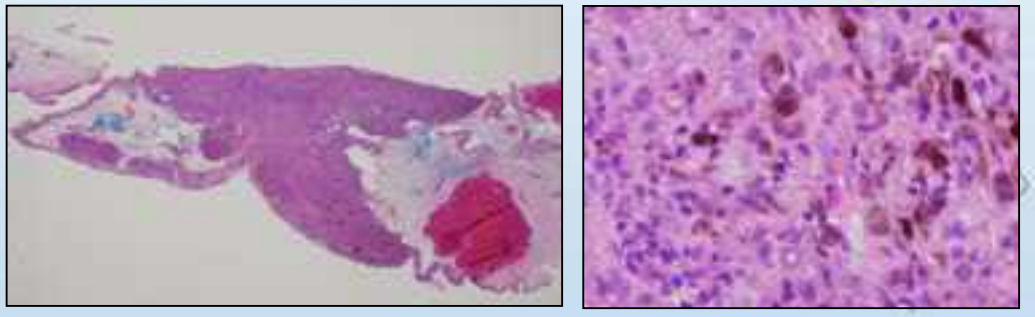
Pigmented Conjunctival Lesions

- Conjunctival Nevi
- Flat pigmented patches
  - Complexion melanosis
  - Freckles and lentigines
  - PAM (early stages)
- PAM with Atypia
- Malignant Melanoma









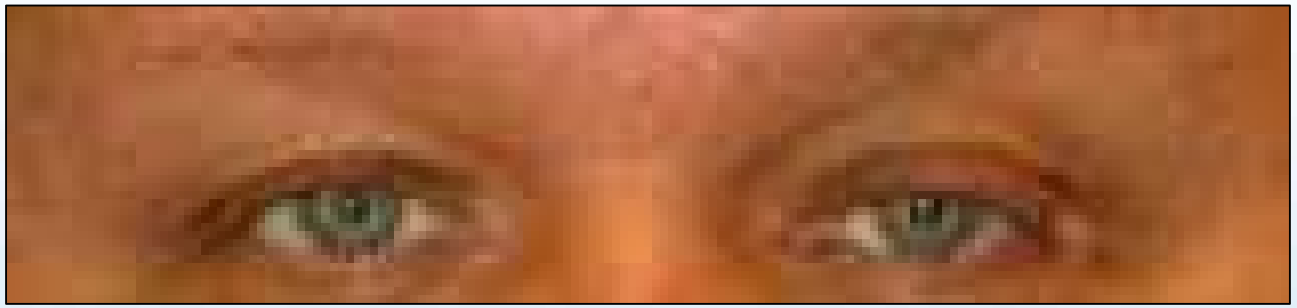
EYELID

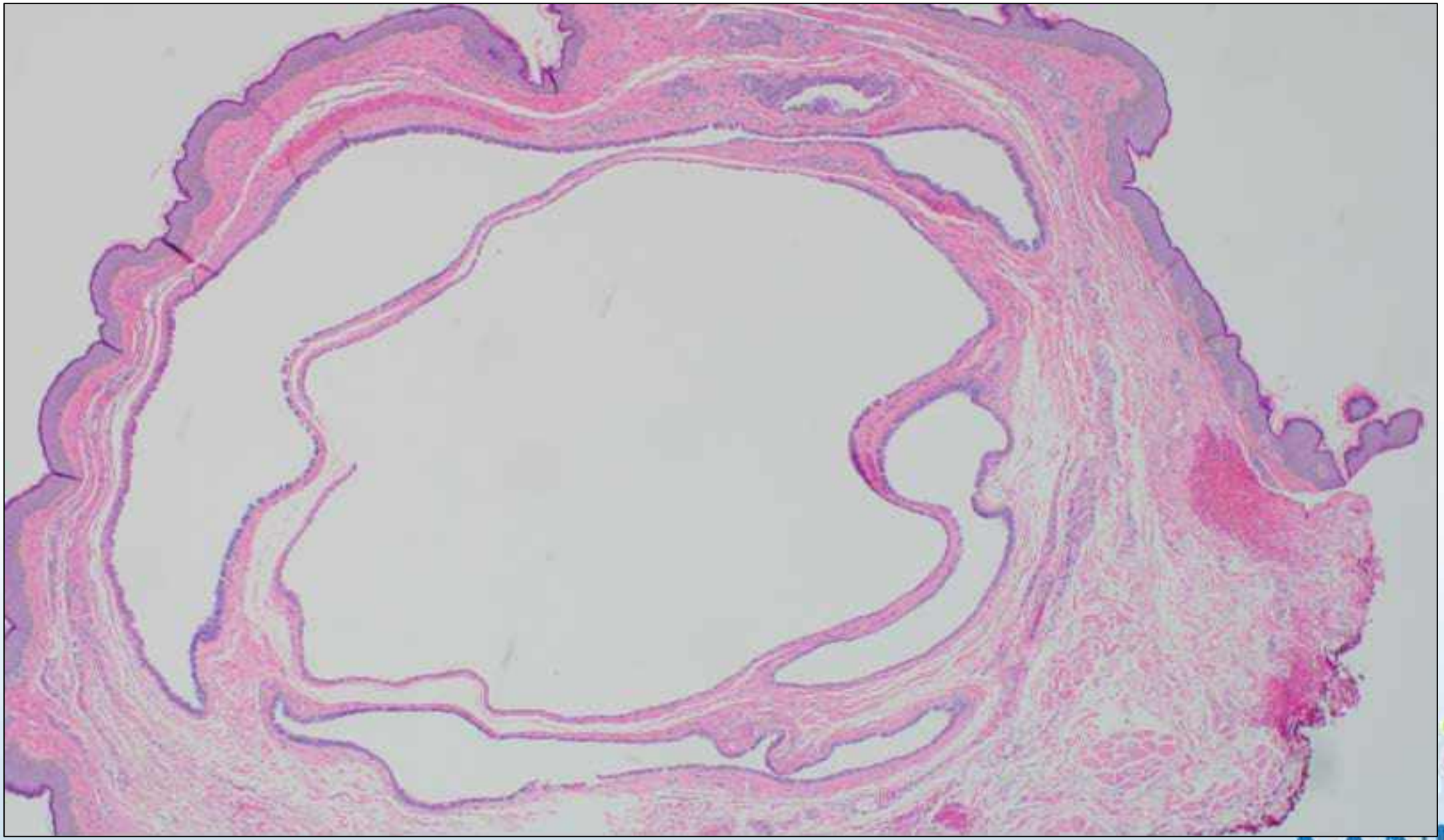
EYELID LESIONS: Differential Diagnosis

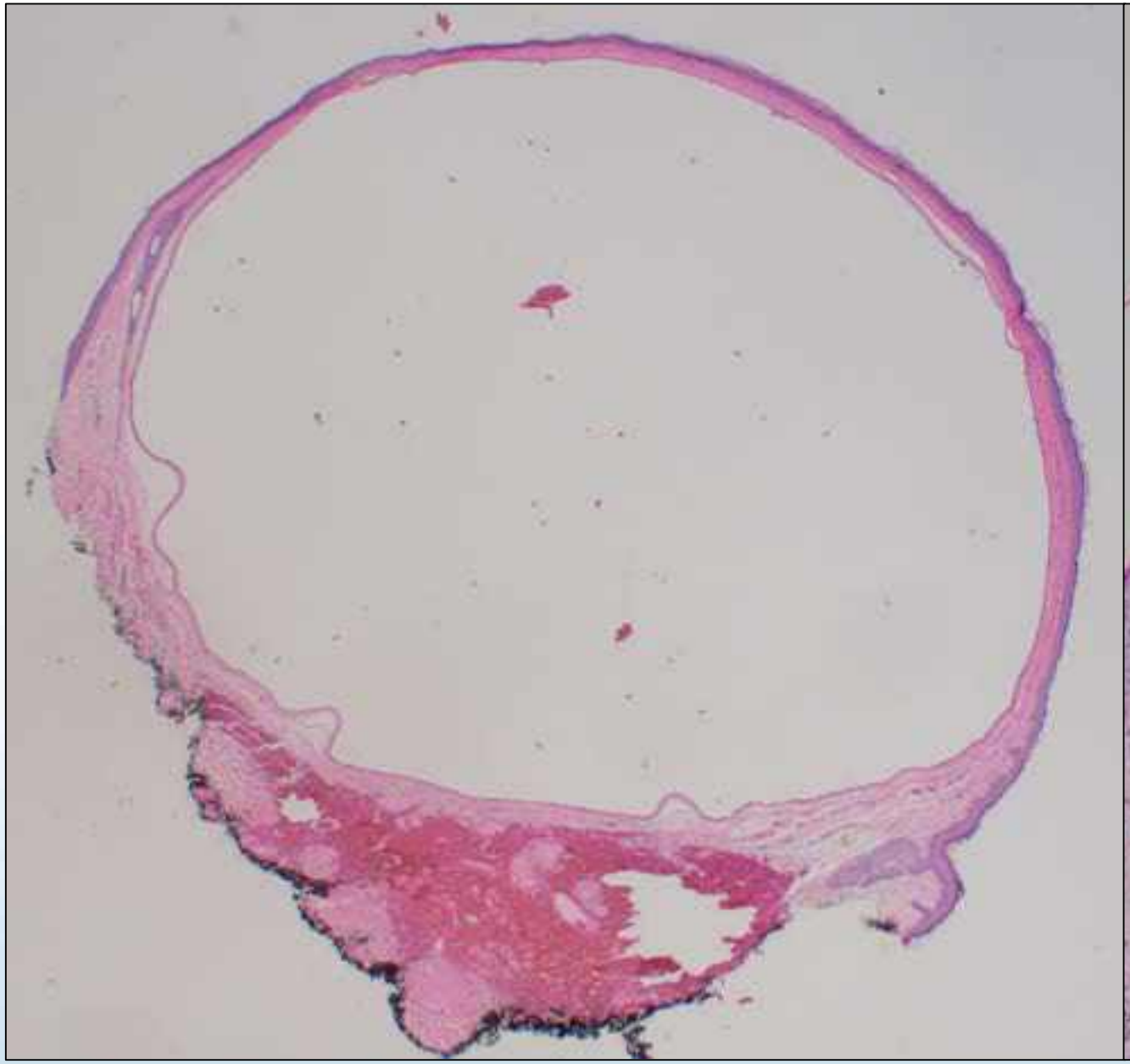
- **Epidermis**
  - Benign: SK, Papilloma, EIC
  - AK, KA
  - Malignant: BCC, SCC
- **Adnexal**
  - Sebaceous
  - Sweat glands
  - Hair follicles
- **Melanocytic**
  - Nevi
  - Melanoma
- **Vascular**
  - Hemangioma
- **Neural**
  - Neurofibroma
  - Traumatic neuroma
- **Miscellaneous**
  - Lymphoid
  - Chalazion
  - Xanthelasma
- **Metastatic**
  - Breast (50%), lung, prostate, melanoma, RCC

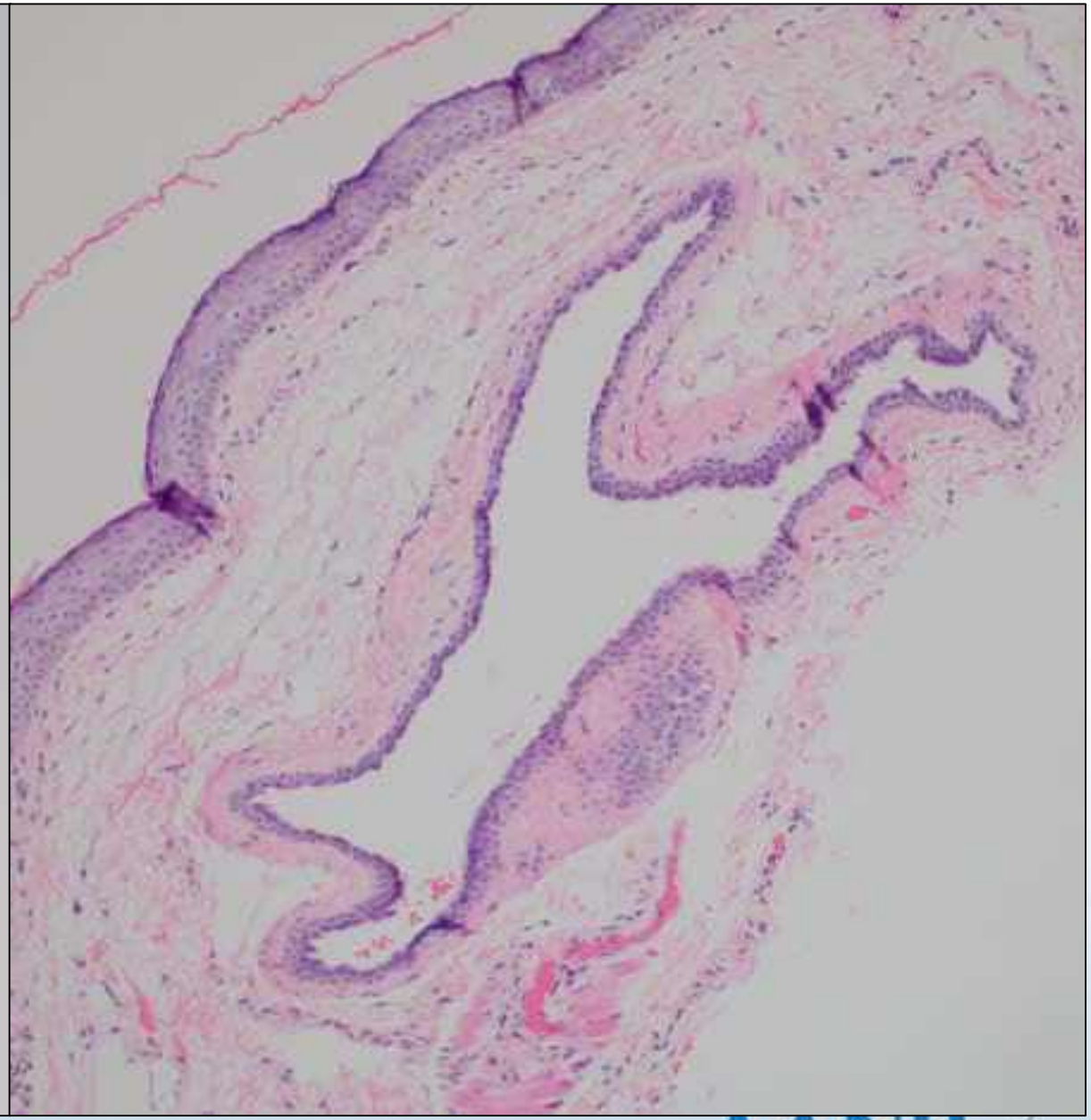
AANP

HIDROCYSTOMA









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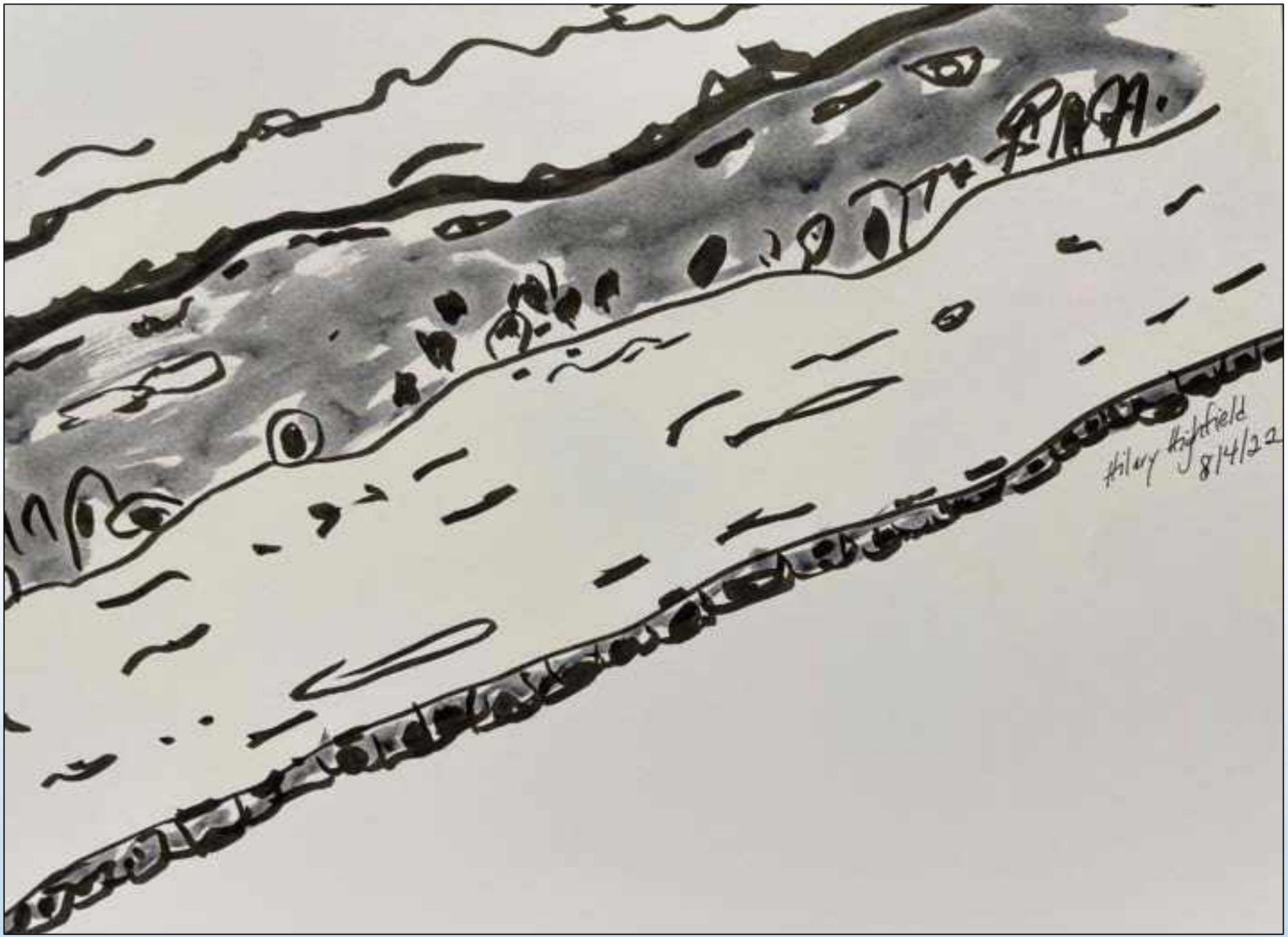
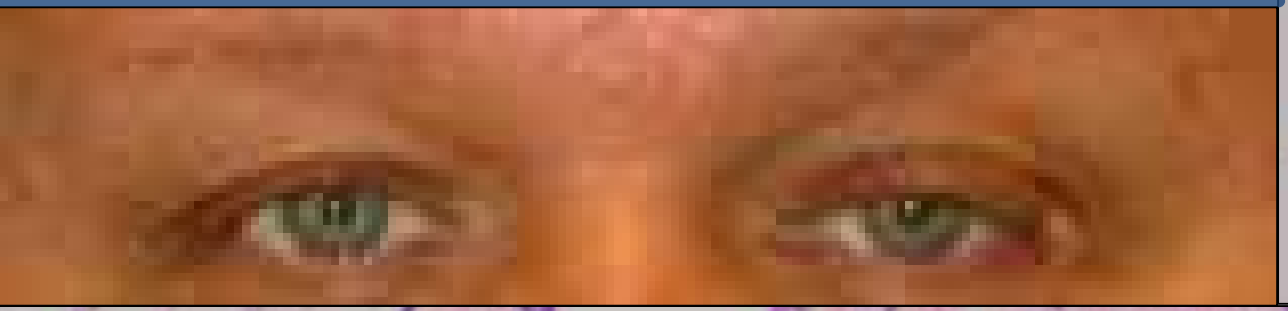
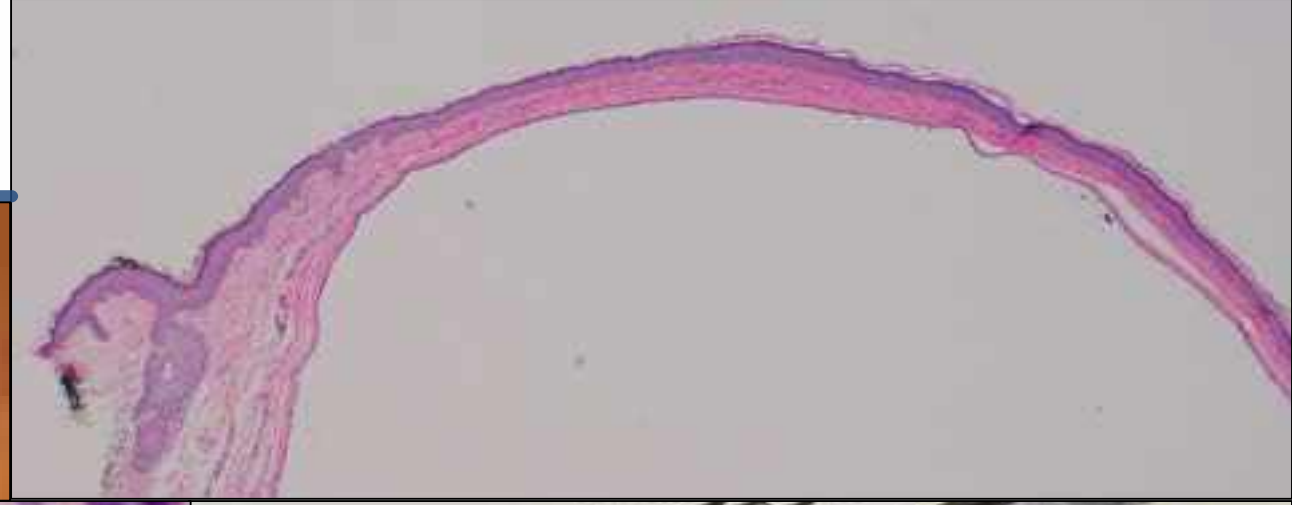
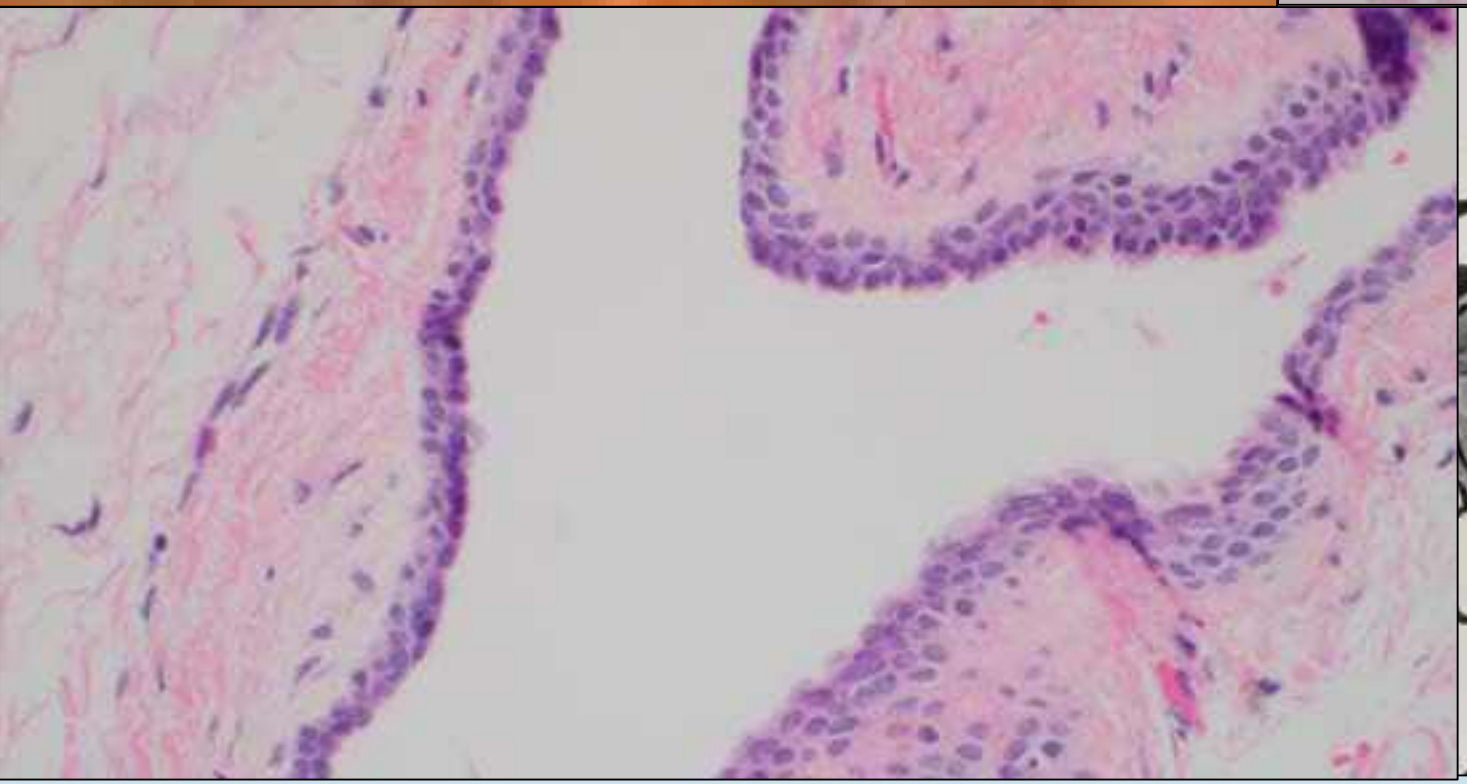
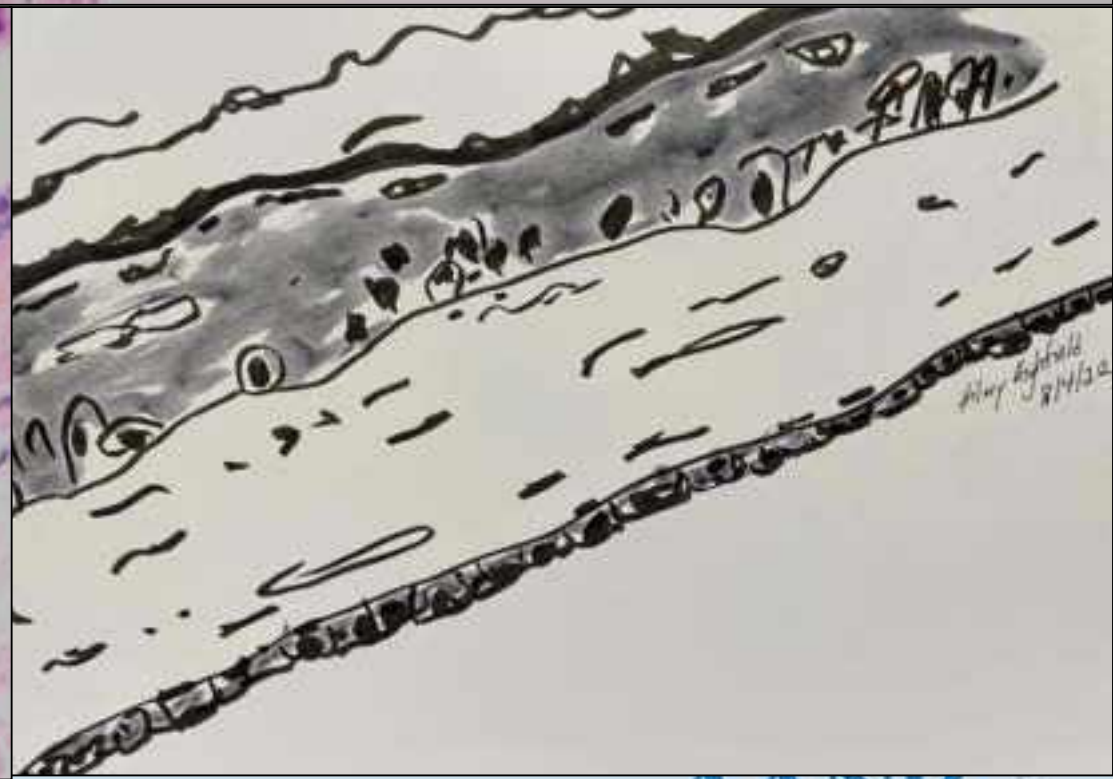

Hilary Hightfield
8/4/22

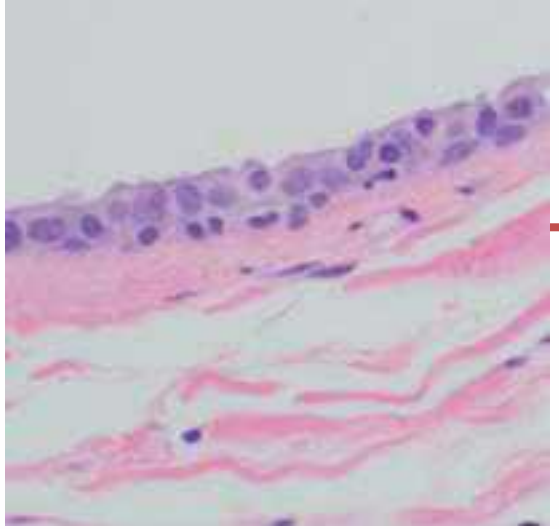
HIDROCYSTOMA



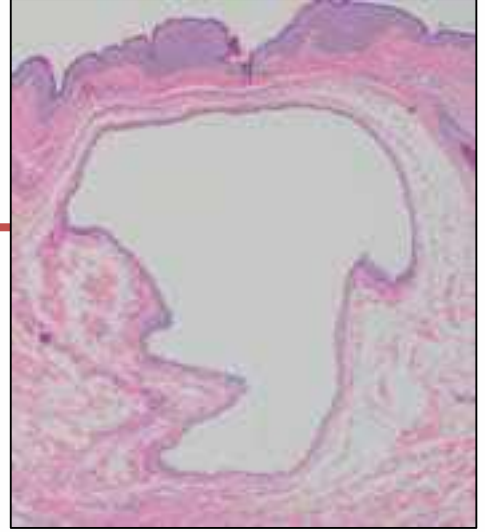




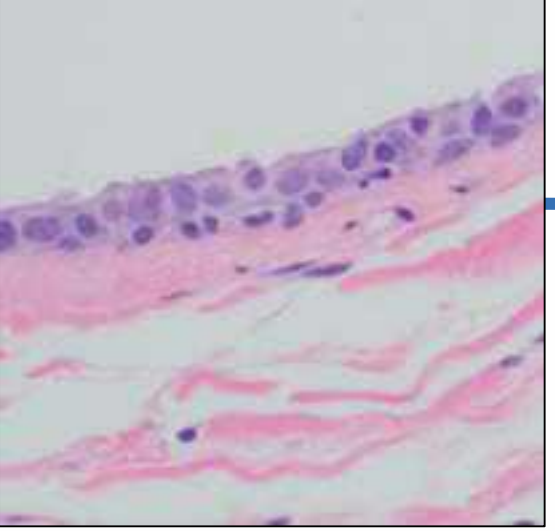




Hidrocystoma



- Cystadenoma or Moll’s gland cyst
- Cyst of sweat duct
- Eccrine or apocrine
- Low cuboidal epithelium
- Apocrine with decapitation secretion



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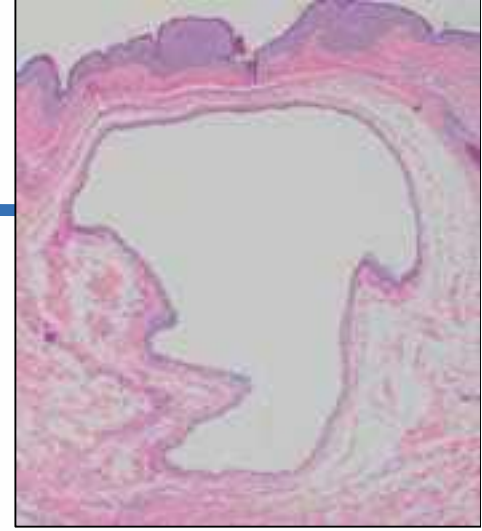
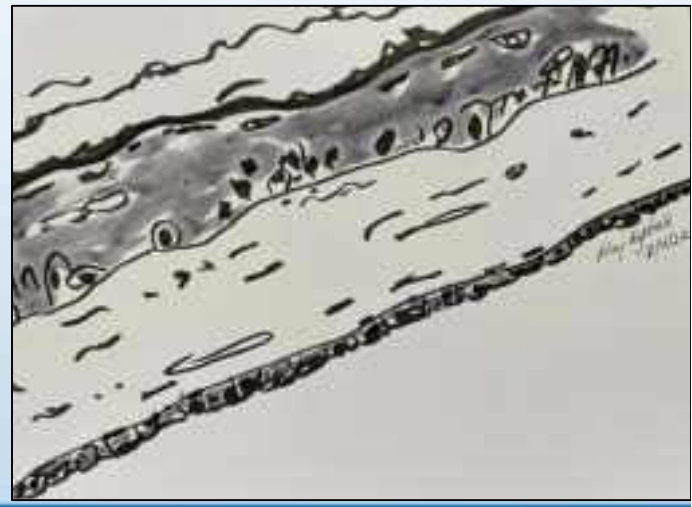


Eccrine: retention cyst of eccrine sweat gland

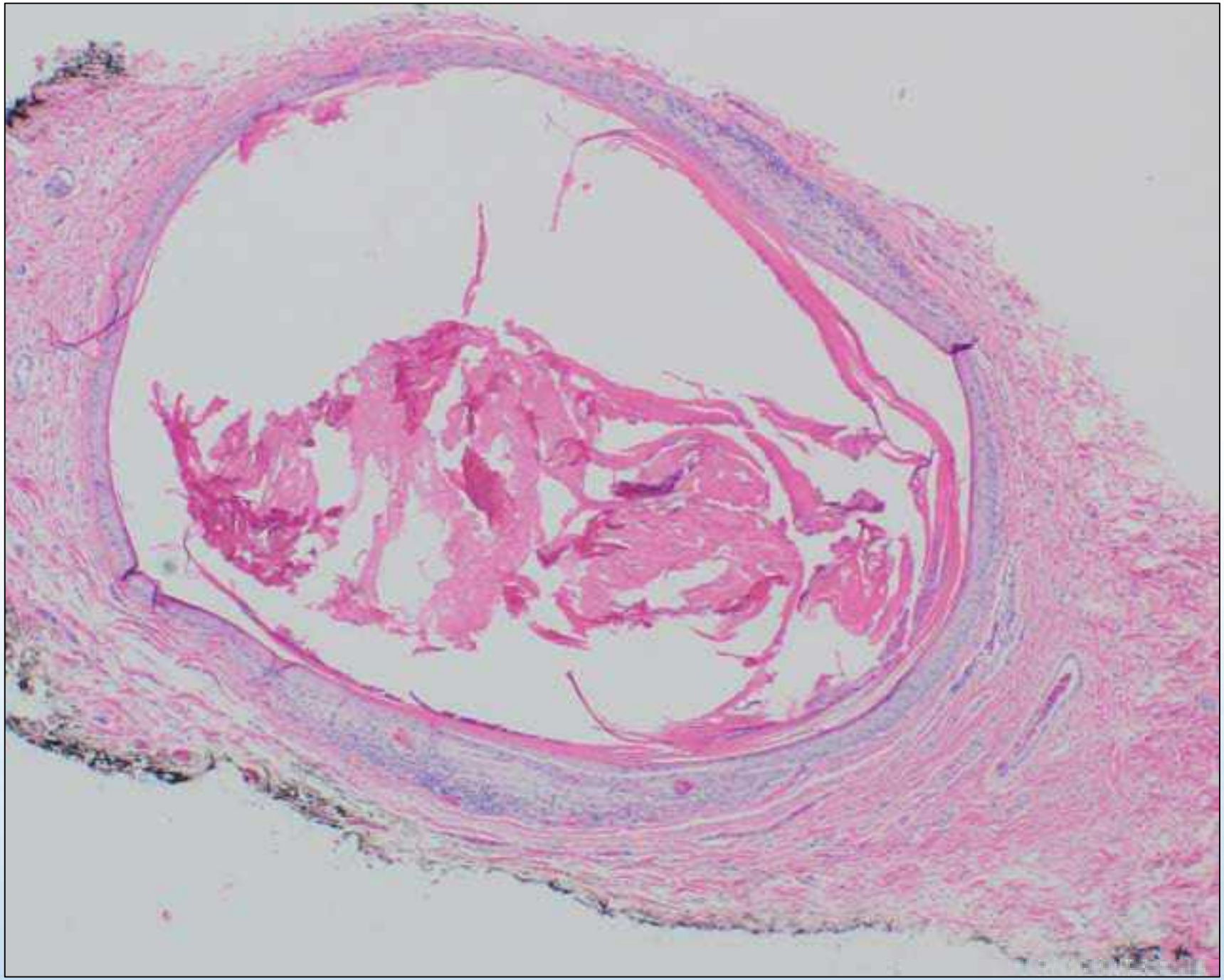
- Common in eyelid region; often multiple
- Clear translucent lesion near eyelid margin
- Smooth shiny overlying skin
- Clear cystic lesion lined by bilayer cuboidal cells

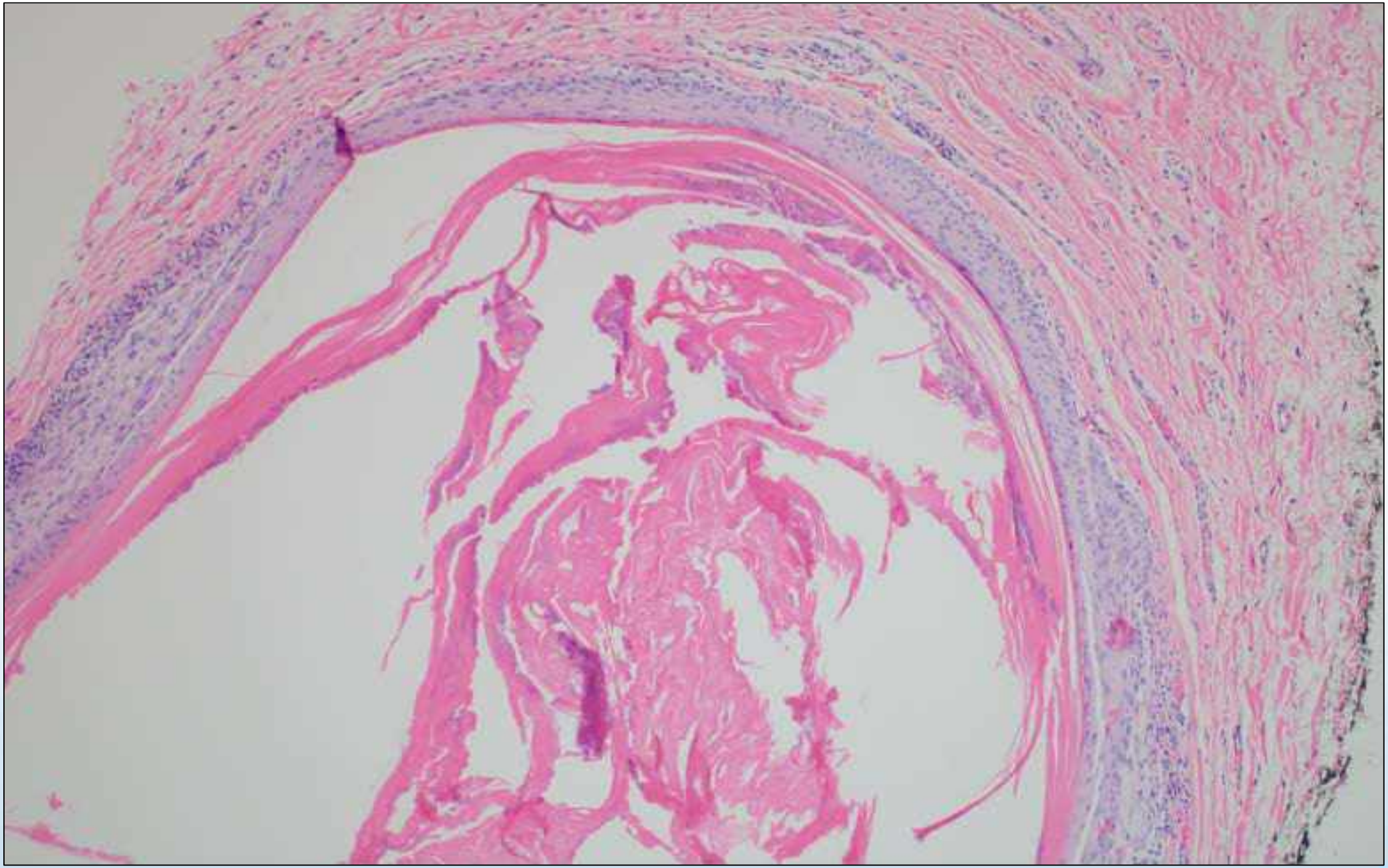
Apocrine: retention cyst of apocrine gland

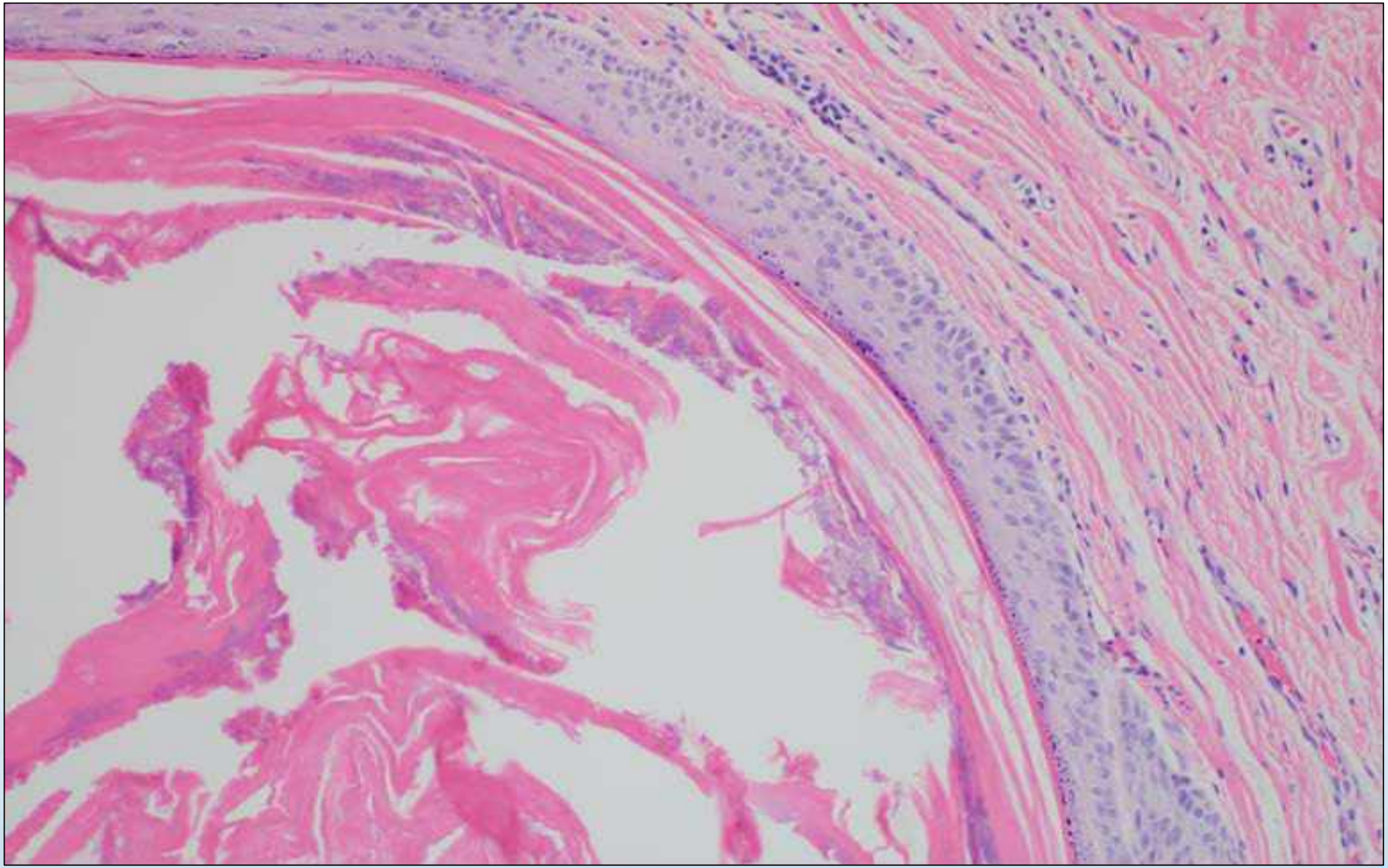
- Usually solitary
- Apocrine glands of eyelid (glands of Moll)
- Frequently bluish
- Decapitation secretion

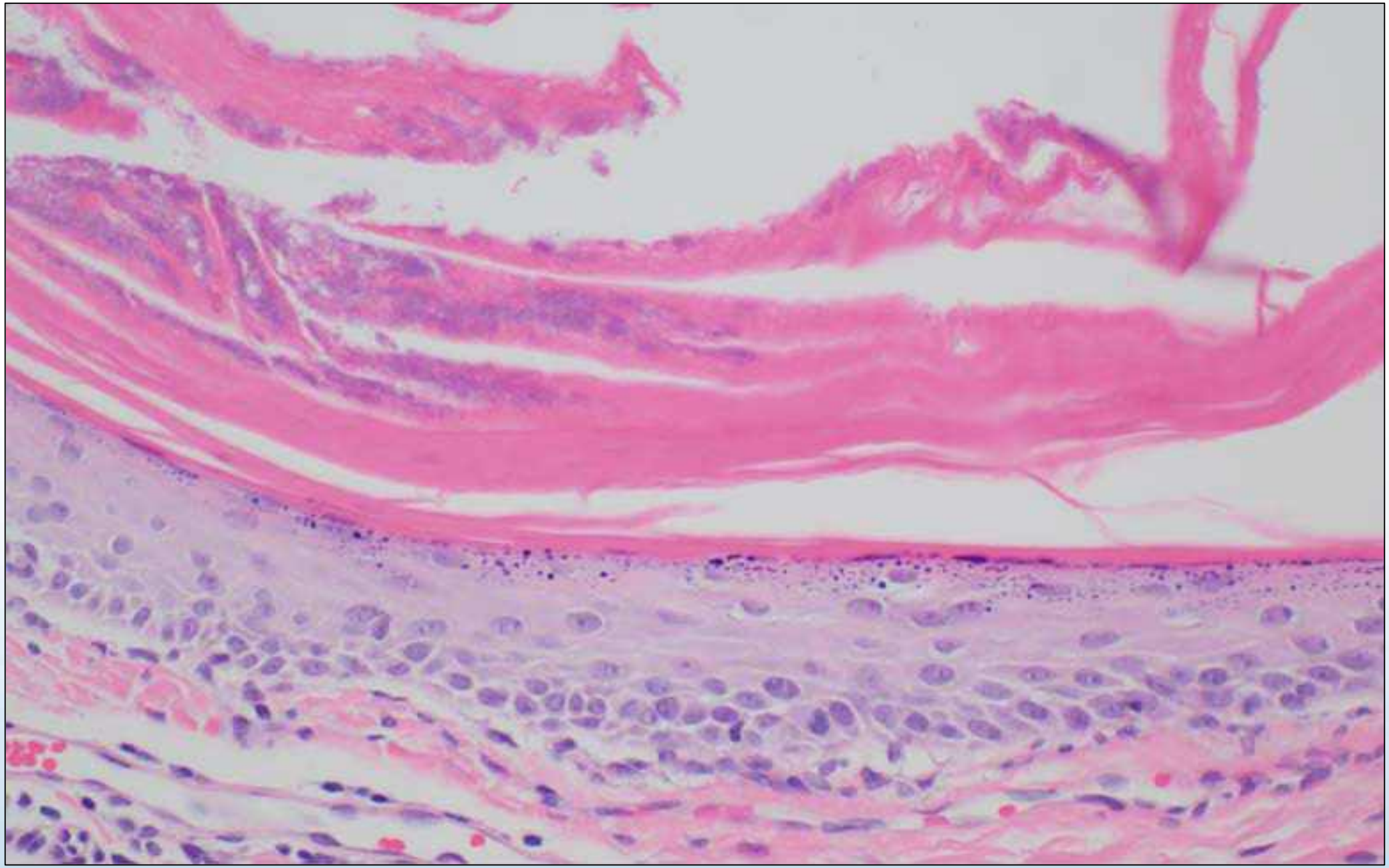


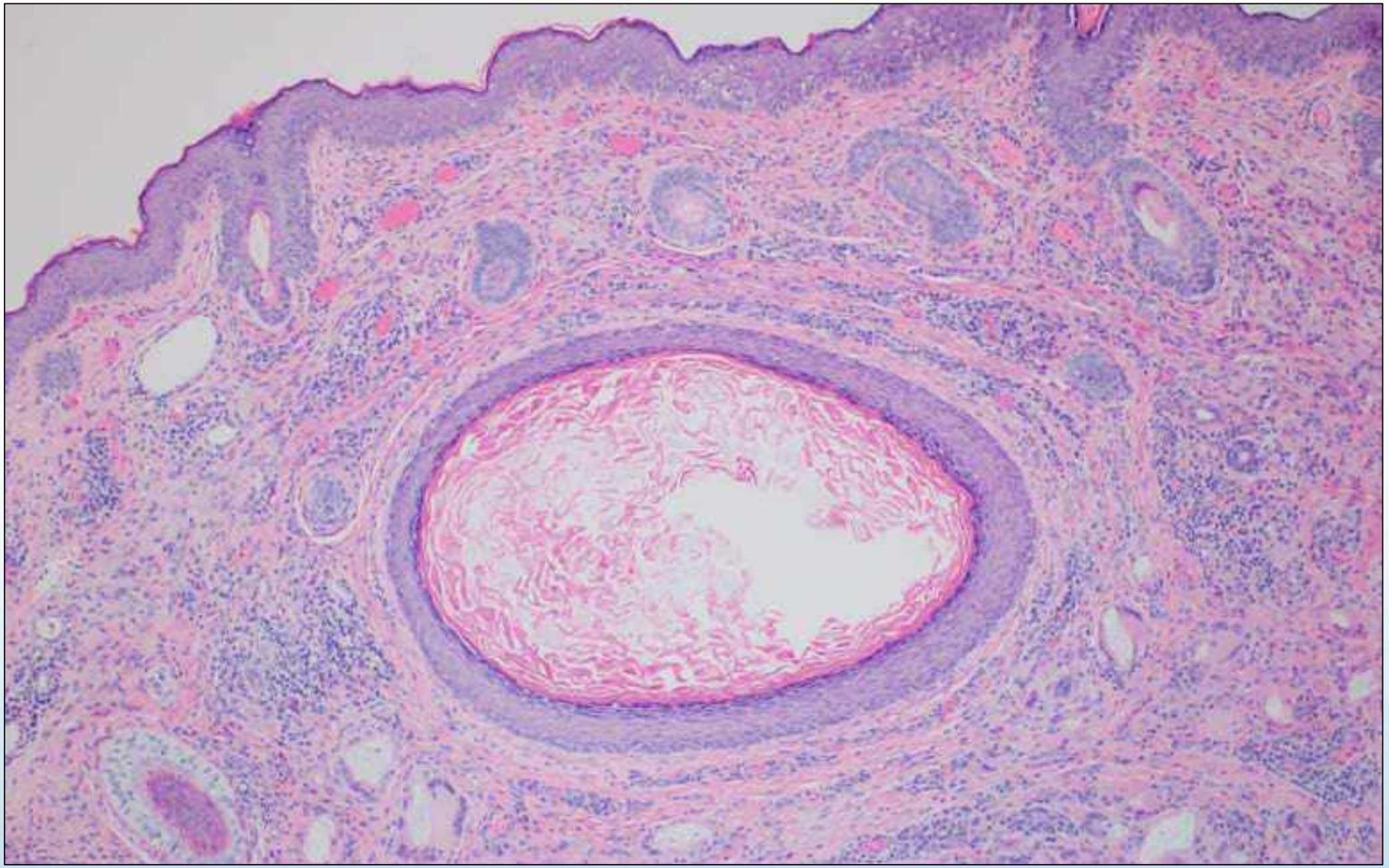
Epidermal Inclusion Cyst

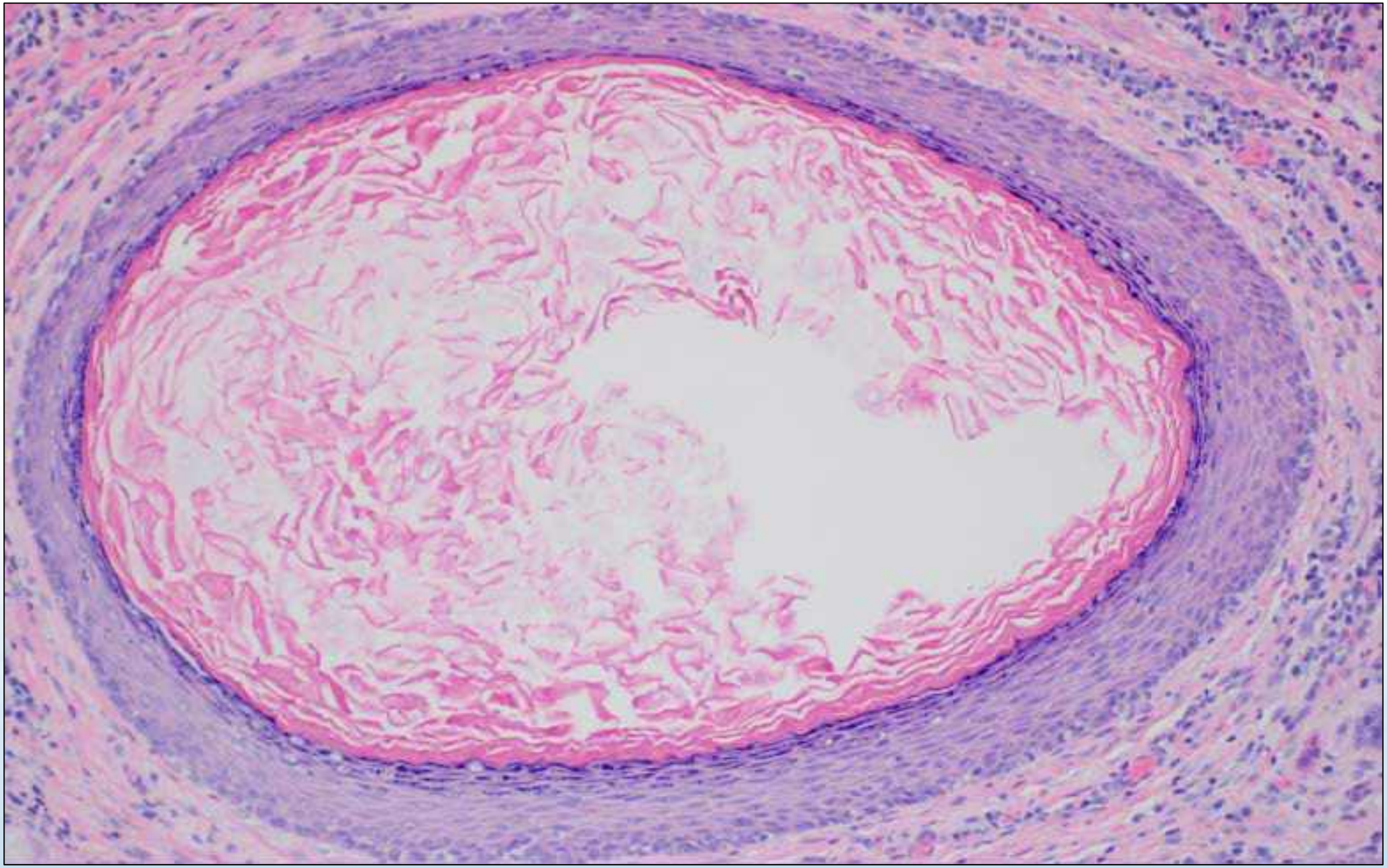


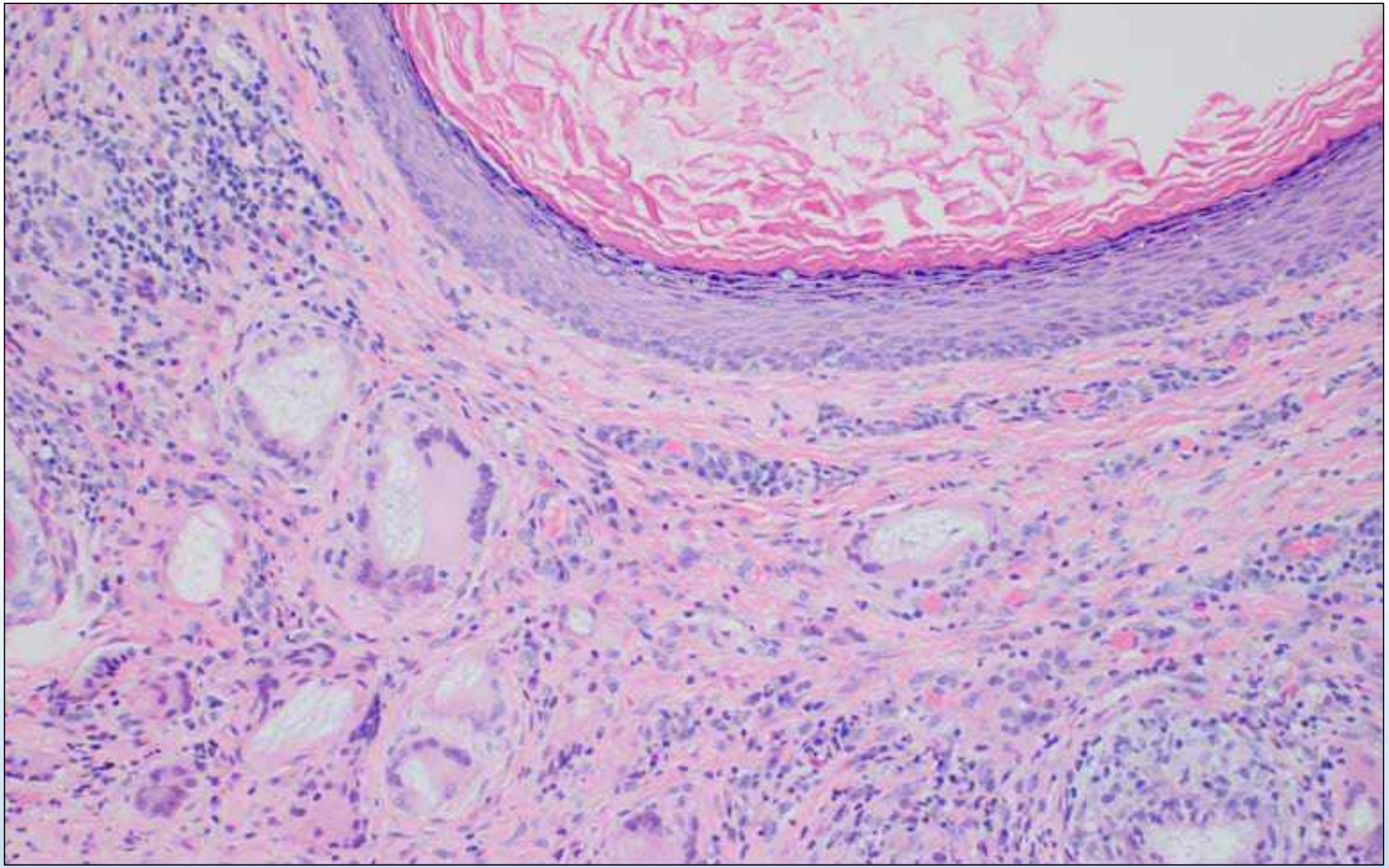


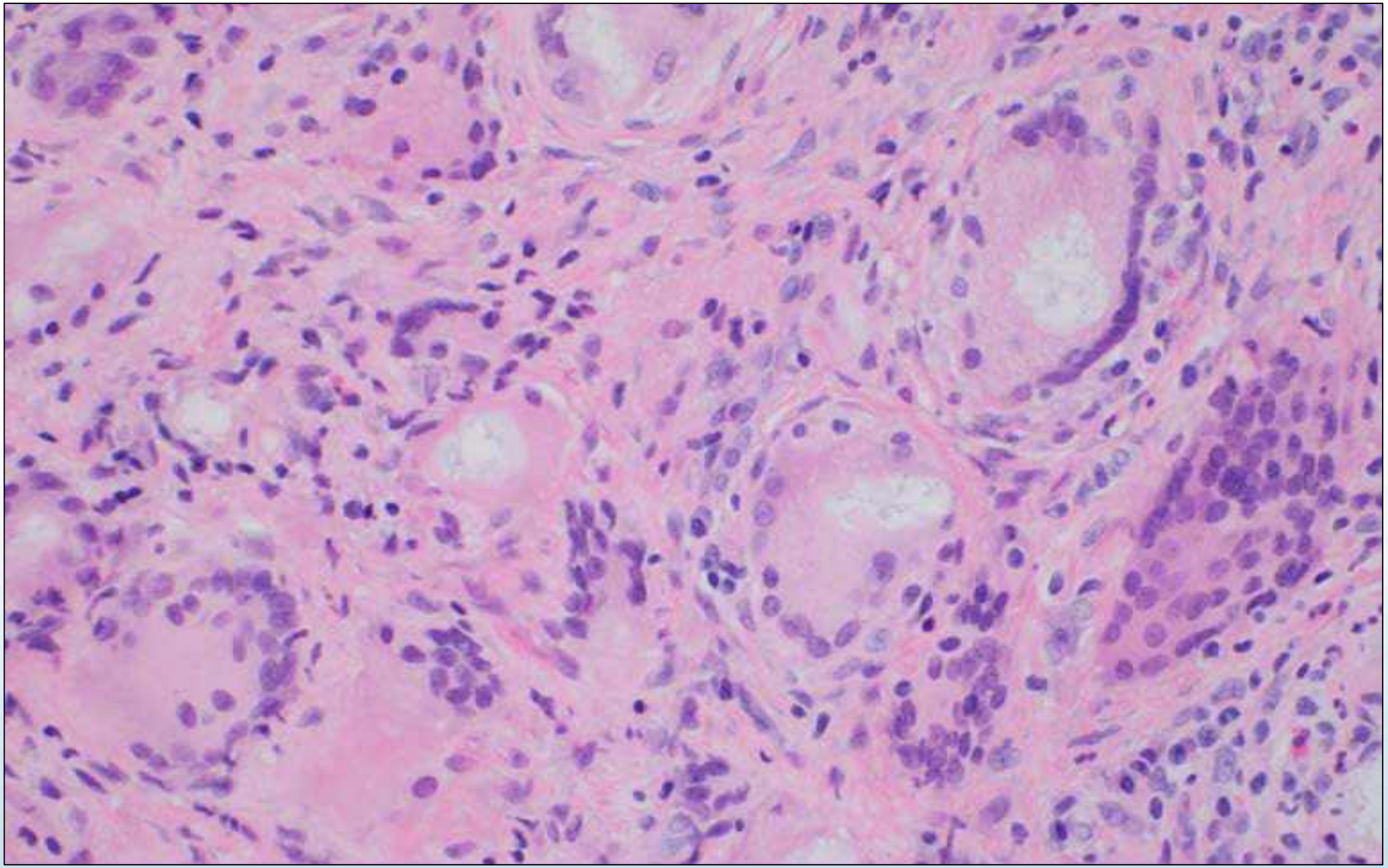


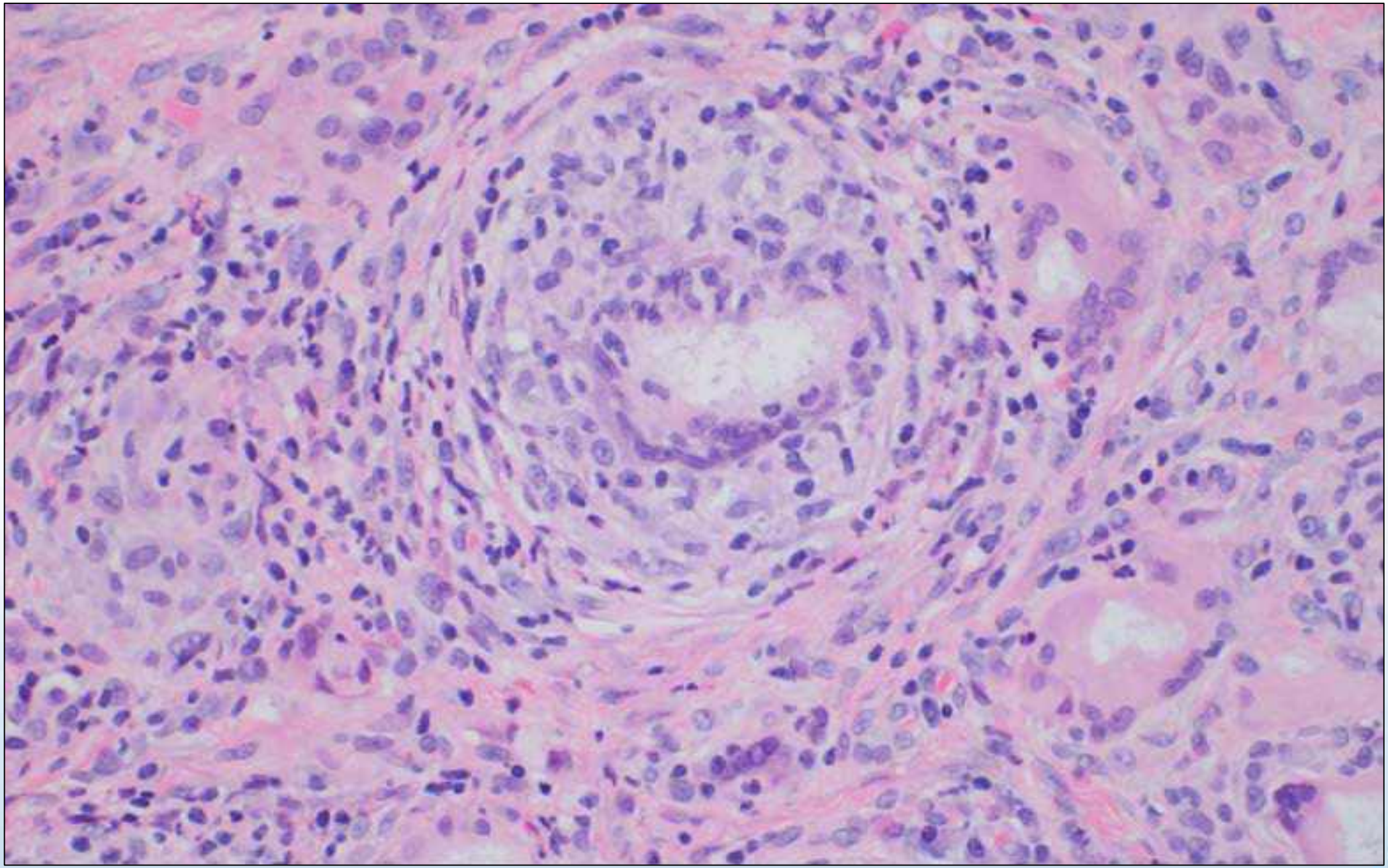













Hilary Highfield
7/26/22

Epidermal inclusion cyst

- Cyst lined by squamous epithelium with granular cell layer containing lamellated keratin

- Rupture leads to granulomatous/foreign body giant cell reaction

- Multiple: syndromic

  (Bowel cancer and internal/cutaneous lesions)

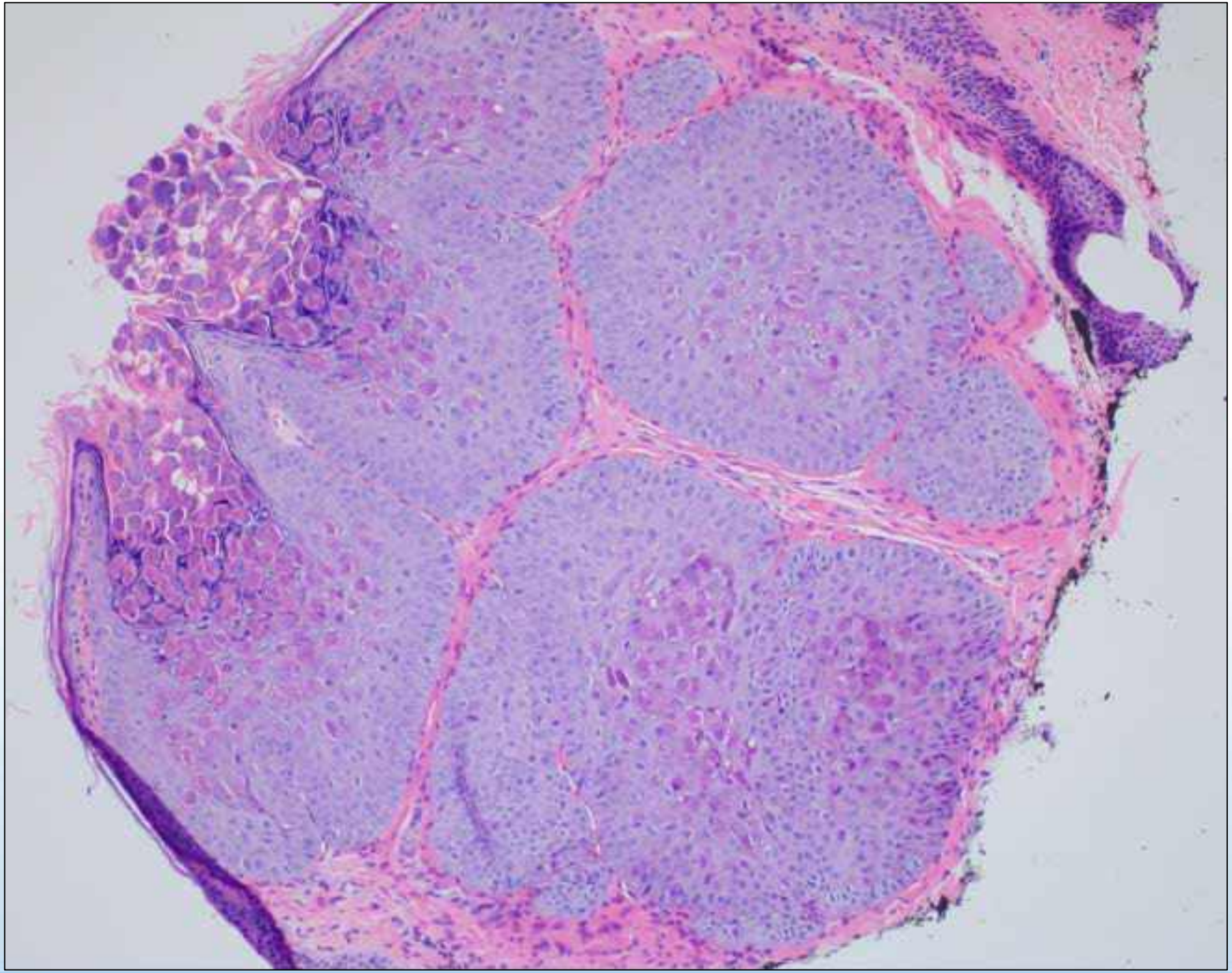
  – Muir-Torre: Lynch syndrome

  – Gardner syndrome: form of FAP (AD)

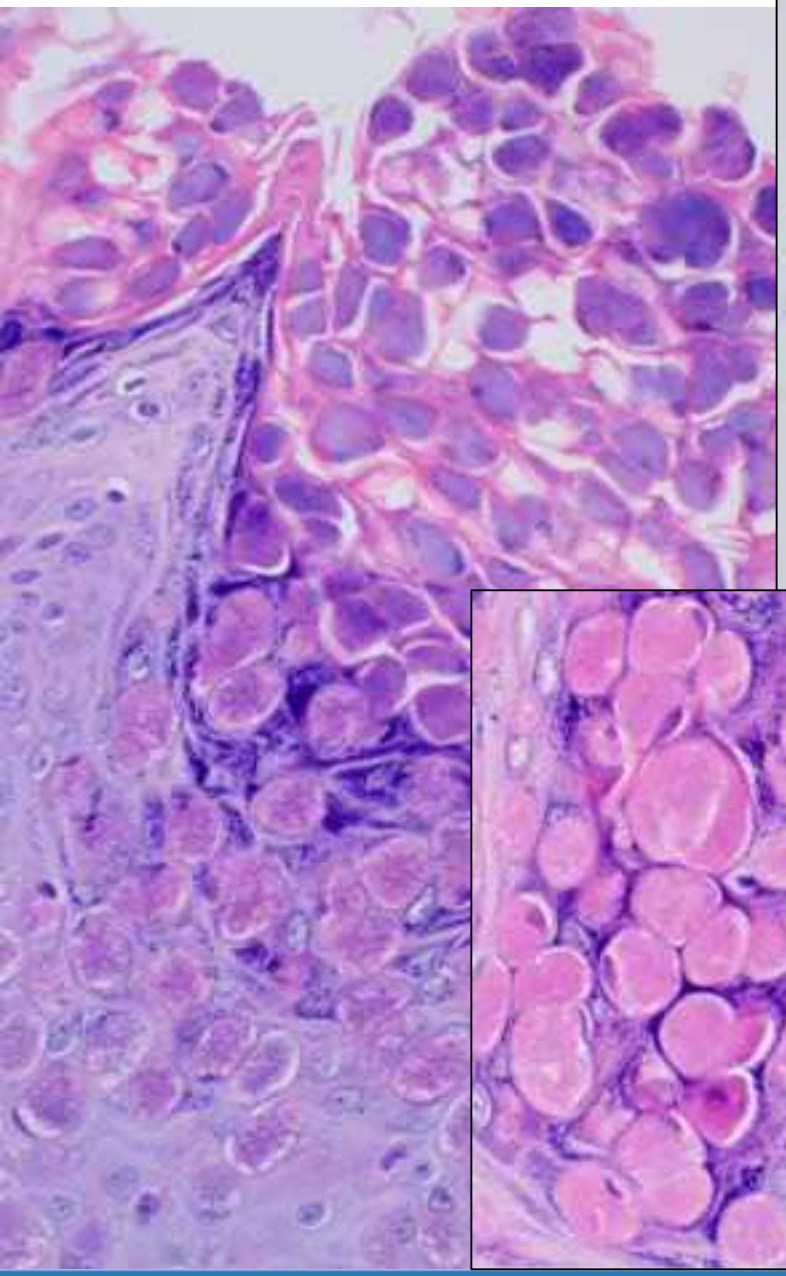
Epidermal inclusion cyst: syndromes

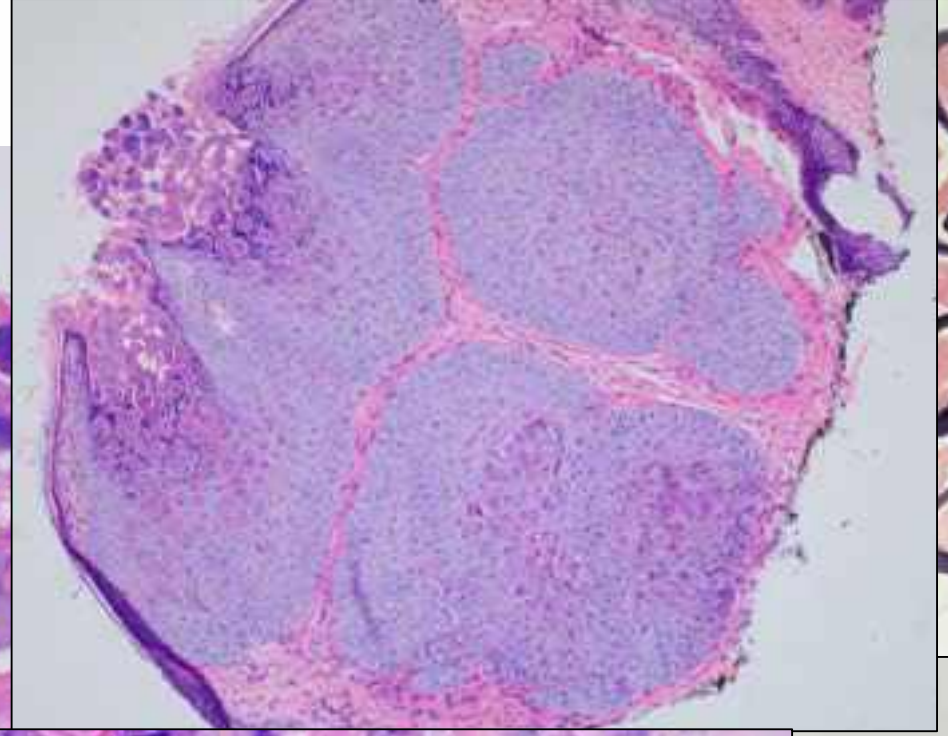
- Muir-Torre syndrome (AD):
  - Lynch syndrome: hereditary non-polyposis colorectal cancer (HNPCC)
  - Increased risk of Colorectal/GI cancer and others
  - DNA mismatch repair (*MLH1*, *MSH2*, *MSH6*, *PMS2* or *EPCAM* gene)

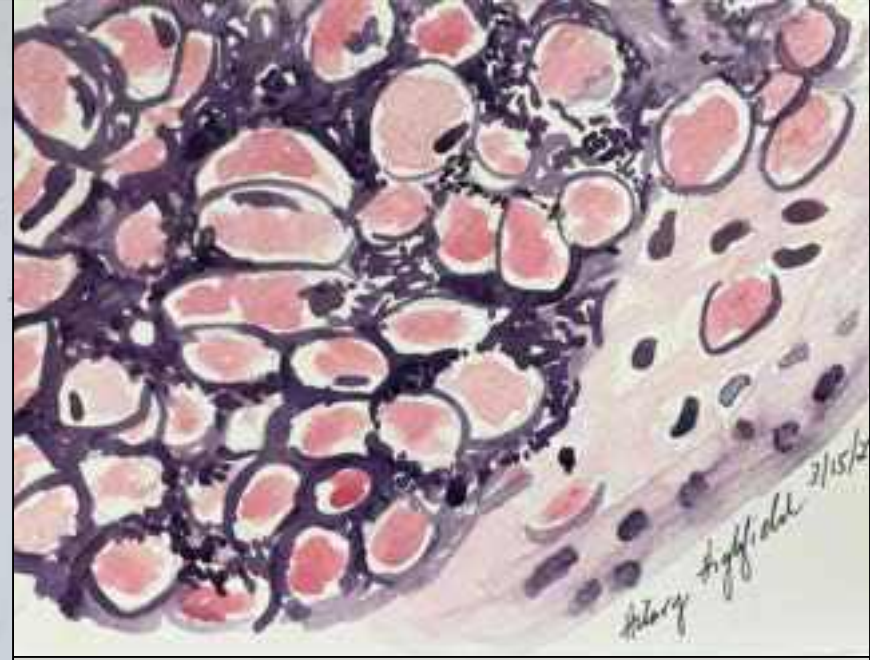
- Gardner syndrome (AD):
  - form of Familial Adenomatosis Polyposis (AD)
  - Colorectal polyps, tumors, dental, osteomas, fibromas, lipomas
  - Tumors: colorectalthyroid, liver, bile ducts, adrenal
  - APC gene: tumor suppressor gene cell growth/division

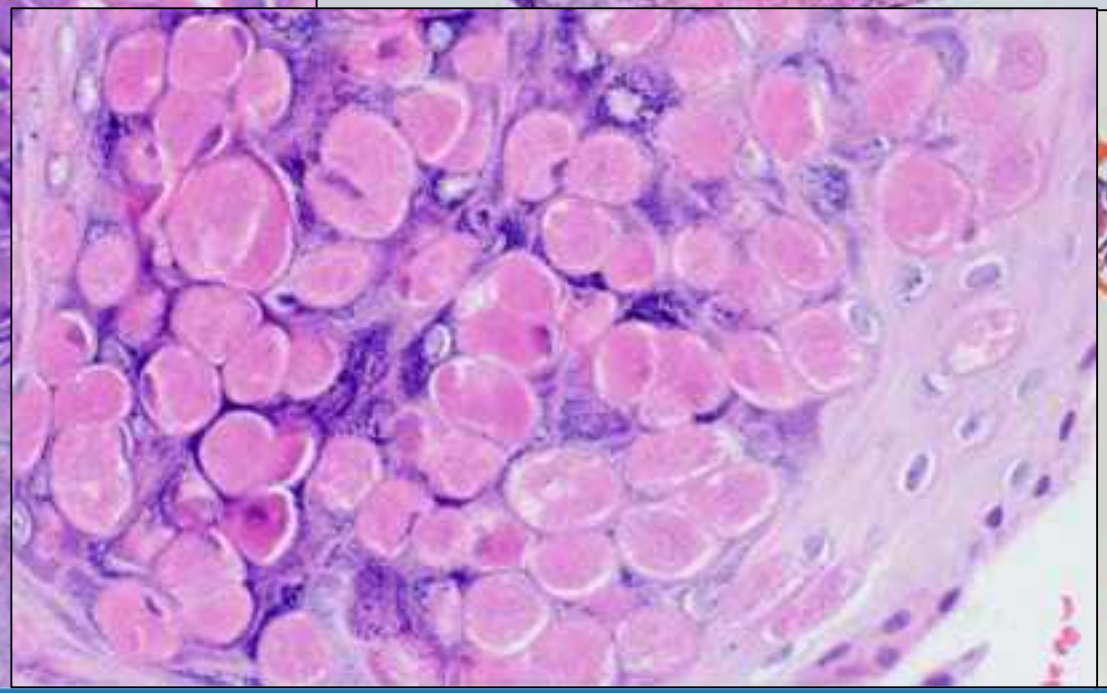


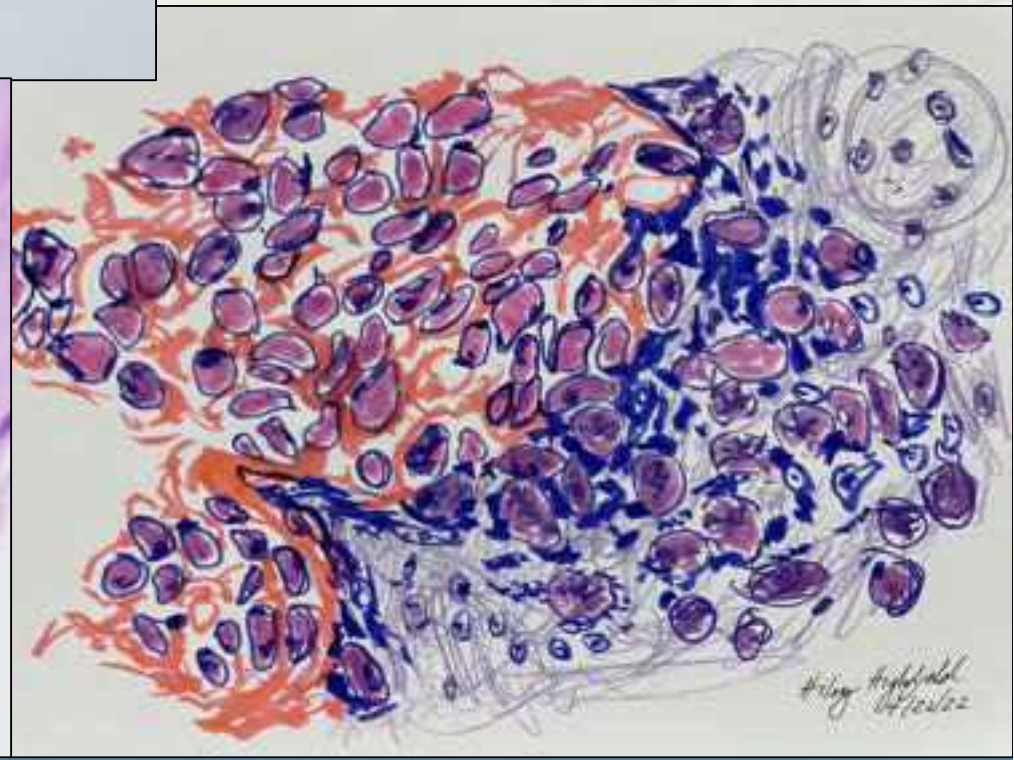
Molluscum





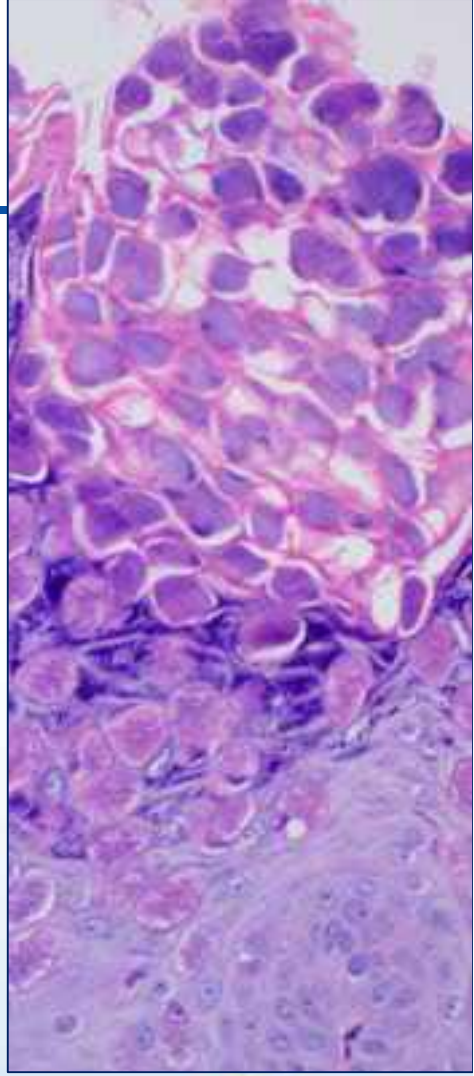






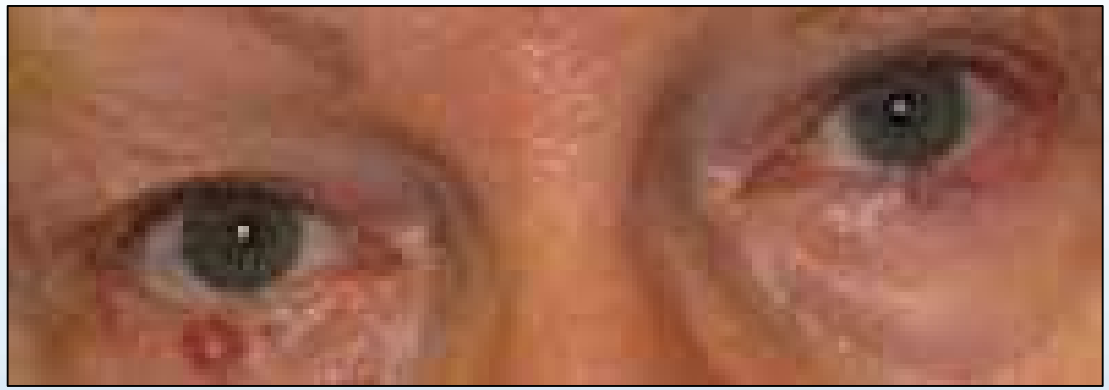
MOLLUSCUM CONTAGIOSUM

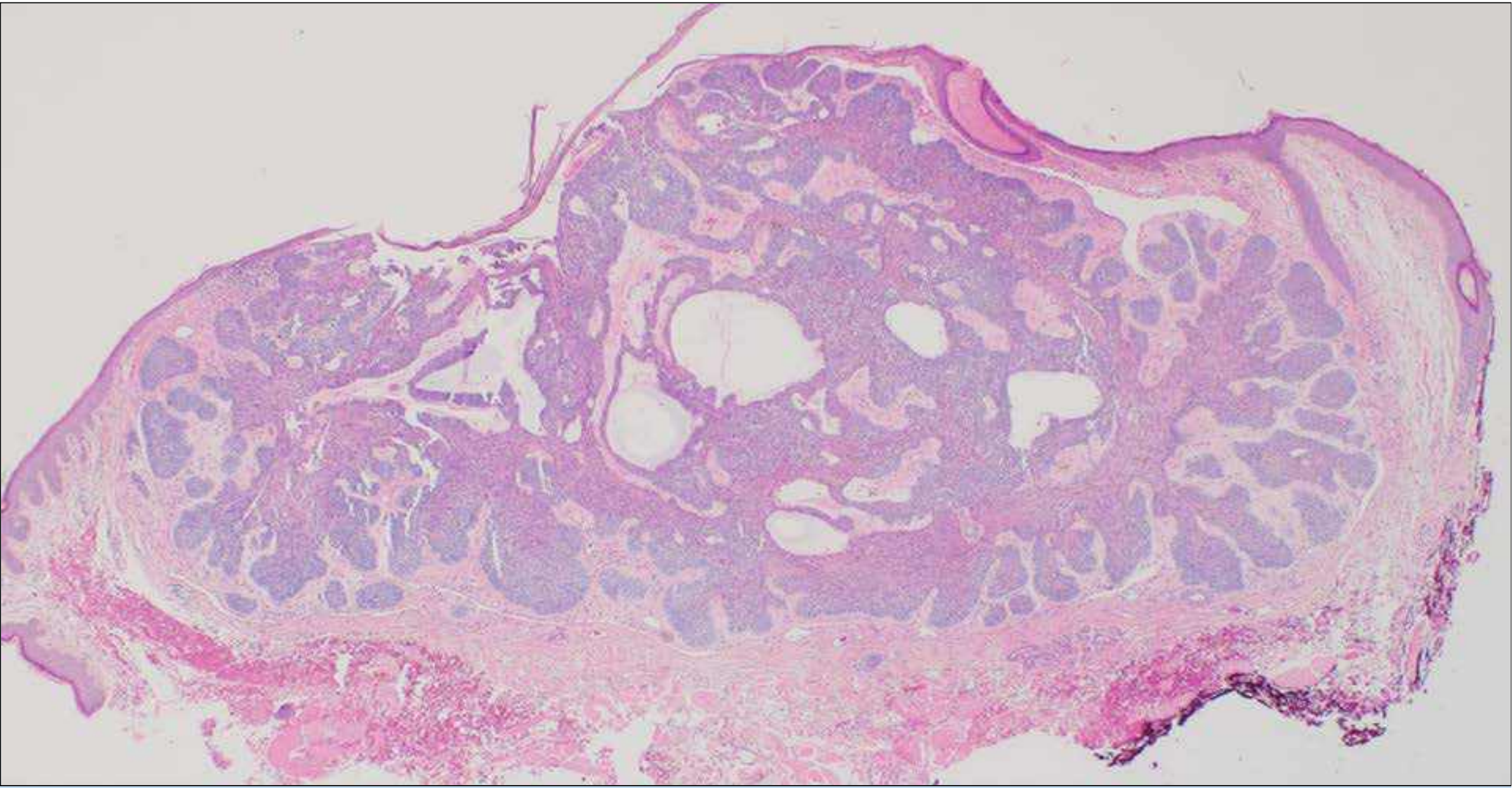
- Pox virus
- Elevated smooth nodule with central umbilication
- Crateriform shape of acanthotic epithelium
- Large intracytoplasmic inclusion bodies: **Henderson-Patterson corpscules**
- Inclusions become more basophilic as they mature

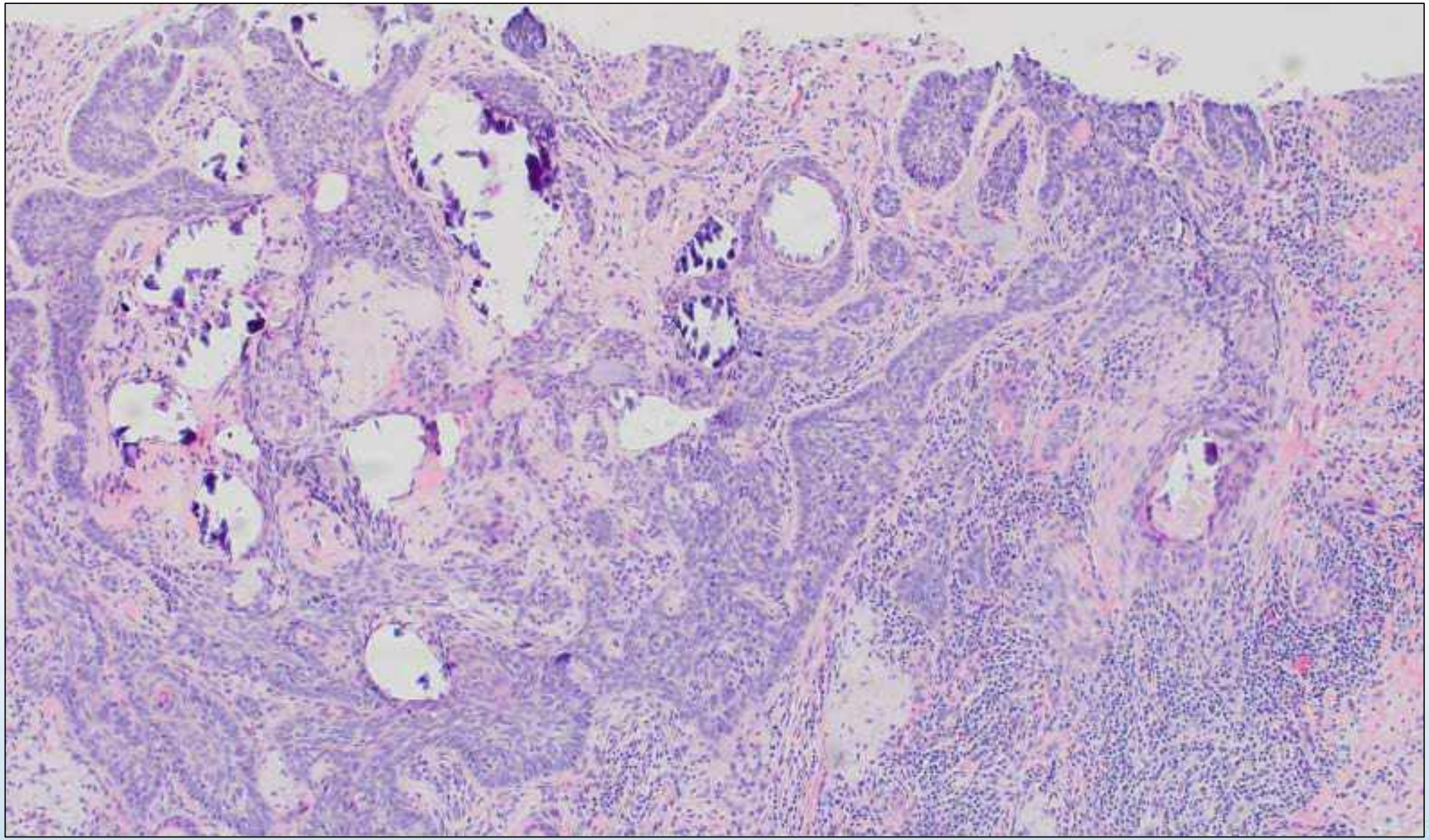


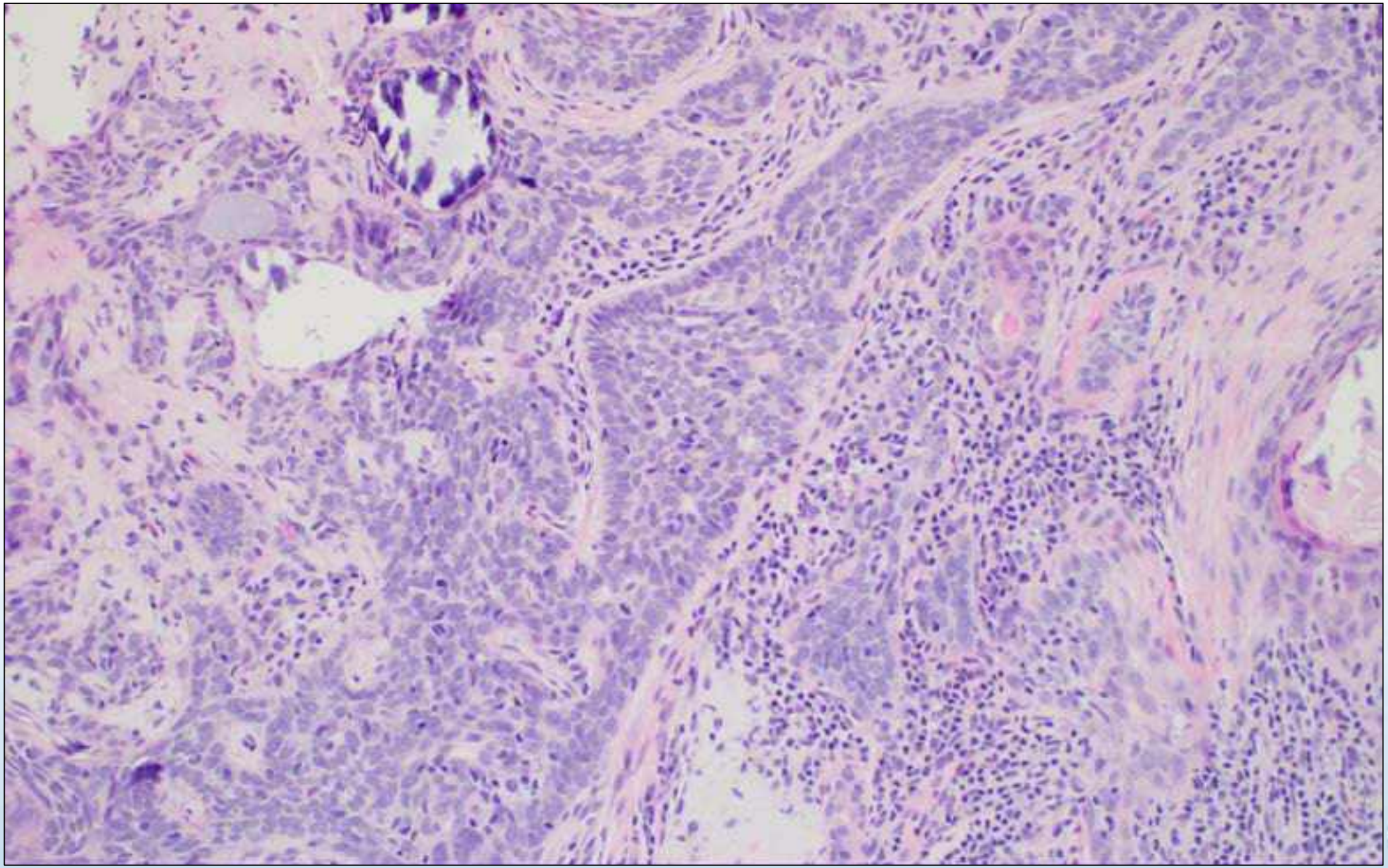
AANP

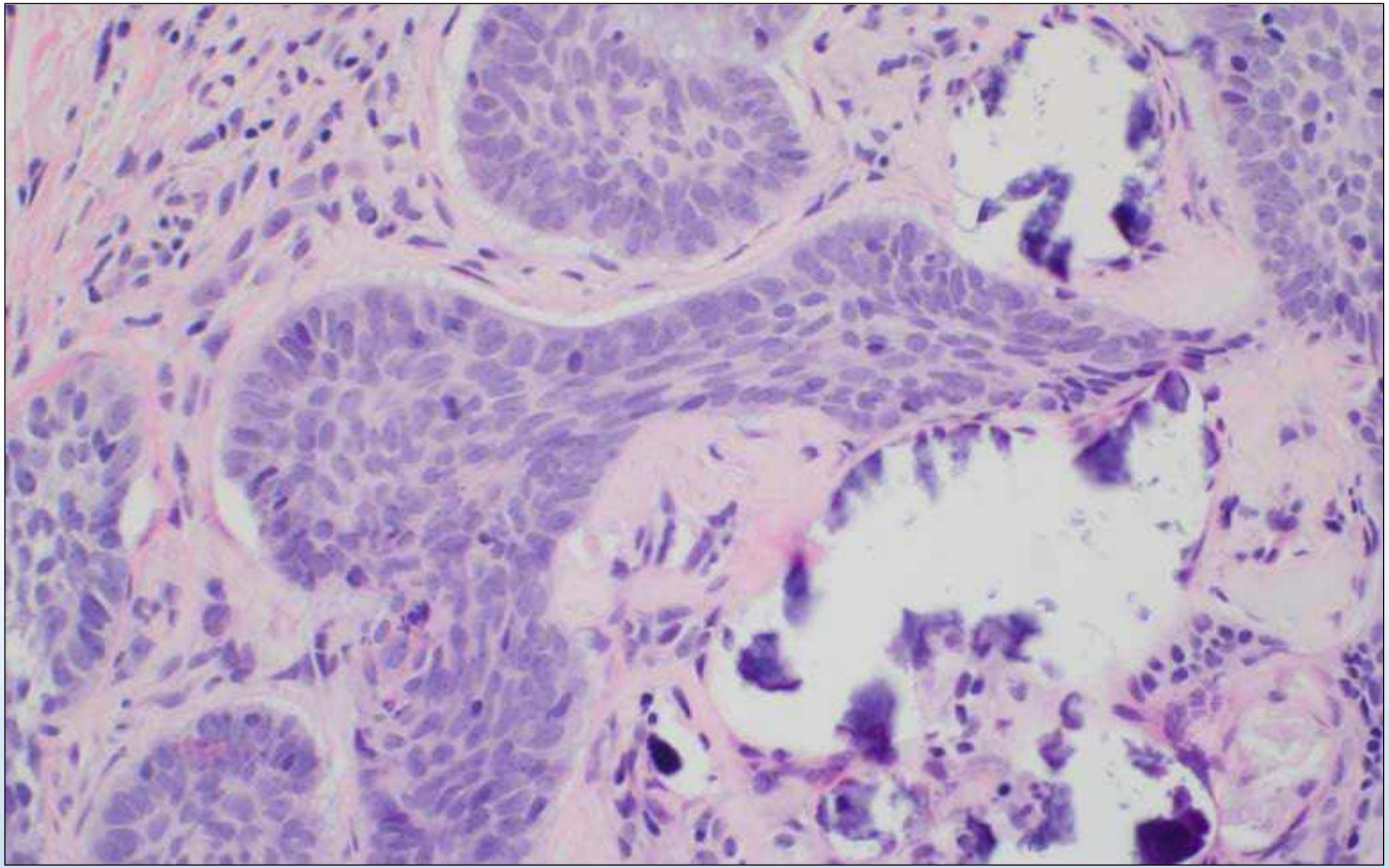
BASAL CELL CARCINOMA

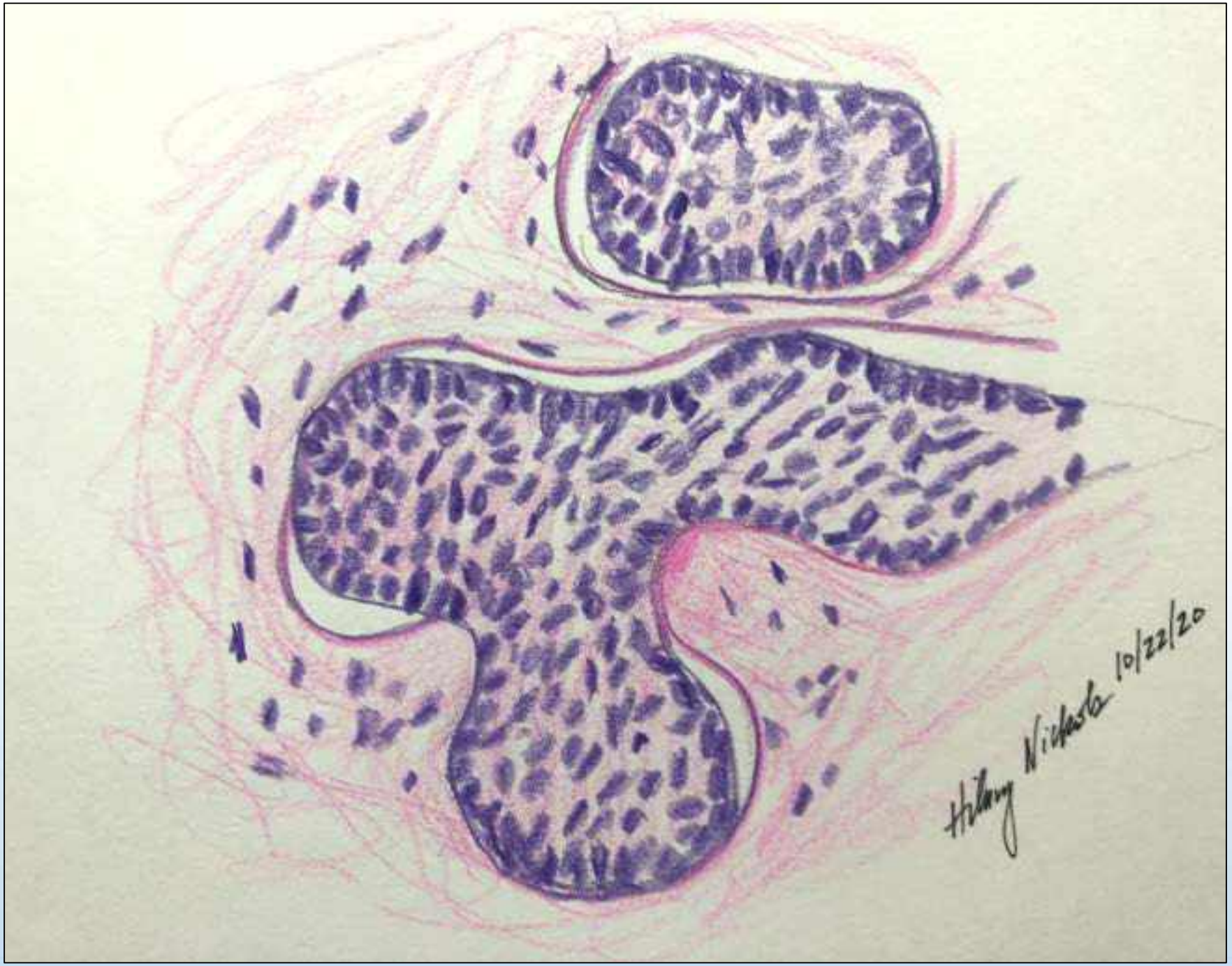








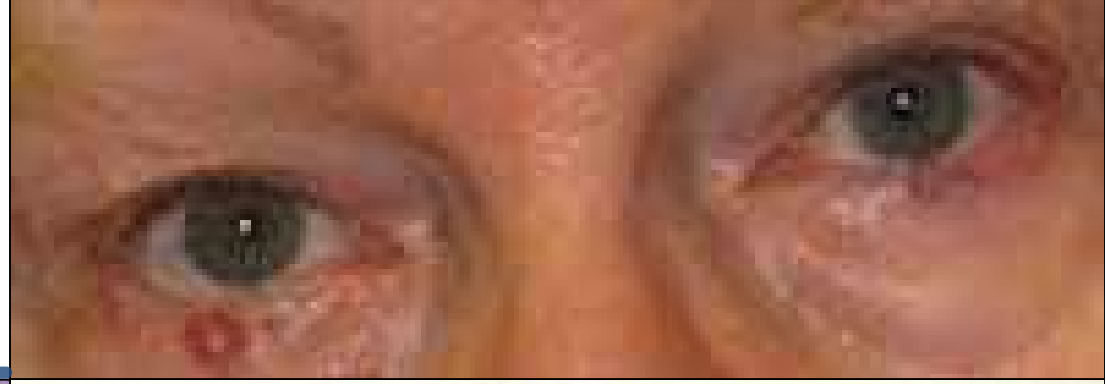


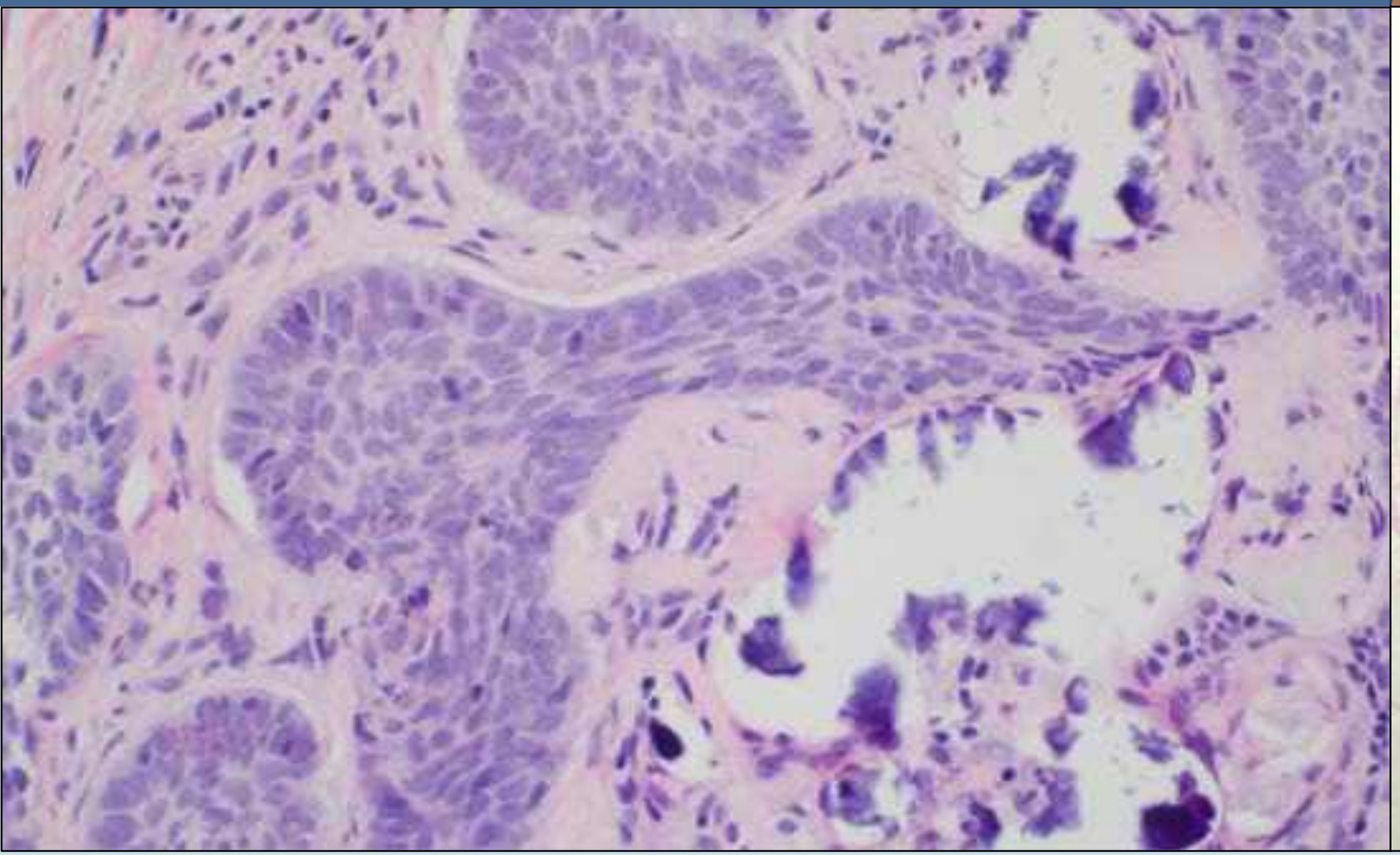

Hillary Nichols 10/22/20

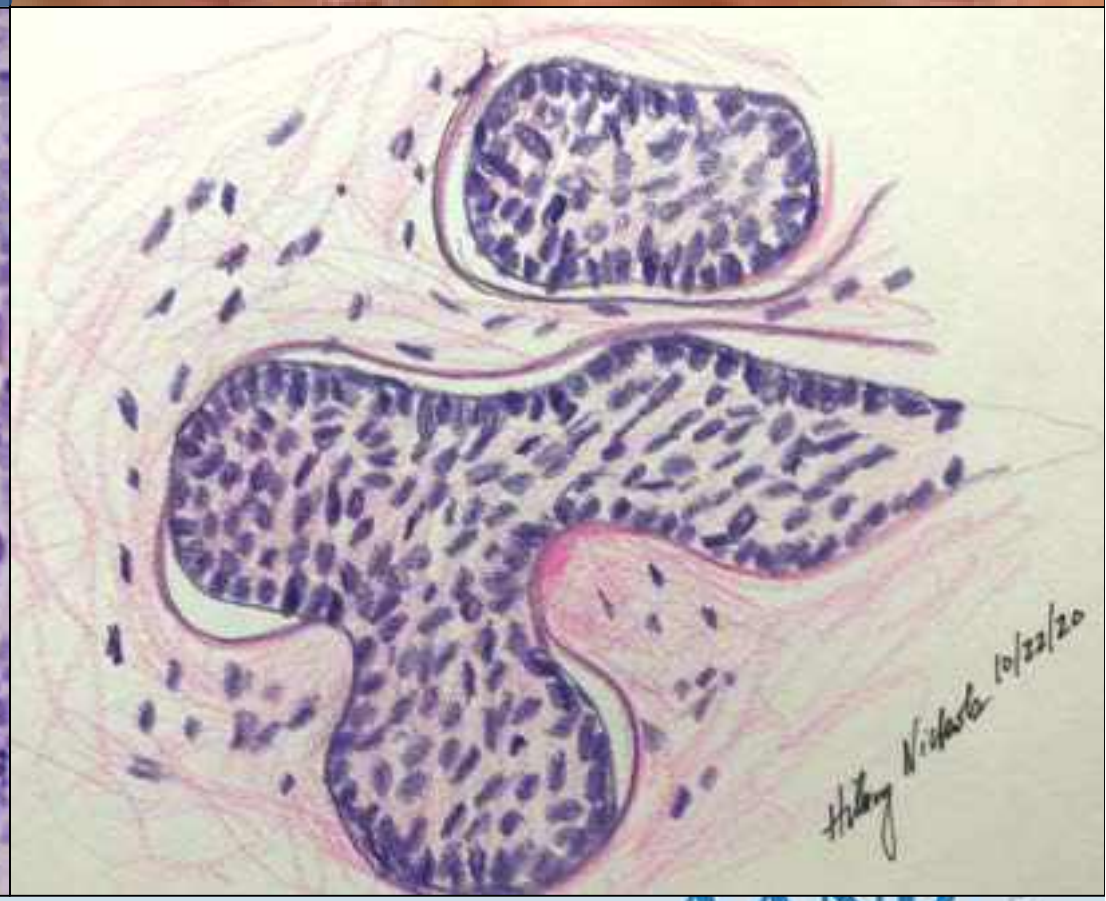
BASAL CELL CARCINOMA

- Most common malignant tumor periocular skin
- Incidence highest in fair-skinned adults (sun exposed)
- Lower > inner canthus > upper > outer canthus
- Basaloid nests with peripheral palisading

BASAL CELL CARCINOMA







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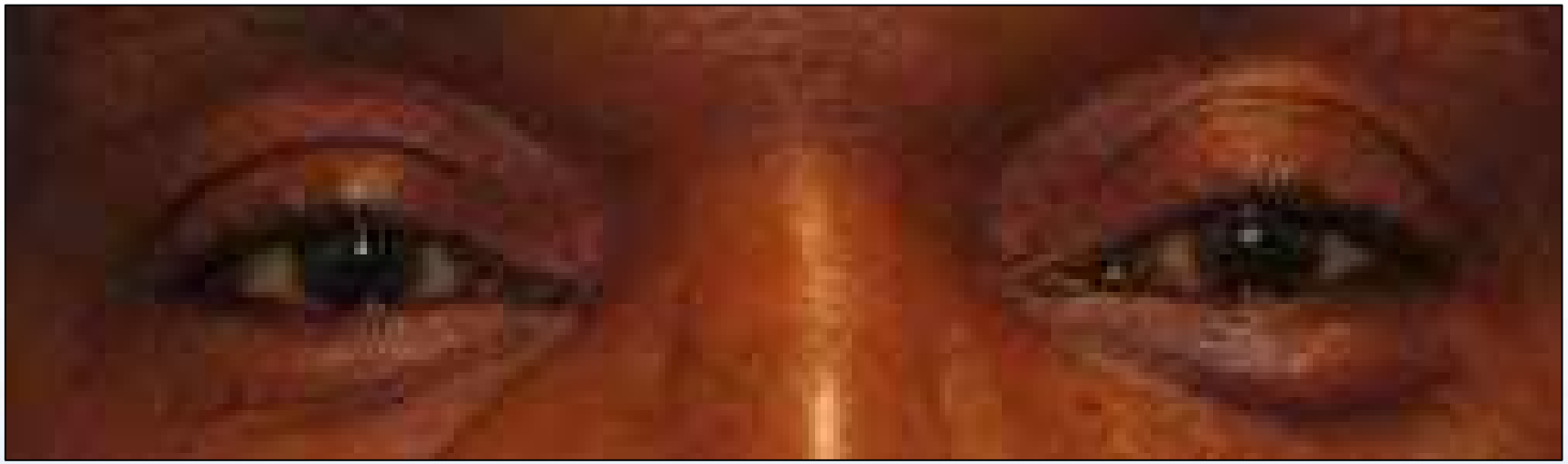
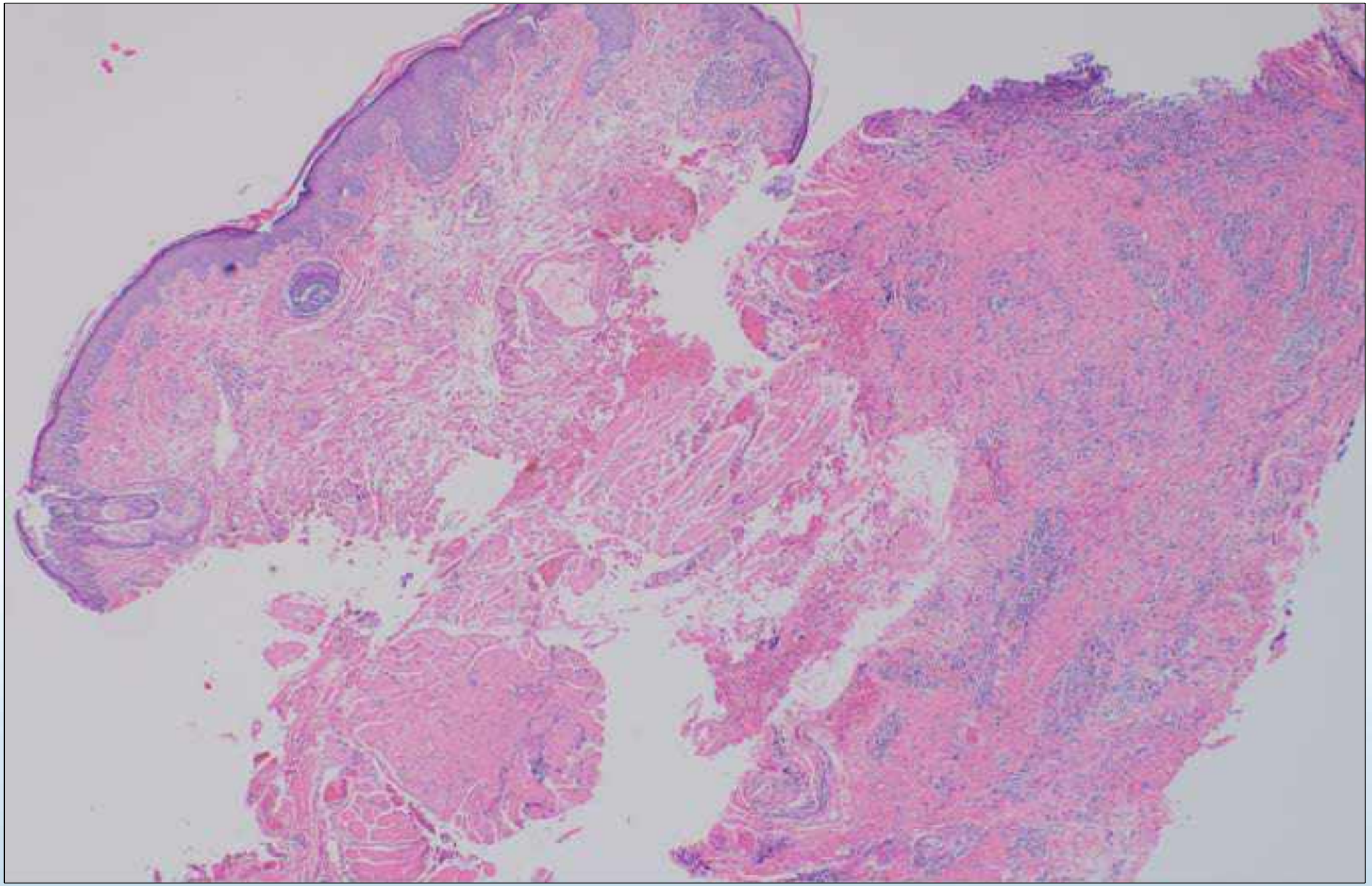
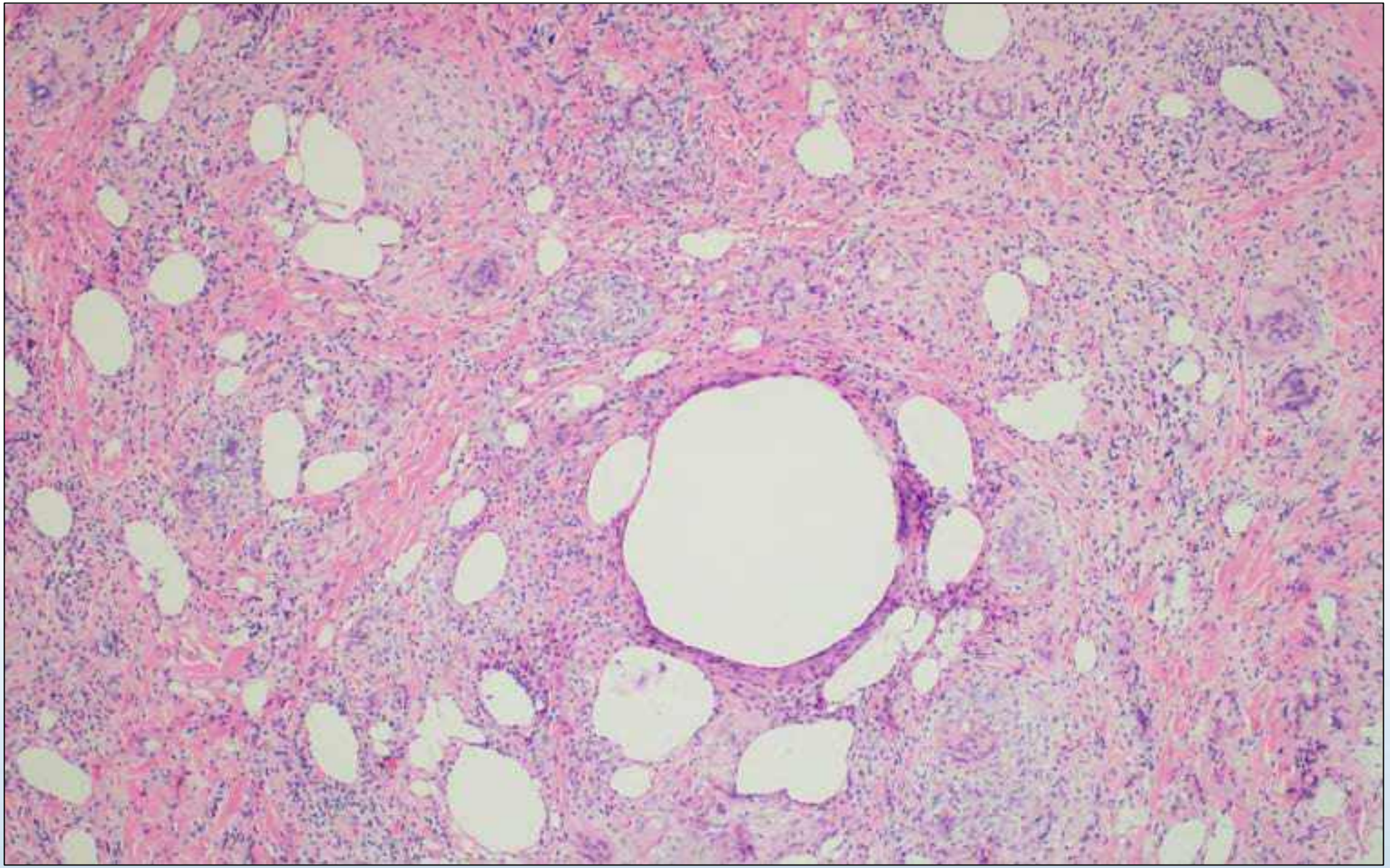
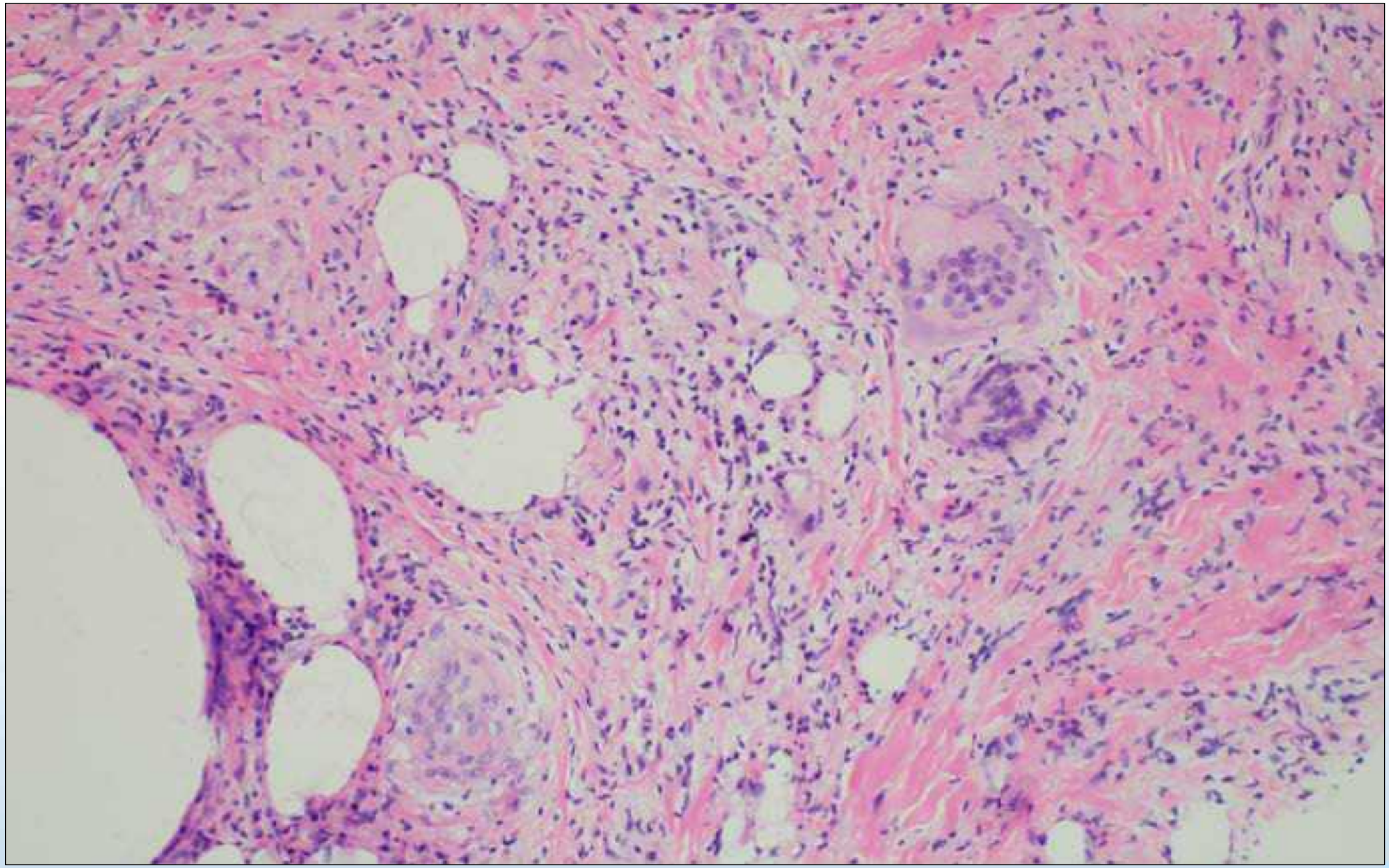
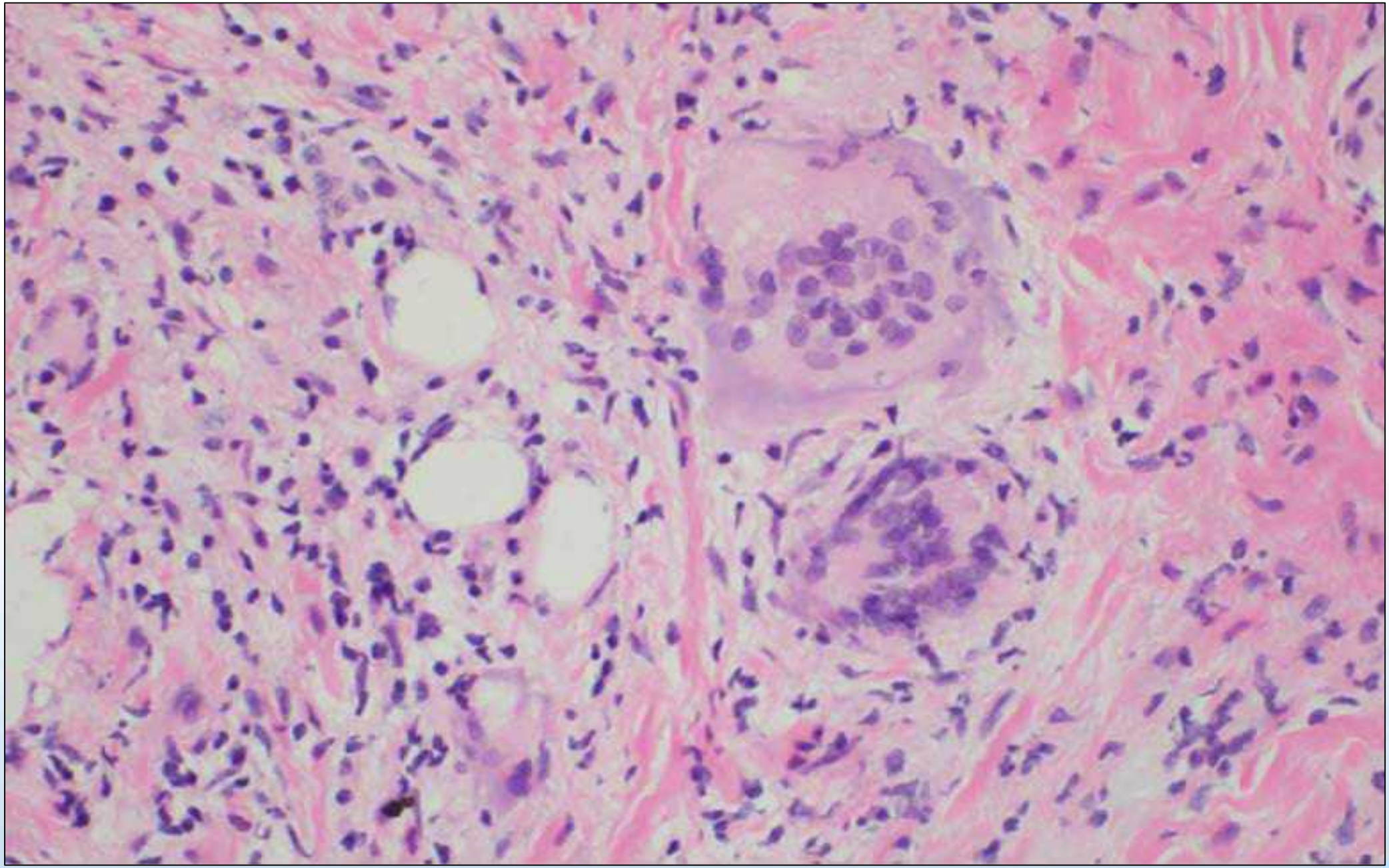
CHALAZION

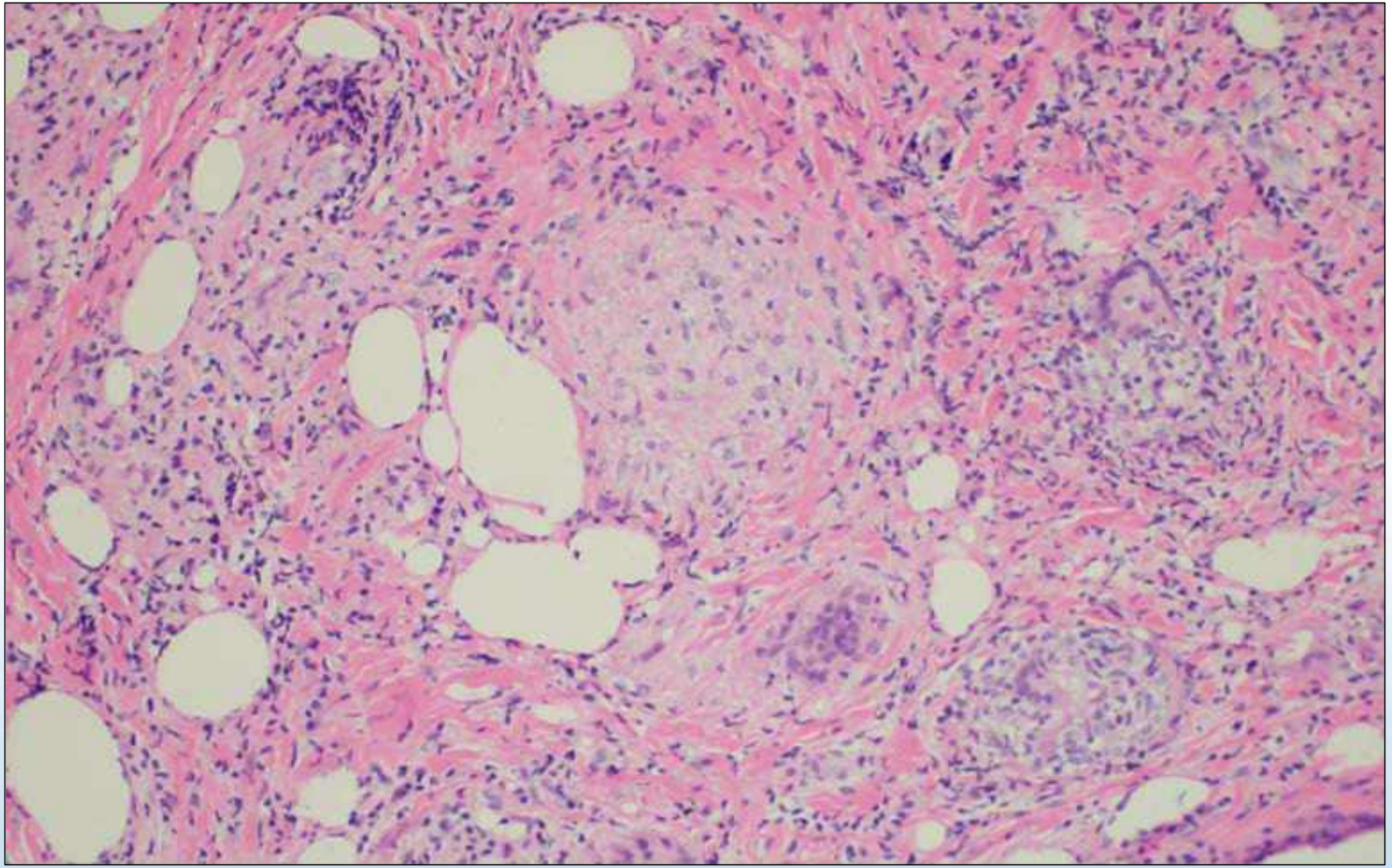


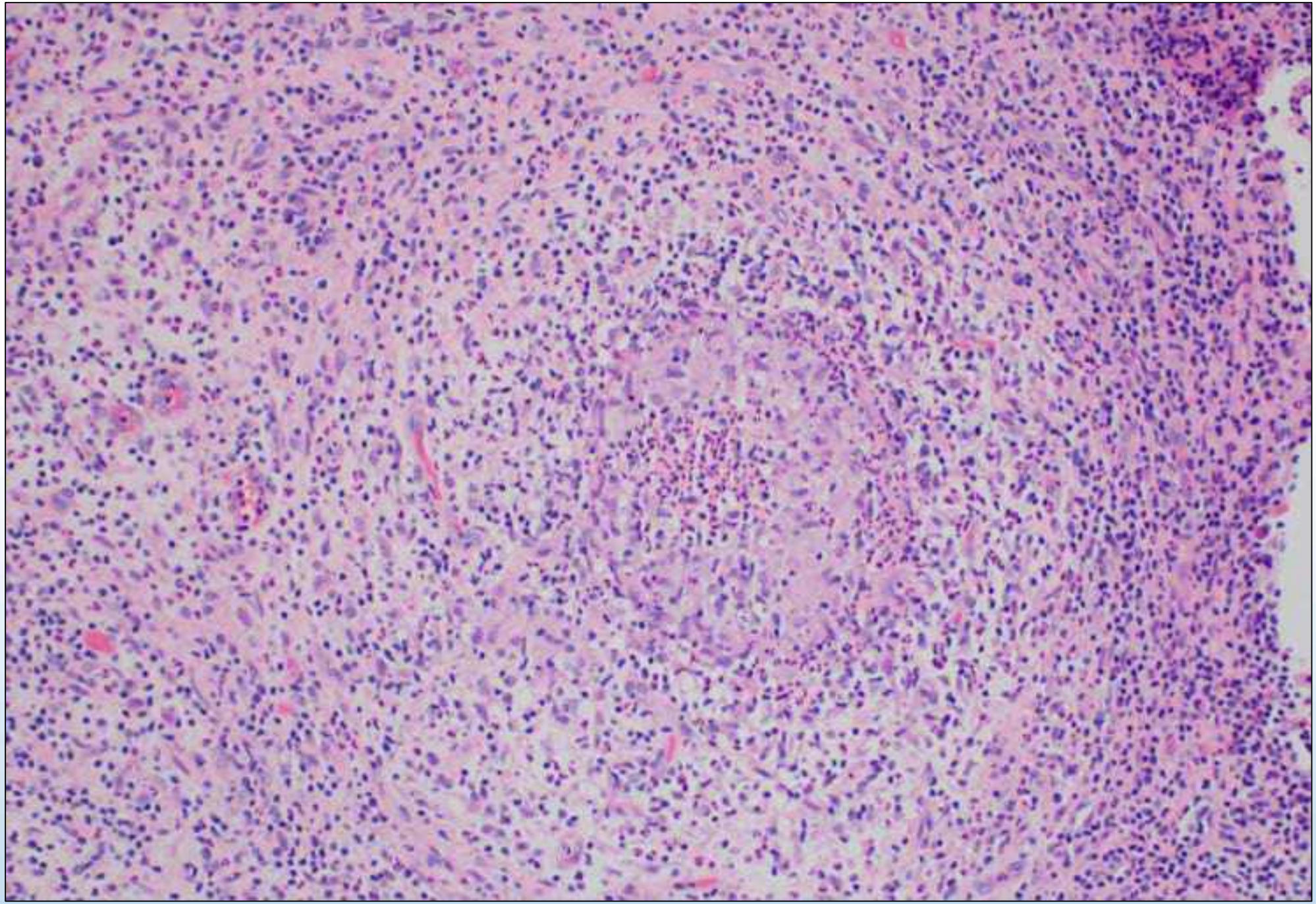


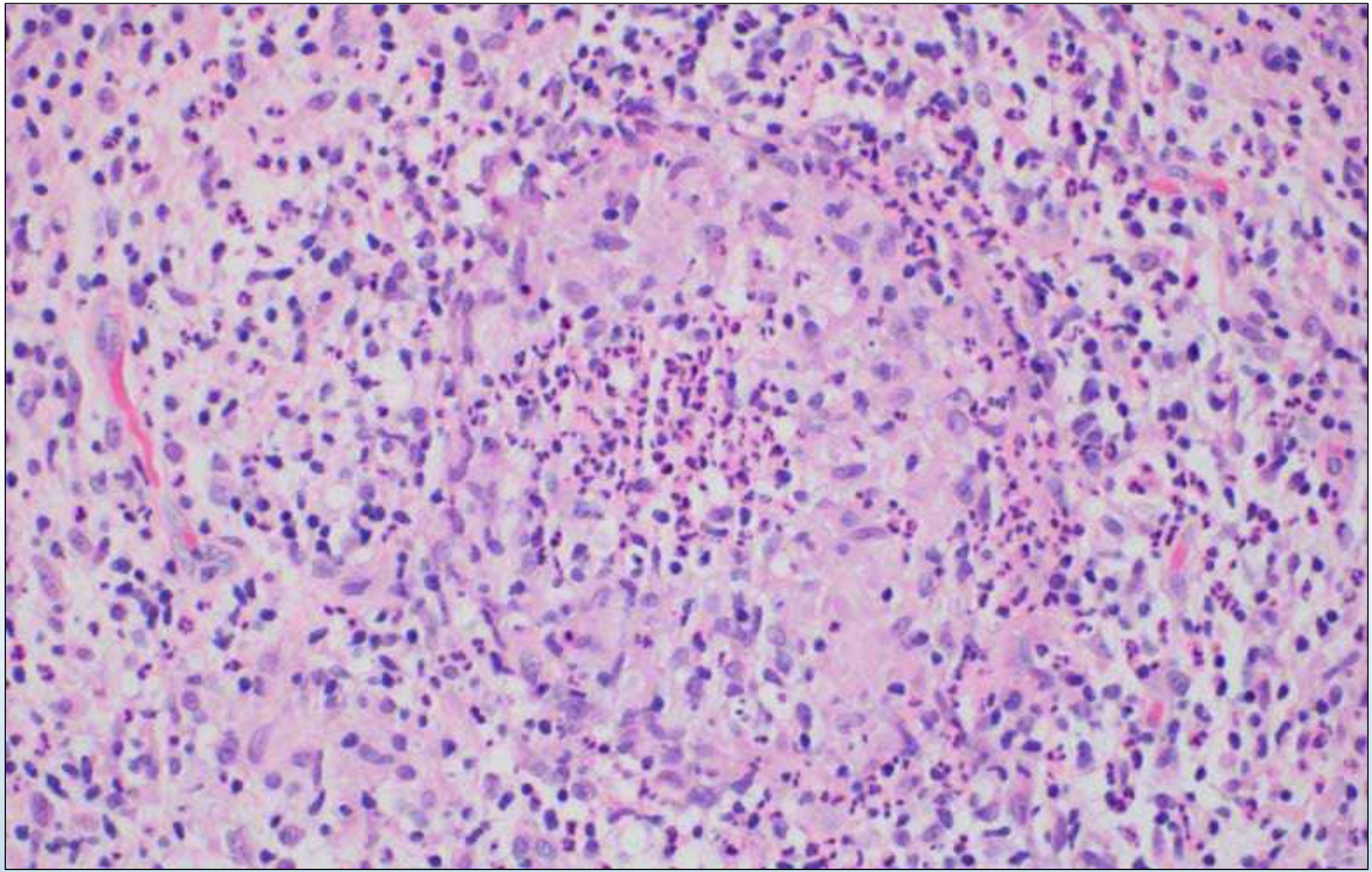


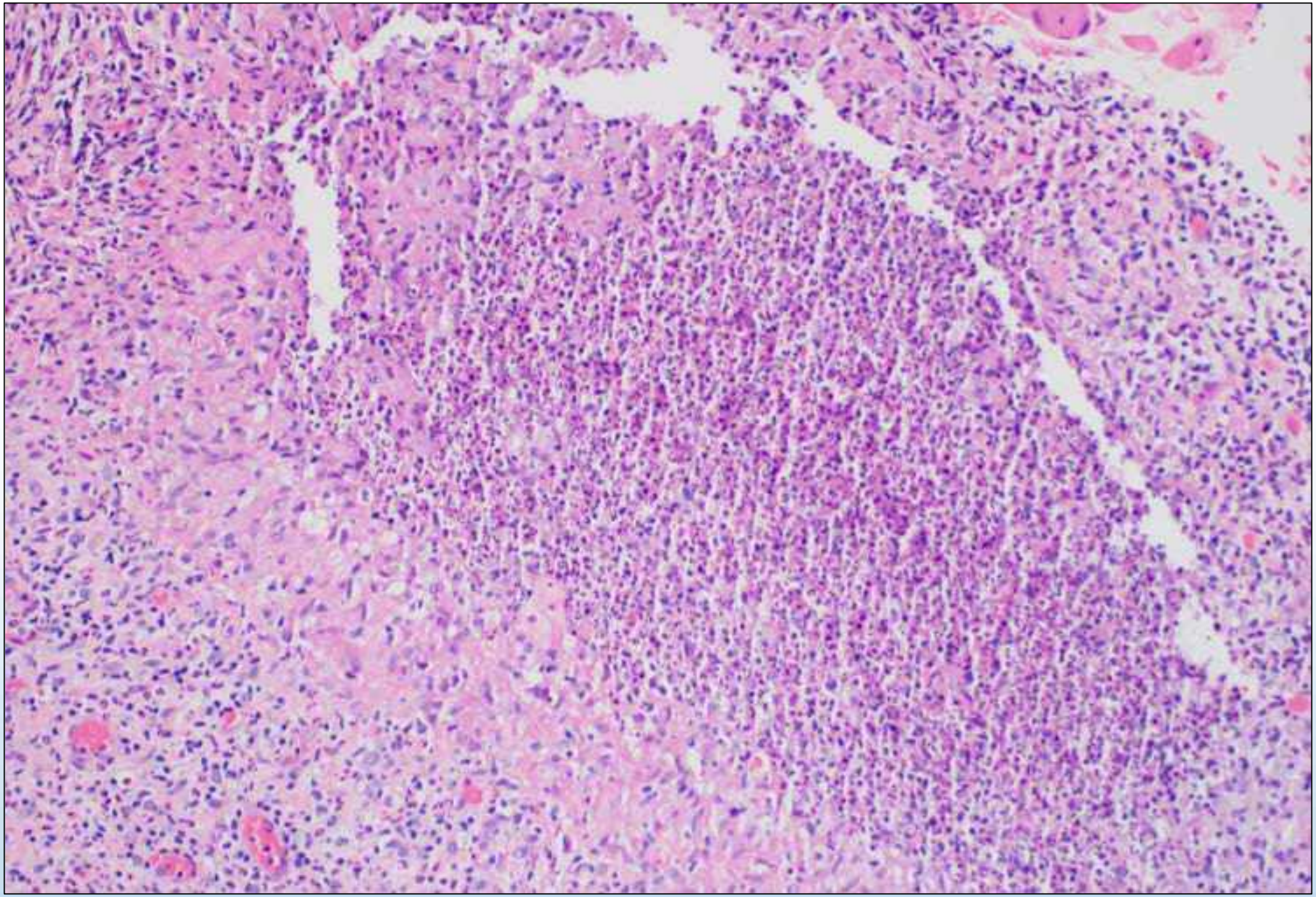


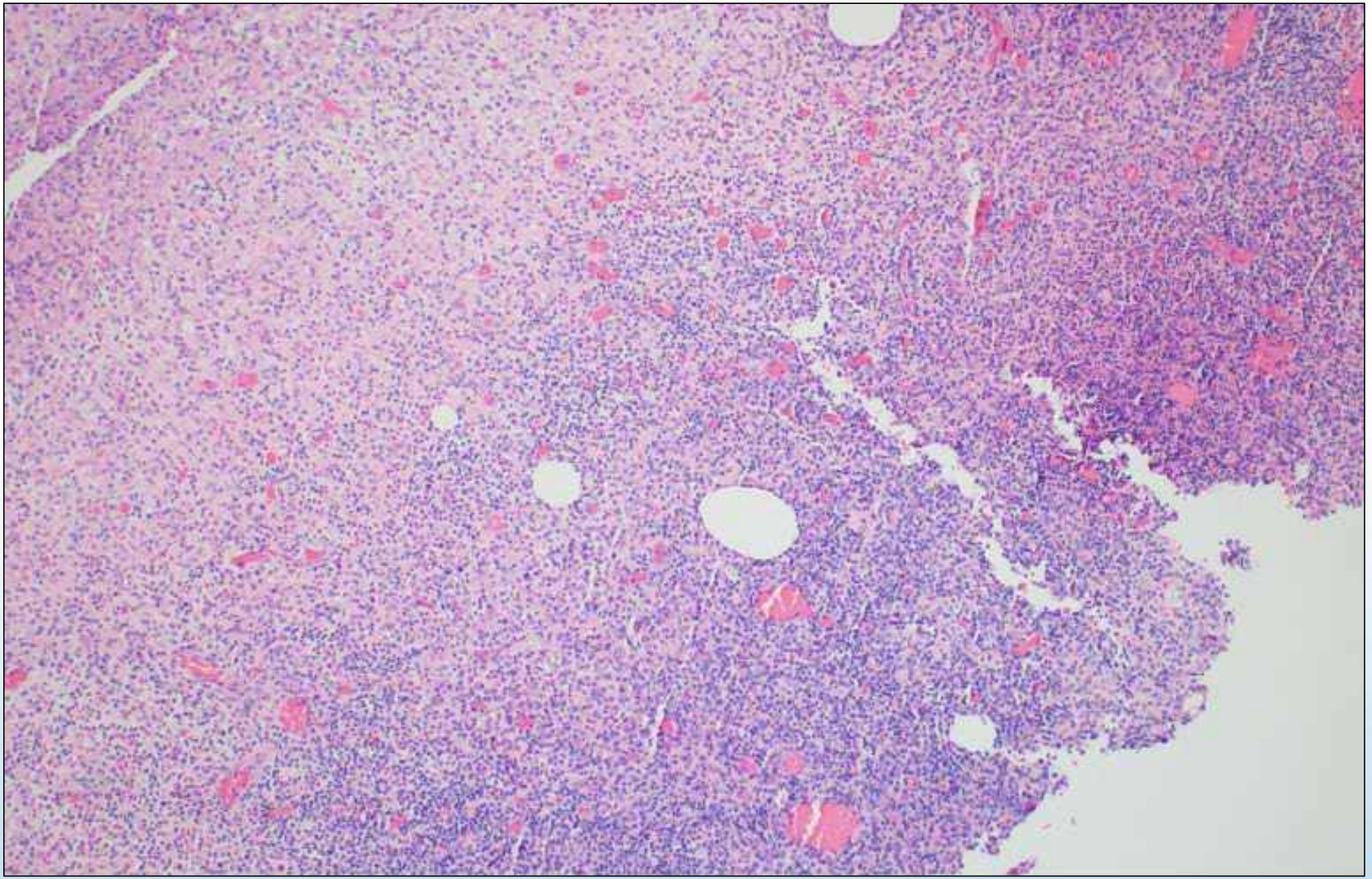


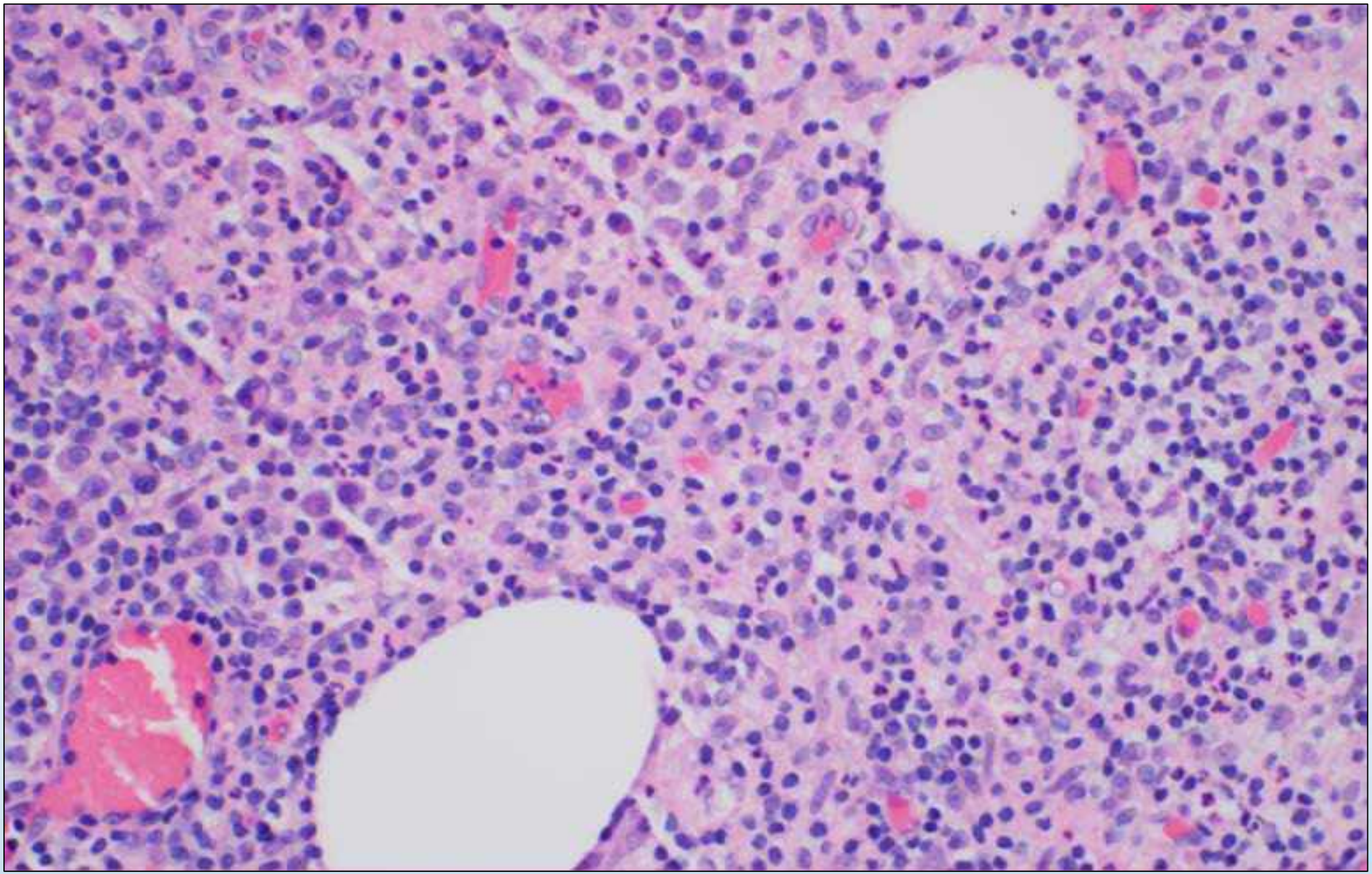


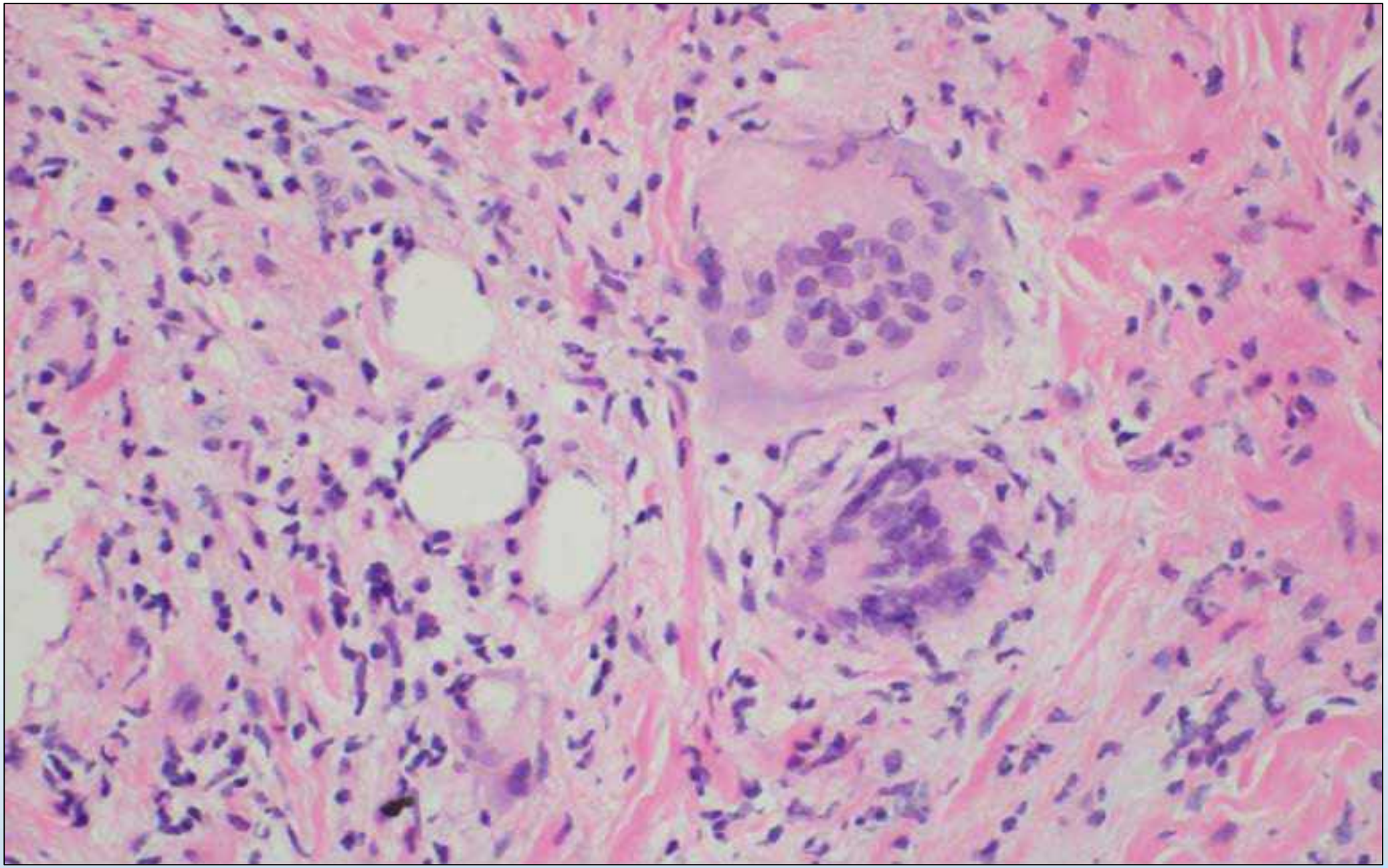






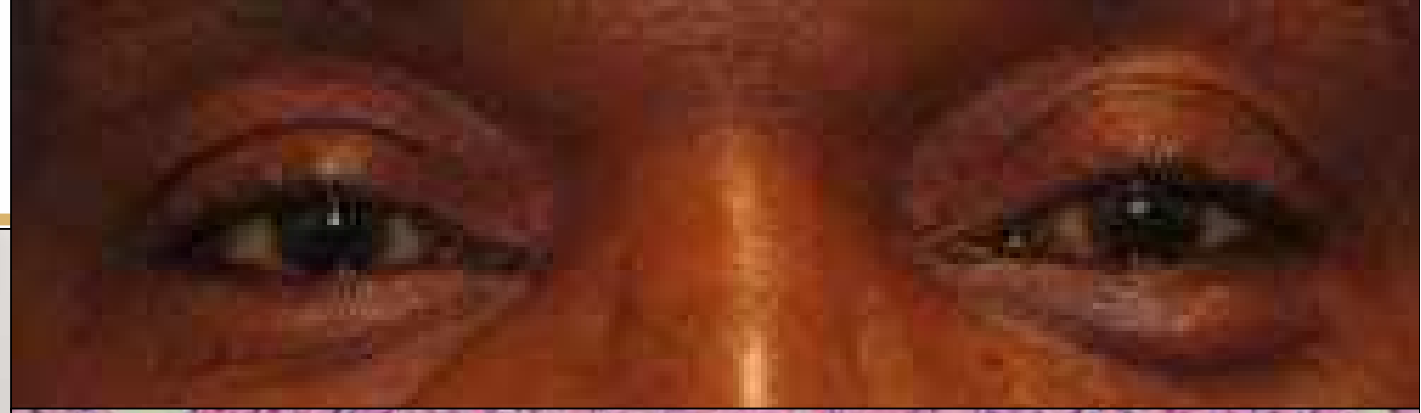


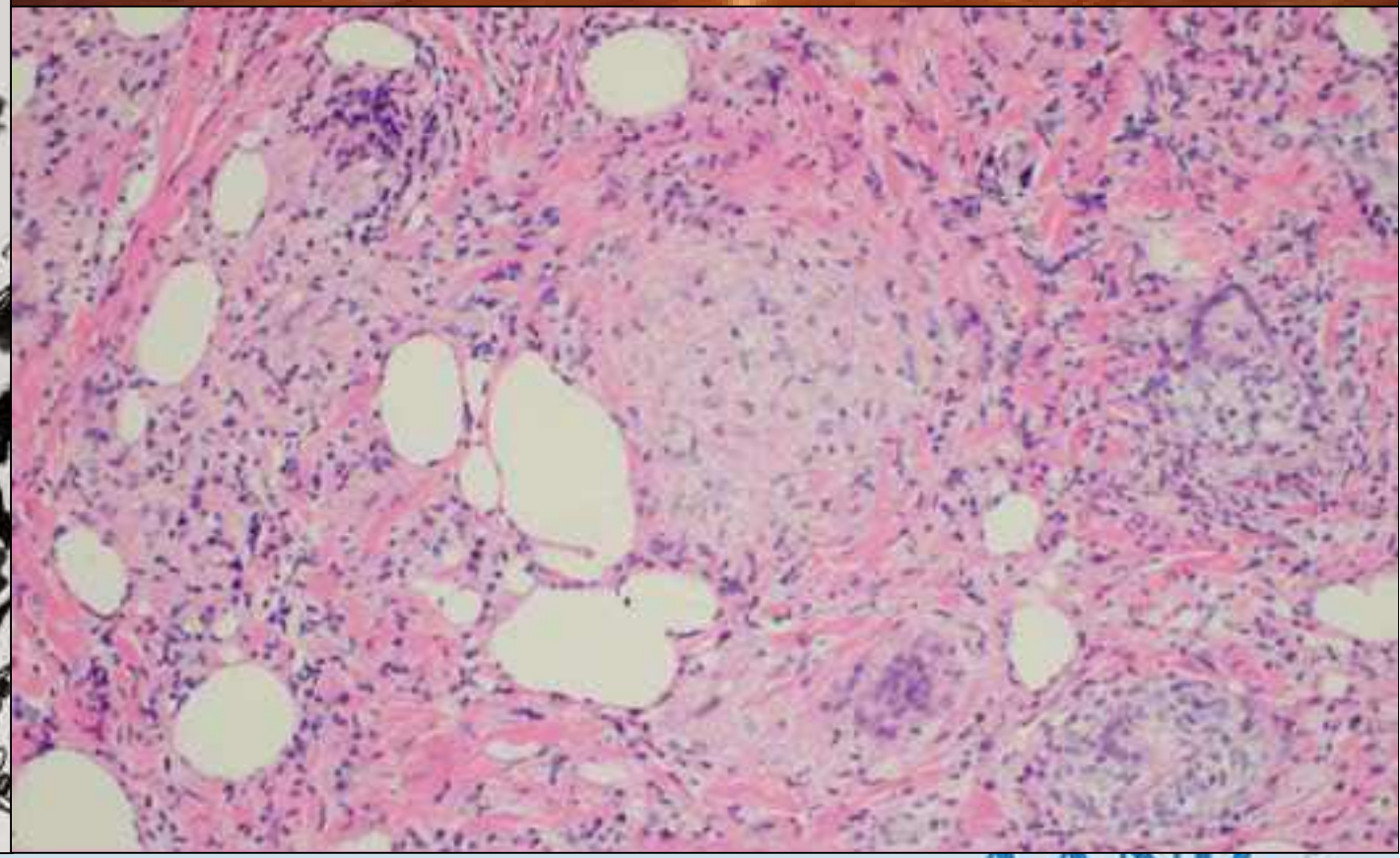





Hilary Hightfield
7/28/22

CHALAZION



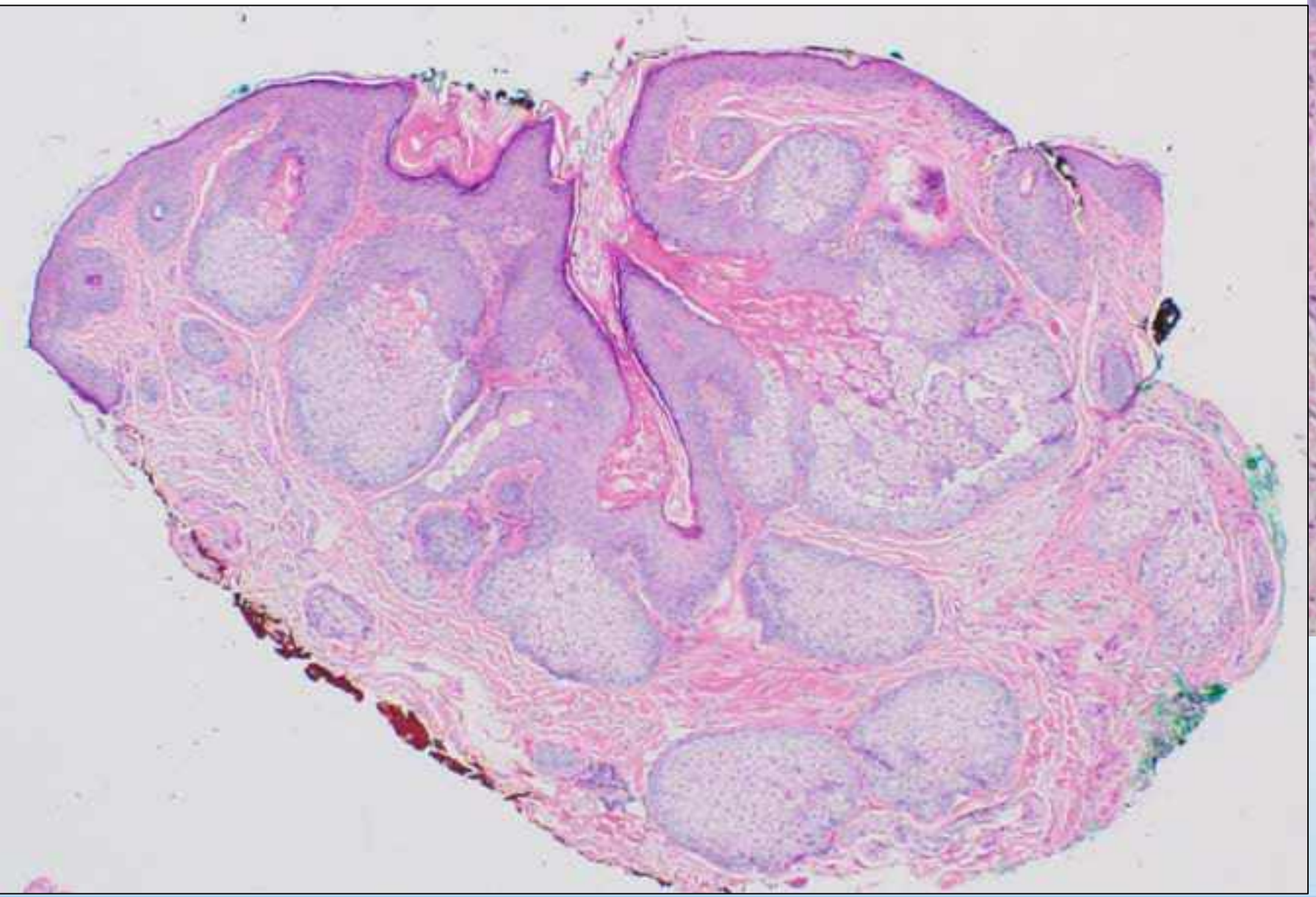


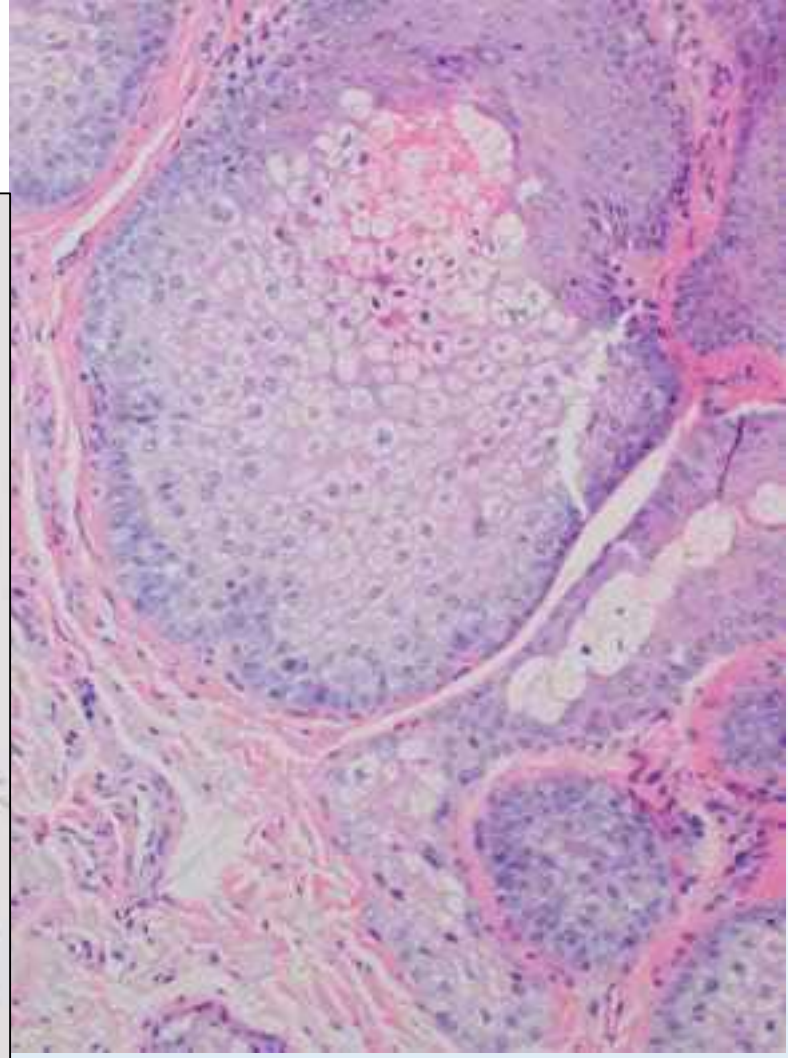
CHALAZION

- Nodule(s) on eyelid
- Chronic lipogranuloma
  - Endogenous foreign body reaction to lipid-rich secretions of Meiobian/Zeiss glands
- Epithelioid histiocytes/giant cells surrounding empty spaces (lipid vacuoles), lymphocytes and plasma cells
- DDx: Sebaceous ca, Merkel cell ca, metastatic ca

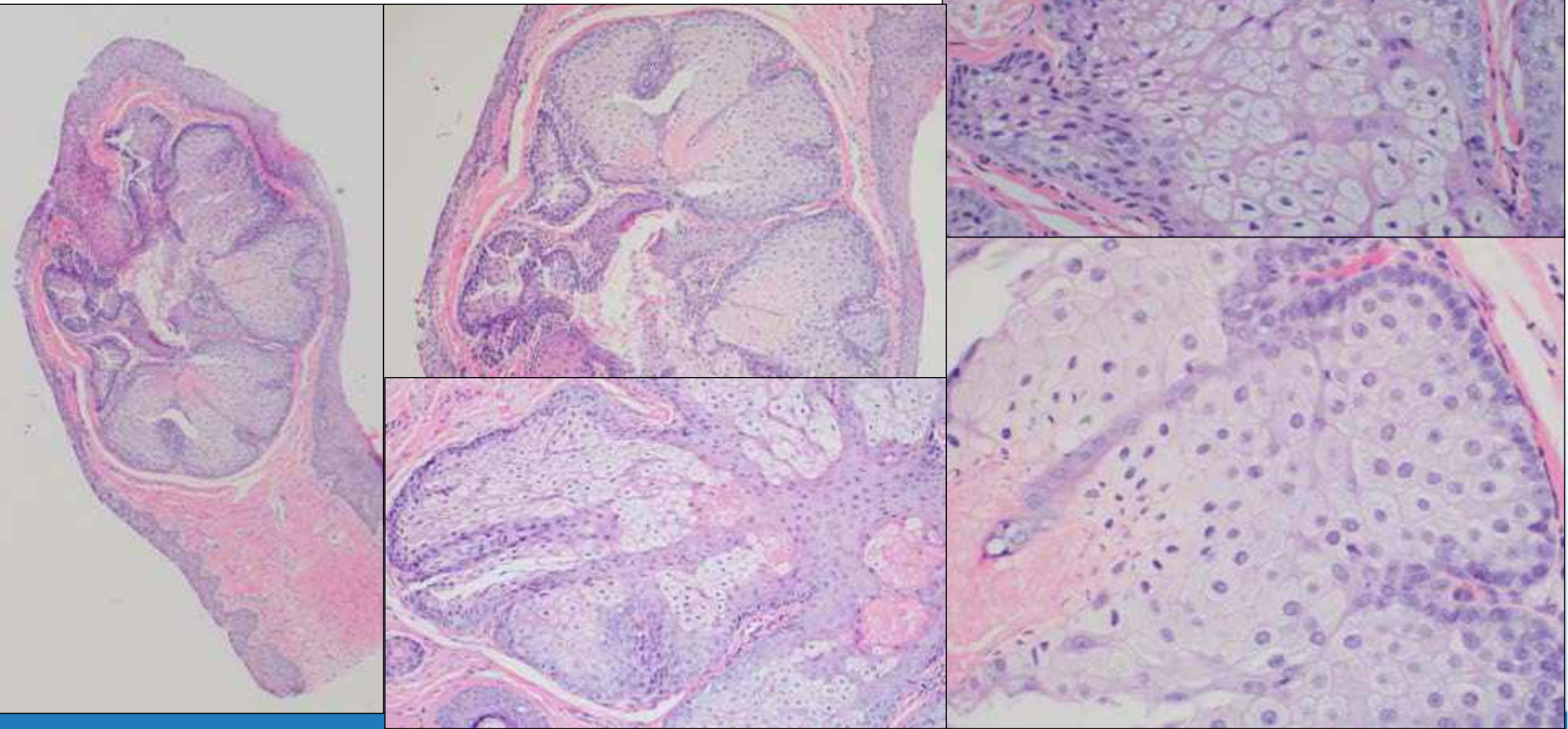
SEBACEOUS LESIONS

Sebaceous hyperplasia

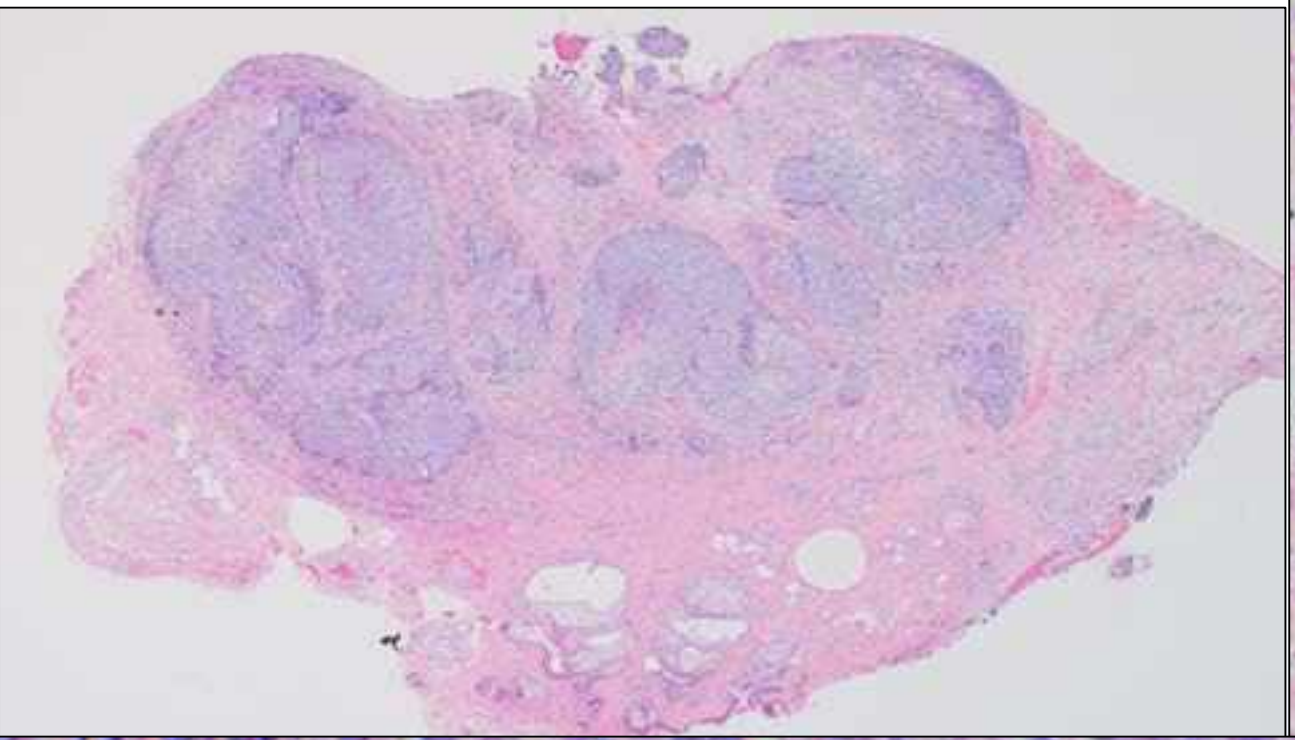


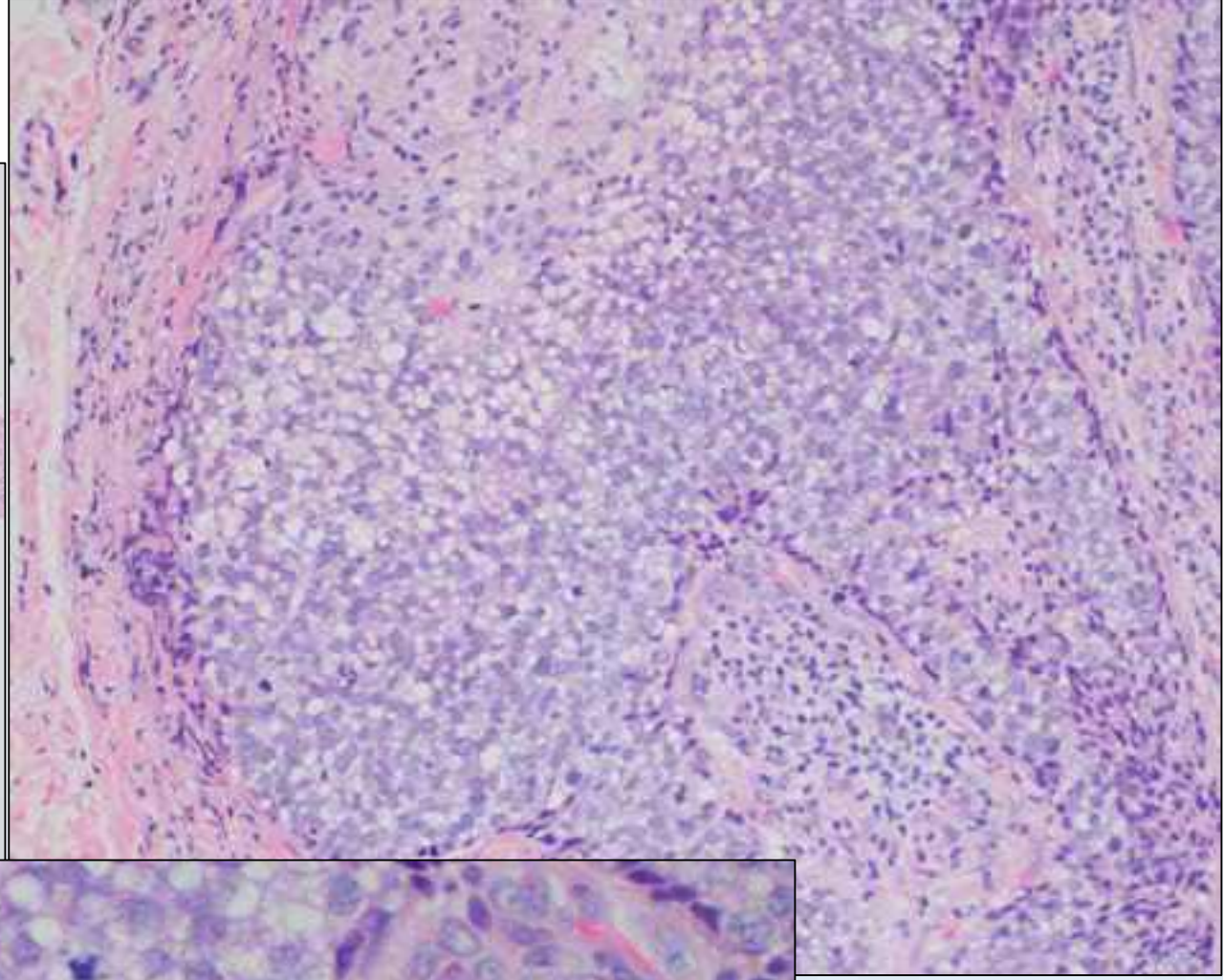


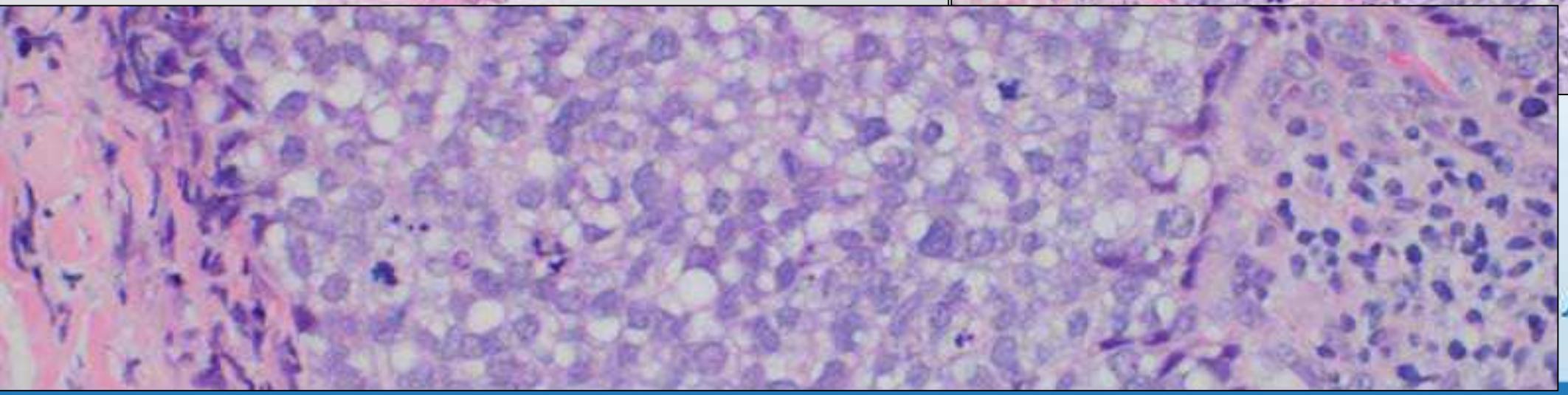
Sebaceous adenoma



Sebaceous carcinoma







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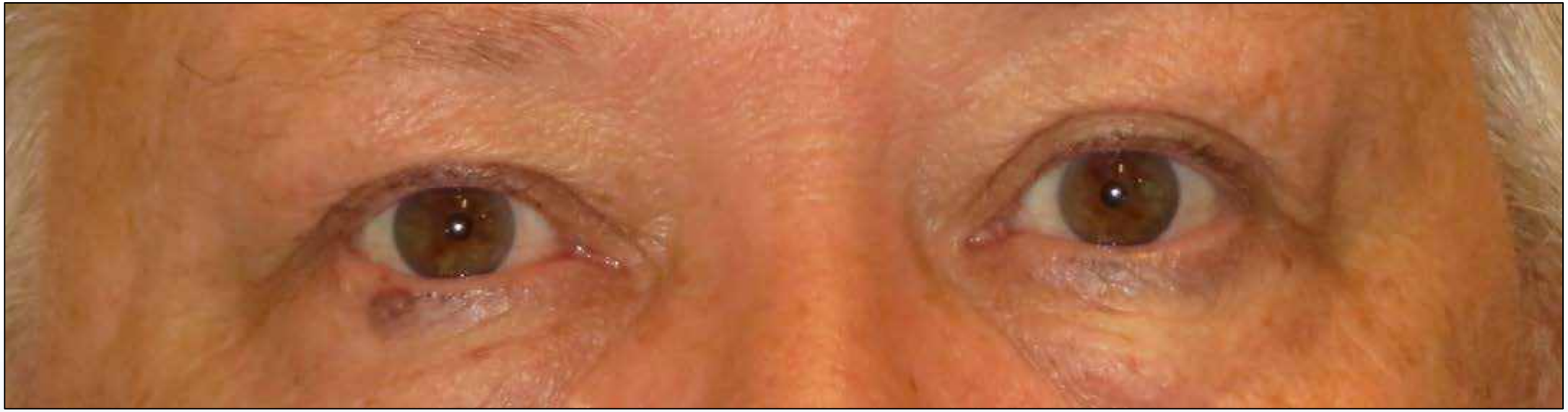
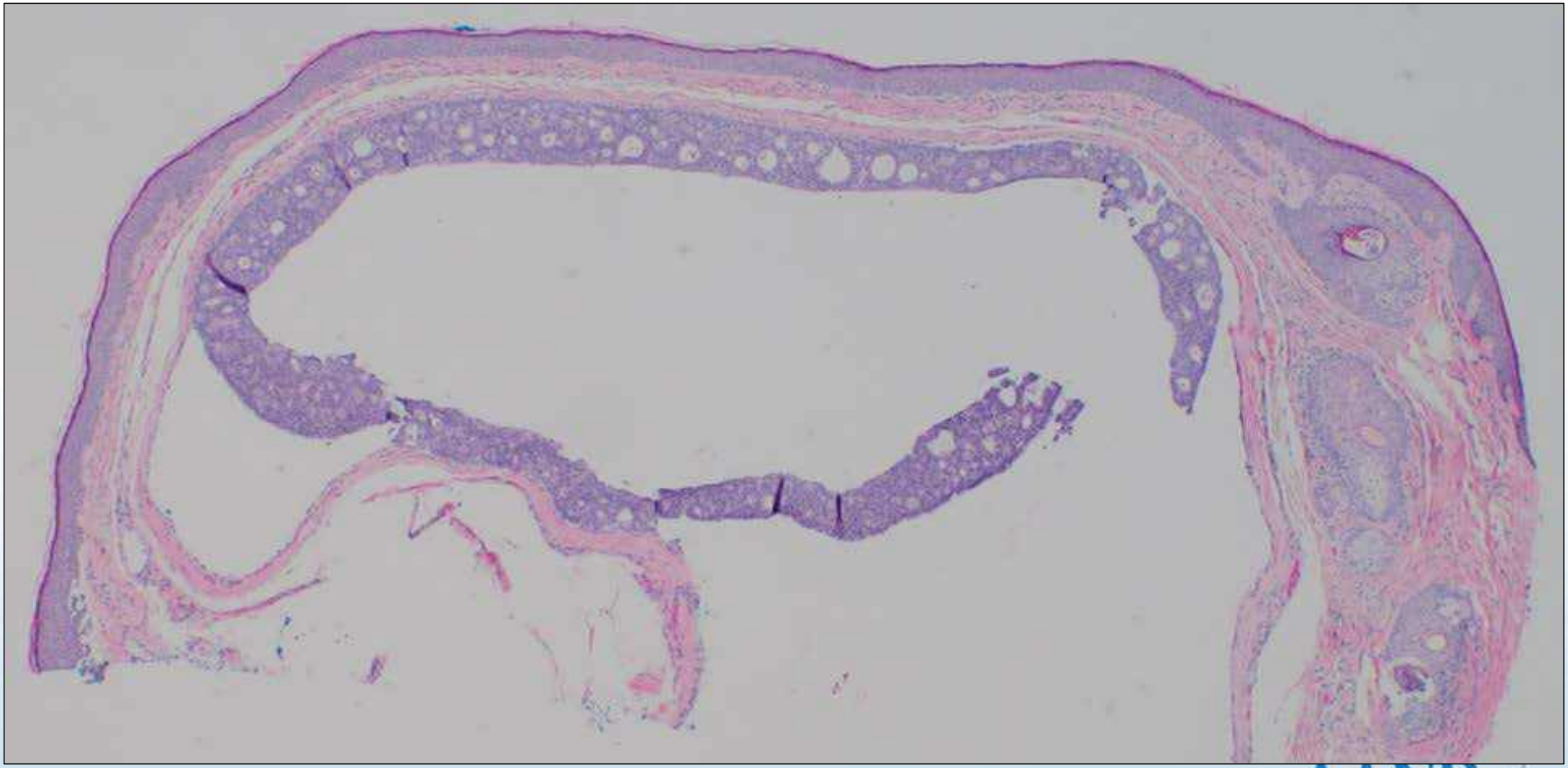
Patient History



- 65 year old female with a RLL central violaceous lesion
- Cystic, 5 x 6 mm, with overlying telangiectasia
- Associated with 6 lashes



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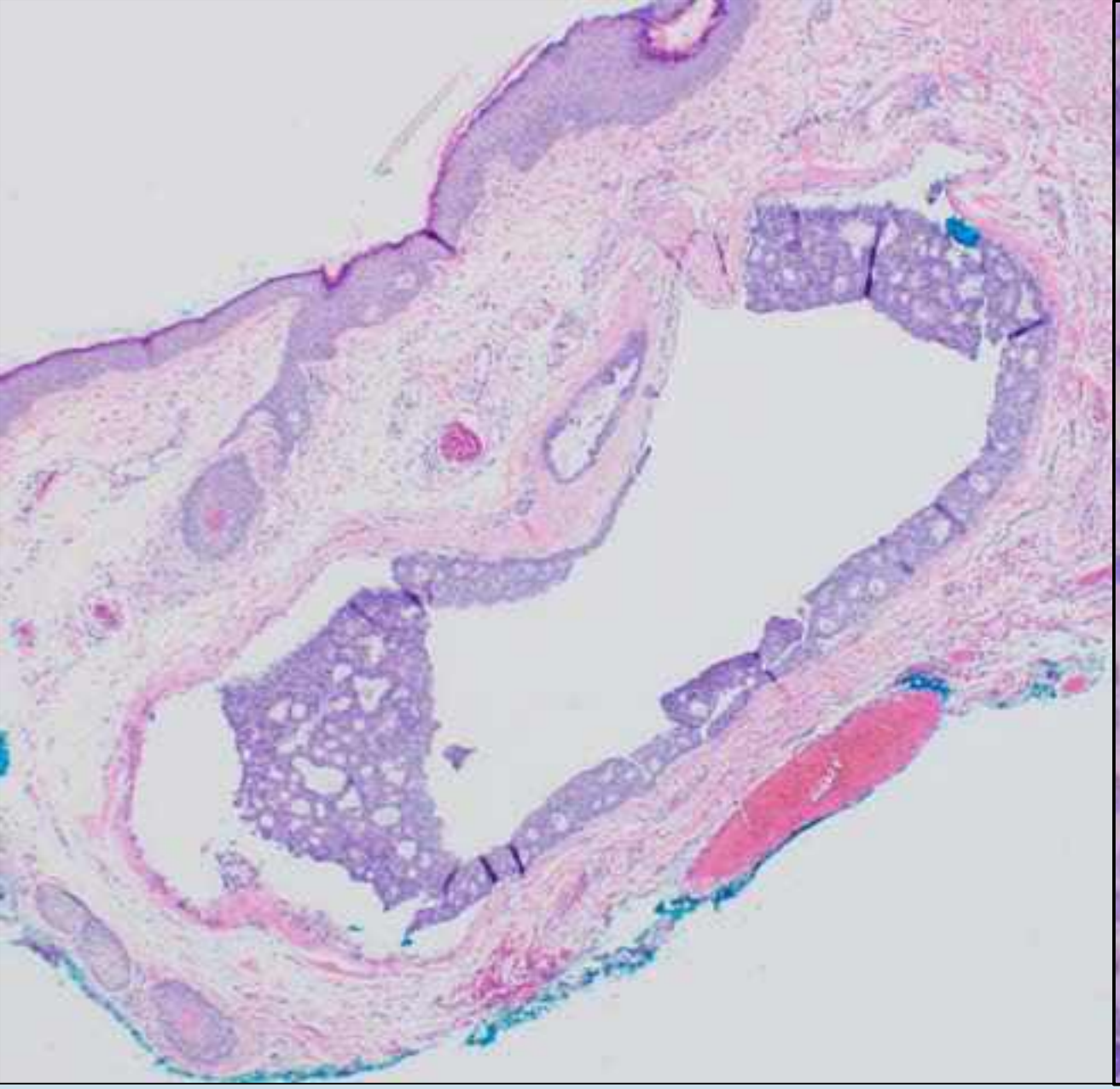
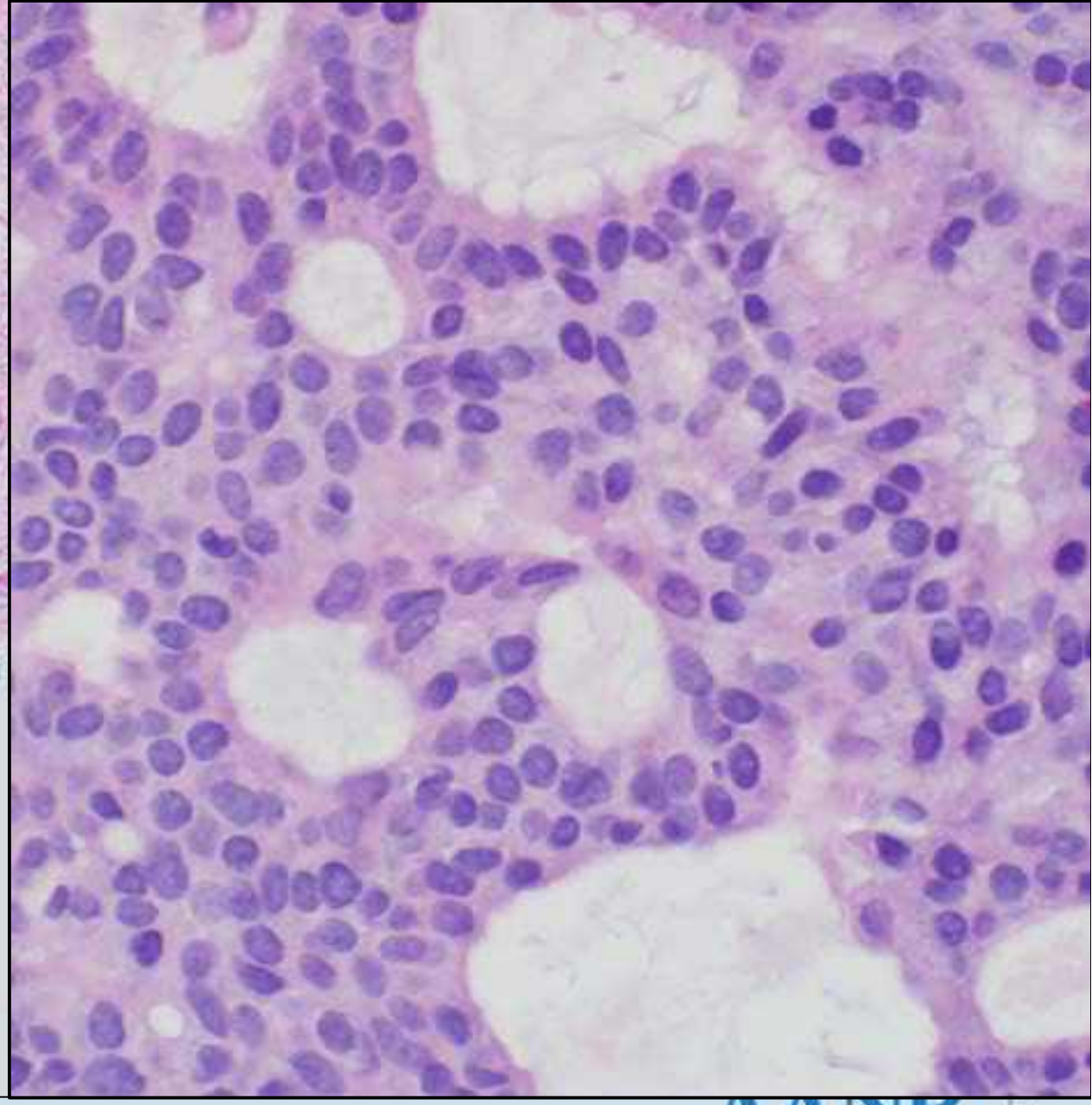
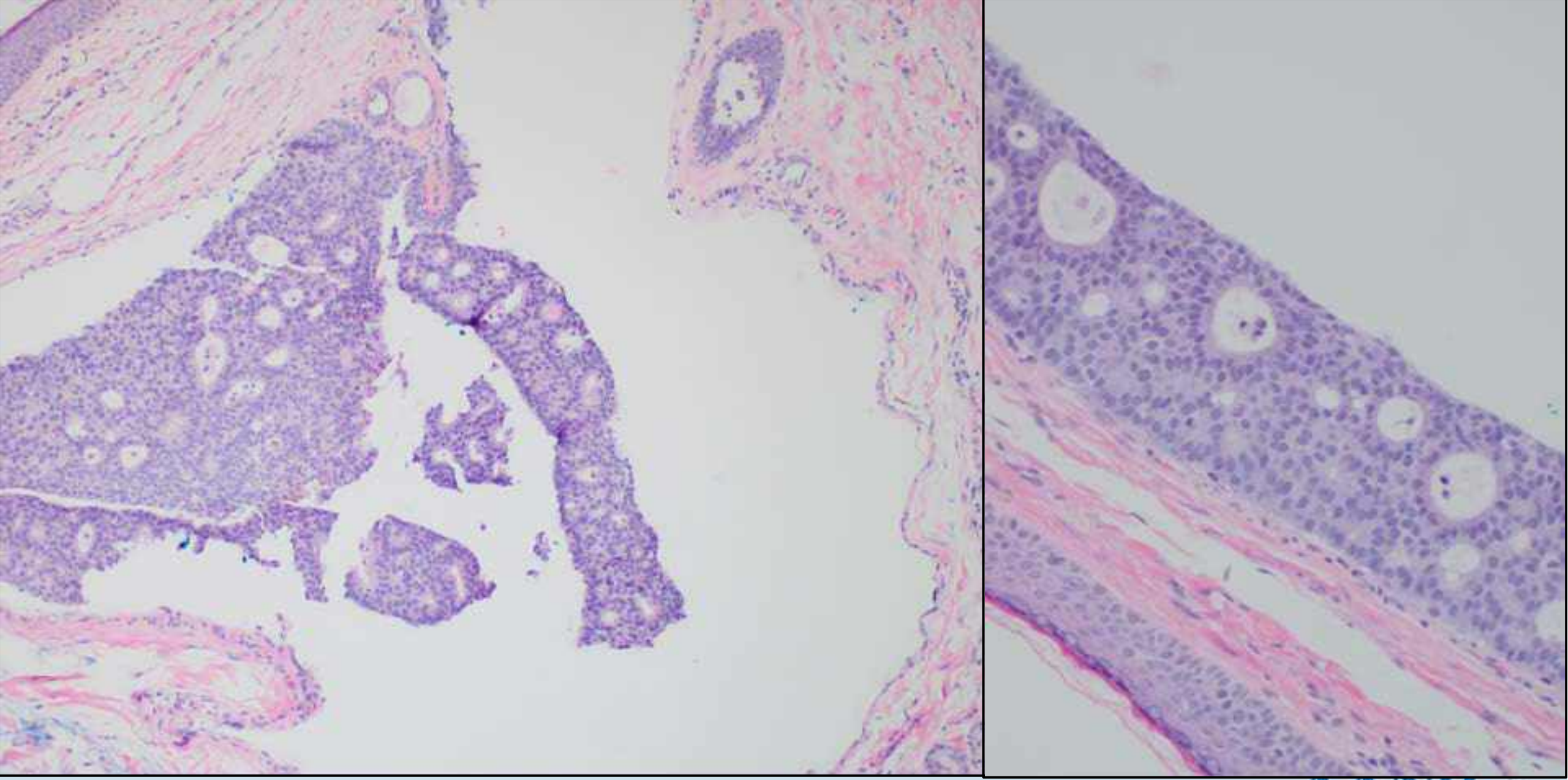
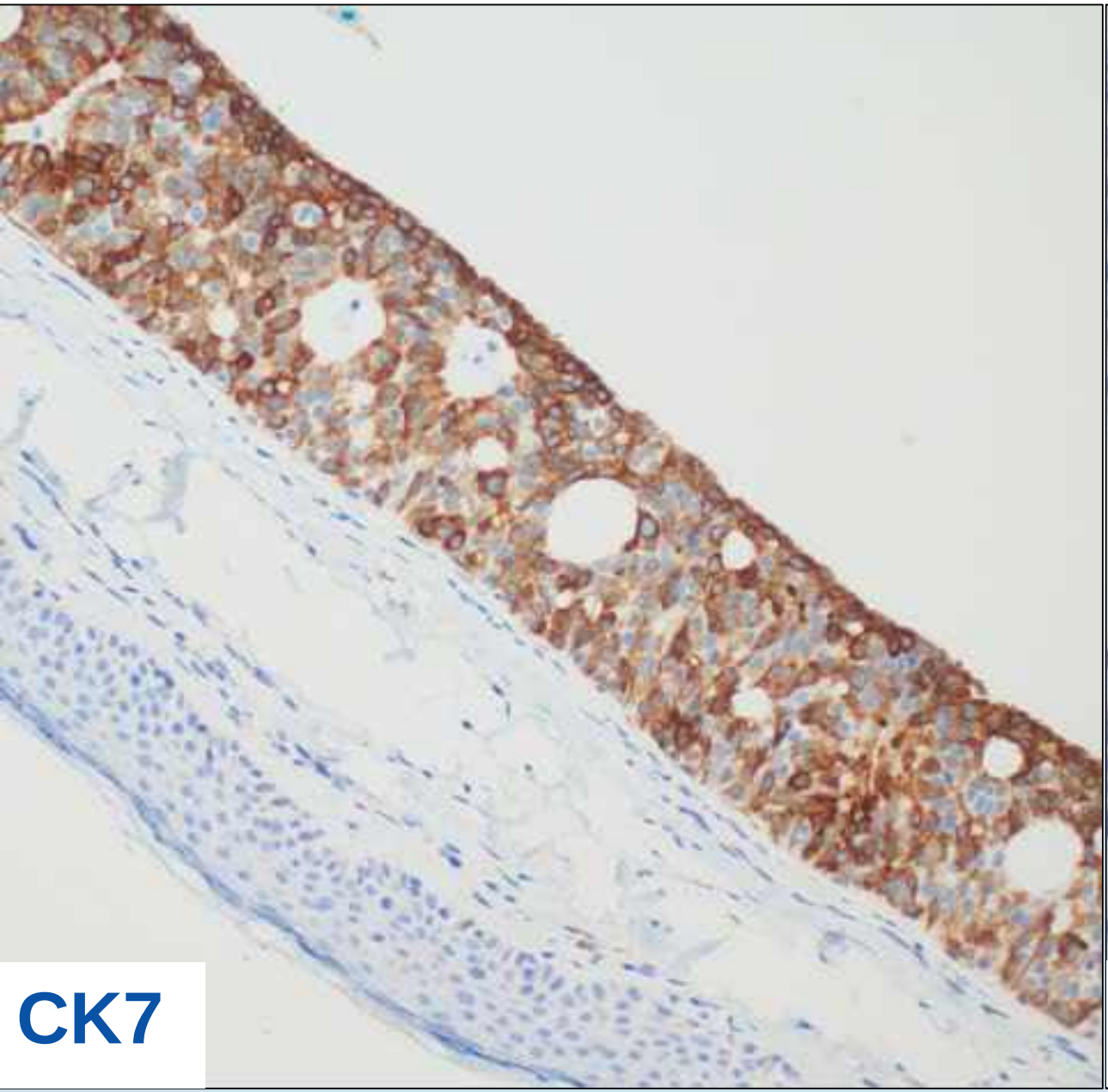
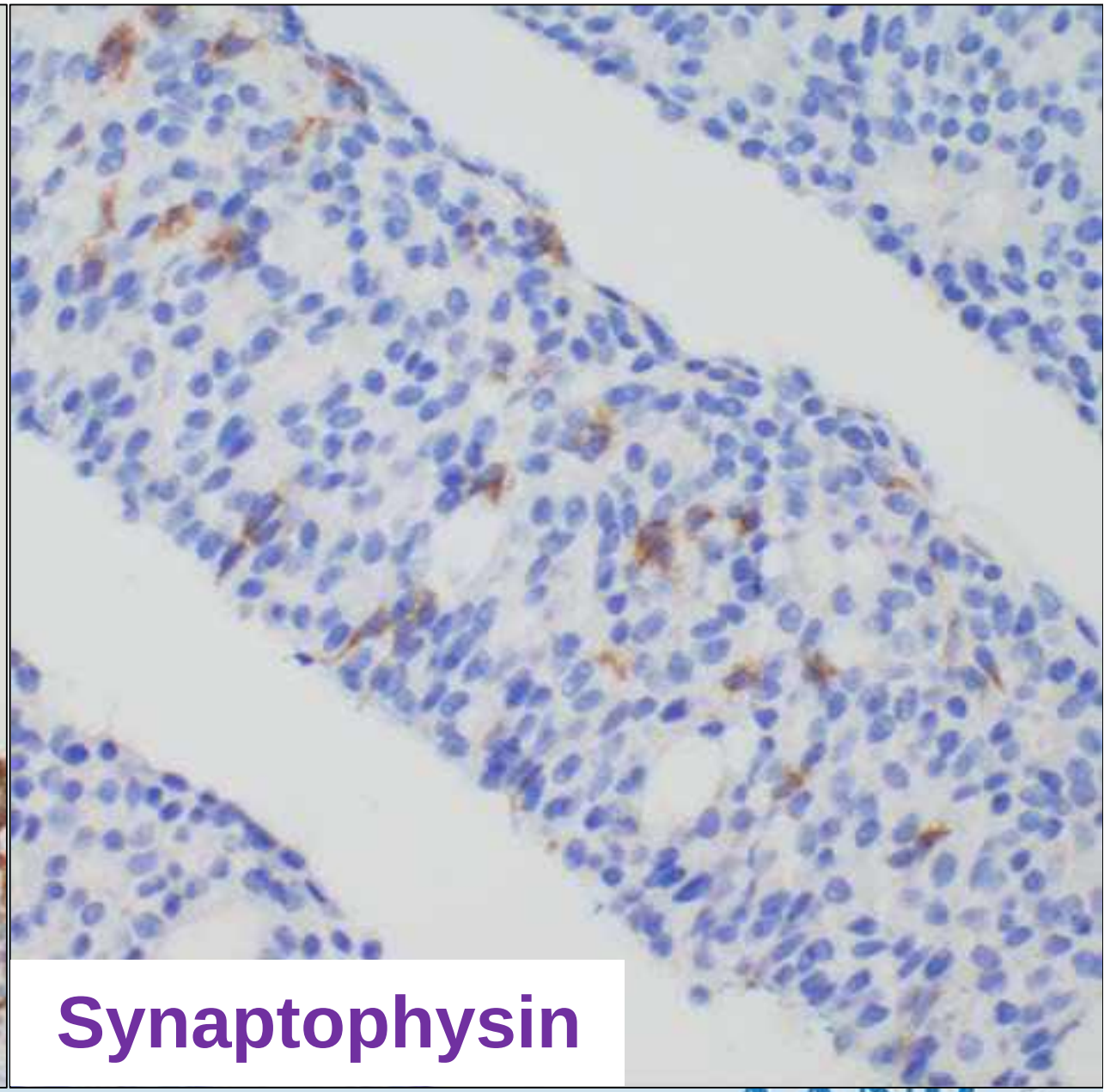








CK7



Synaptophysin

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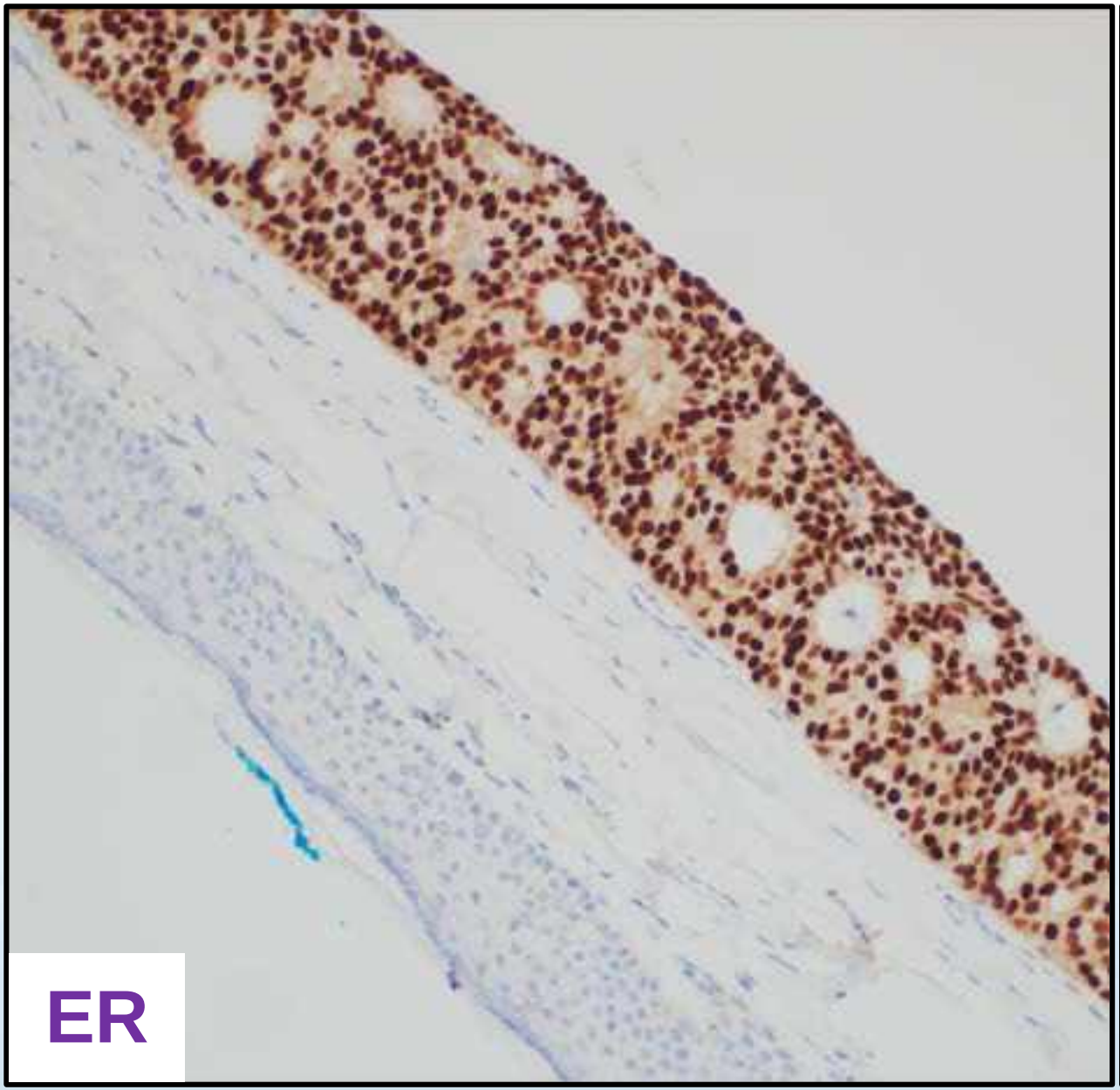

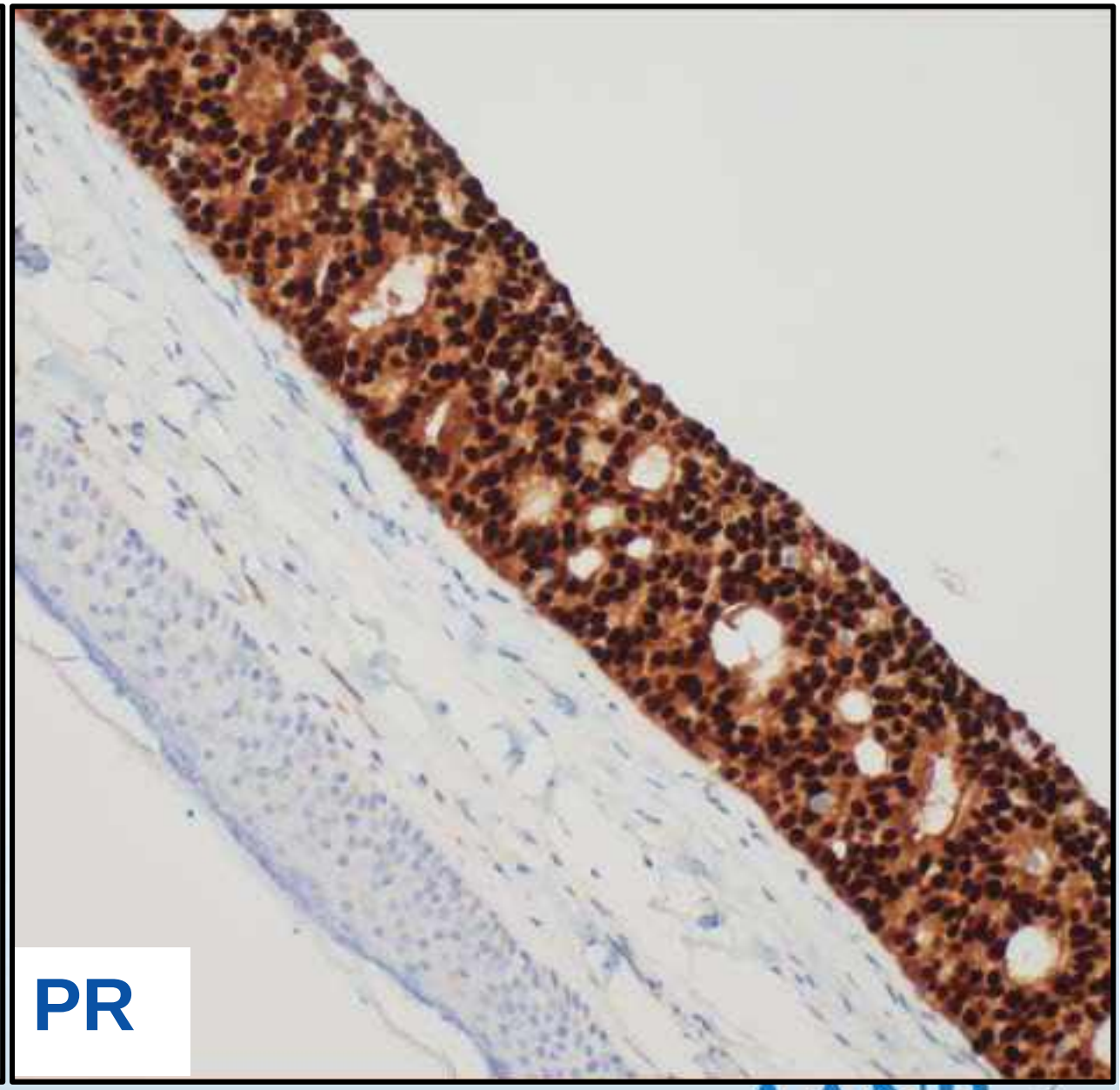

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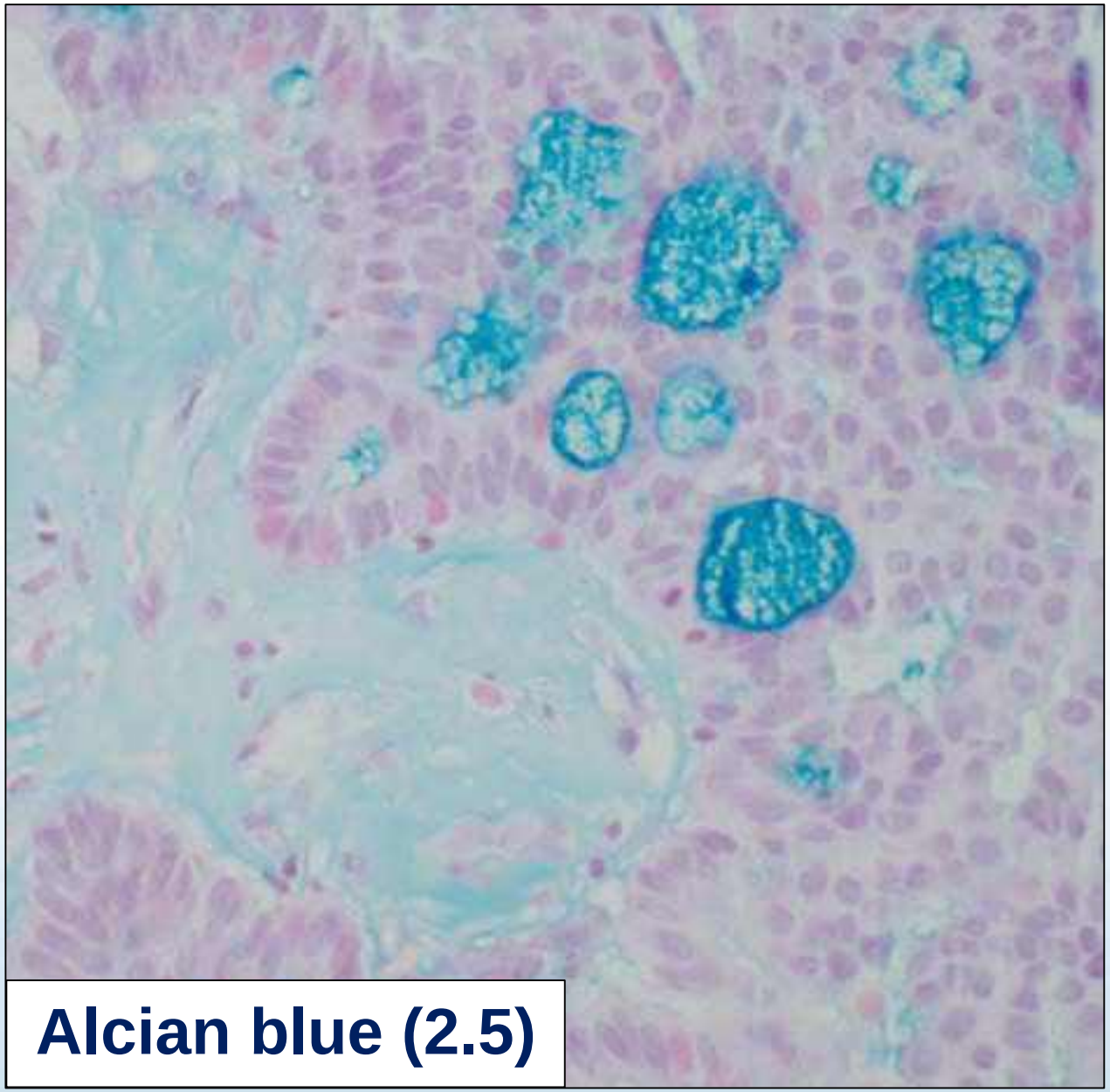
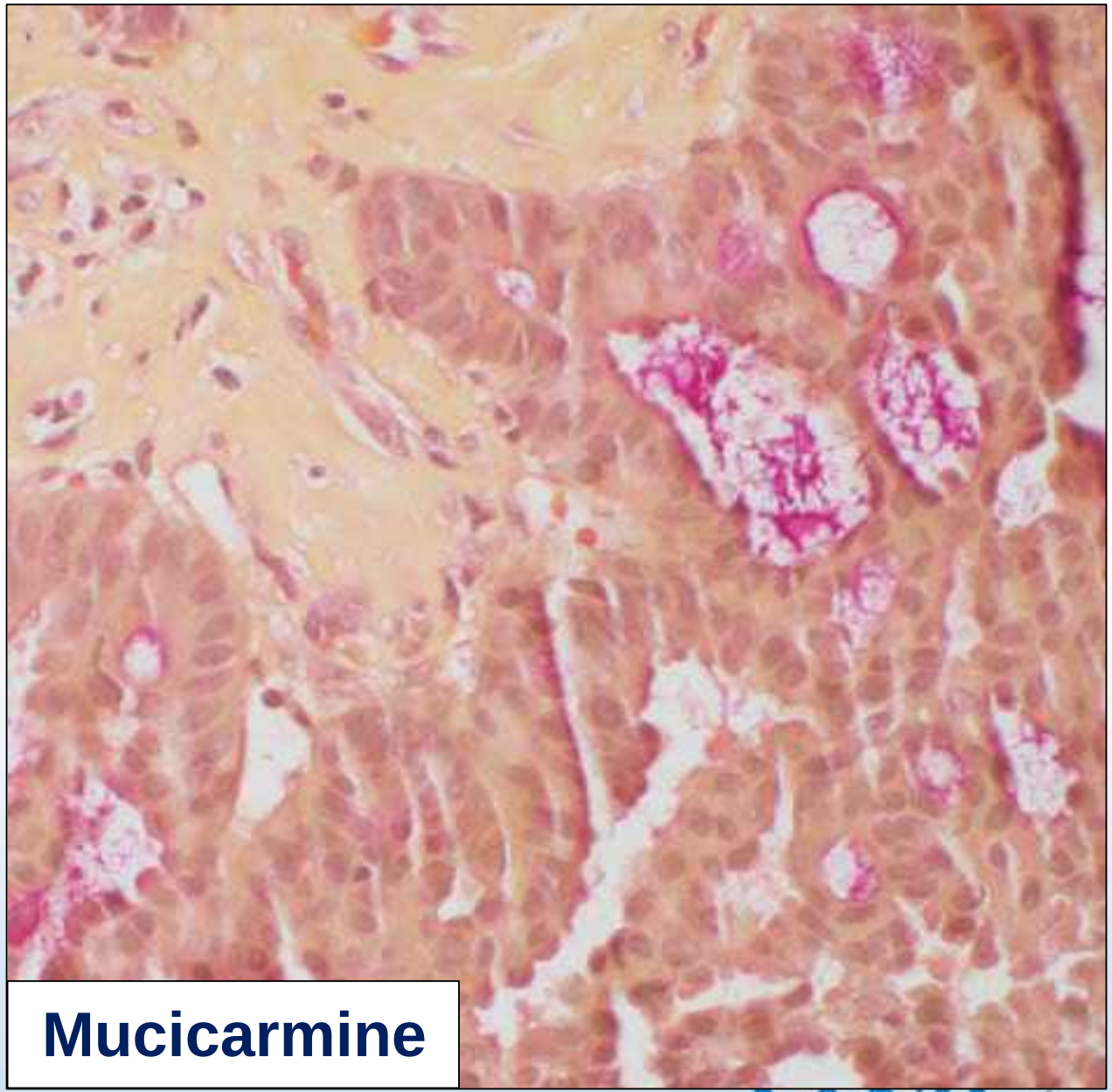


Alcian blue (2.5)



Mucicarmine

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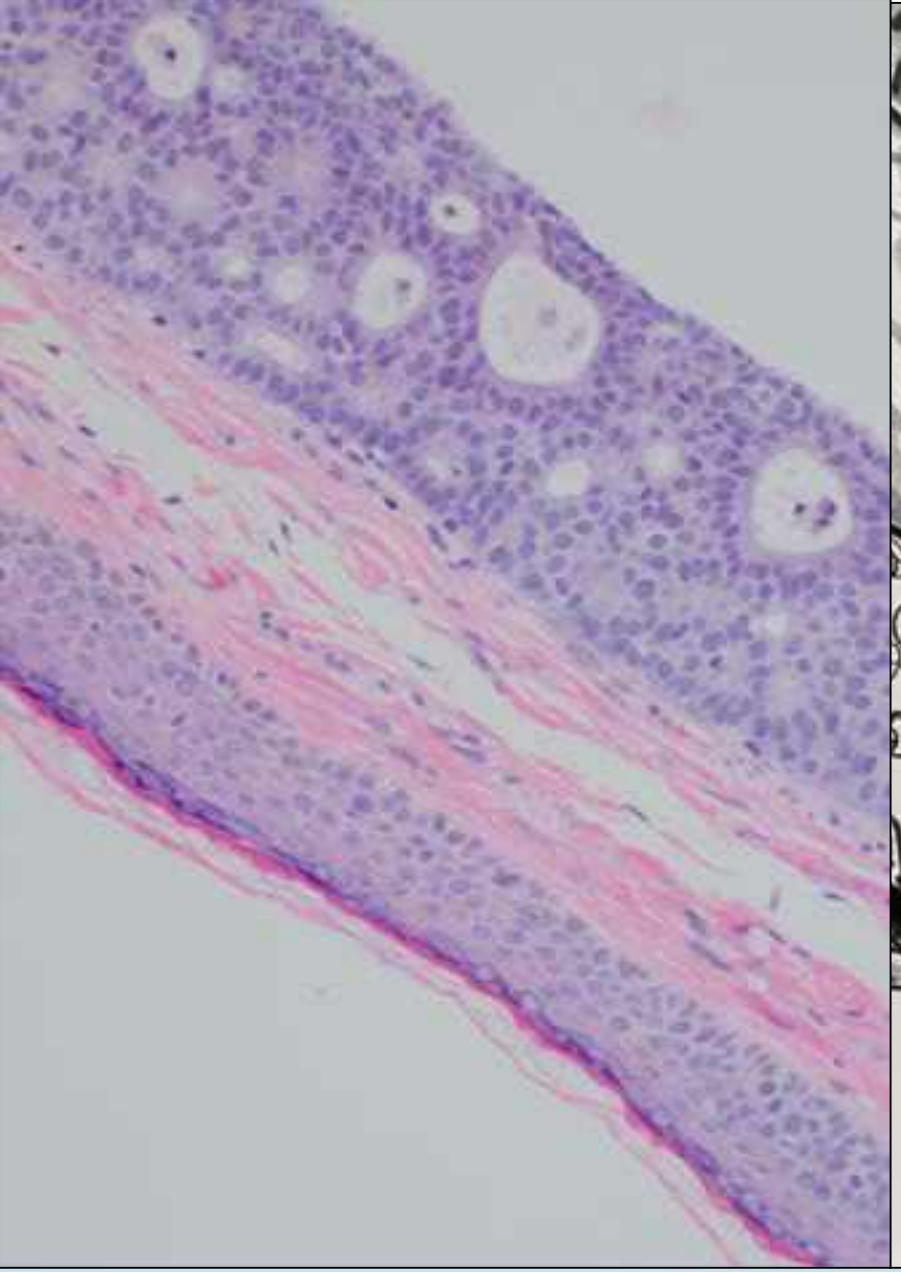
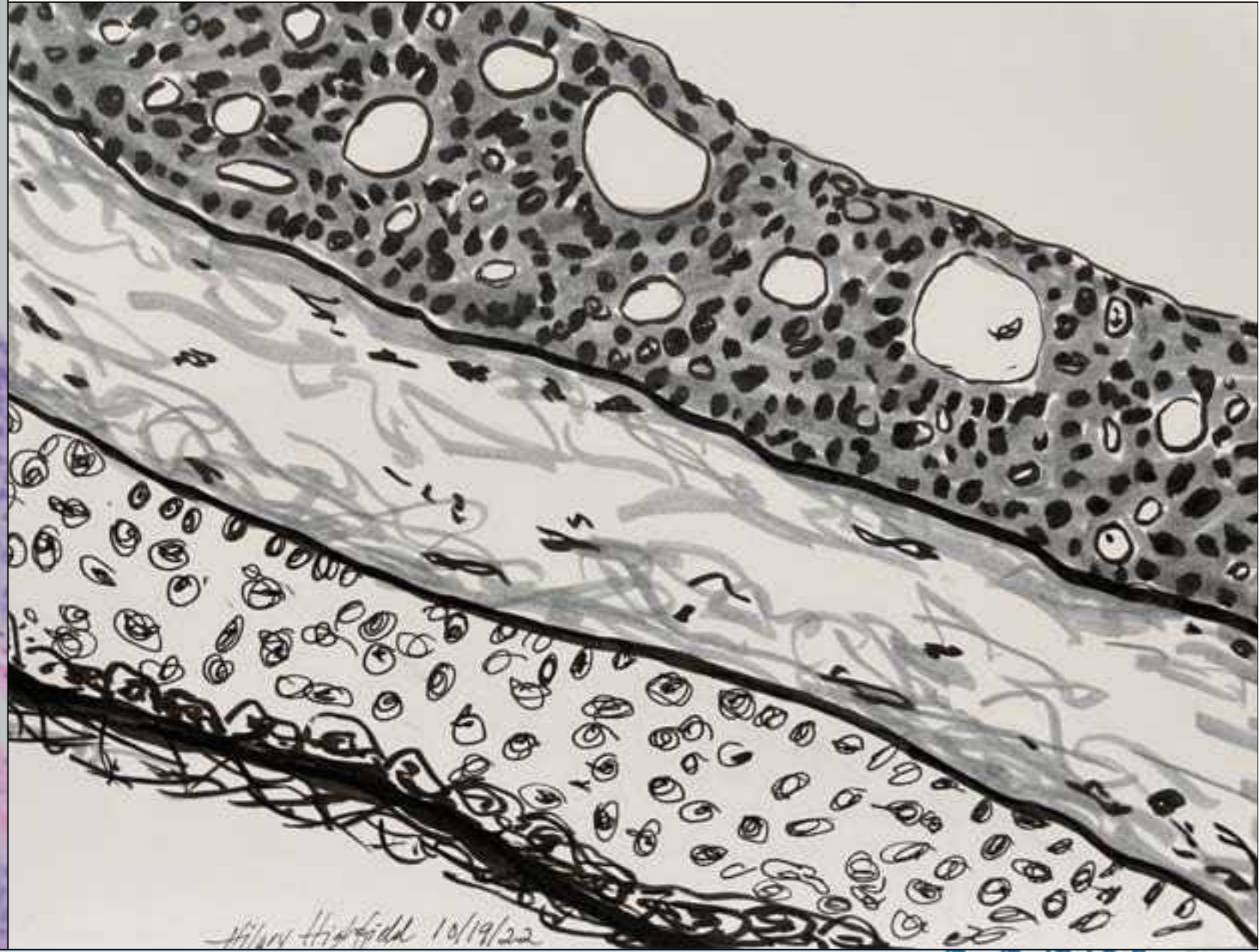
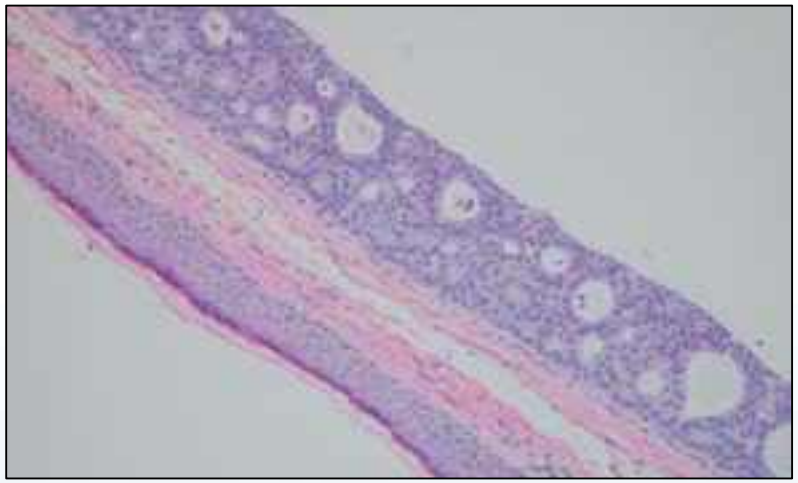



Hilary Hightfield 10/19/22

Diagnosis?

Endocrine Mucin-Producing Sweat Gland Carcinoma (EMPSGC)

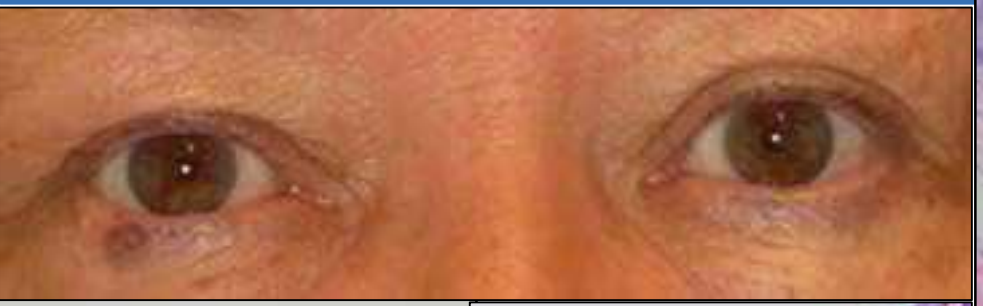
- Low-grade carcinoma
- Eyelid lesion of older females
- Present as slow-growing lesion or cyst
- Can be associated with invasive mucinous component

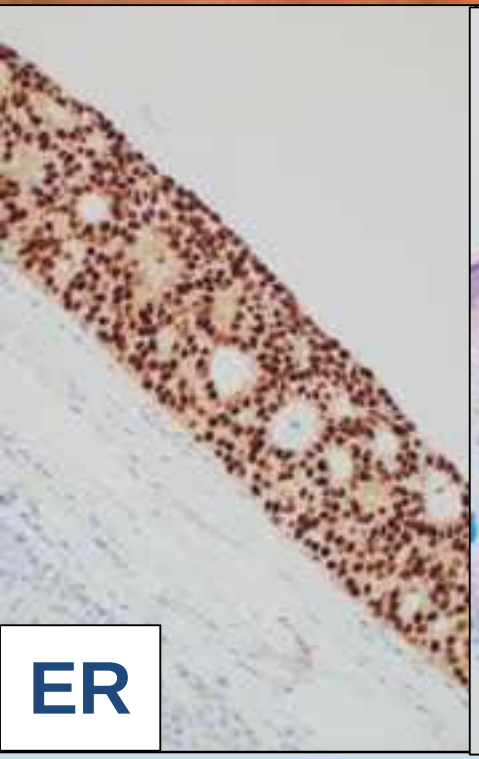


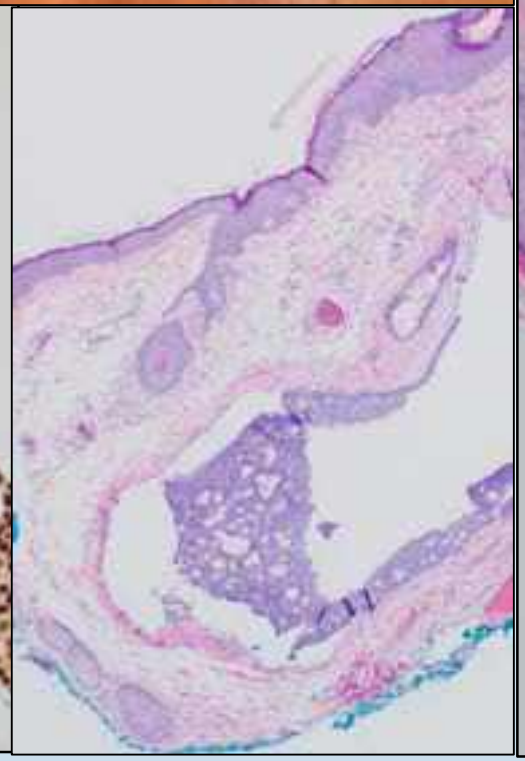
Differential Diagnosis:

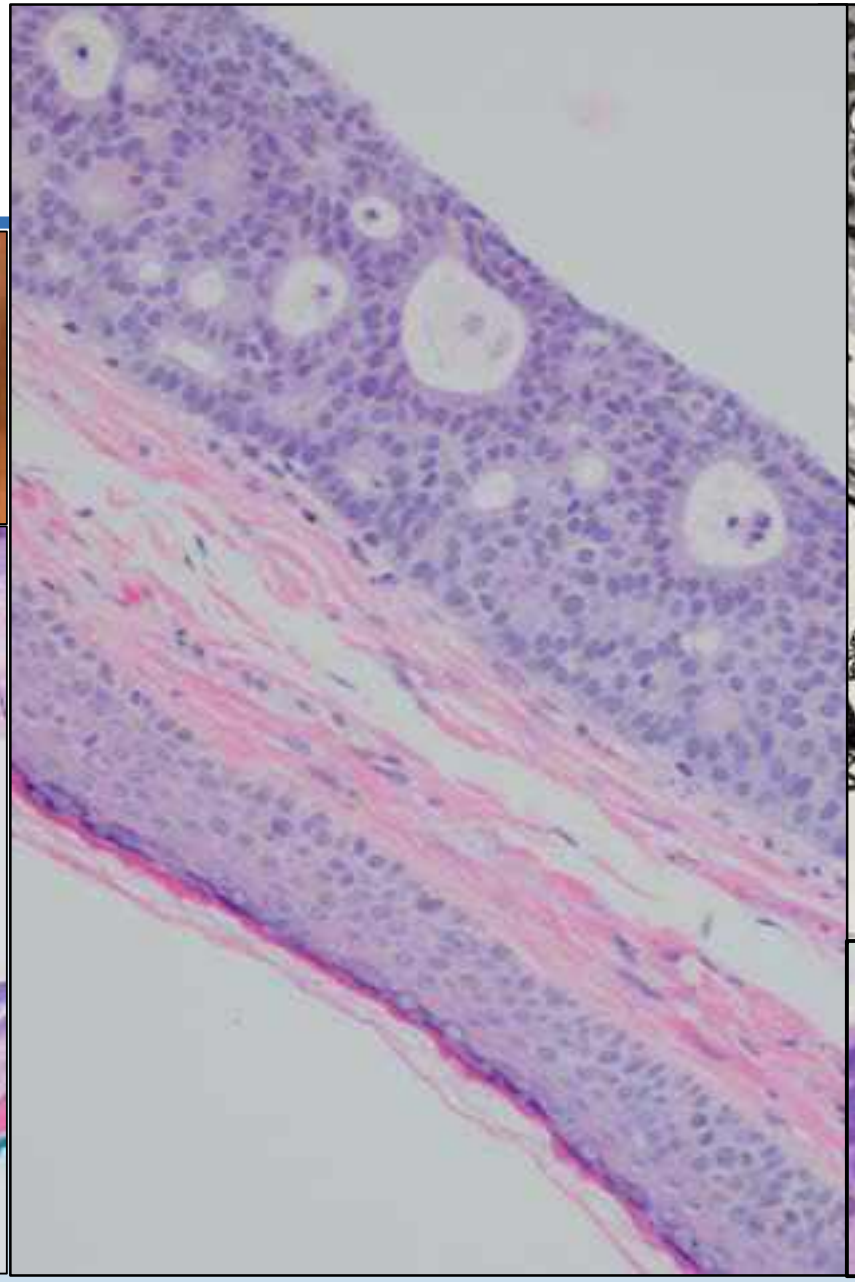
- Benign Cyst (Hidrocystoma)
- Basal Cell Carcinoma
- Chalazion
- Metastatic Breast Carcinoma

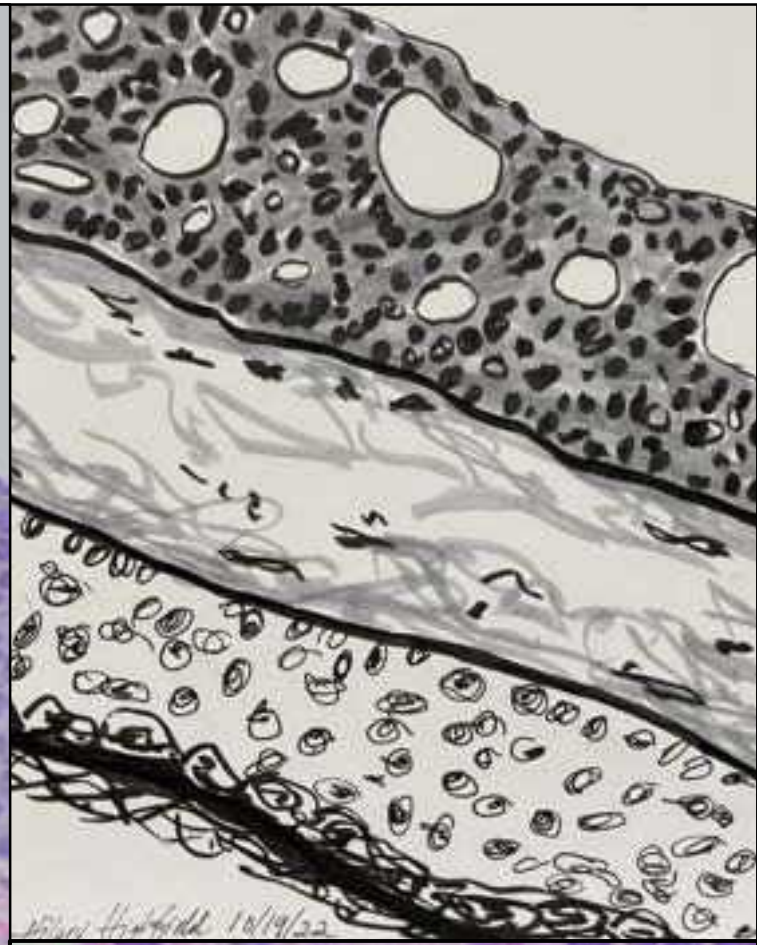
EMPSGC

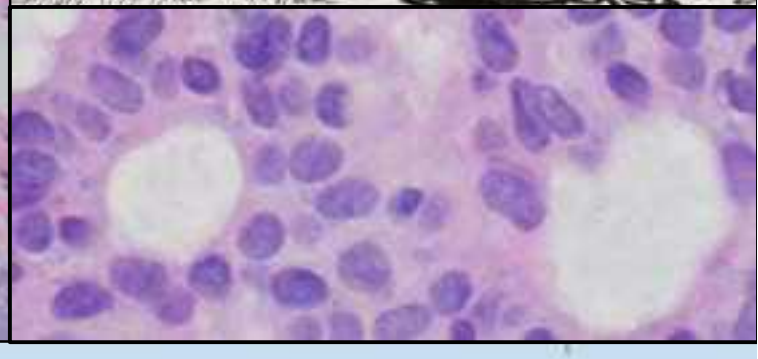




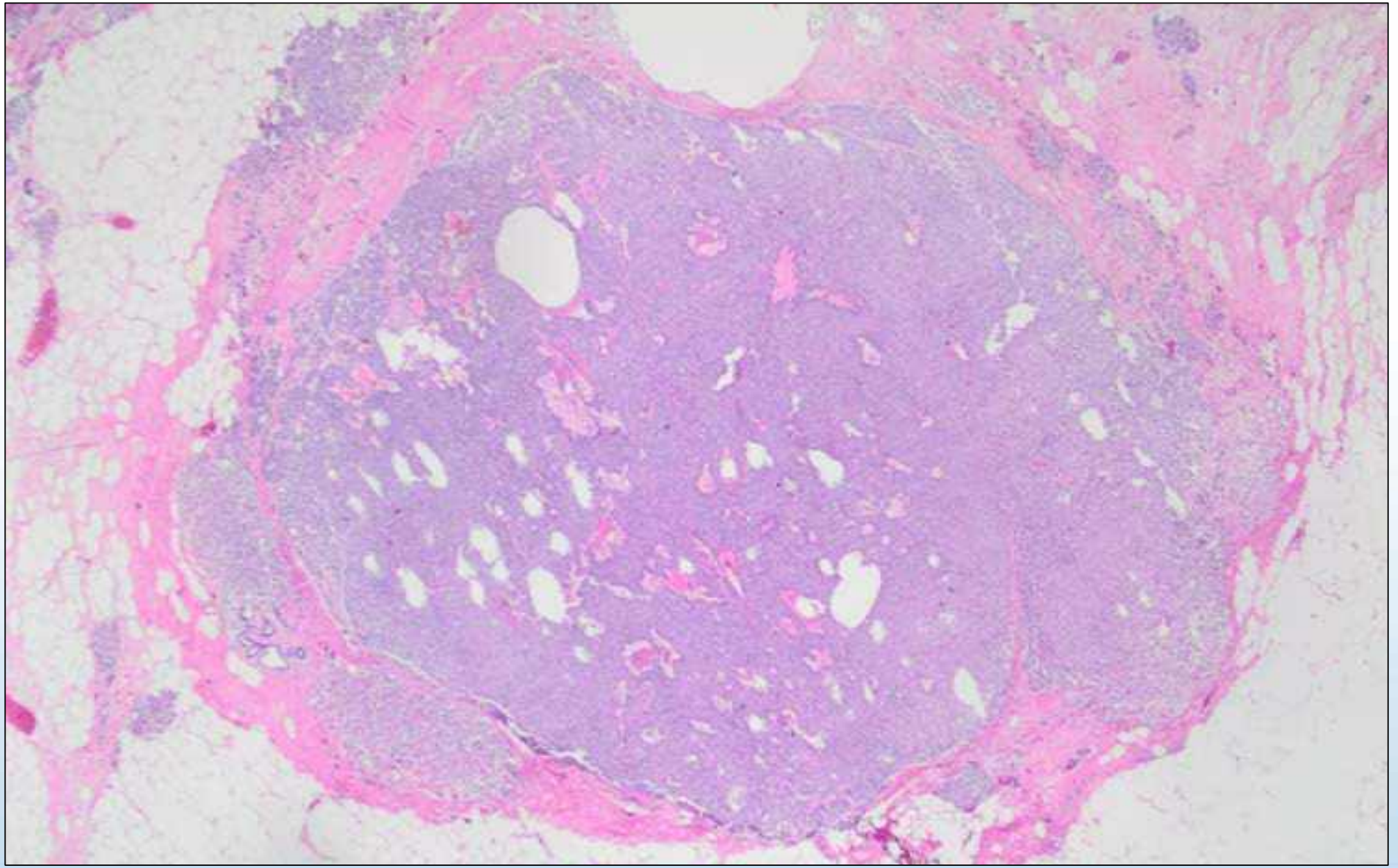








BREAST: SOLID PSEUDOPAPILLARY CARCINOMA



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Endocrine Mucin-Producing Sweat Gland Carcinoma (EMPSGC)

- Rare low-grade carcinoma eyelid lesion of older(64yrs) females (2/3)
- Can be associated with an invasive mucinous component (1/3)
- Differential includes cystic lesions (hidrocystoma), BCC, chalazion, metastasis (breast)

Endocrine Mucin-Producing Sweat Gland Carcinoma (EMPSGC)

- Neuroendocrine appearance with mucin
  - + Synaptophysin/chromogranin/NSE/INSM-1
  - + Alcian blue (2.5), Mucicarmine, PAS (mucin)
  - + CAM5.2, CK7 (CK20 negative)
  - + ER/PR

- EMPSGC with invasive mucinous component → Primary cutaneous mucinous carcinoma (PCMC)

- Differential includes metastasis (breast) – consider systemic workup and plan for follow-up

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1. Agni, M et al. An Update on EMPSGC. Am J Surg Pathol. 2020 44(8):1005-1016.
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Resources

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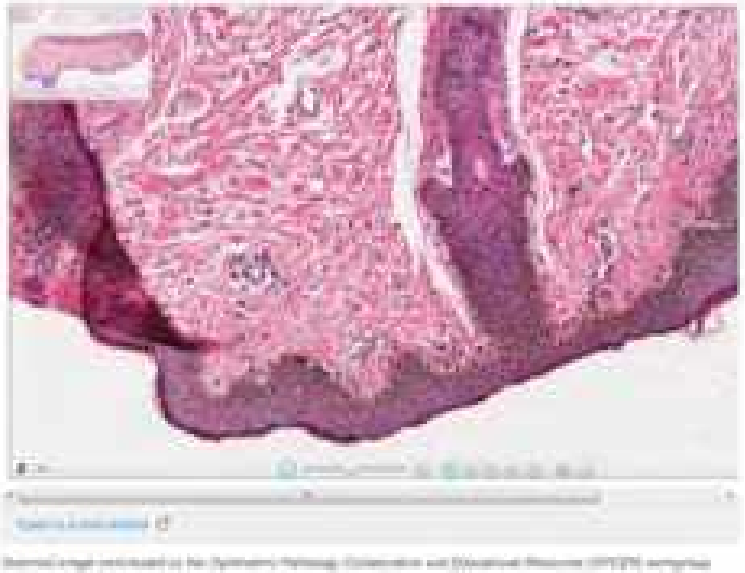

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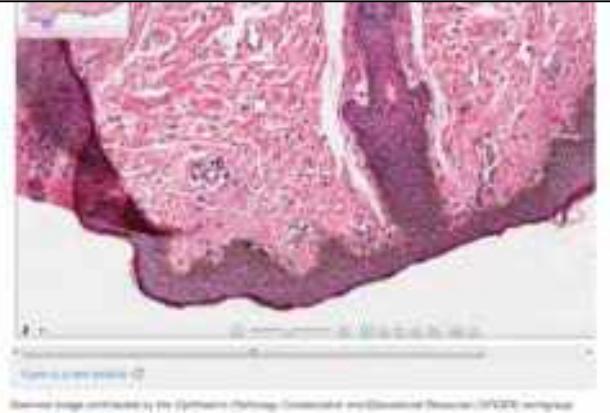

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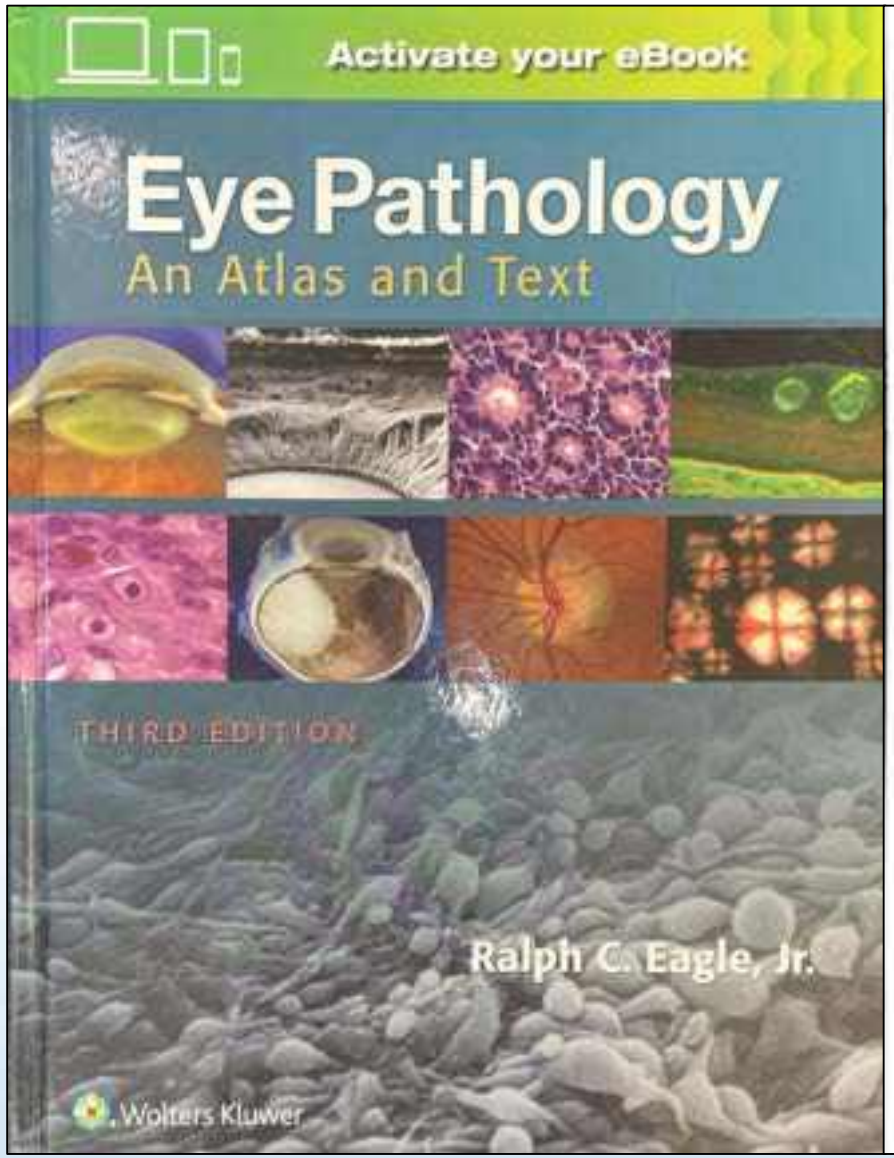
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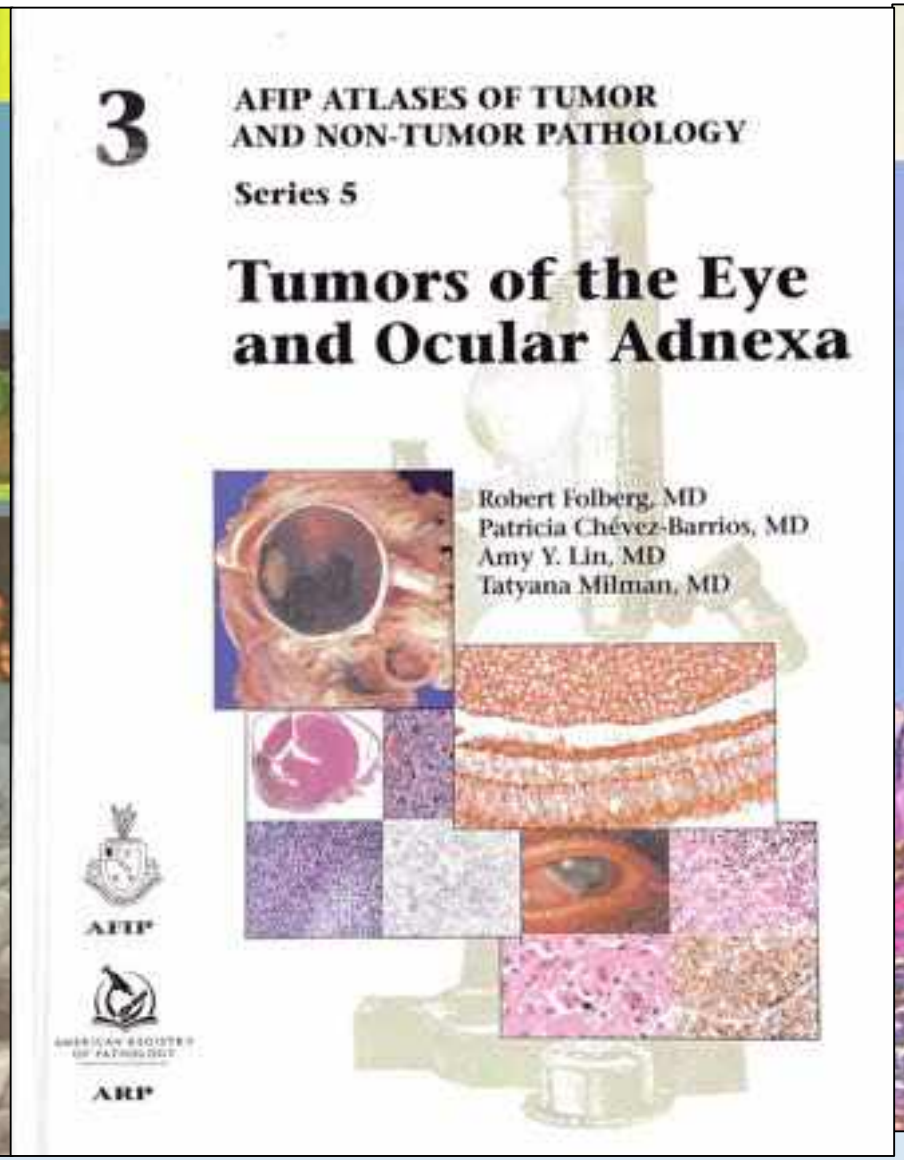
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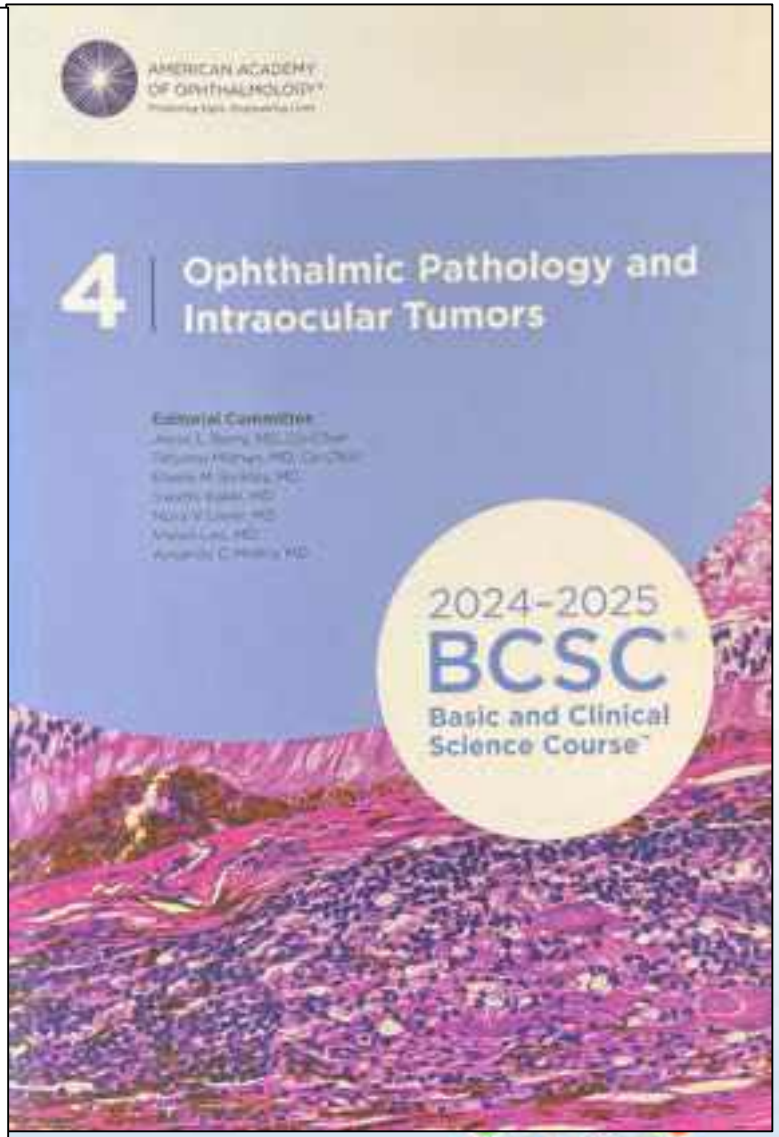
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