

# CUTANEOUS CYSTS AND RELATED CONDITIONS

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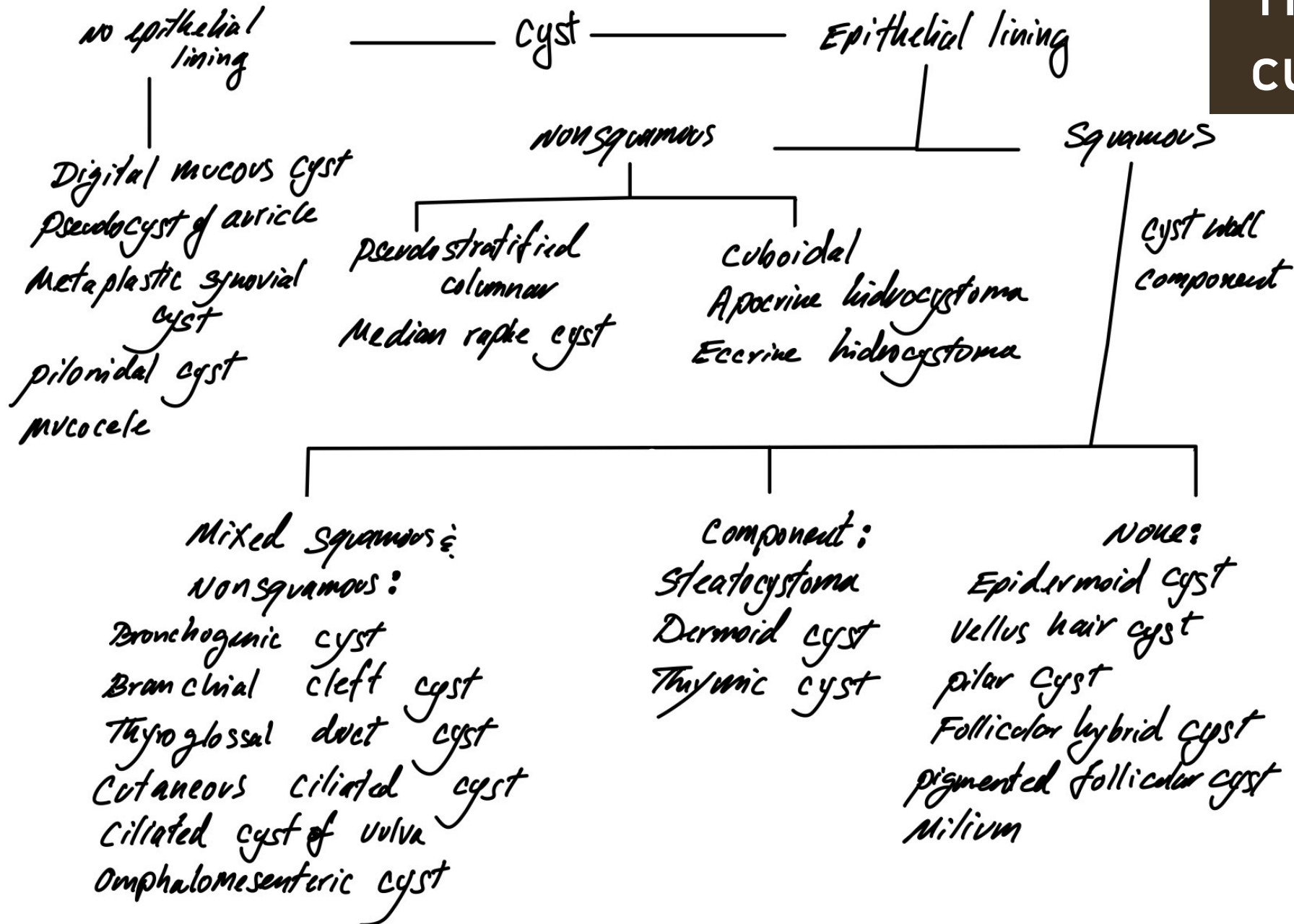
# LEARNING TIPS, PITFALLS, AND HACKS

- One of the most common specimens; Found in any organ
- What is a cyst?
  - A cyst: any cavity lined by an epithelium (native to that organ)
- How are cysts classified?
  - Classified according to the nature of the epithelial lining
- Need to recognize the histopathogenesis of epithelial lining, especially adnexal structures
- Overlapping classification schemes
  1. Appendageal origin i.e., hair, apocrine, eccrine, or salivary glands
  2. Derivation i.e., either developmental or non-developmental
- Pitfalls:
  - Nodular tumors may fall apart or deteriorate (cystic degeneration)
  - Empty space (e.g., mucin) or cracking, not true cyst (histologic artifact)
  - Scarring and granulomatous reaction (no cyst lining): secondary changes of ruptured cyst

# How are cutaneous cysts broadly classified? (types of cyst lining)

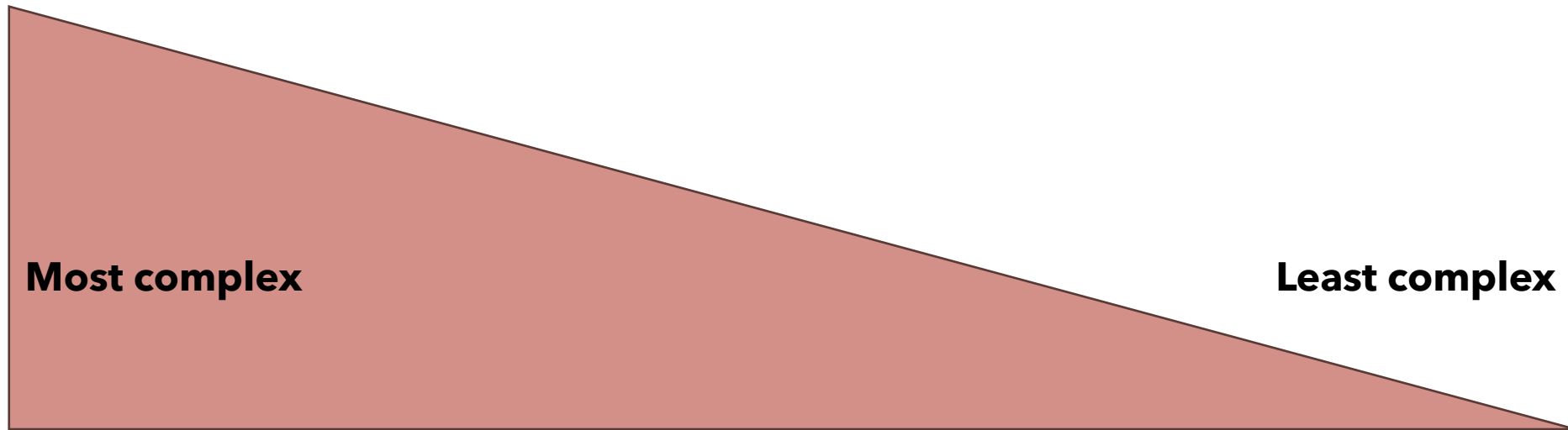
- Squamous lining (follicular cysts)
- Glandular lining (glandular cysts)
- Pseudocysts

# How to diagnose cutaneous cysts?





# Varying histopathologic complexity in cutaneous cysts



Proliferating pilar cyst/tumor  
Steatocystoma  
Dermoid cyst

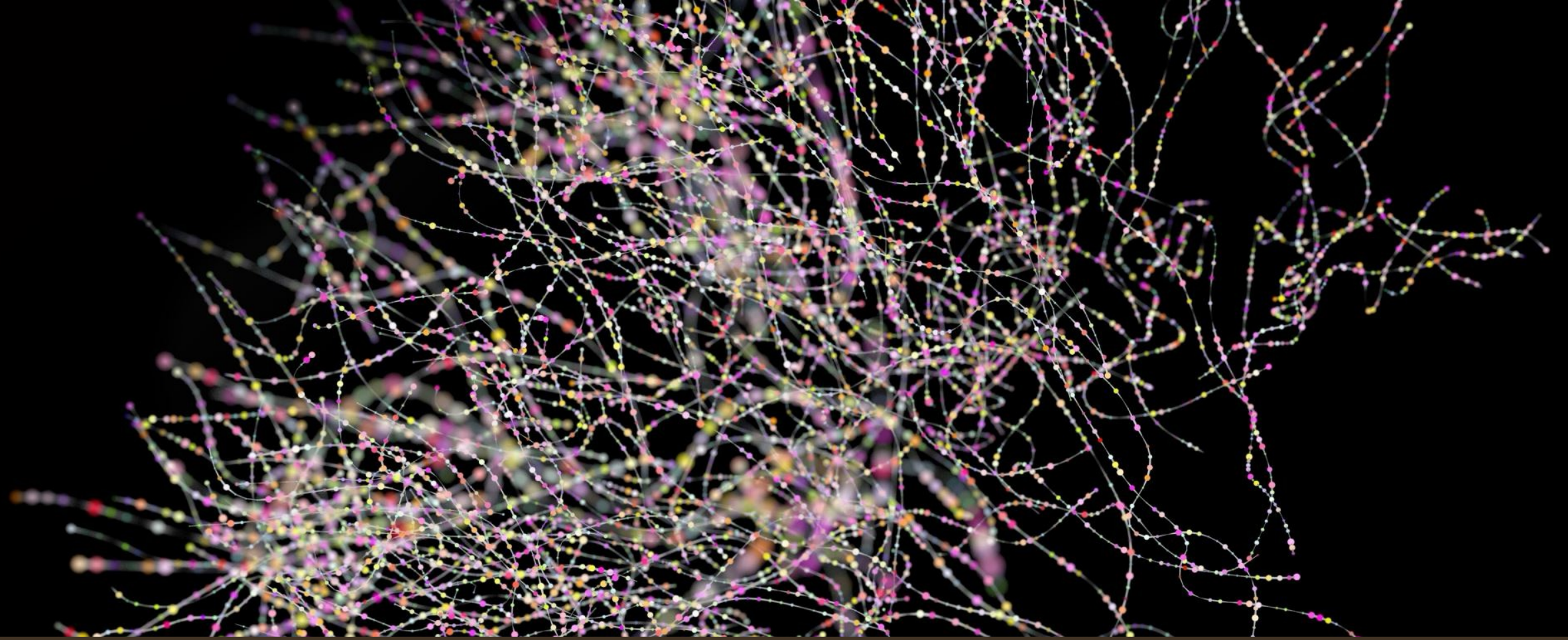
Mixed squamous  
& nonsquamous  
ciliated cysts

Epidermal cyst  
Pilar cyst  
Vellus hair cyst

# How to differentiate an epidermal cyst from a pilar cyst?

Histopathologic features	Epidermal	Pilar
Granular cell layer	Present	Absent
Keratin quality	Loose, flaky	Compact, homogenous
Palisading of nuclei in basal layer	Absent	Present
Resemblance to which structure	Infundibulum	Isthmus



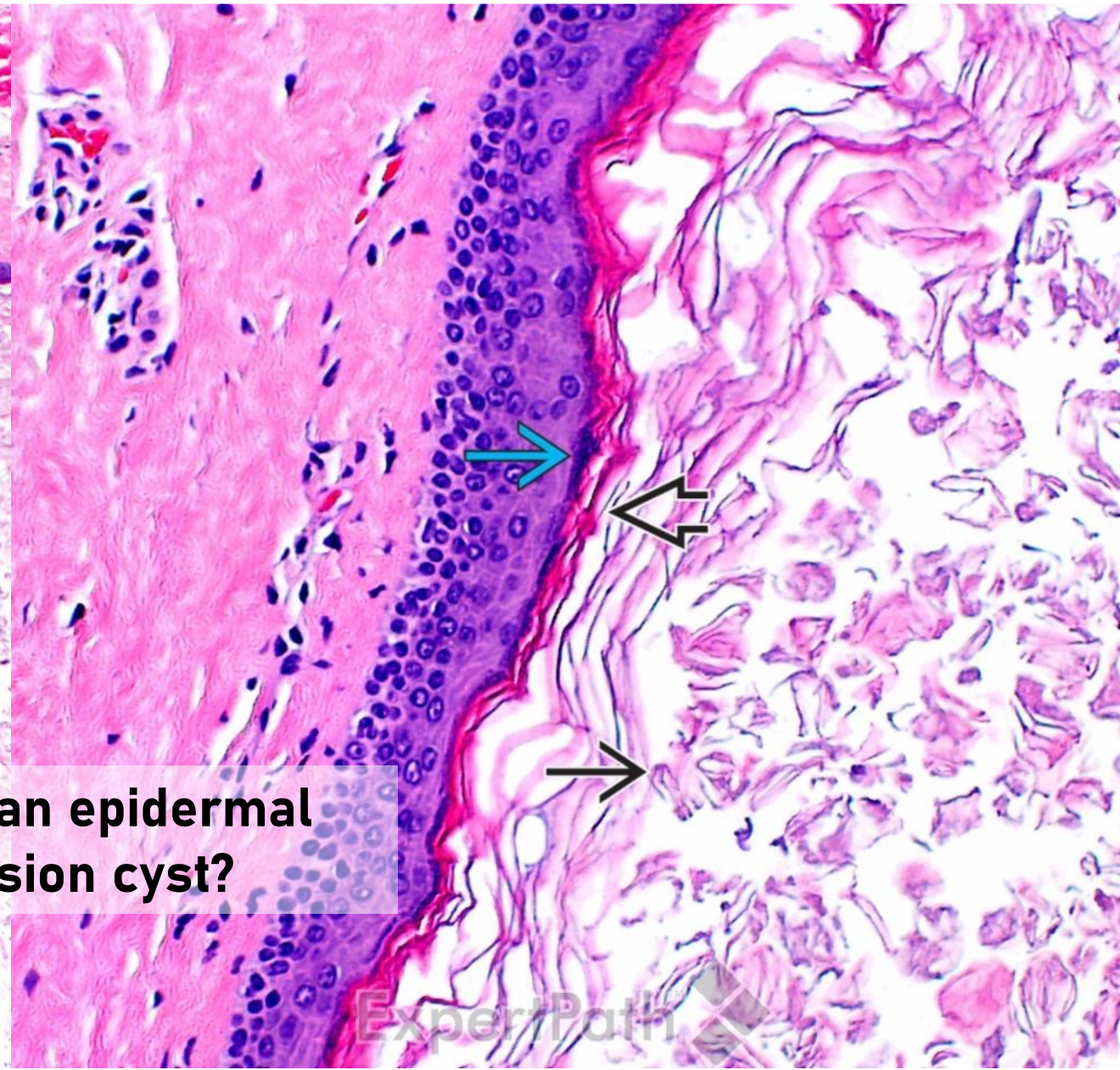
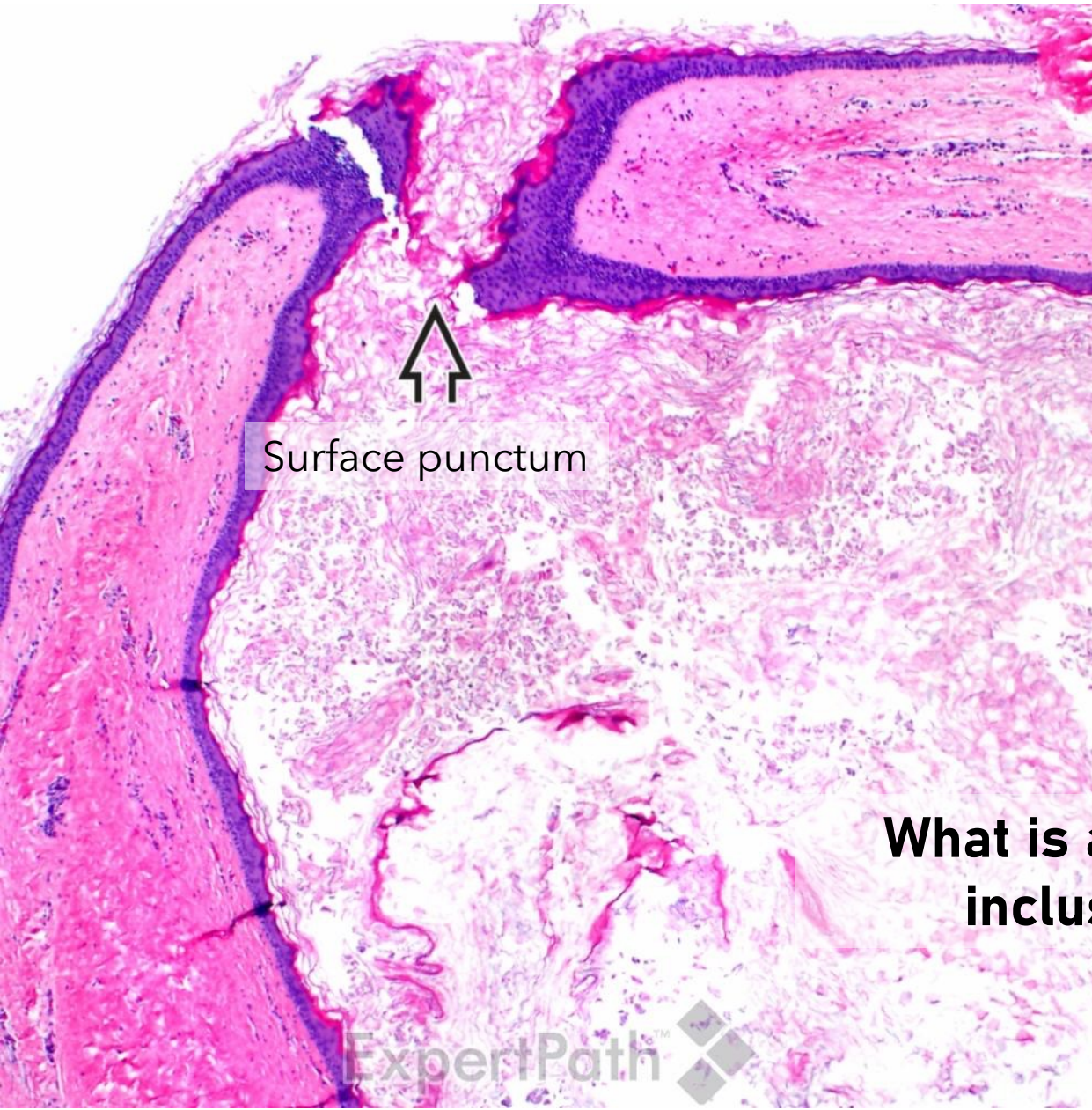


**CYSTIC SPACE WITH EPITHELIAL LINING**



**Epidermal inclusion cysts** often contain a surface punctum or connection to the surface (black open arrow). The cysts contain laminated keratin or keratin debris.

Epidermoid cyst is lined by keratinized squamous epithelium (black open arrow). The cyst wall is composed of fibrous stroma without adnexal structures. The lumen of the cyst contains keratin debris (black solid arrow). The presence of a granular layer (cyan solid arrow) helps differentiate this cyst from other cystic lesions.



**What is an epidermal inclusion cyst?**

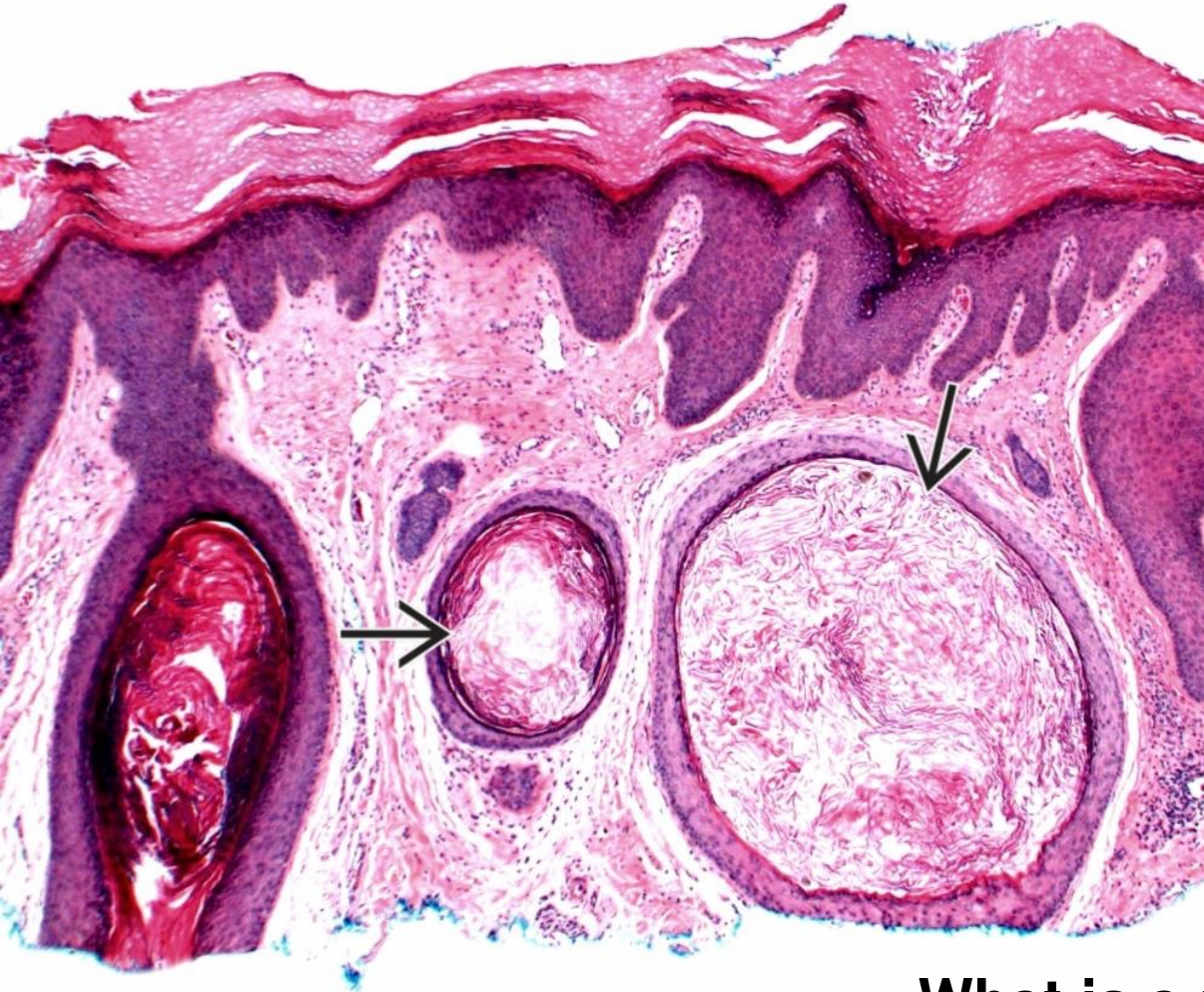


## What is a dermoid cyst?

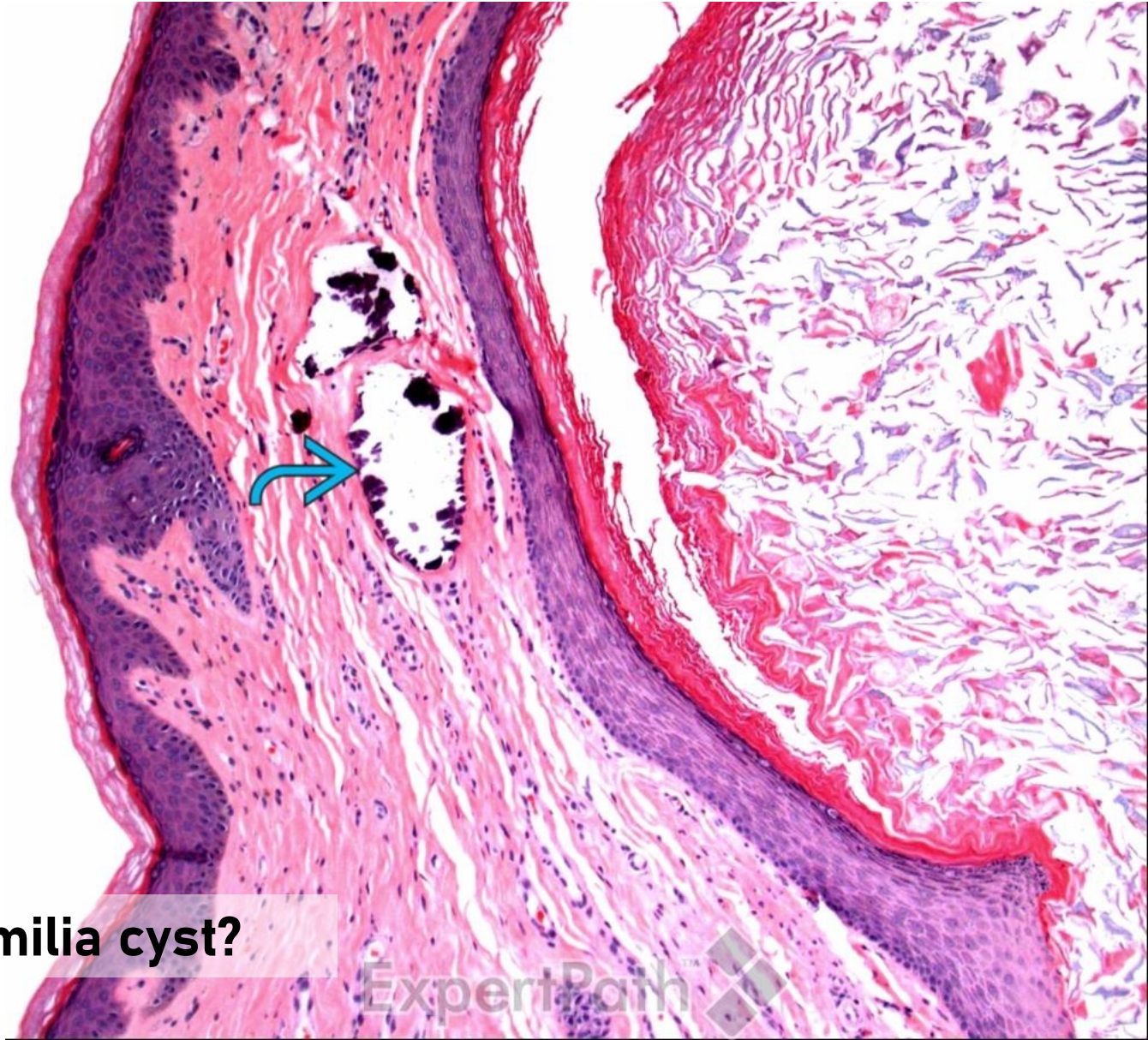
This **dermoid cyst** contains luminal keratin (black open arrow) and is lined by keratinized squamous epithelium (black curved arrow). The cyst wall contains adnexal structures, such as hair follicles (white open arrow) and sebaceous glands (white solid arrow).



Low magnification shows multiple small dermal cysts (black solid arrow), which appear essentially identical to miniature epidermoid/epidermal inclusion (follicular, infundibular-type) cysts with loose keratin debris and a preserved granular layer.



Another example of a milia cyst with adjacent stromal calcifications (cyan curved arrow) and mild fibrosis, changes likely due to previous rupture of the cyst, is shown.



**What is a milia cyst?**



Multiple slightly brownish, small follicular papules are seen on the chest. This is a classic presentation of **eruptive vellus hair cysts**. (Courtesy J. Wu, MD.)

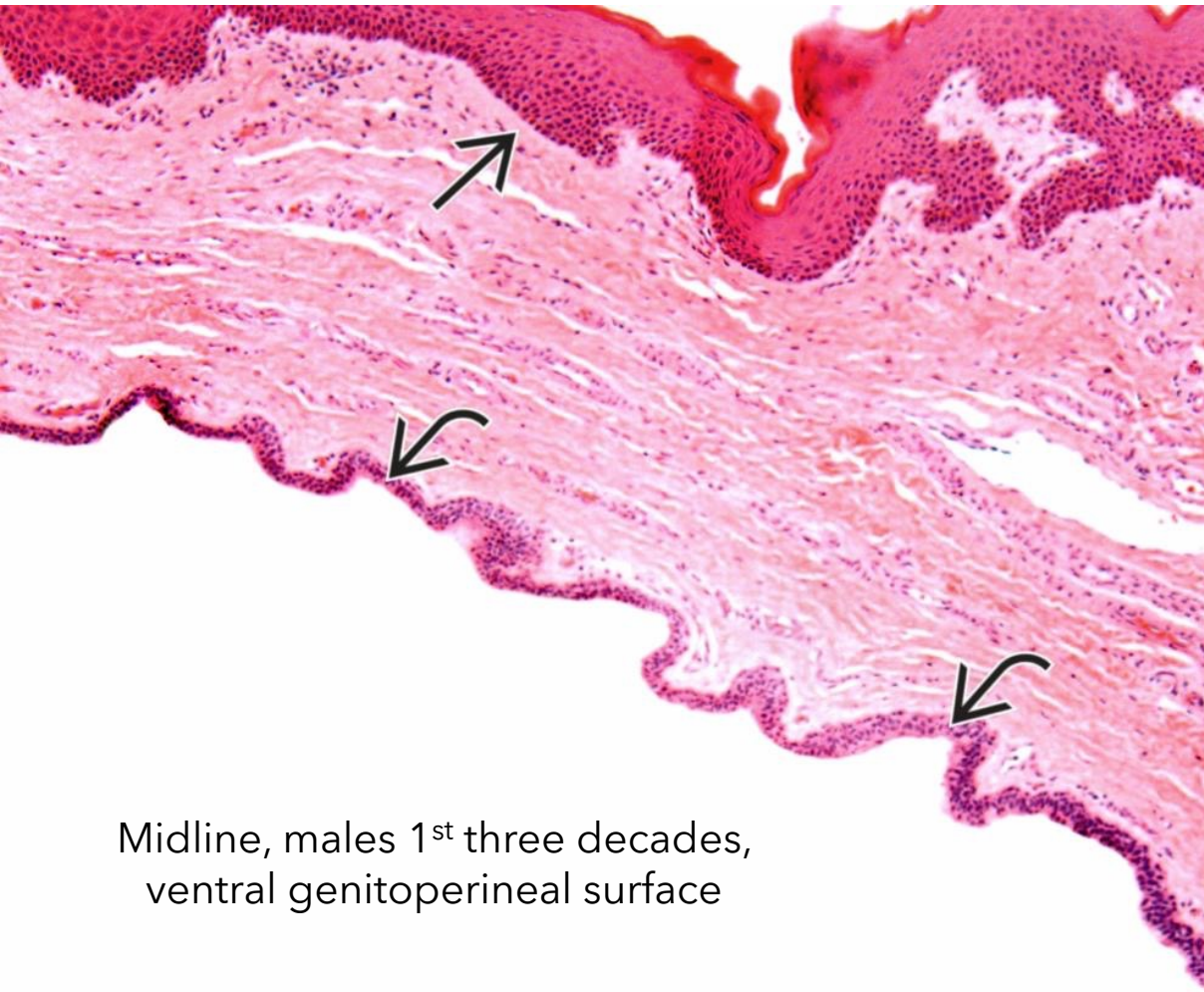
Low magnification shows a cyst lined by a keratinizing squamous epithelium. The cyst contents include laminated keratin (cyan solid arrow) and numerous transversely sectioned hair shafts (cyan curved arrow).



**What is a vellus hair cyst?**

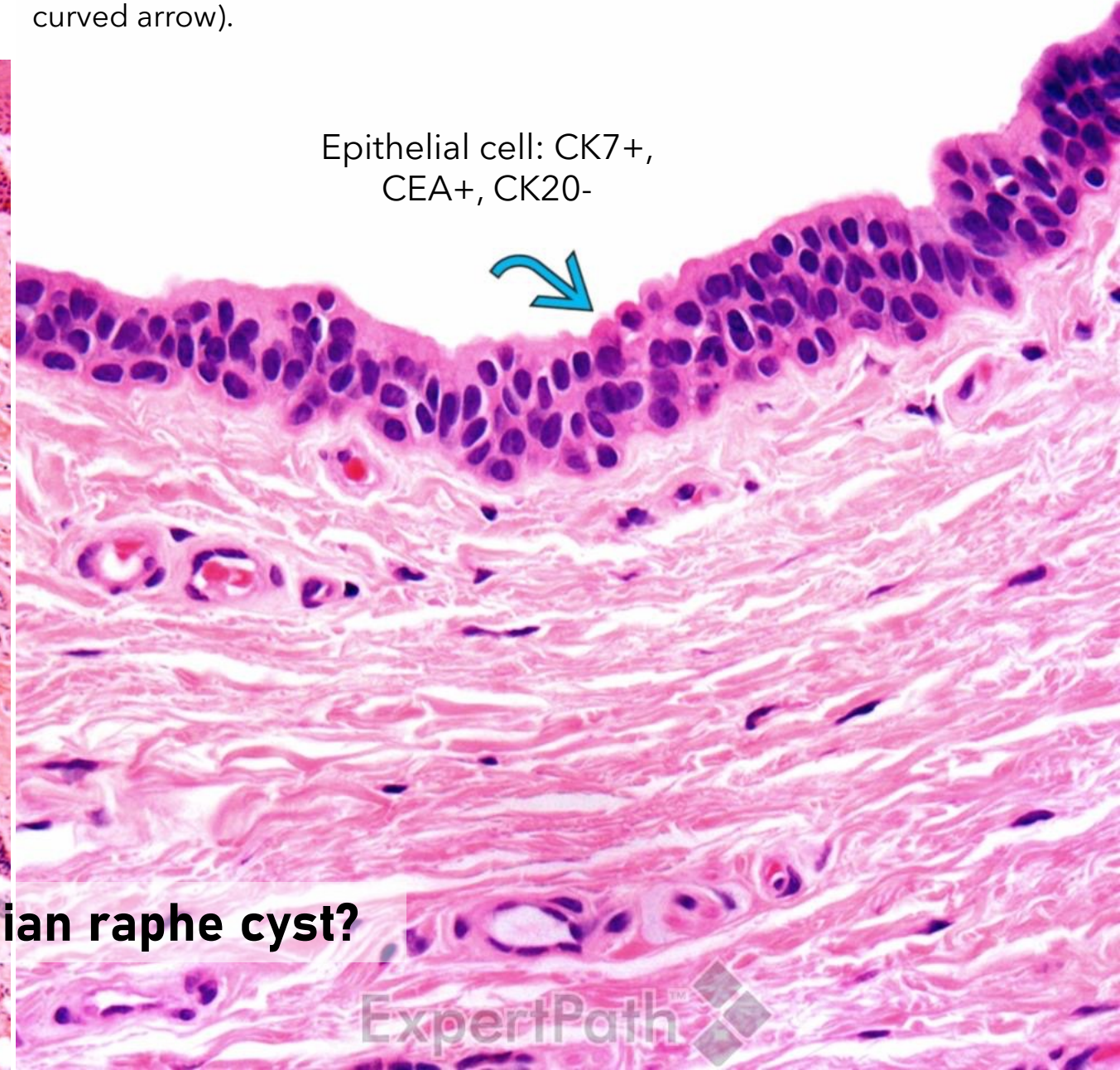


This example of a **median raphe cyst**, shown under low magnification, is located in the middermis. There is no connection with the overlying epidermis (black solid arrow). The cyst lining is composed of a several-cell thick layer in the wall (black curved arrow).



Midline, males 1<sup>st</sup> three decades,  
ventral genitoperineal surface

Under higher magnification, the pseudostratified columnar epithelium is shown, which is the characteristic lining of most median raphe cysts. Some of the surface-lining cells appear apocrine with focal apical snouts (cyan curved arrow).



Epithelial cell: CK7+,  
CEA+, CK20-

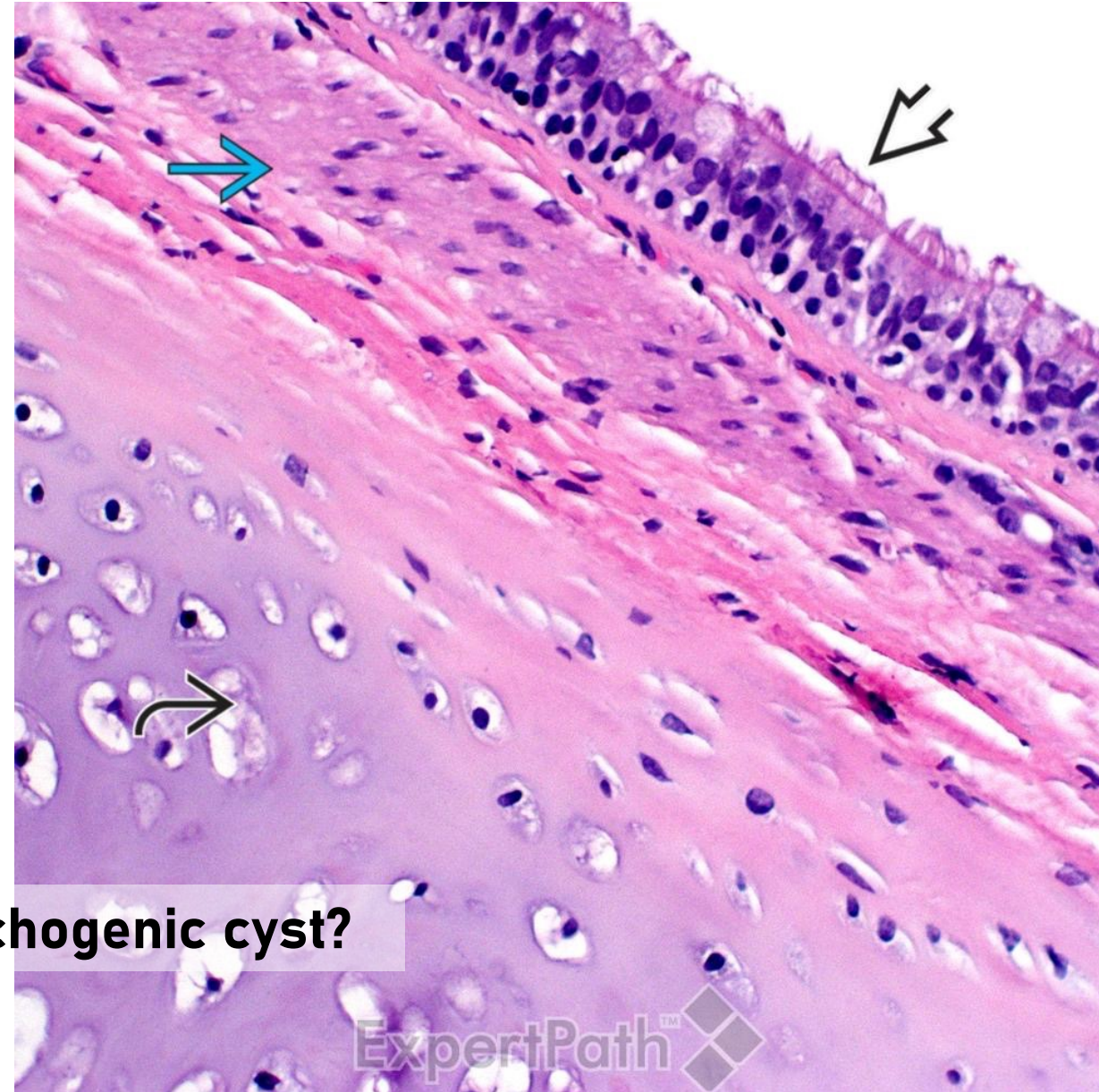
**What is a median raphe cyst?**



Under low magnification, all the major features of a **bronchogenic cyst** are evident: Cyst space (cyan open arrow) lined by respiratory-type epithelium (black solid arrow) with a fibrous connective tissue wall that contains mucoserous glands (white open arrow), hyaline cartilage (white curved arrow), and smooth muscle (black curved arrow). Multiple step sections may be needed to identify the different components.



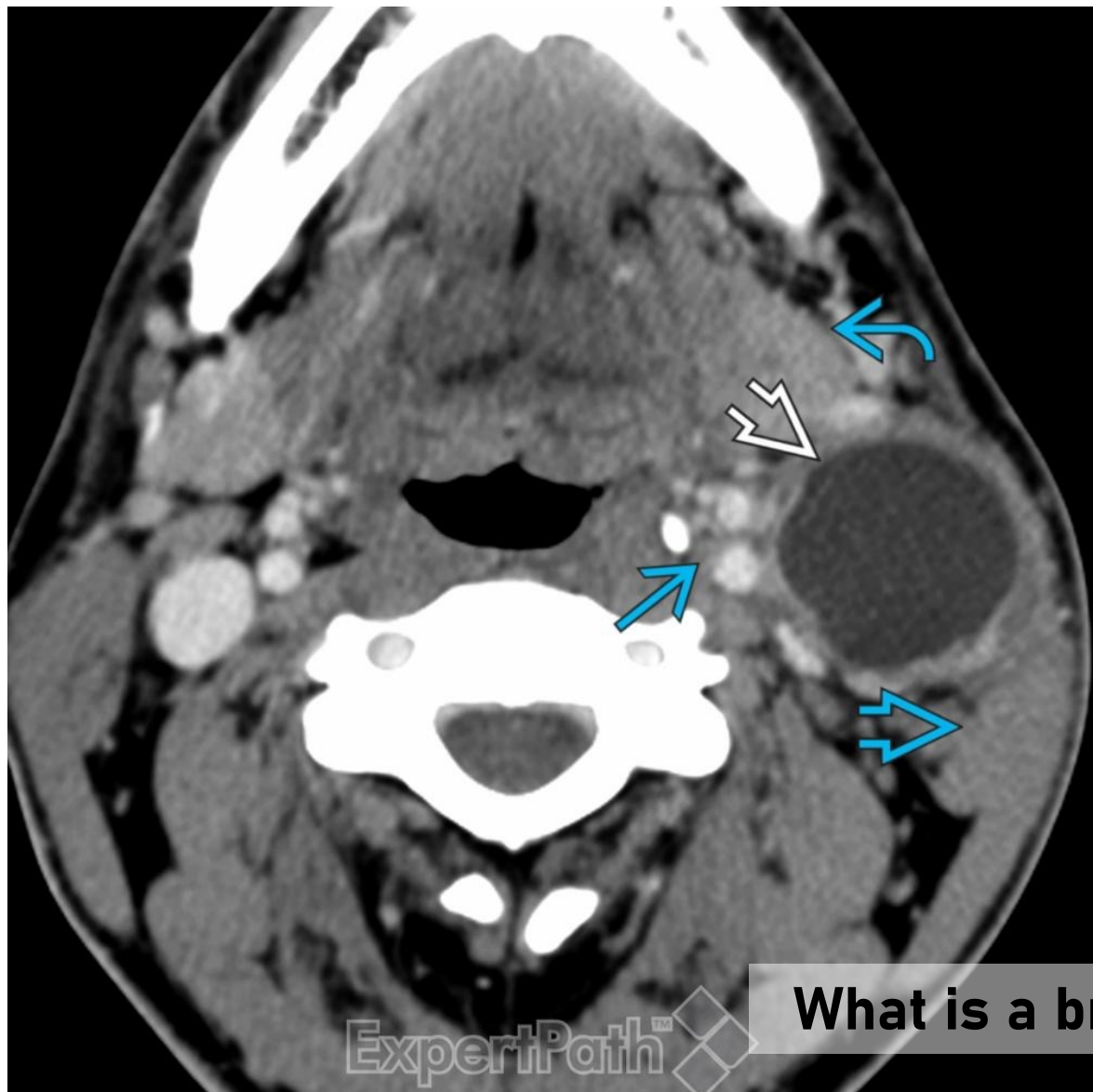
High-power H&E shows ciliated respiratory-type epithelium (black open arrow) overlying a band of smooth muscle (cyan solid arrow) closely associated with cartilage (black curved arrow).



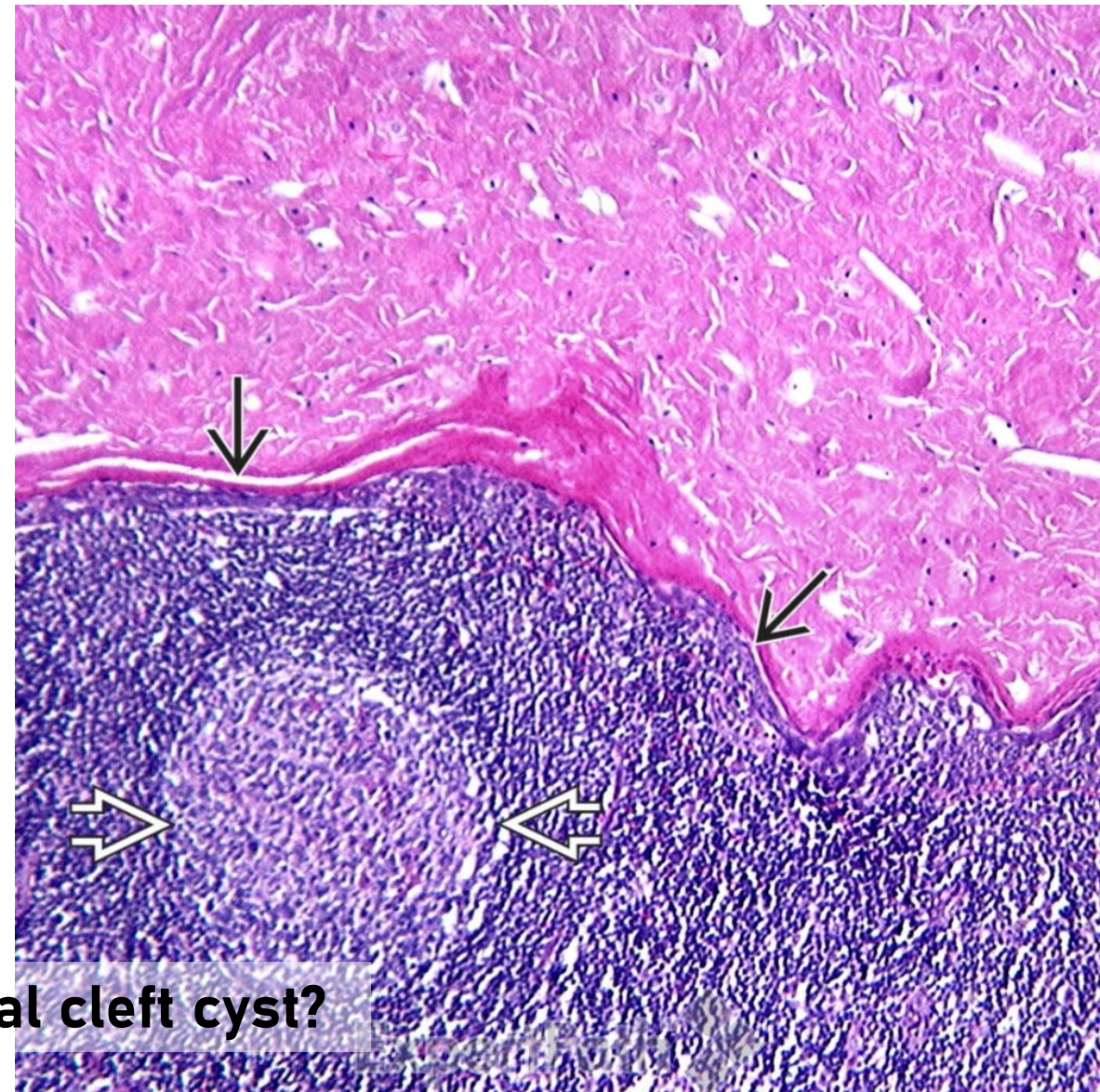
What is a bronchogenic cyst?



Axial CECT reveals a 2nd **branchial cleft cyst** (BCC) (white open arrow) located posterior to the submandibular gland (cyan curved arrow), lateral to the carotid space (cyan solid arrow), and anterior to the sternomastoid muscle (cyan open arrow). Capsule thickening suggests inflammation.



The lumen of this BCC is filled with keratinaceous debris. There is a thin, squamous epithelium (black solid arrow) without any atypia. There is a germinal center (white open arrow) within the associated lymphoid tissue.

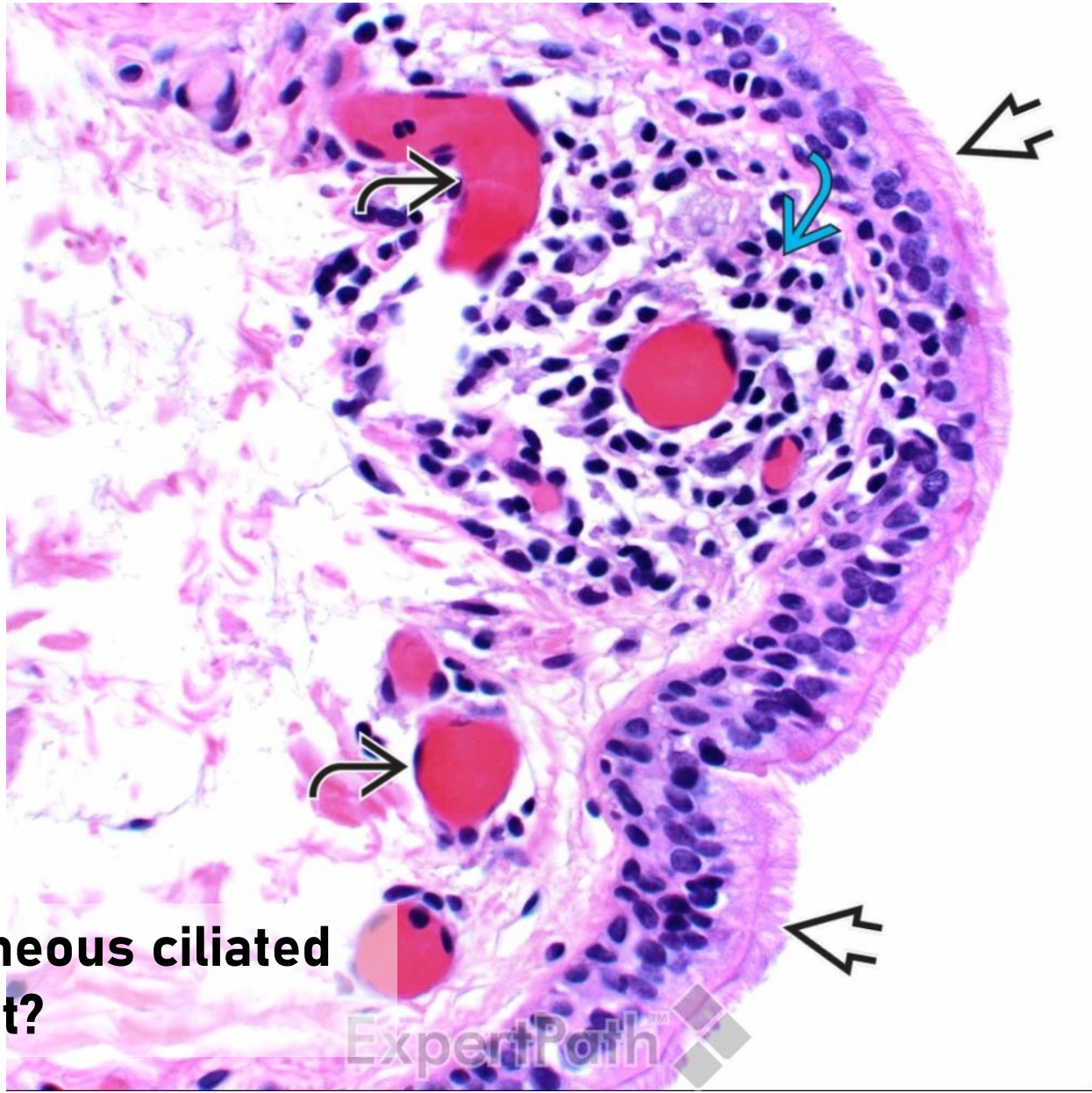
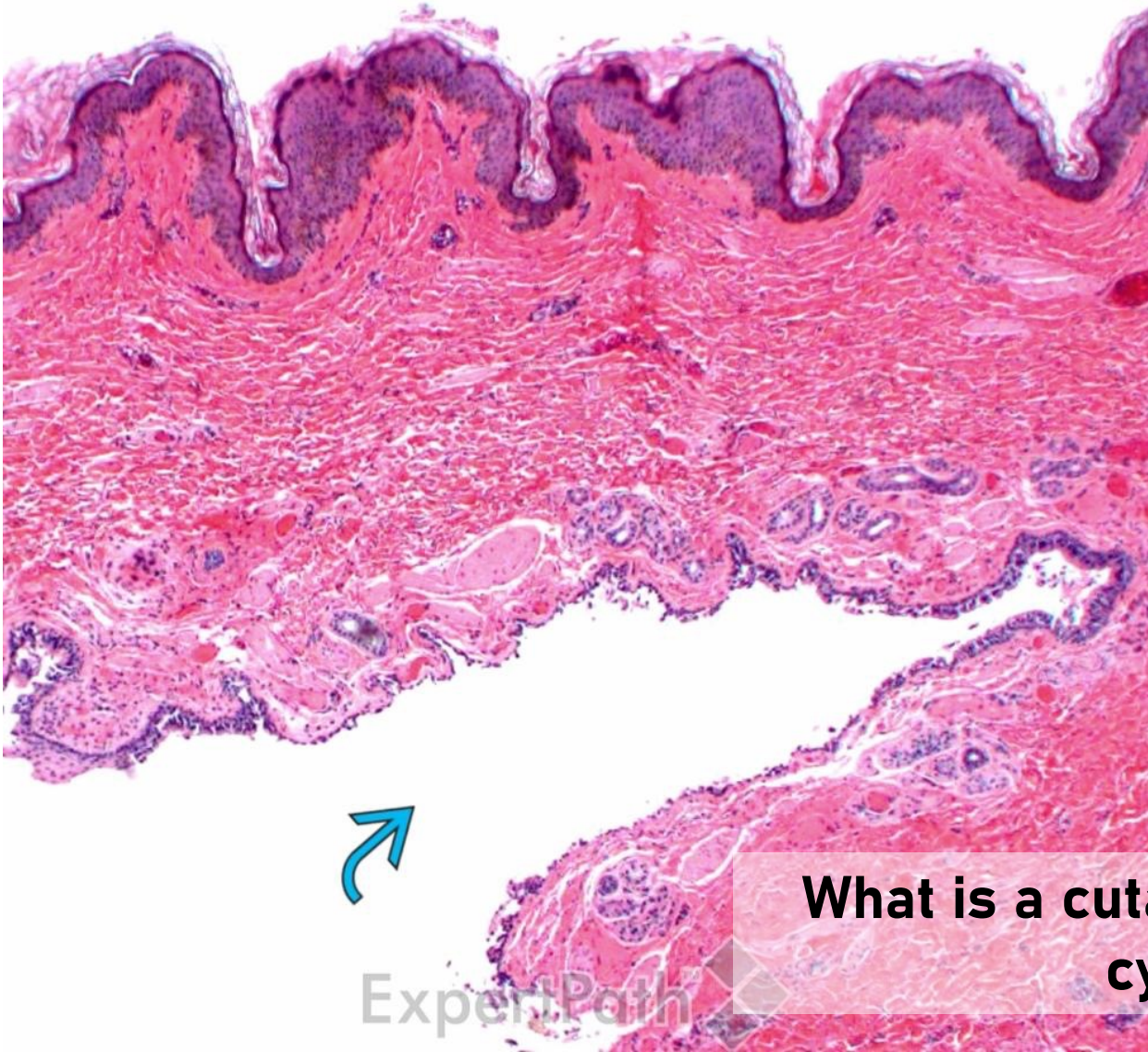


What is a branchial cleft cyst?



**Cutaneous ciliated cyst** (cyan curved arrow) presents as a unilocular cavity within the dermis. Occasionally, they may be located in the subcutis.

The fibroconnective tissue underlying the cyst wall shows small, dilated blood vessels (black curved arrow) and a surrounding subtle lymphocytic infiltrate (cyan curved arrow). Smooth muscle bundles are usually absent. As expected, a ciliated pseudo-columnar epithelium (black open arrow) lines the surface of the cavity.

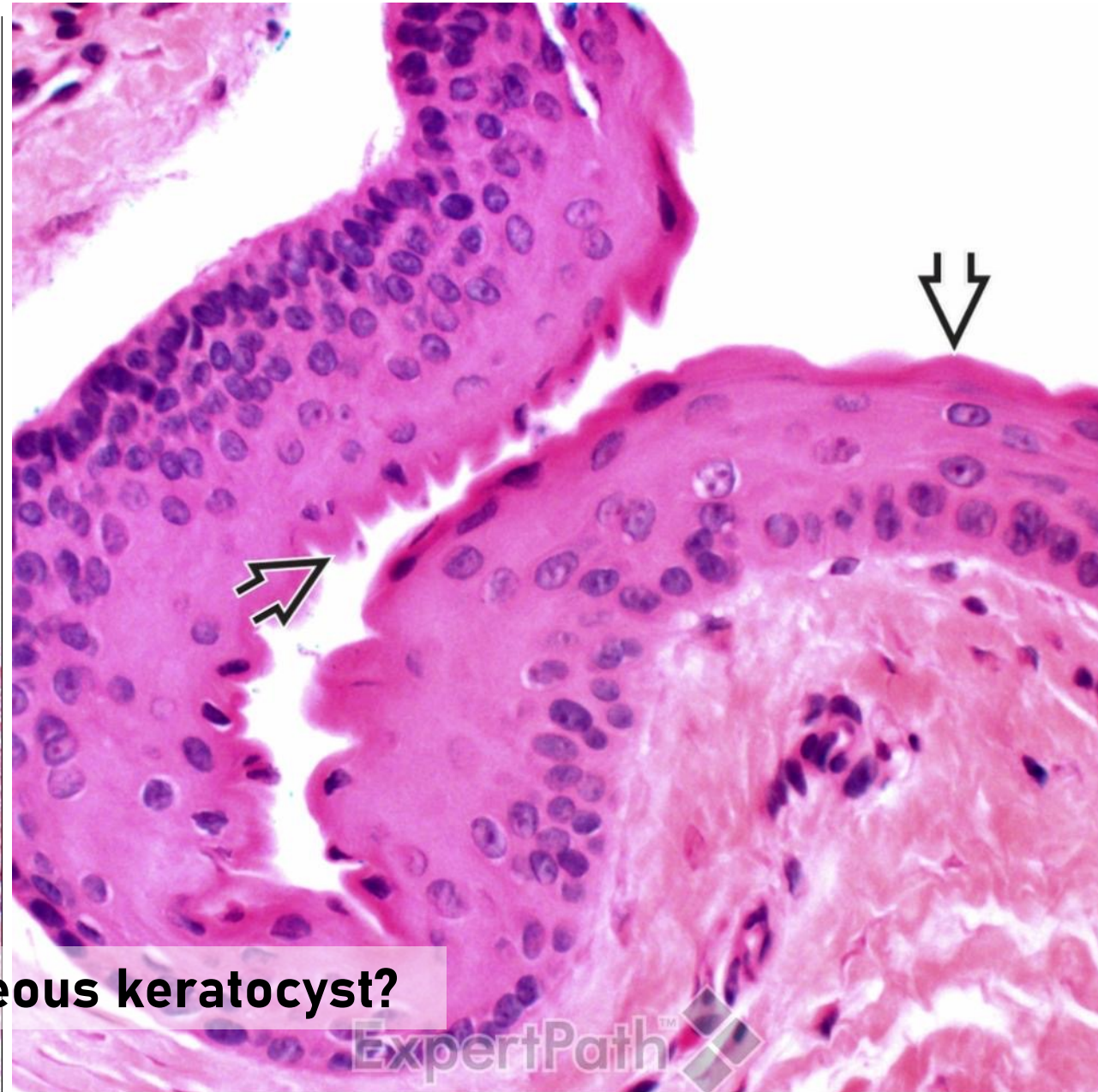


What is a cutaneous ciliated cyst?



Scanning magnification view of a **cutaneous keratocyst** shows an undulating squamous epithelium lining the irregularly shaped cystic spaces. There are no associated sebaceous glands, unlike in steatocystoma.

High-magnification view of a cutaneous keratocyst shows a bland squamous epithelium with a dense, eosinophilic, jagged-appearing cuticle (black open arrow) lining the cystic space.

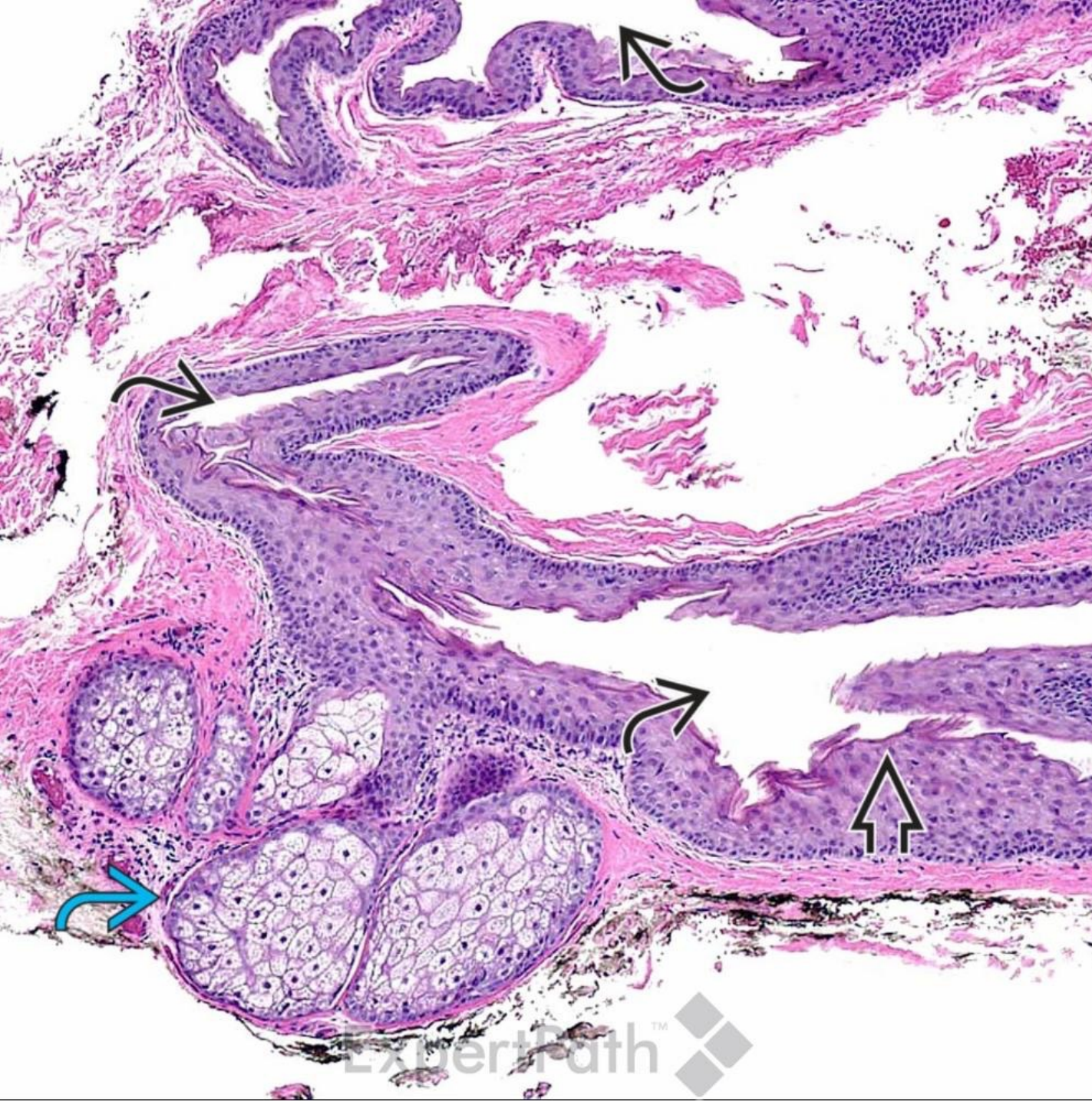


What is a cutaneous keratocyst?

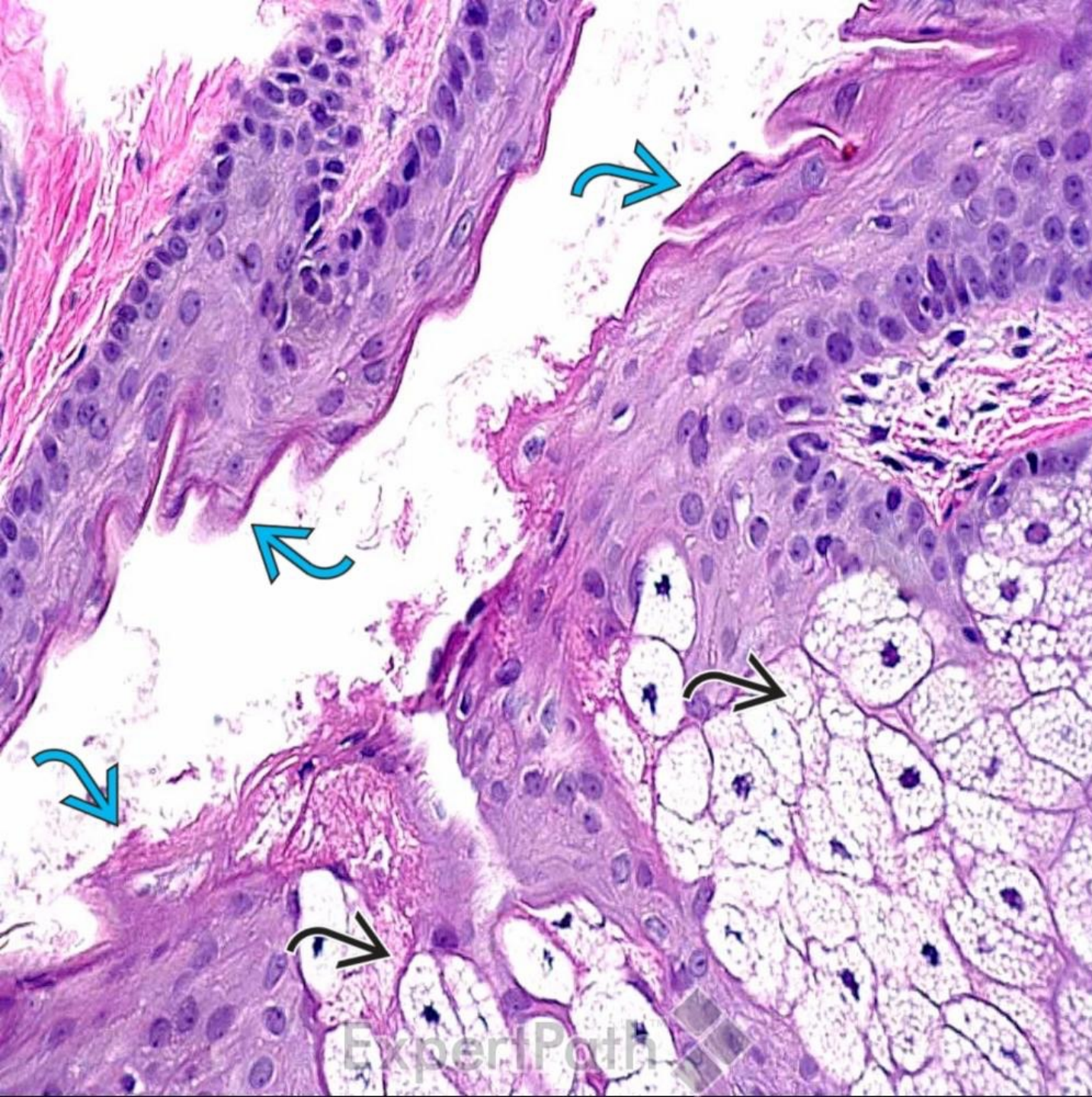


# What is steatocystoma multiplex?

A young male patient presented with multiple cystic papules. At first glance, cystic spaces (black curved arrow) are evident. There are sebaceous glands (cyan curved arrow) attached to the cyst. There is no glandular layer in the epidermal cyst lining (black open arrow).

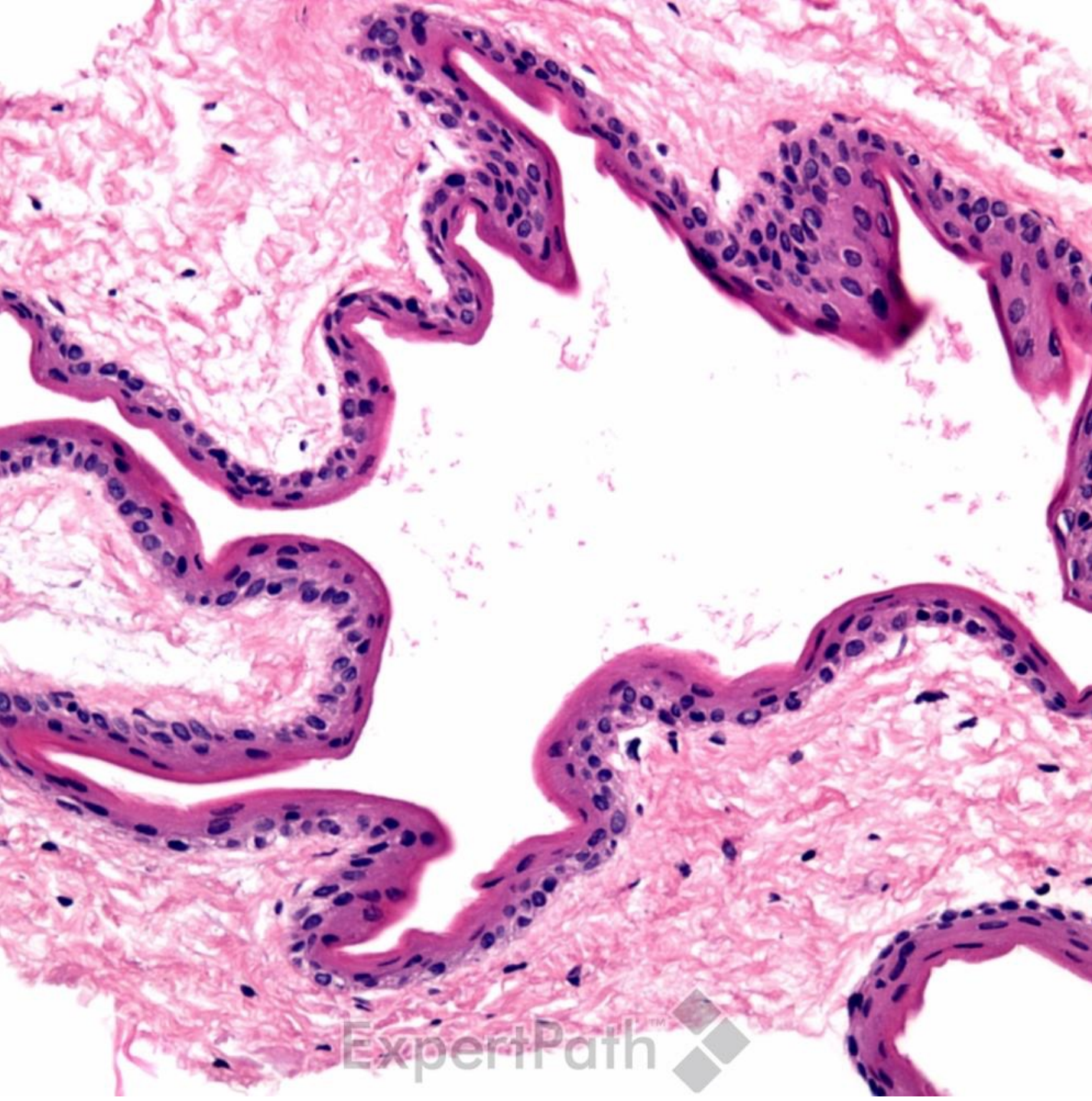






The inner surface of the cyst lining has characteristically eosinophilic jagged or shark tooth appearance (cyan curved arrow). The attached sebaceous glands (black curved arrow) are evident. Fragments of vellus hair were seen in the cystic space (not shown).





In some cases of steatocystoma, sebaceous glands may not be evident in a given histologic section. May need deeper sections to demonstrate sebaceous glands.

**DDX: cutaneous keratocyst**



## Can a cyst be related to HPV infection?

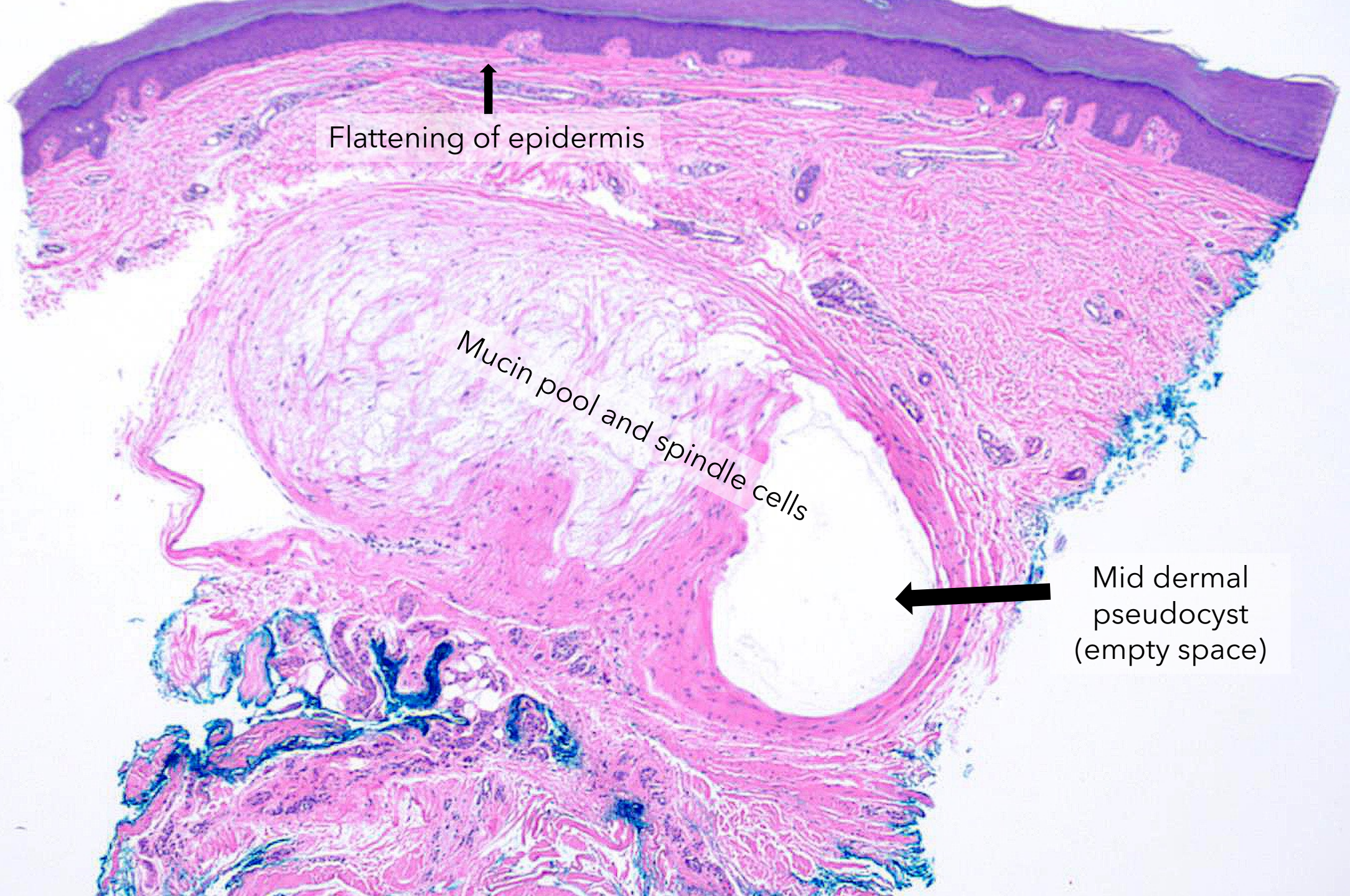
This **verrucous epidermal cyst** shows a thickened cyst wall (cyan solid arrow) lined by benign-appearing squamous epithelium. The surface epithelium displays verrucous hyperplasia with papillomatosis (black curved arrow). The lumen contains keratin (black open arrow) and a degenerating fibrovascular core (cyan curved arrow).





CYSTIC SPACE WITHOUT EPITHELIAL LINING



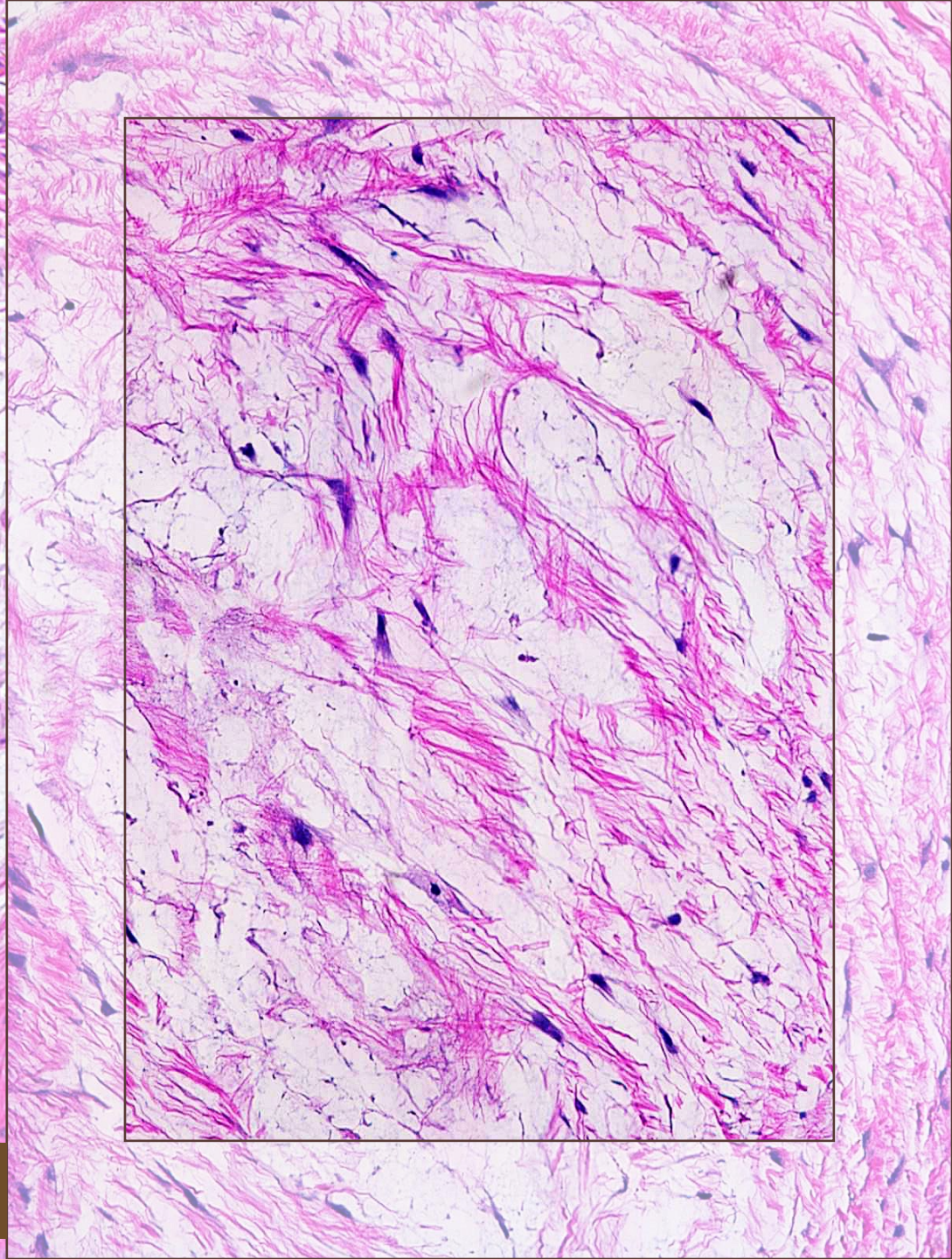
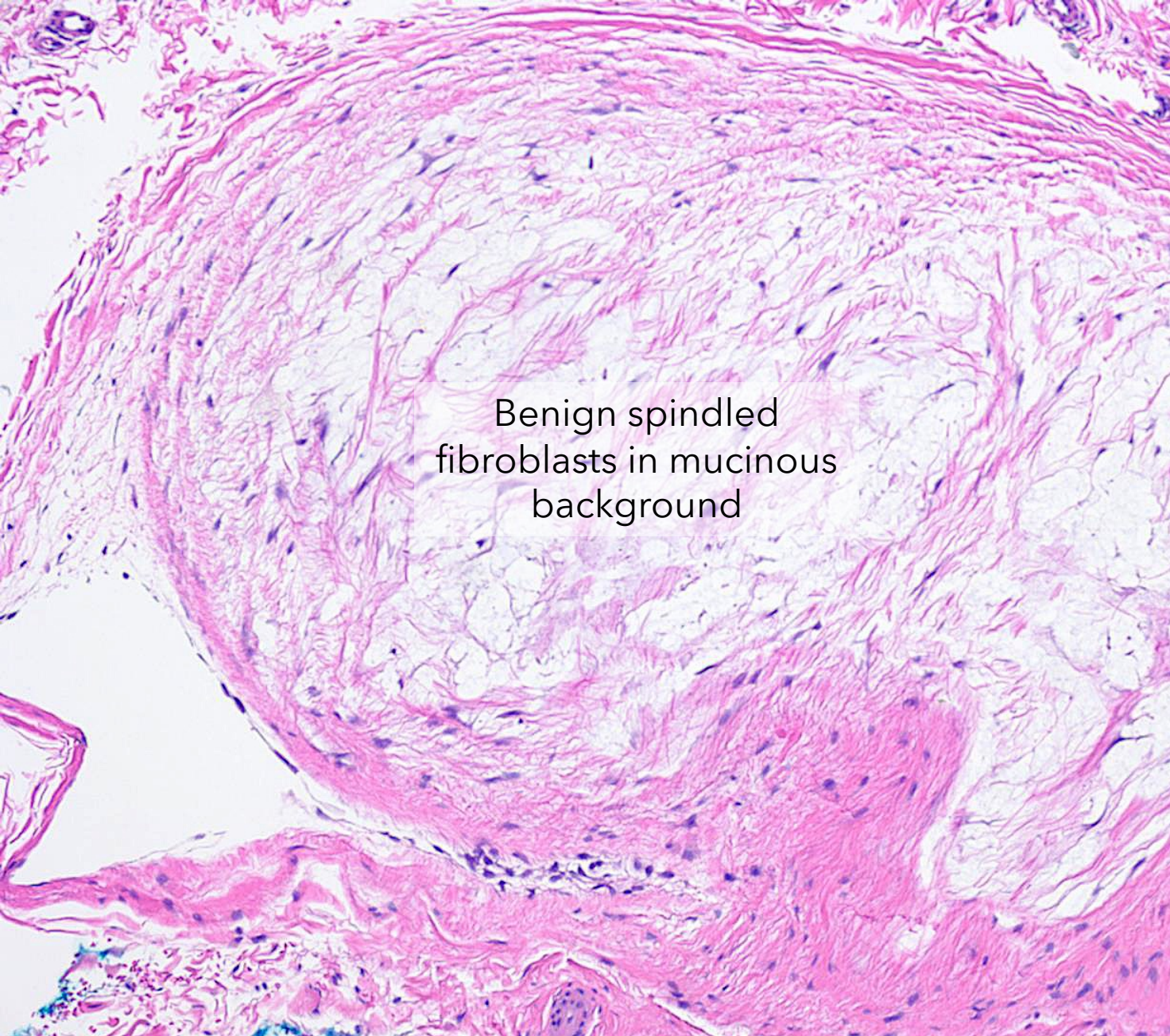


↑  
Flattening of epidermis

Mucin pool and spindle cells

←  
Mid dermal  
pseudocyst  
(empty space)





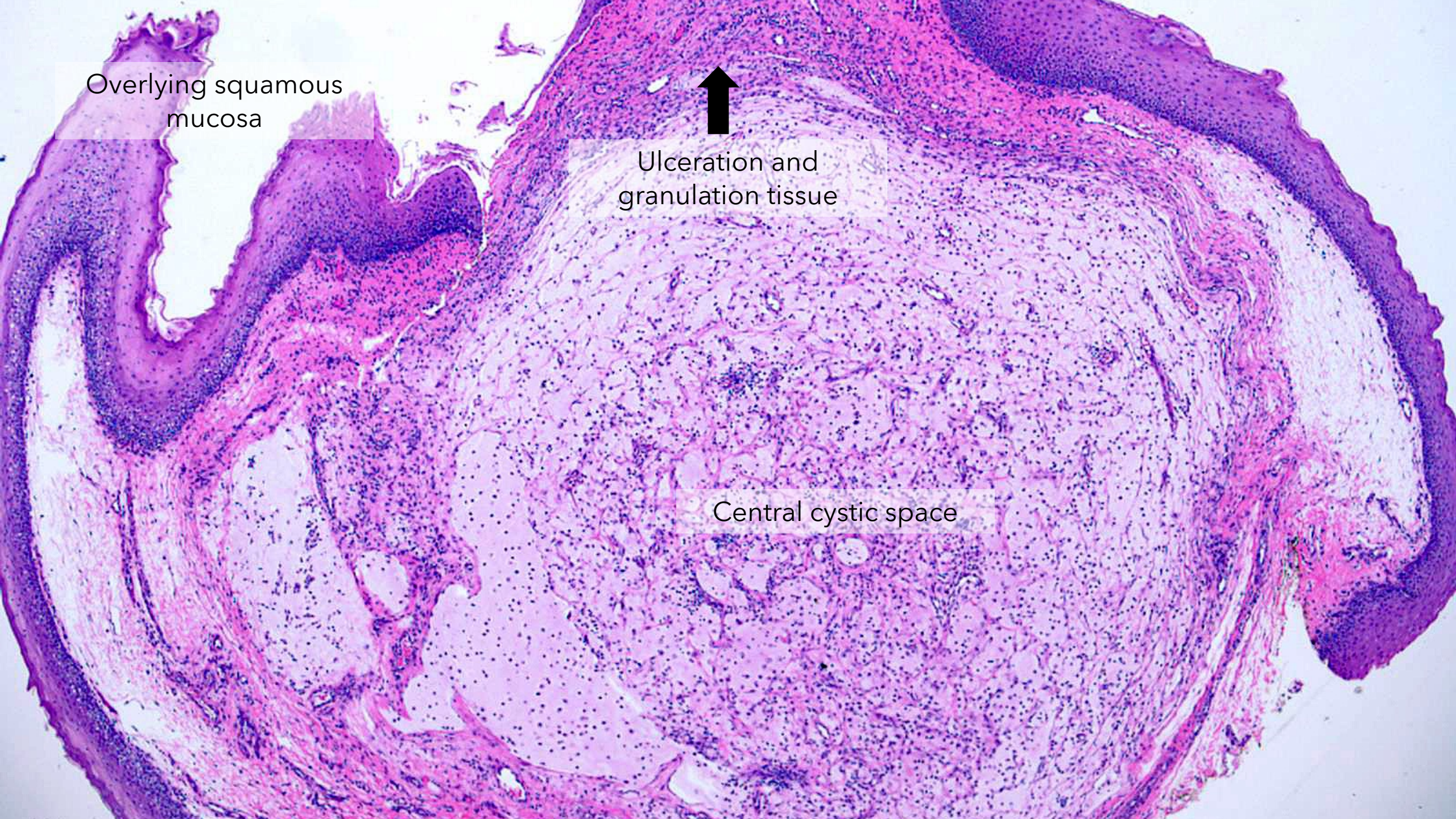
What is a digital mucous pseudocyst (cyst)?



# What is a mucocele?

Clinical photo shows a dome-shaped swelling on the lower lip, the most common location for a mucocele. Mucoceles are generally fluctuant, although older lesions may be firm on palpation. Color ranges from mucosal to blue to red and surface ulceration may be present if traumatized.





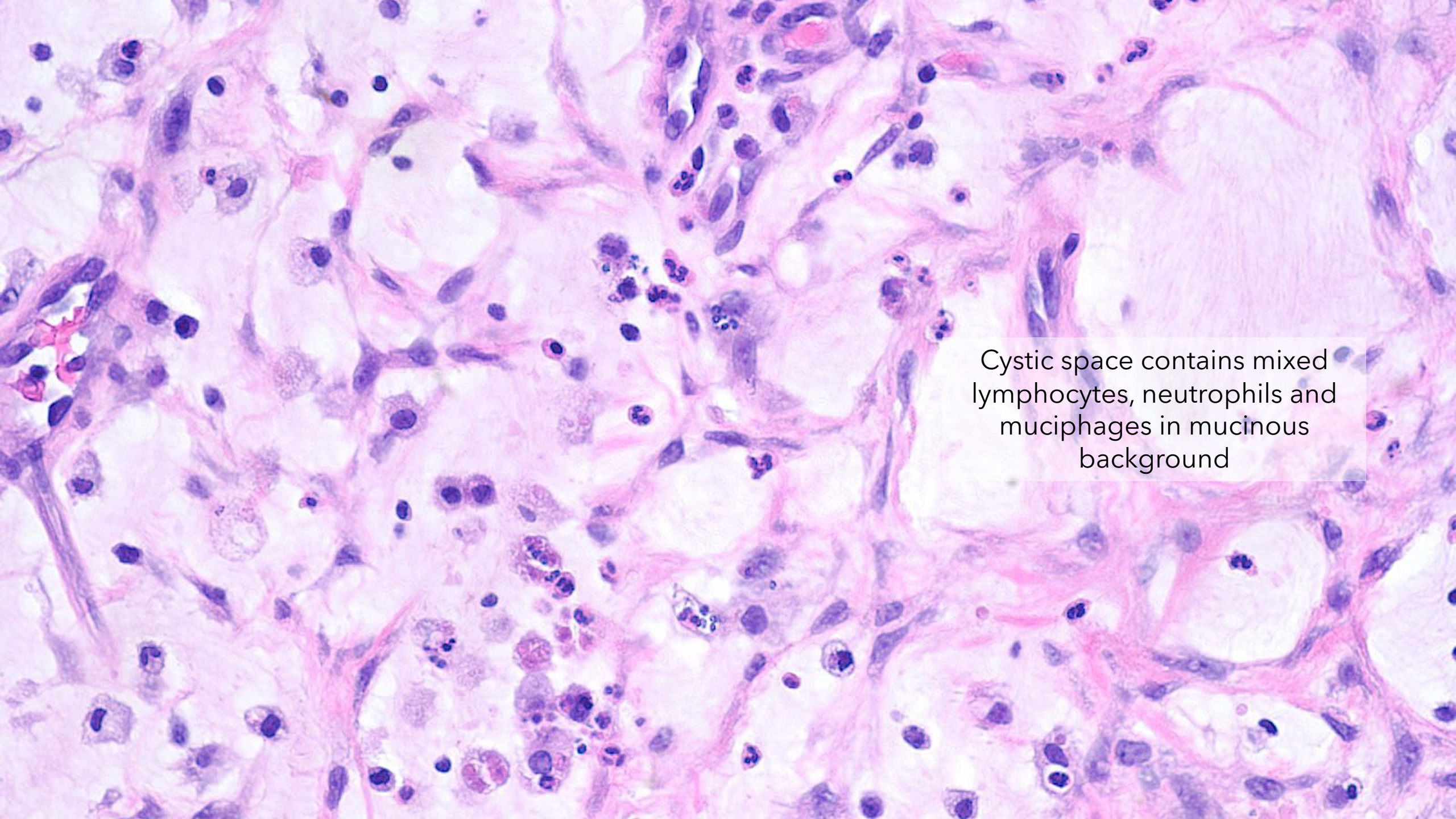
Overlying squamous  
mucosa

This histological section shows a large, irregularly shaped cystic lesion. The outer boundary is defined by a thick layer of squamous mucosa. The central area of the lesion is a large, clear space, indicating a cystic cavity. The tissue surrounding this space is densely cellular, showing signs of ulceration and granulation. The overall structure is complex, with various layers and cellular components visible.

↑  
Ulceration and  
granulation tissue

Central cystic space

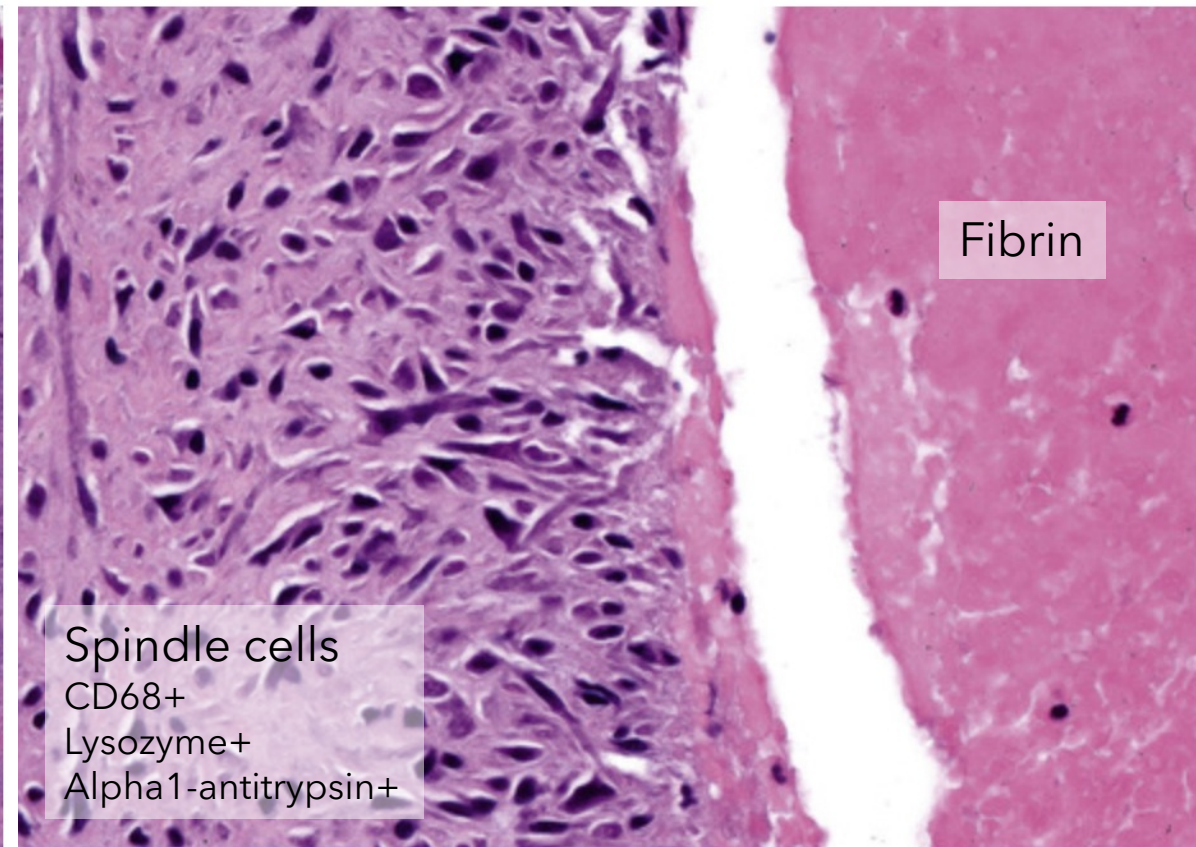
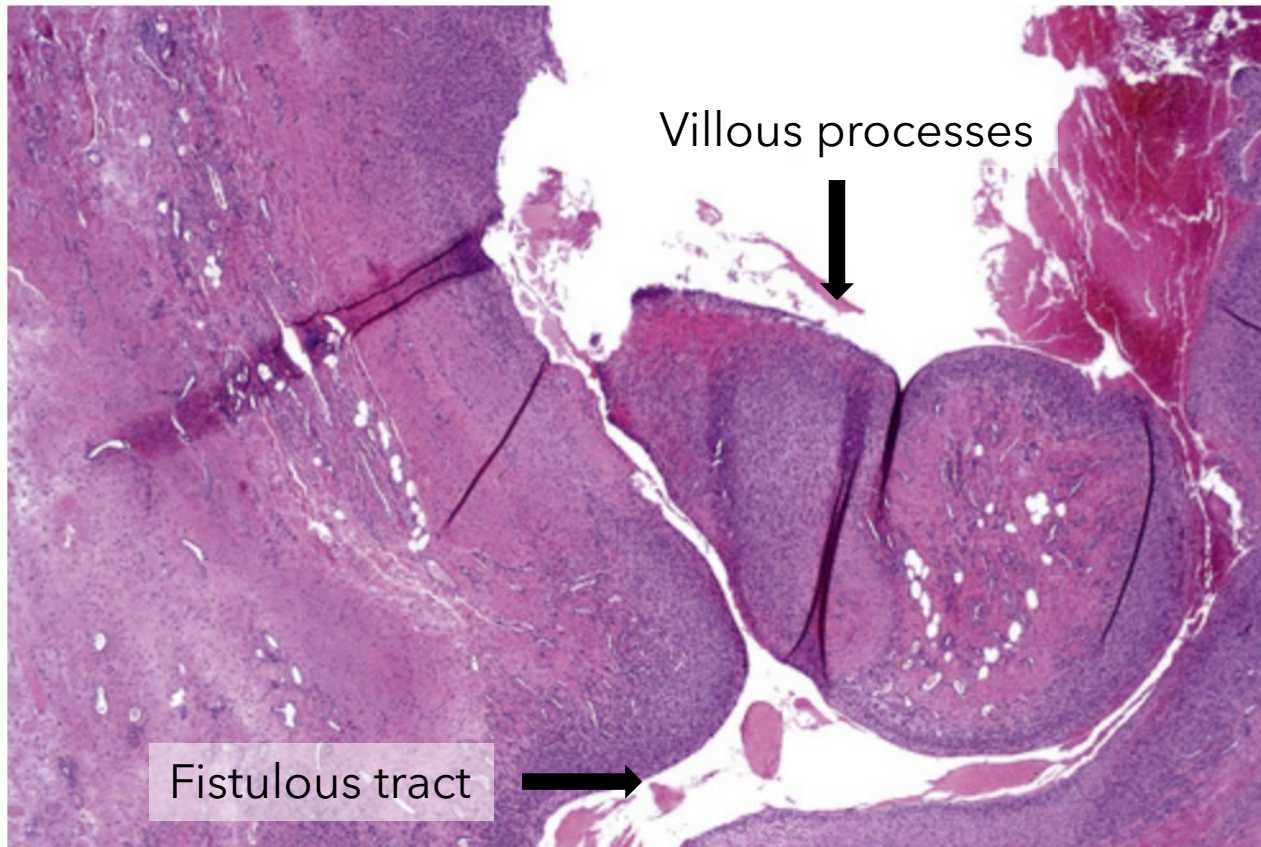




Cystic space contains mixed lymphocytes, neutrophils and muciphages in mucinous background

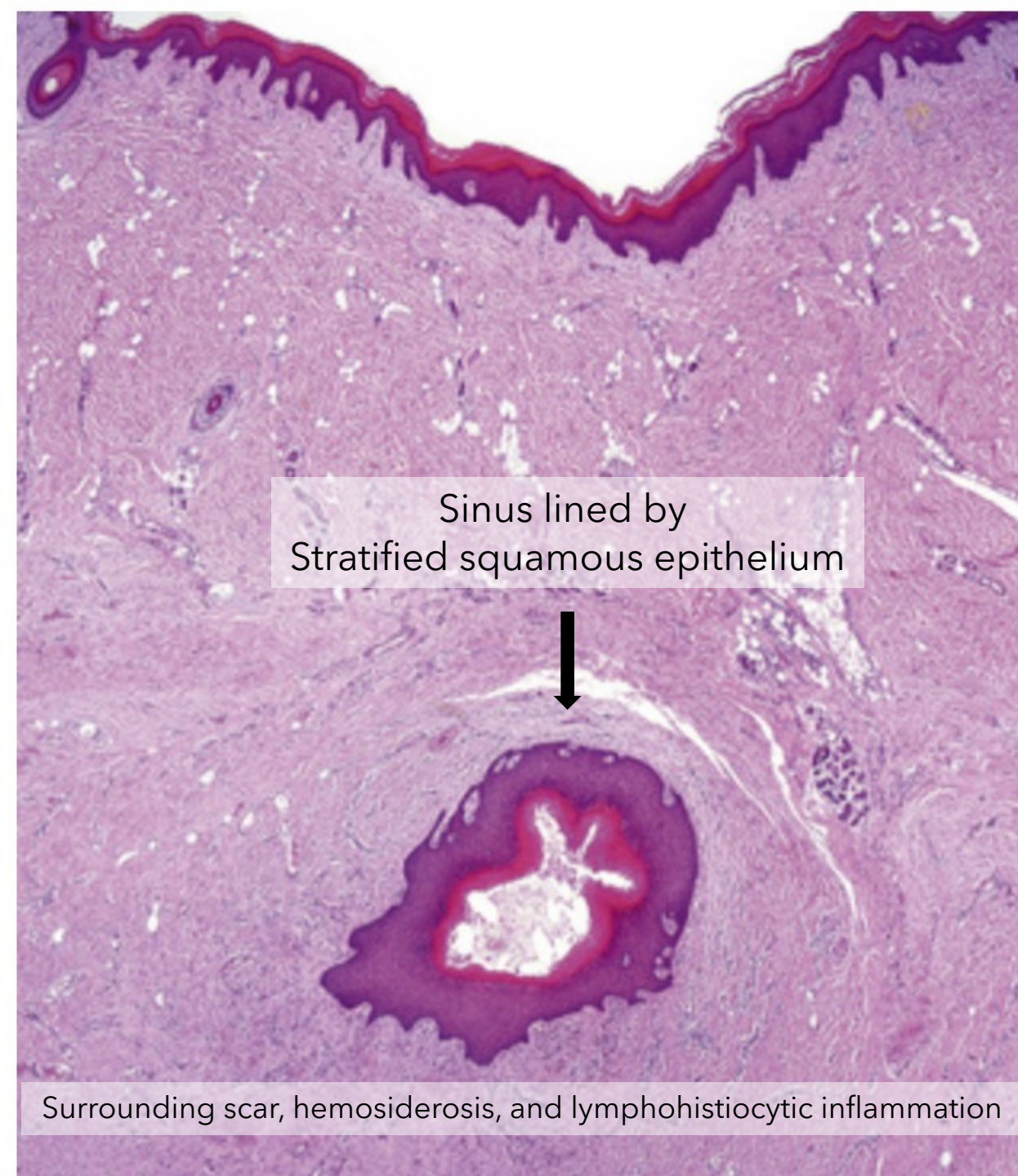


# What is a metaplastic synovial cyst?



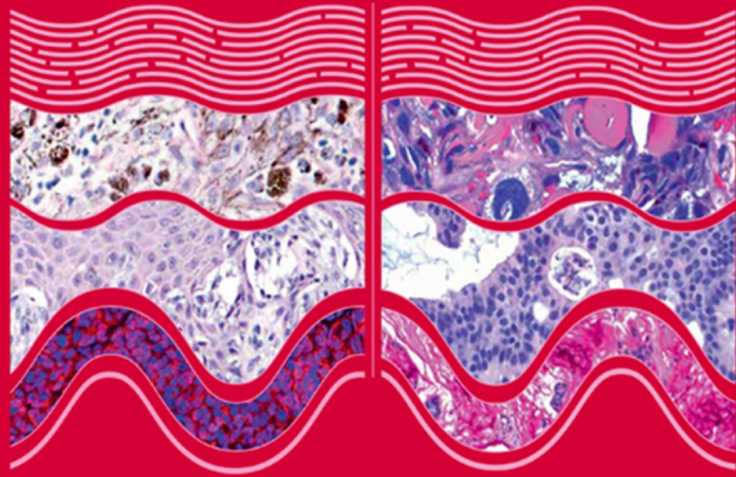


# What is a pilonidal sinus?





# References



Diagnostic Pathology

## **Neoplastic Dermatopathology**

**Cassarino | Dadras**



THIRD EDITION

- Cases of cutaneous cysts and related conditions
- Digitalskinpathology.com
- Personal collection
- *Dermatopathology*, R. L. Barnhill, 3<sup>rd</sup> edition
- *Neoplastic Dermatopathology*, 3rd edition
- <https://app.expertpath.com/>
- *McKee's Pathology of the Skin*, Eduardo Calonje, 5<sup>th</sup> edition