Skin Adnexal Tumors

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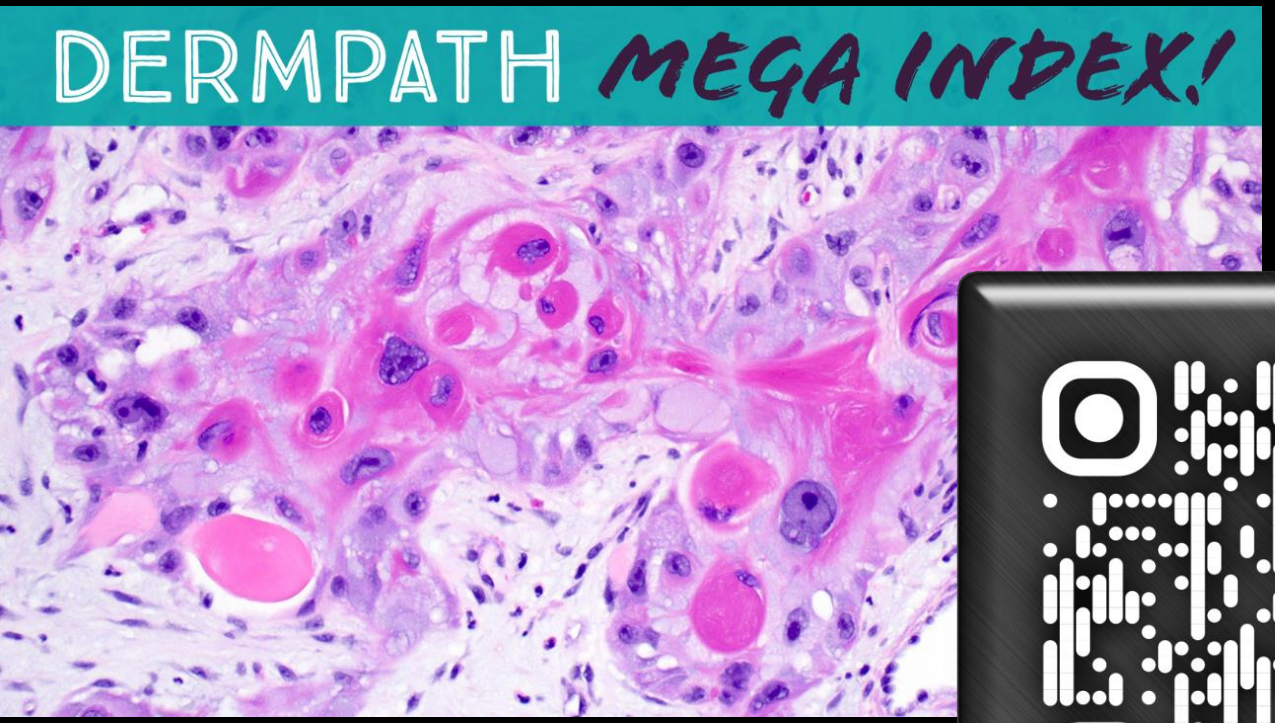
A complete organized library of all my videos, digital slides, pics, & sample pathology reports



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Outline

- Sebaceous vs Sweat Gland vs Follicular Differentiation
- Sebaceous entities
- Sweat gland entities
- Follicular entities

Skin Adnexal Tumors in Plain Language

A Practical Approach for the General Surgical Pathologist

Edward H. Fulton, MD; Jennifer R. Kaley, MD; Jerad M. Gardner, MD

• ***Context.***—**Skin adnexal tumors, those neoplasms deriving from hair follicles and sweat glands, are often a source of confusion amongst even experienced pathologists. Many well-described entities have overlapping features, tumors are often only partially sampled, and many cases do not fit neatly into well-established classification schemes.**

Objectives.—**To simplify categorization of adnexal tumors for the general surgical pathologist and to shed light on many of the diagnostic dilemmas commonly encountered in daily practice. The following review breaks adnexal neoplasms into 3 groups: sebaceous, sweat gland-derived, and follicular.**

Data Sources.—**Pathology reference texts and primary literature regarding adnexal tumors.**

Conclusions.—**Review of the clinical and histopathologic features of primary cutaneous adnexal tumors, and the diagnostic dilemmas they create, will assist the general surgical pathologist in diagnosing these often challenging lesions.**

(*Arch Pathol Lab Med.* 2019;143:832–851; doi: 10.5858/arpa.2018-0189-RA)

As a general guideline, one might consider the possibility of an adnexal tumor when there is an epithelial proliferation in the dermis or subcutis that looks different from common epidermally-derived lesions like basal cell or squamous cell carcinoma, or is otherwise challenging to classify. In our dermatopathology practice at a tertiary academic medical center, we see adnexal neoplasms

range from small duct lumens within individual tumor cells all the way up to large dilated cystic spaces comprising much of the volume of the entire tumor. If there are no sebocytes or sweat ducts, then the last step is to consider the possibility of a hair follicle proliferation. This is often the most difficult category to recognize in our opinion, as follicular proliferations represent the most diverse group of

Free PDF at Arch Pathol Lab Med website

Sebaceous vs Sweat Gland vs Follicular Differentiation

Skin Adnexa:

1. Sebaceous
2. Sweat gland/duct
3. Hair follicle

Clues for Skin Adnexal Tumors:

1. Sebocytes
2. Ducts, glands, tubules
3. Basaloid, palisading, cellular spindled stroma

Epithelial neoplasm in skin that doesn't fit for BCC, SCC, SK, or other common lesion?

Think of…

1. Adnexal tumor
2. Metastatic carcinoma

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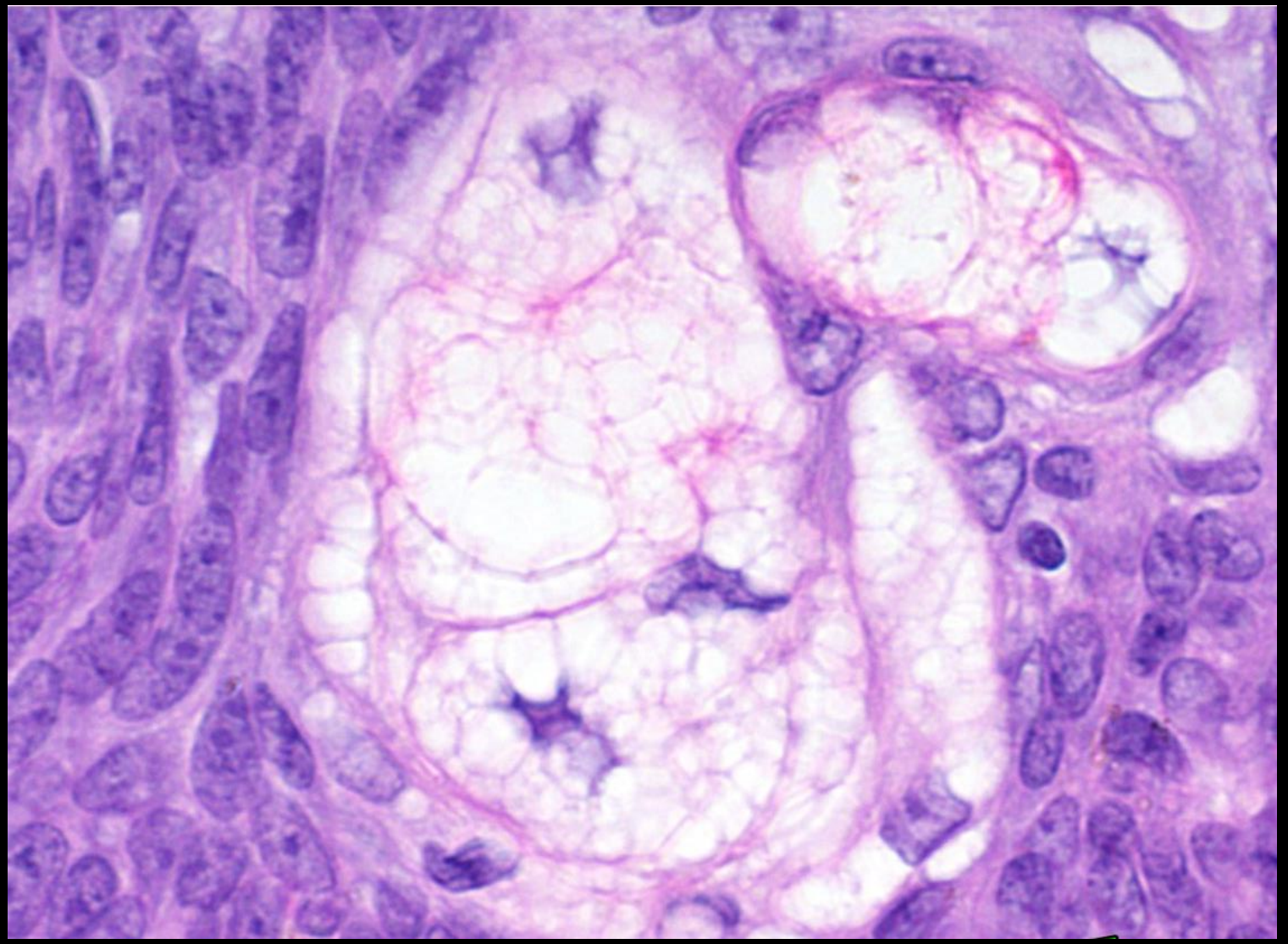
Sebocytes

Clear vacuoles (lipid)

Sharply circumscribed

Scallop/indent nuclei



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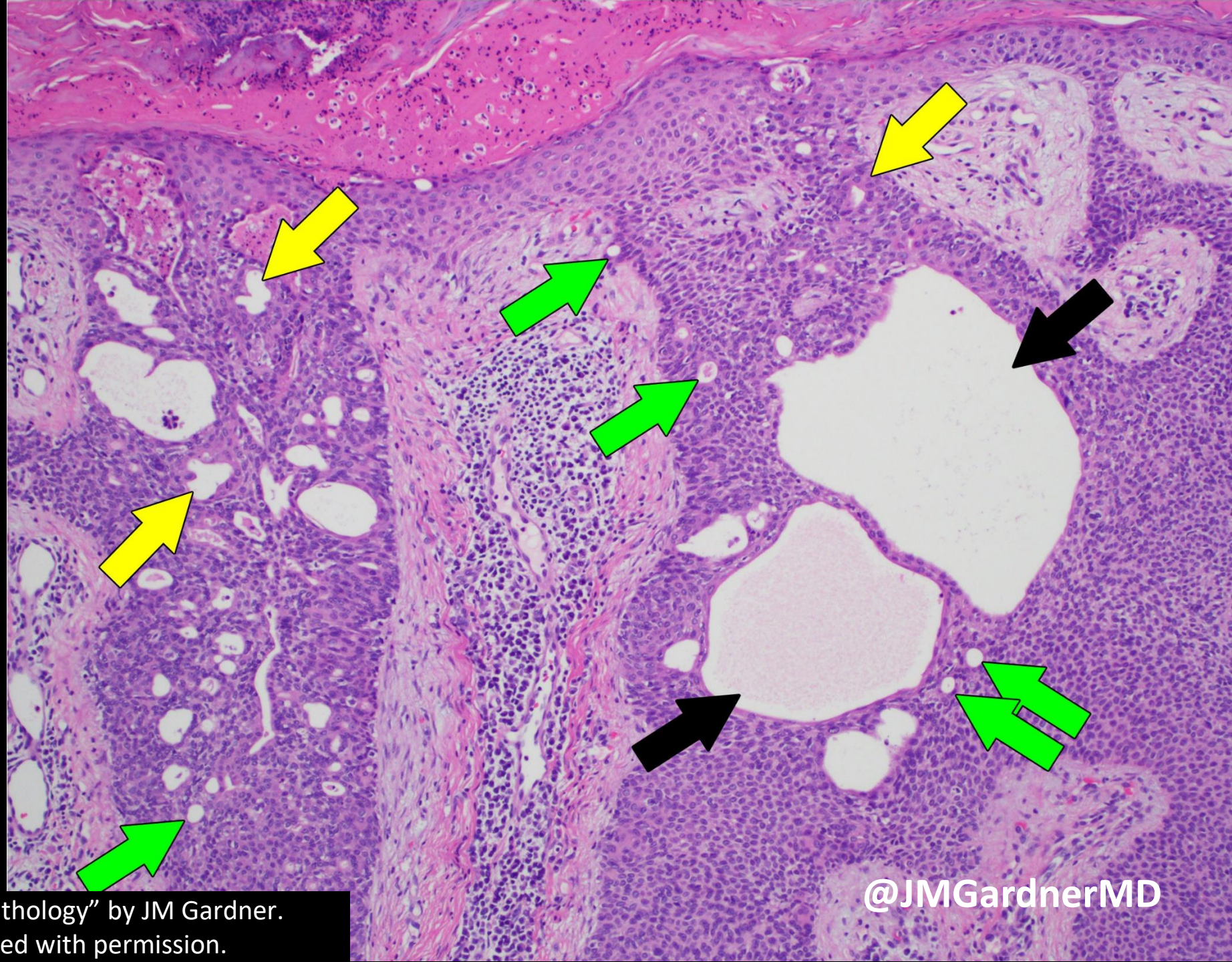
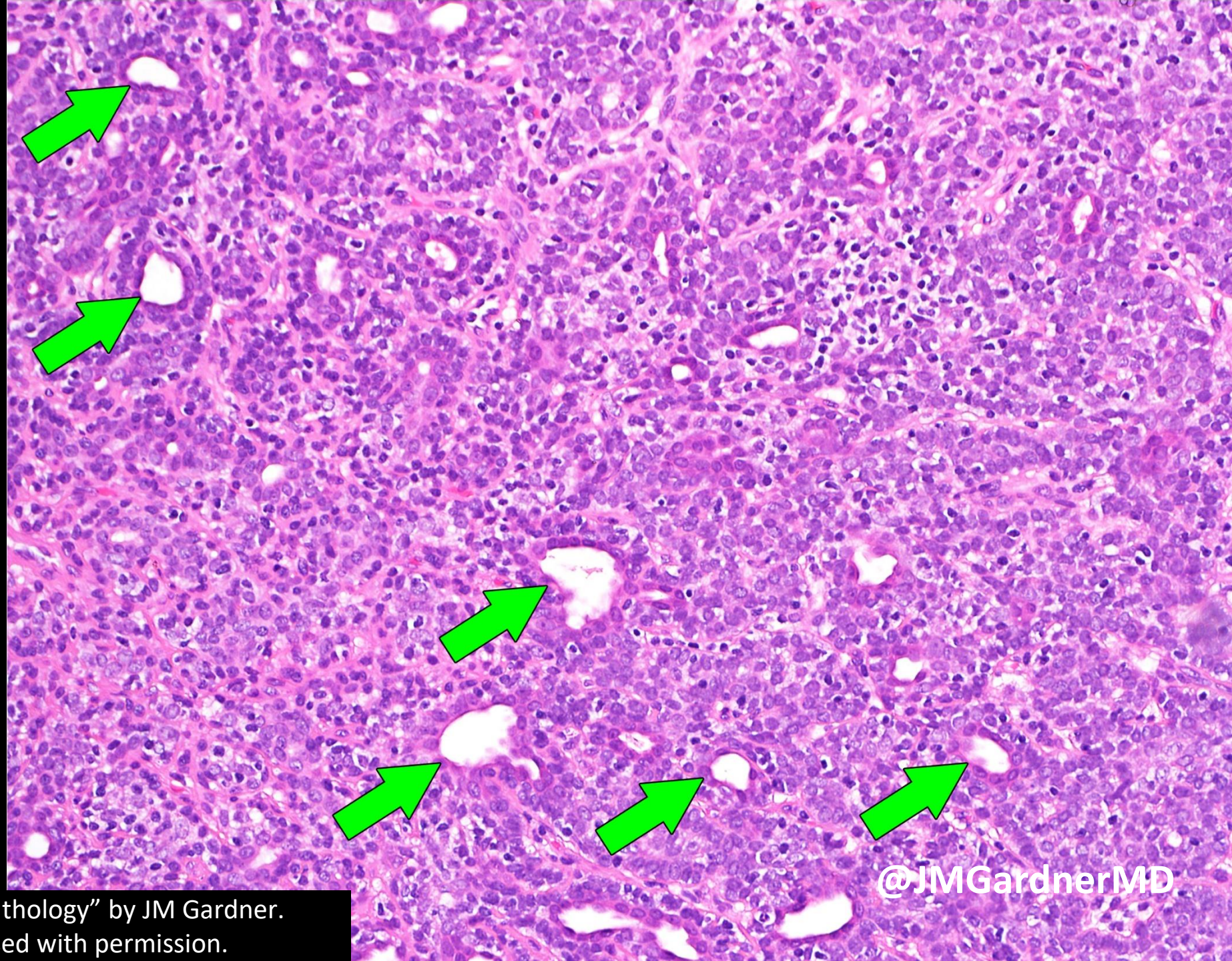
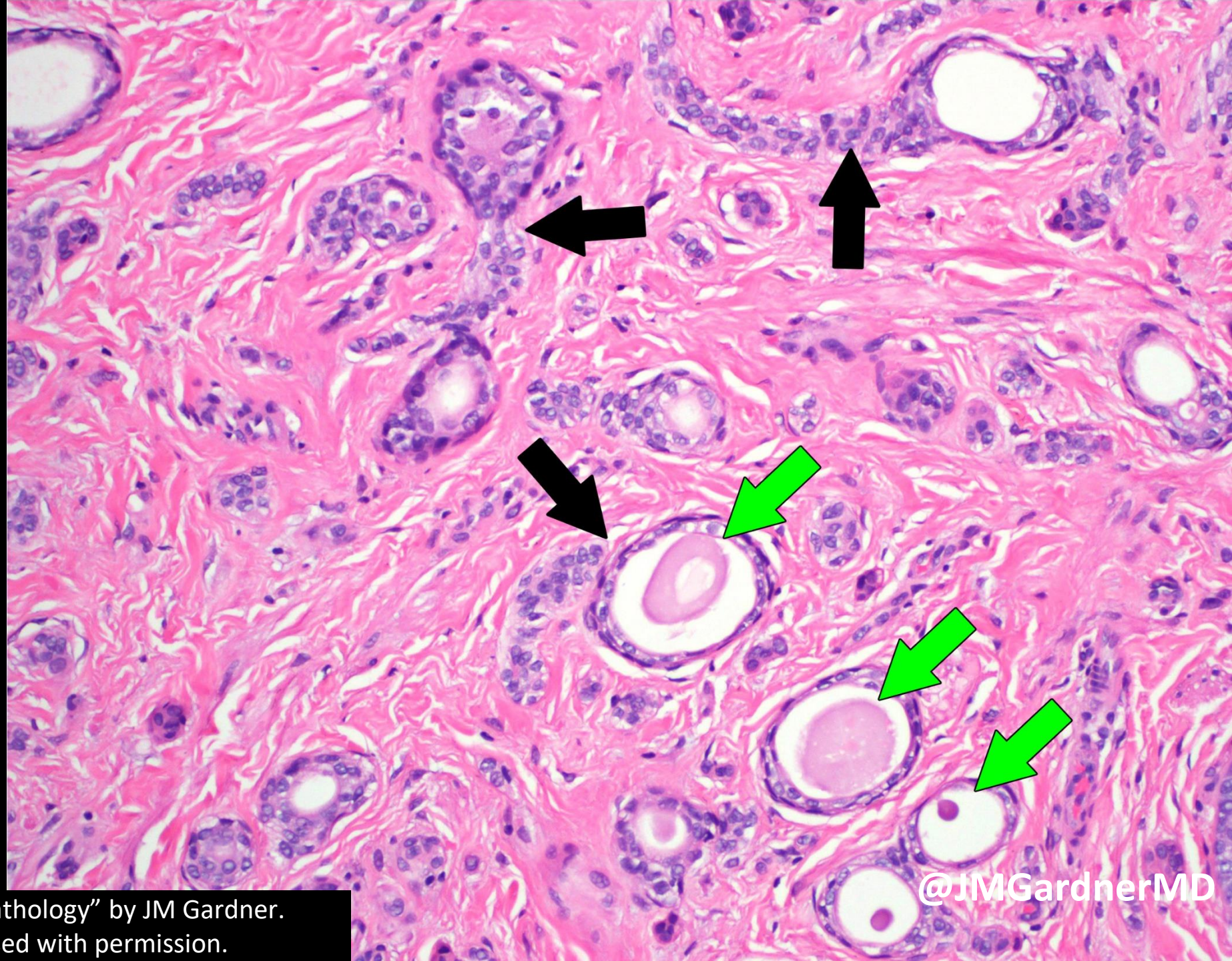
Sweat ducts (sharply defined spaces within tumor)



Sweat ducts

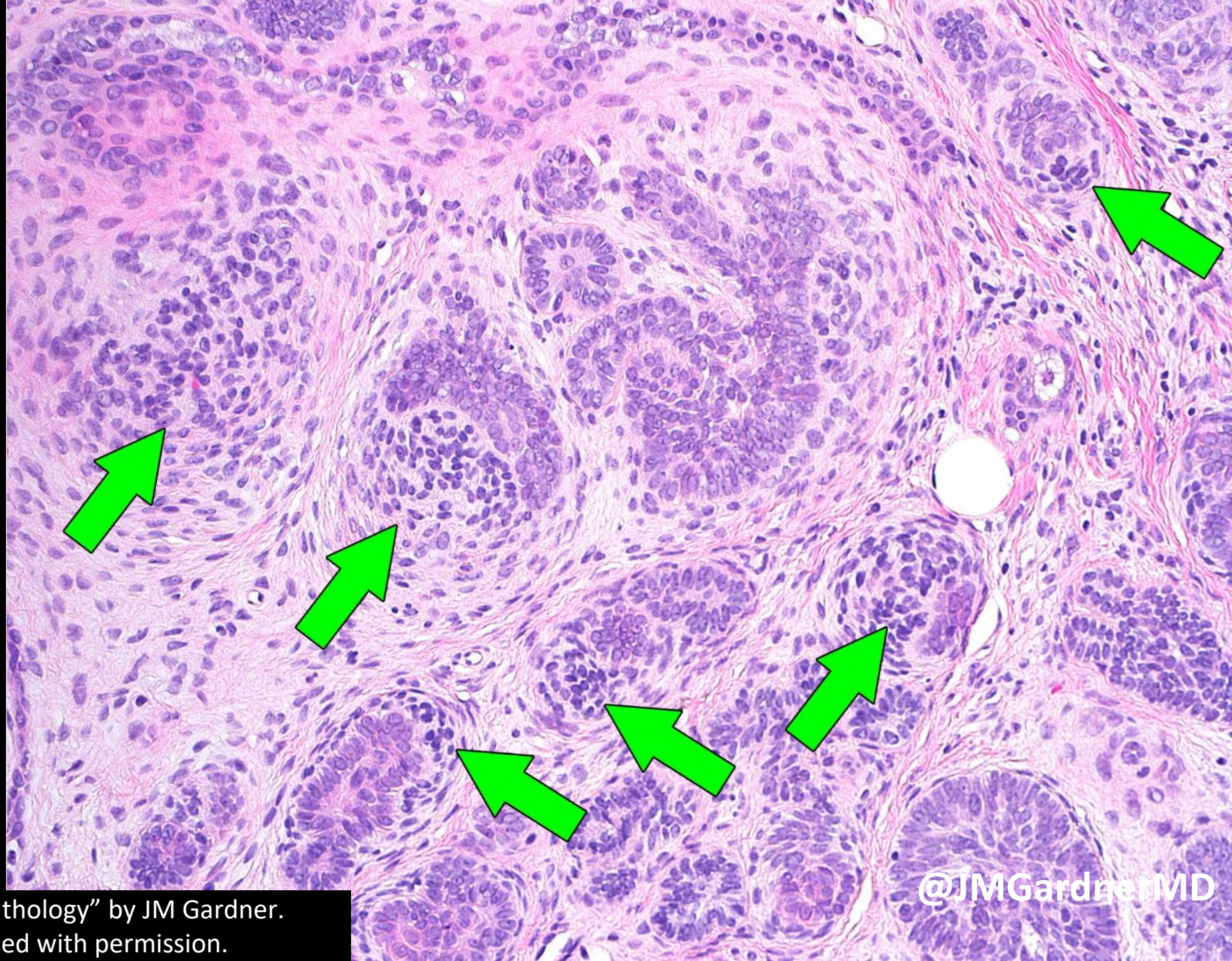


Sweat ducts (tubules or glands in dermis)



Follicular tumors:

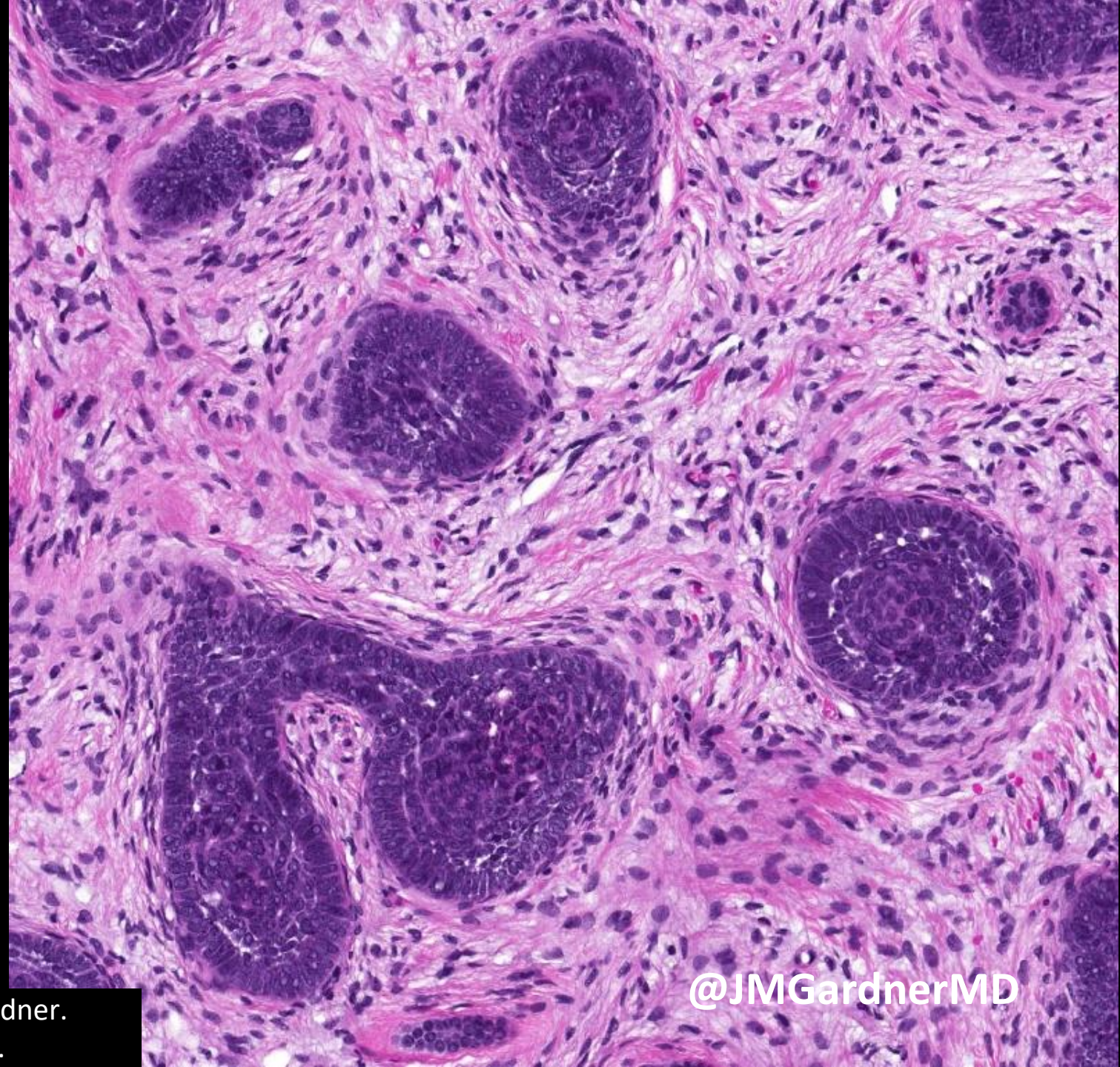
- Basaloid cells
- Peripheral palisading
- Cellular spindled stroma
- +/- papillary mesenchymal bodies (arrows)

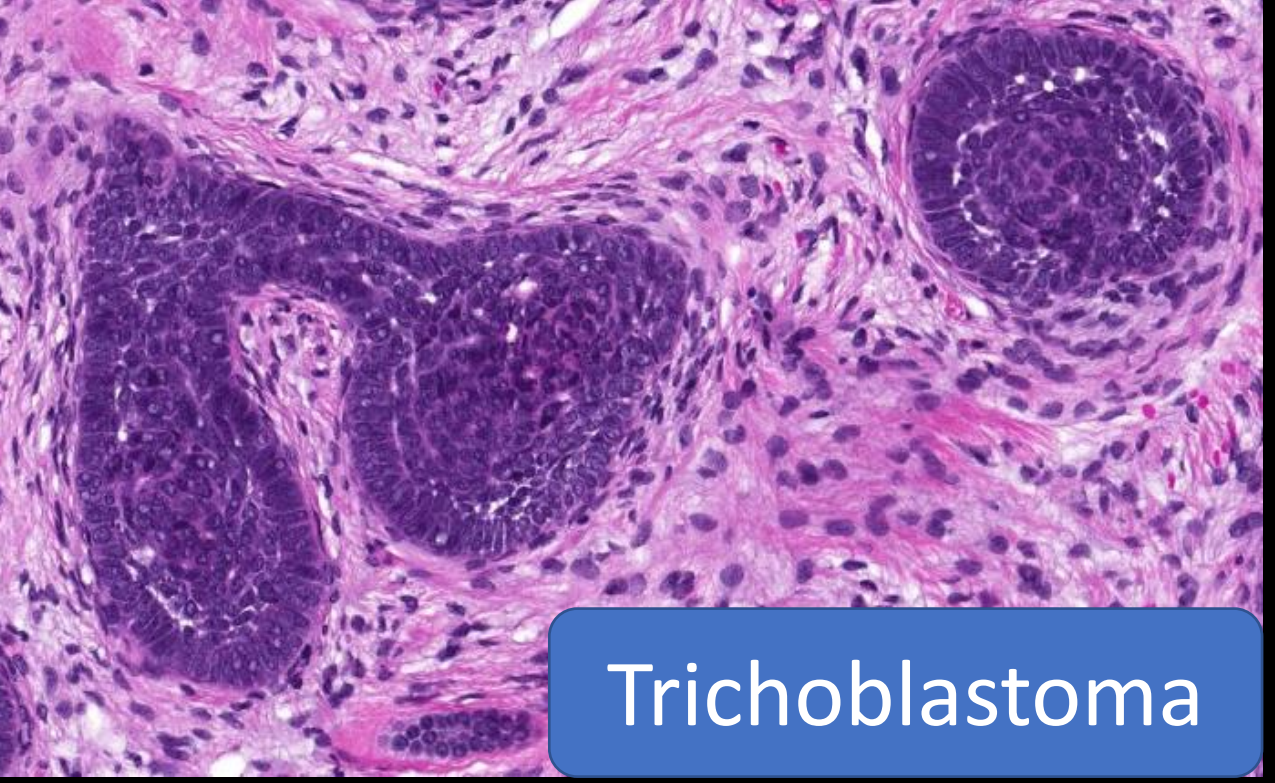


Follicular tumors

- Basaloid cells
- Peripheral palisading
- Cellular spindled stroma
- +/- papillary mesenchymal bodies (arrows)

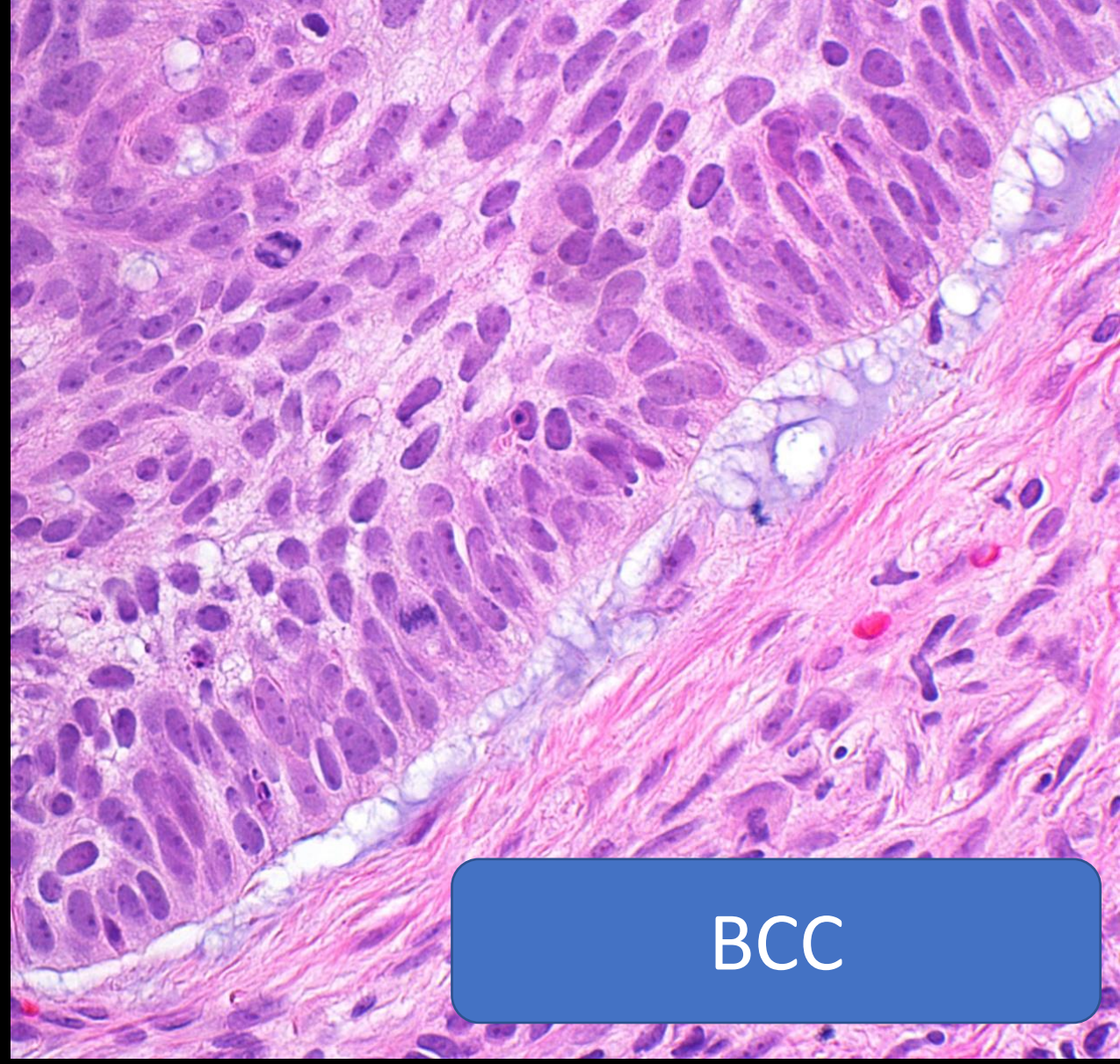
Looks like BCC, but lacks clefting and lacks mucinous stroma…think of follicular tumors





Trichoblastoma

Looks like BCC, but lacks clefting and lacks mucinous stroma…think of follicular neoplasm



BCC

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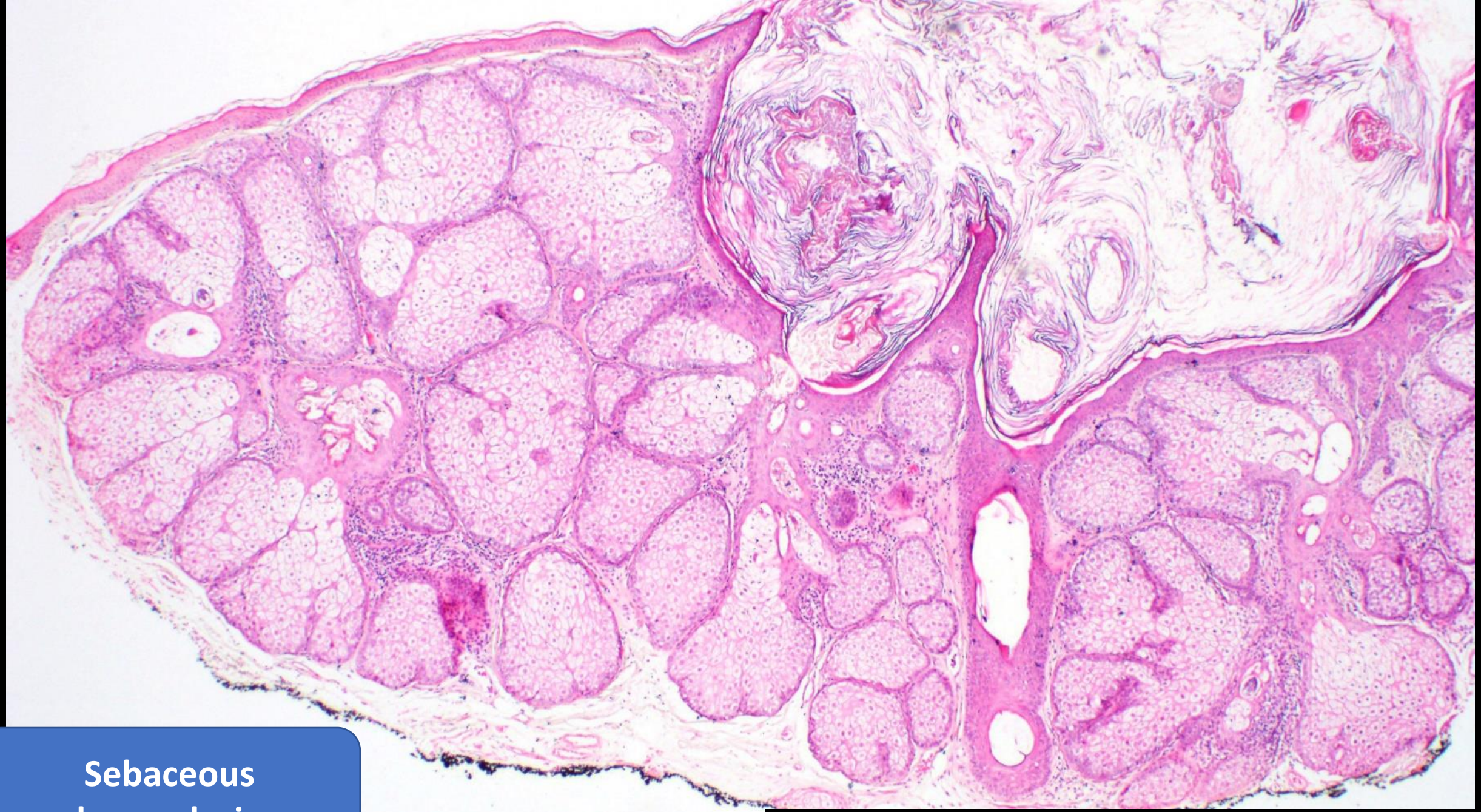
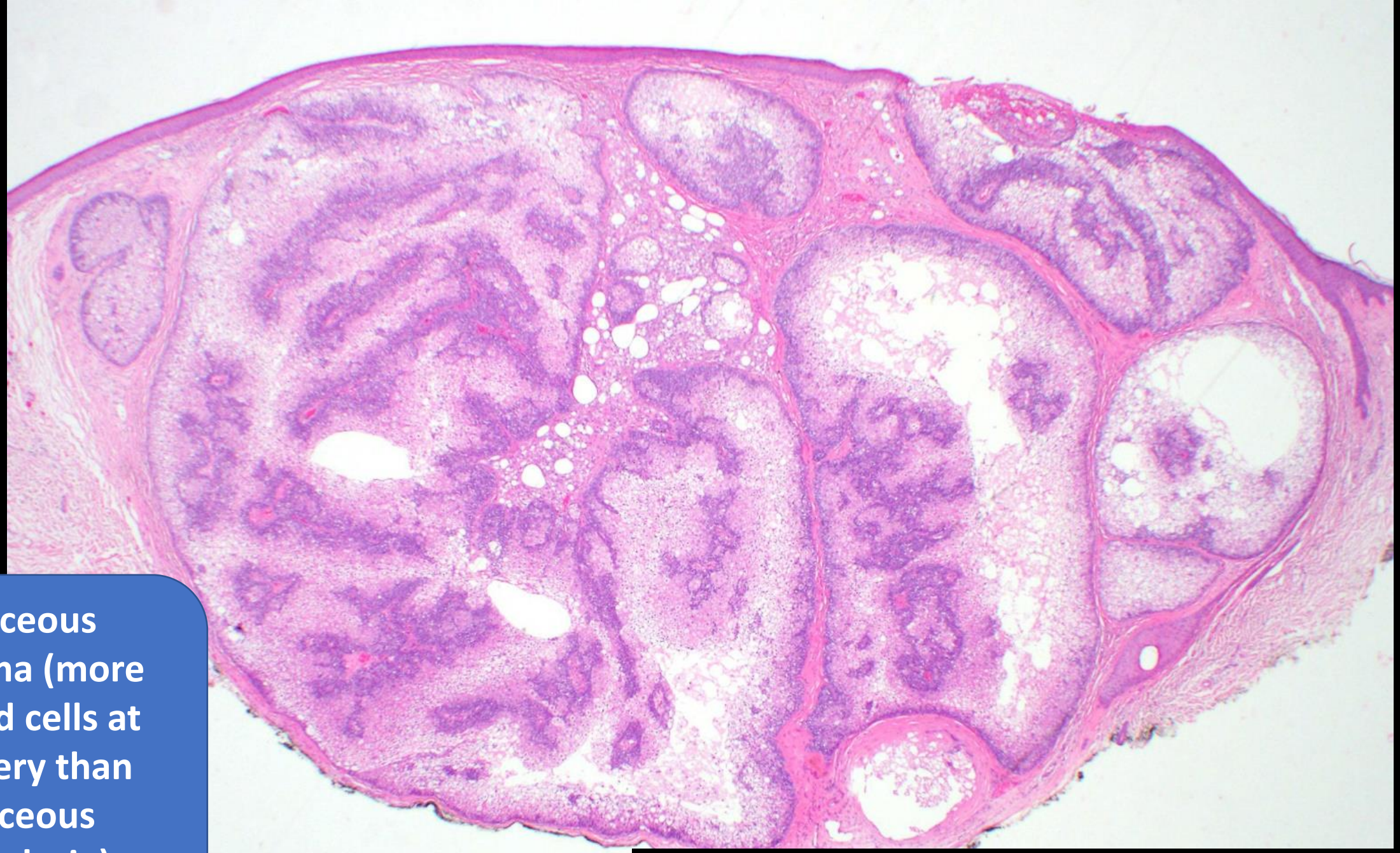
Sebaceous Entities

- Sebaceous hyperplasia
- Sebaceous adenoma
- Sebaceoma (on a spectrum with sebaceous adenoma IMO)
- Sebaceous carcinoma



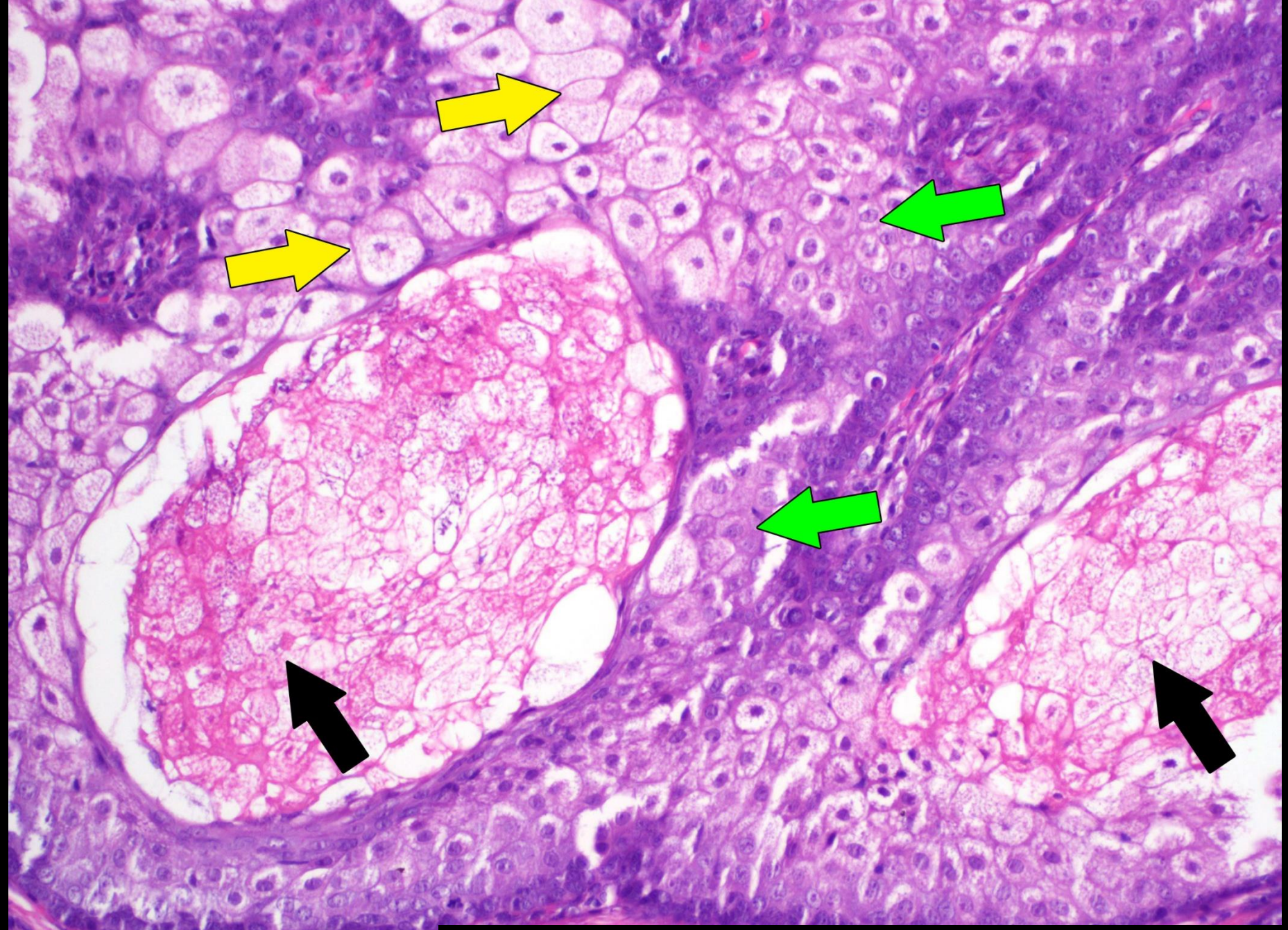
Sebaceous hyperplasia

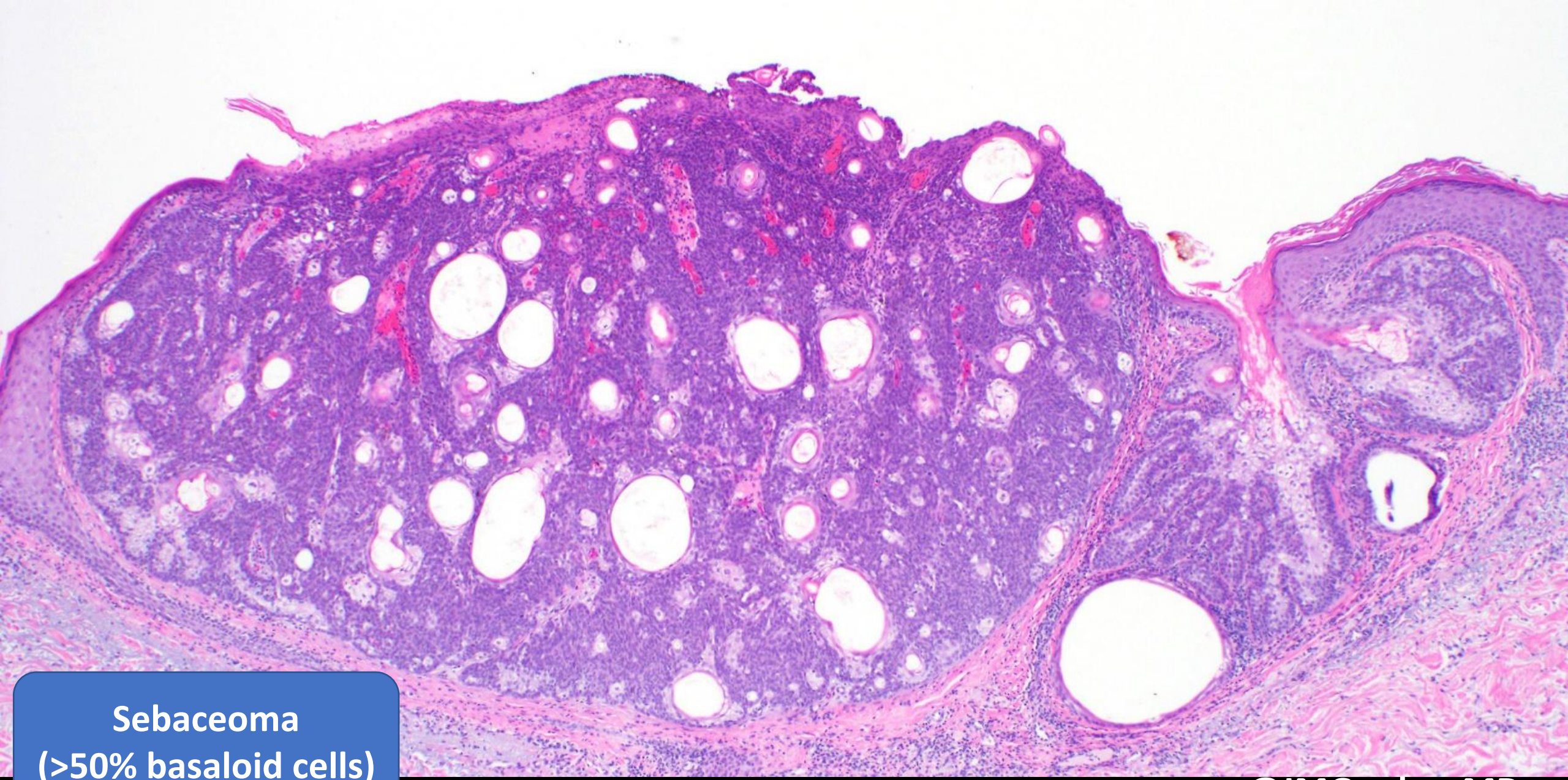


Sebaceous Adenoma (more basaloid cells at periphery than sebaceous hyperplasia)

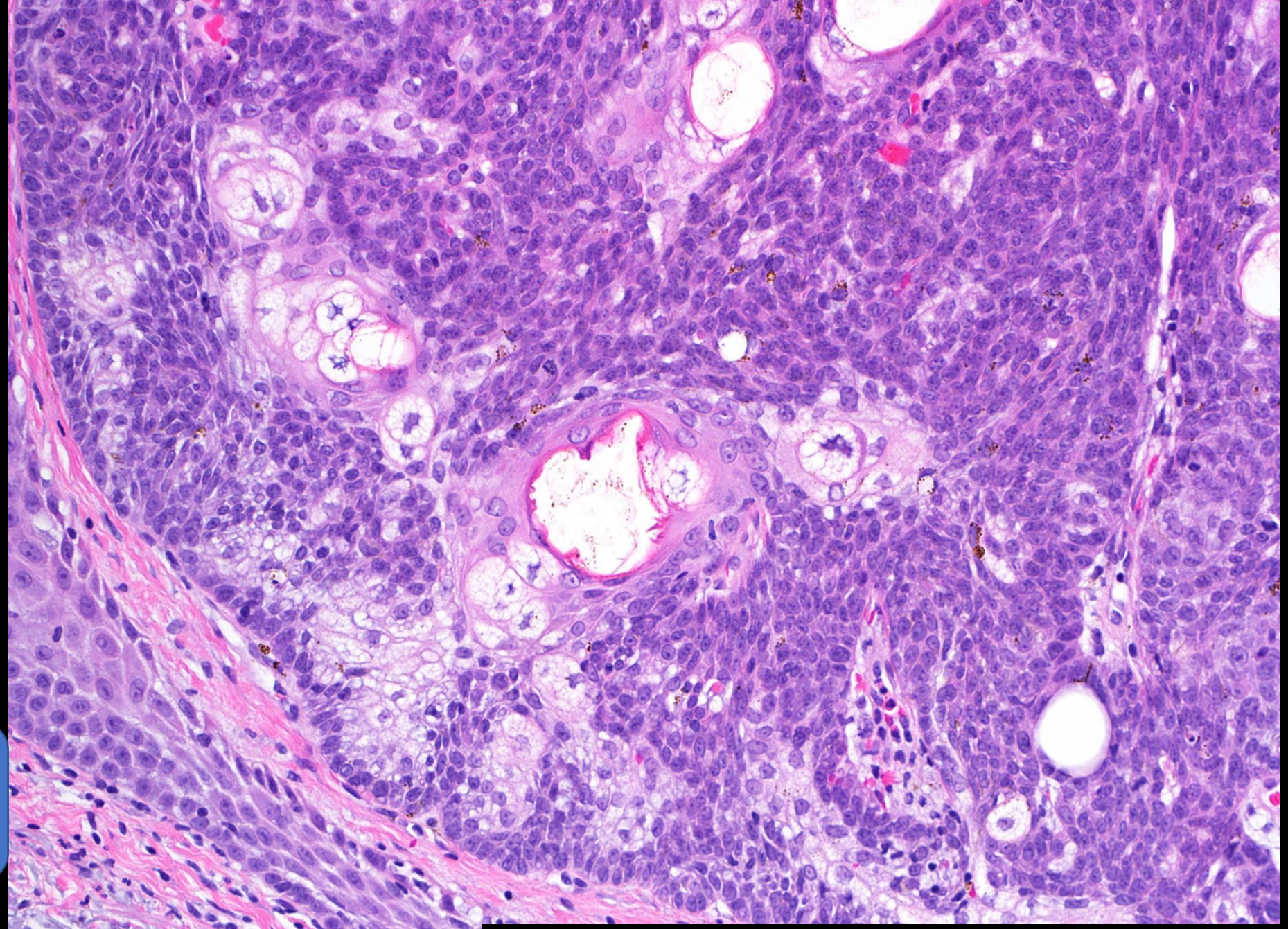
Towards the periphery of each lobule, the sebocytes tend to be somewhat less mature giving more of a pink or gray color (green arrows) than the white/pale color of more mature sebocytes (yellow arrows). Dead mature sebocytes here (black arrows) represent holocrine secretion phenomenon, not true tumor necrosis.

Sebaceous adenoma





Sebaceoma
(>50% basaloid cells)

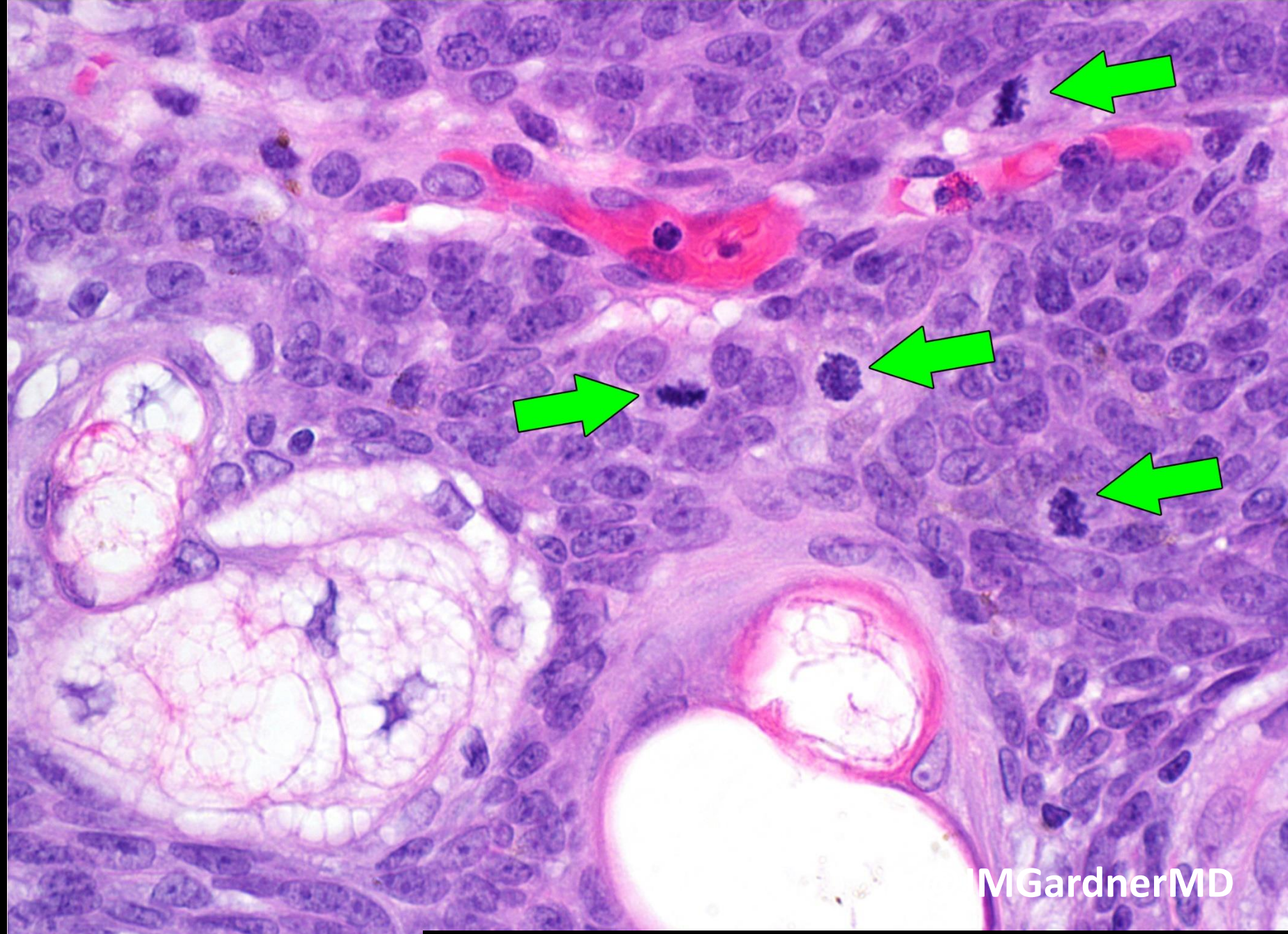


Sebaceoma
(>50% basaloid cells)

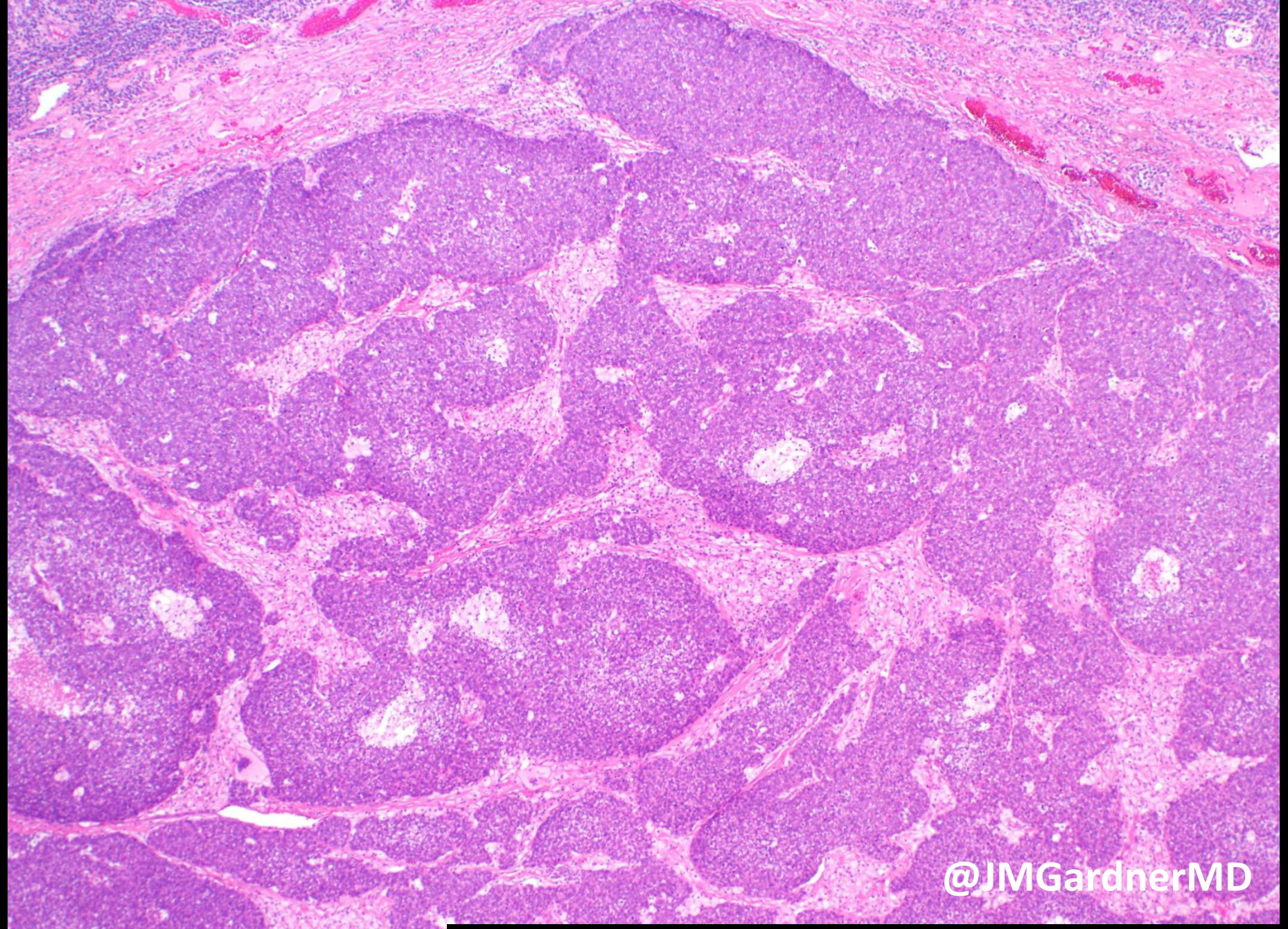
The basaloid cells are uniform and often display multiple mitoses (green arrows). Atypical mitotic forms and nuclear pleomorphism should not be seen.

Some authors regard sebaceoma as a form of sebaceous carcinoma (I disagree with this viewpoint).

Sebaceoma (mitoses common)



Sebaceous carcinoma

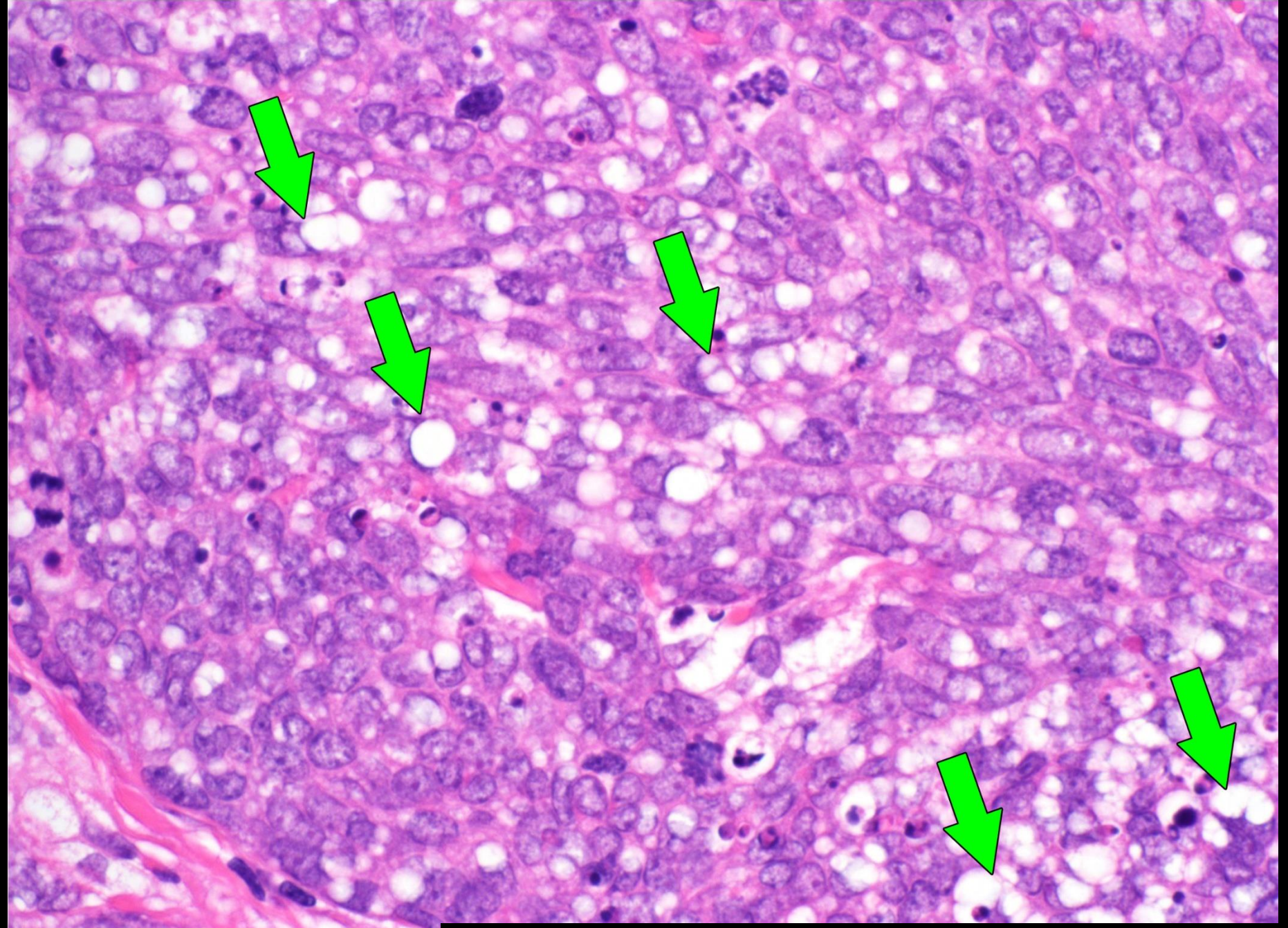


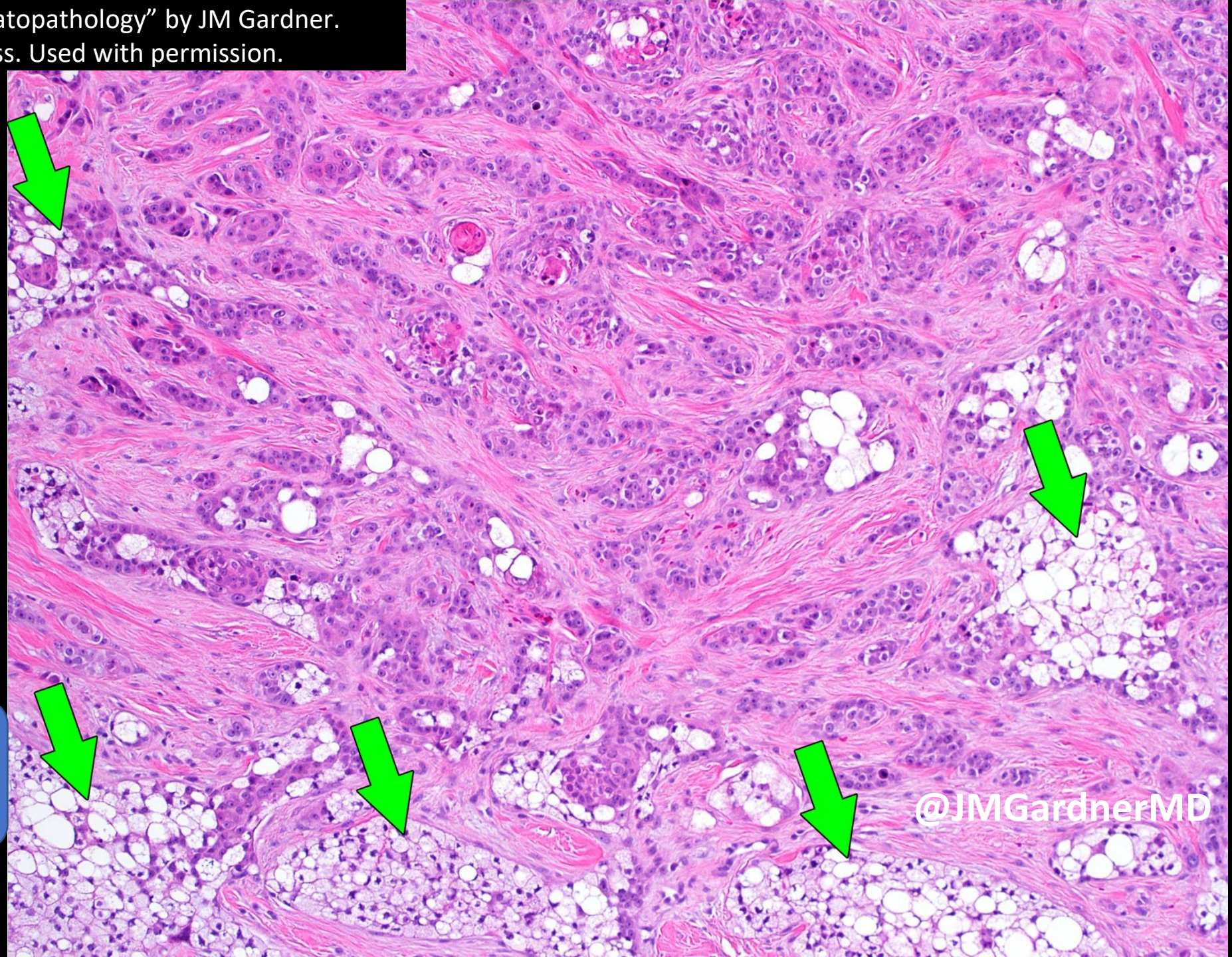
Vacuoles are sebaceous differentiation.

It can be difficult to be sure in some cases. Immunostains may help, but none are perfect.

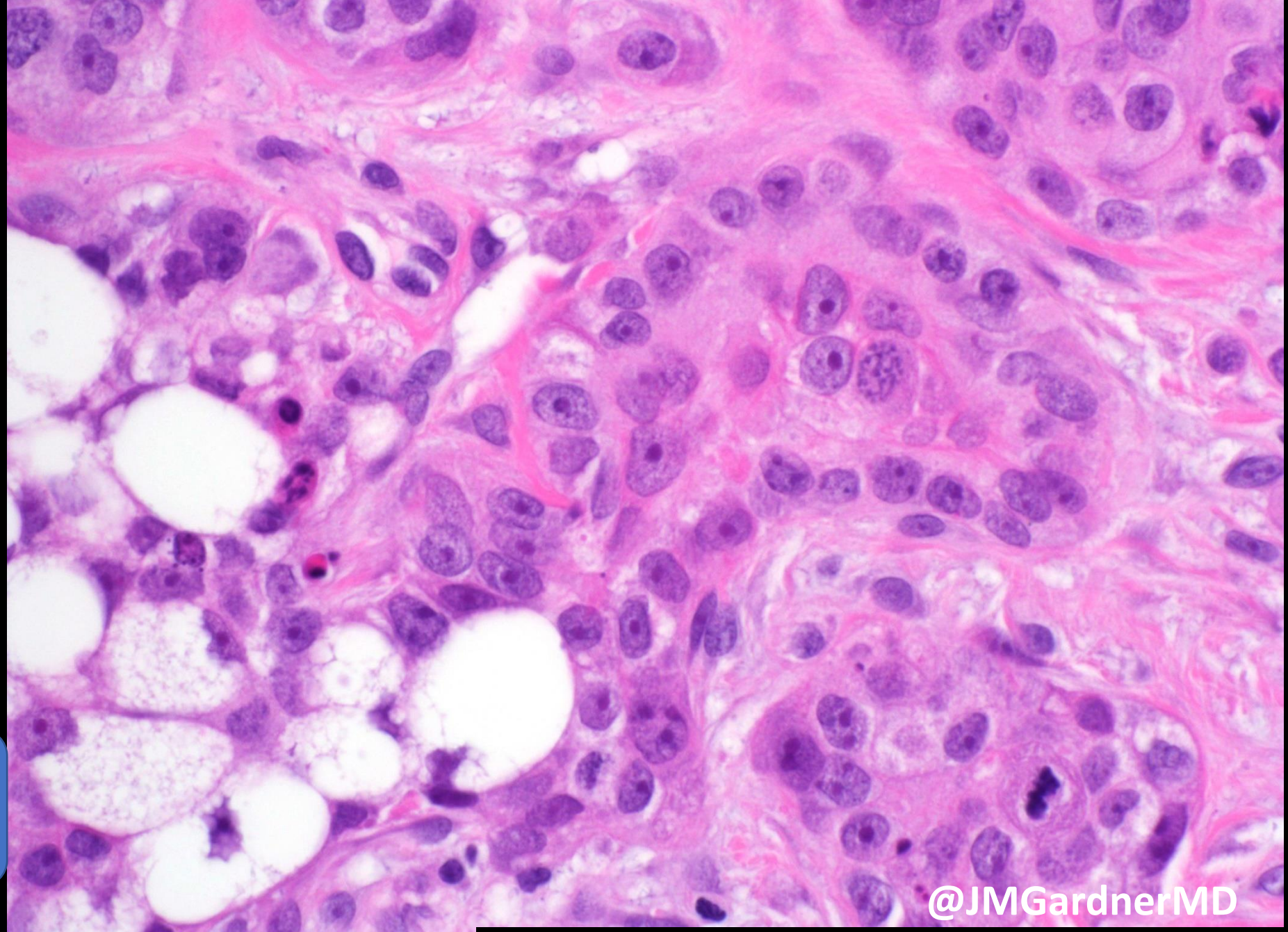
- Androgen receptor
- Adipophilin (vacuoles)
- EMA (vacuoles)
- Factor XIIIa (nuclei; only works with clone AC-1A1)

Sebaceous carcinoma

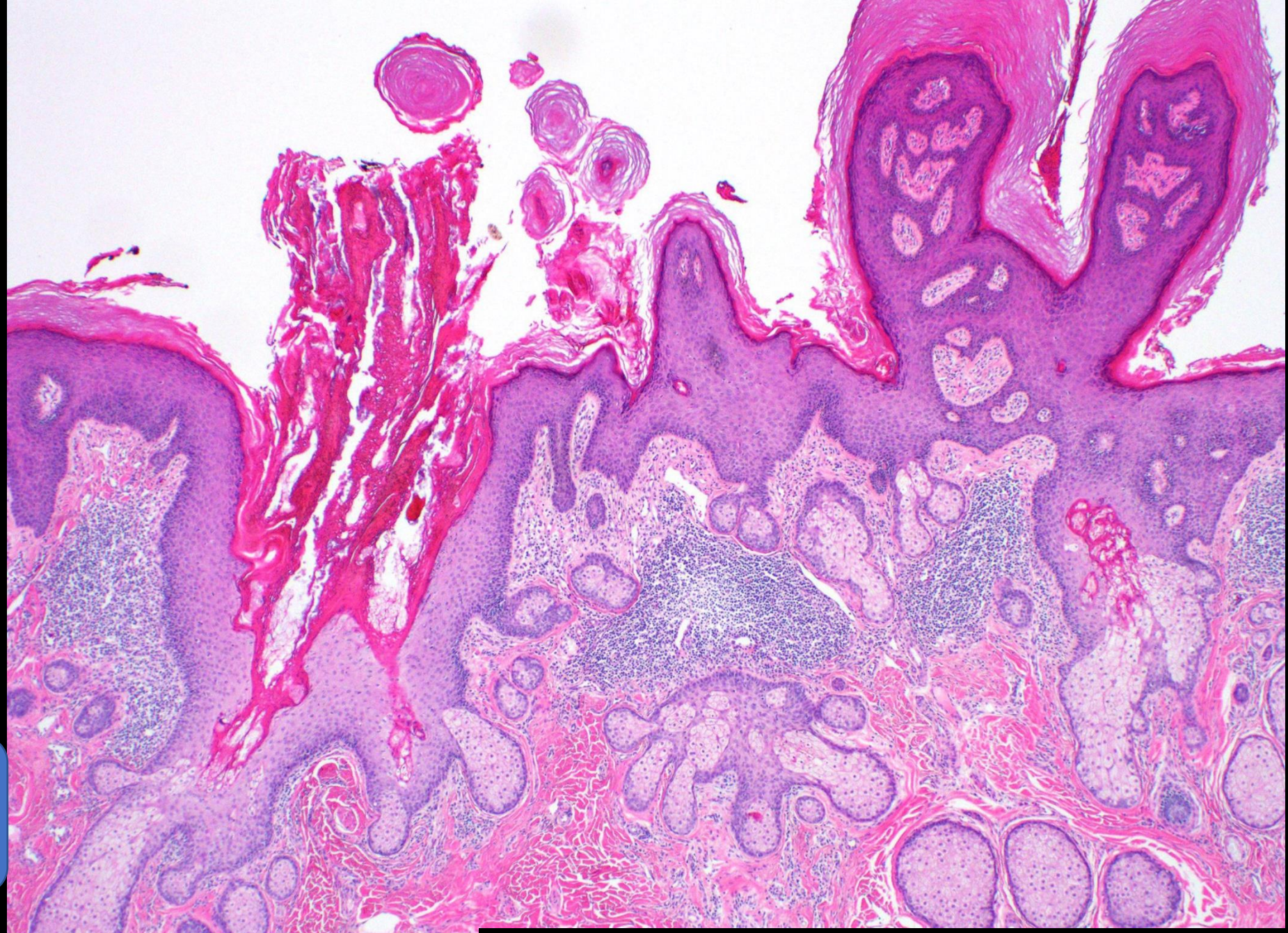




Sebaceous carcinoma



Sebaceous carcinoma



Nevus sebaceus
(NOT sebaceOus)

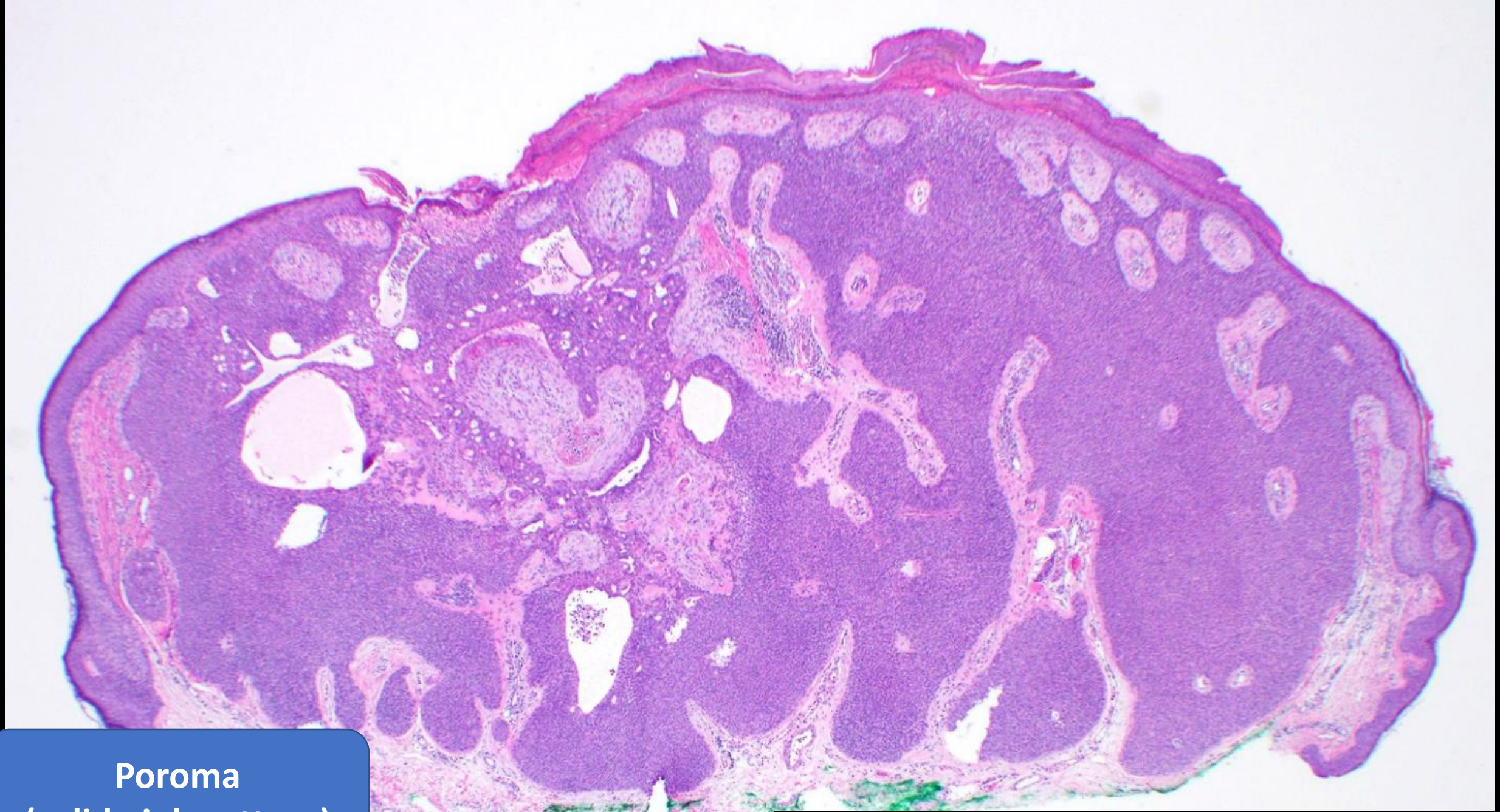
Sweat Gland Entities

Table 5-1

PATTERN-BASED APPROACH TO SWEAT GLAND TUMORS[a]

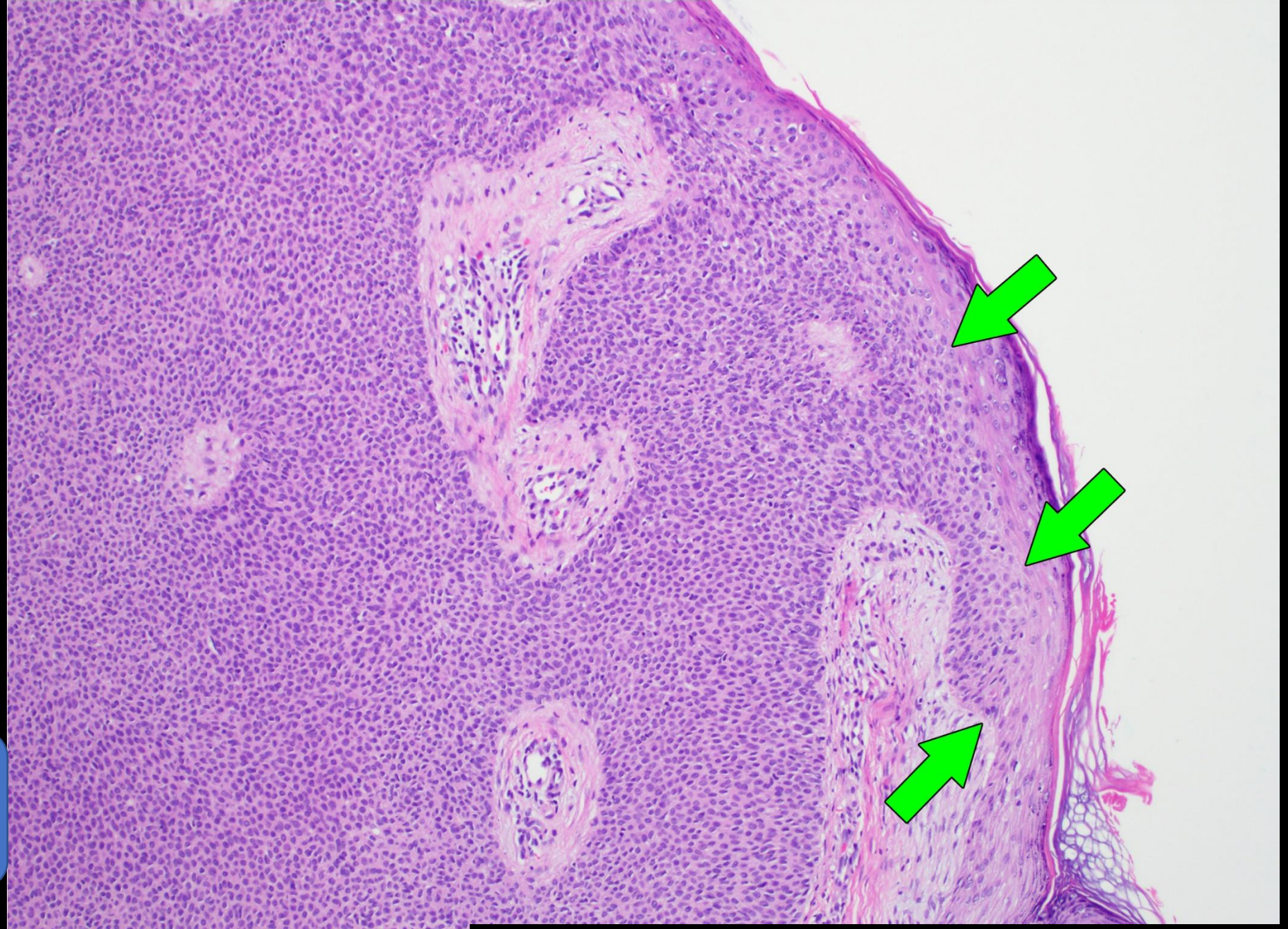
Pattern	Tumors
Solid pink/clear/squamoid proliferation in epidermis and/or dermis +/- cysts	Acrospiroma family: Hidroacanthoma simplex Poroma Dermal duct tumor Hidradenoma
Blue basaloid nodules in dermis or subcutis	Spiradenoma Cylindroma
Tadpole/paisley tie	Syringoma Microcystic adnexal carcinoma Desmoplastic trichoepithelioma[b] Infiltrative/morpheaform BCC[b,c]
Cystic spaces with papillary projections	Syringocystadenoma papilliferum Hidradenoma papilliferum Digital papillary adenocarcinoma
Dermal or subcutaneous nodule with cords/chains/tubules and chondromyxoid stroma	Mixed tumor (chondroid syringoma) Myoepithelioma

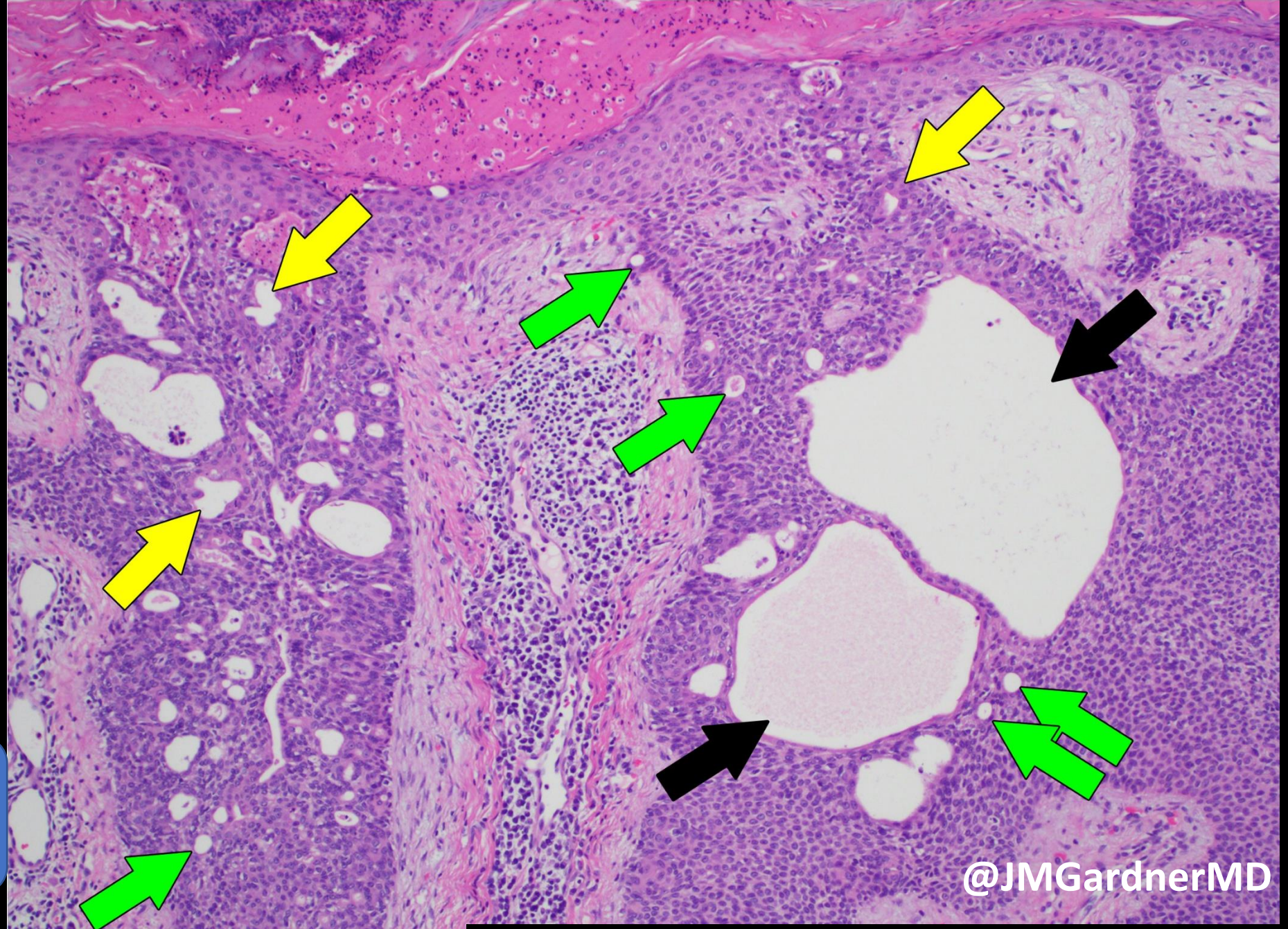
[a]Adapted from Table 2 from Arch Pathol Lab Med 2019;143:832-851 with permission from Archives of Pathology and Laboratory Medicine. Copyright 2019 College of American Pathologists.
[b]These are not sweat gland tumors, but they enter the differential for this pattern and are thus included here.
[c]BCC = basal cell carcinoma.



Poroma
(solid pink pattern)

Poroma
(solid pink pattern)





Poroma
(solid pink pattern)

> Am J Surg Pathol. 2021 Sep 1;45(9):1221-1227. doi: 10.1097/PAS.0000000000001693.

NUT Is a Specific Immunohistochemical Marker for the Diagnosis of YAP1-NUTM1-rearranged Cutaneous Poroid Neoplasms

Nicolas Macagno [1 2 3], Thibault Kervarrec [1 4], Pierre Sohier [1 5 6], Brigitte Poirot [7 8], Aurélie Haffner [2], Agnès Carlotti [1 5], Brigitte Balme [1 9], Christine Castillo [10], Marie-Laure Jullie [1 11], Amélie Osio [1 12], Jacqueline Lehmann-Che [6 7 8], Eric Frouin [1 13 14], Maxime Battistella [1 6 12 8]

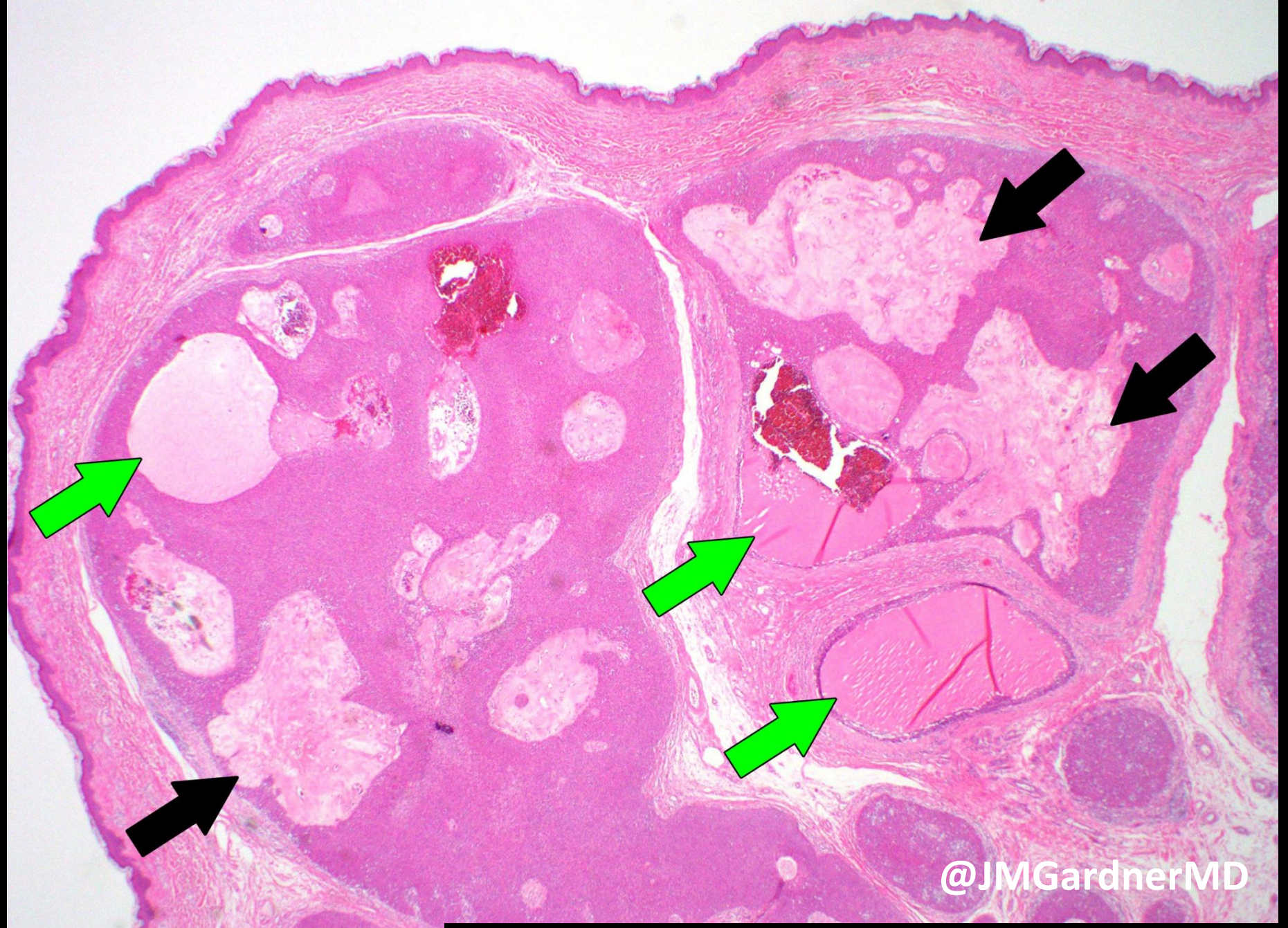
Affiliations + expand

PMID: 33739783 DOI: 10.1097/PAS.0000000000001693

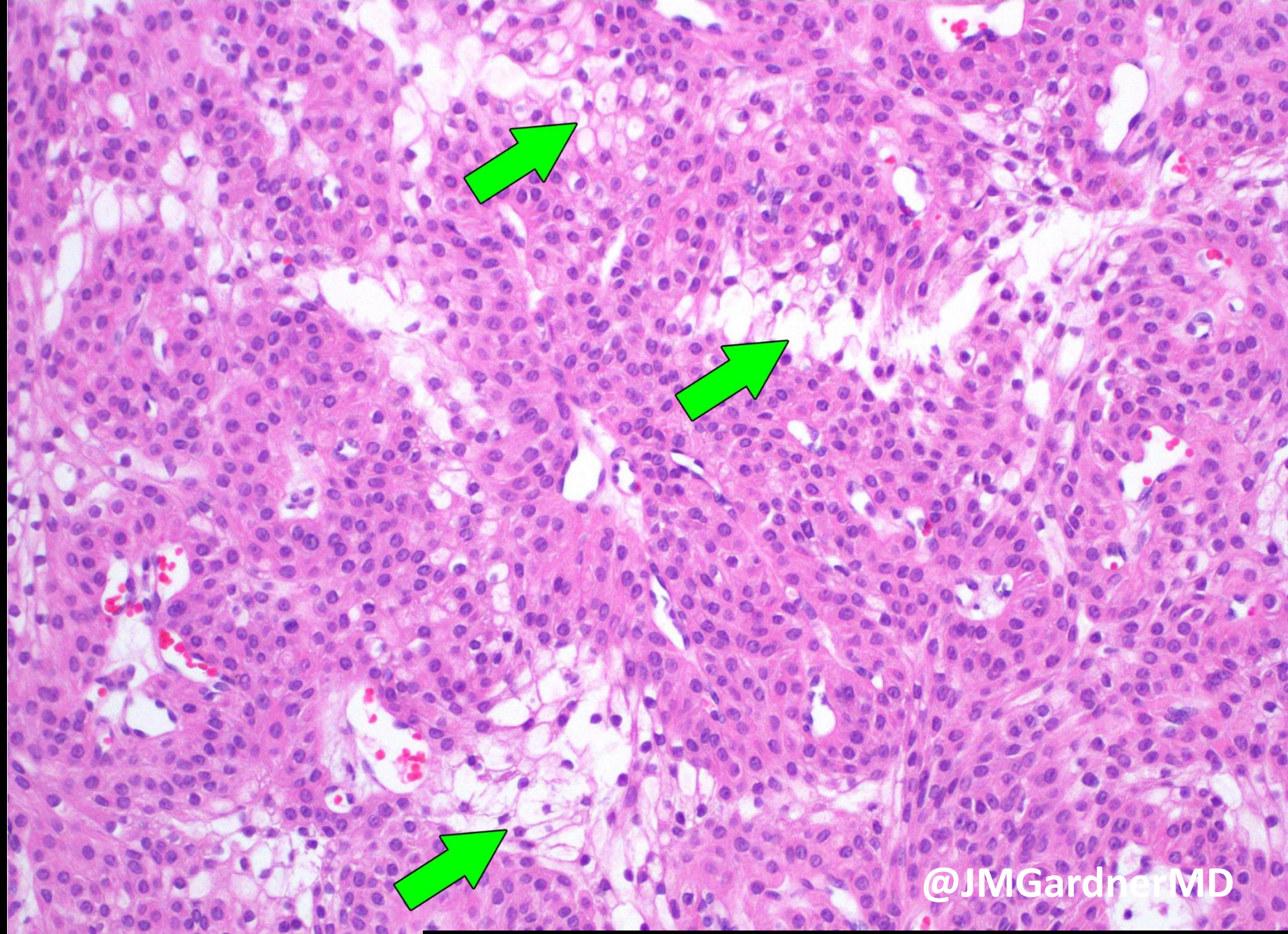
Abstract

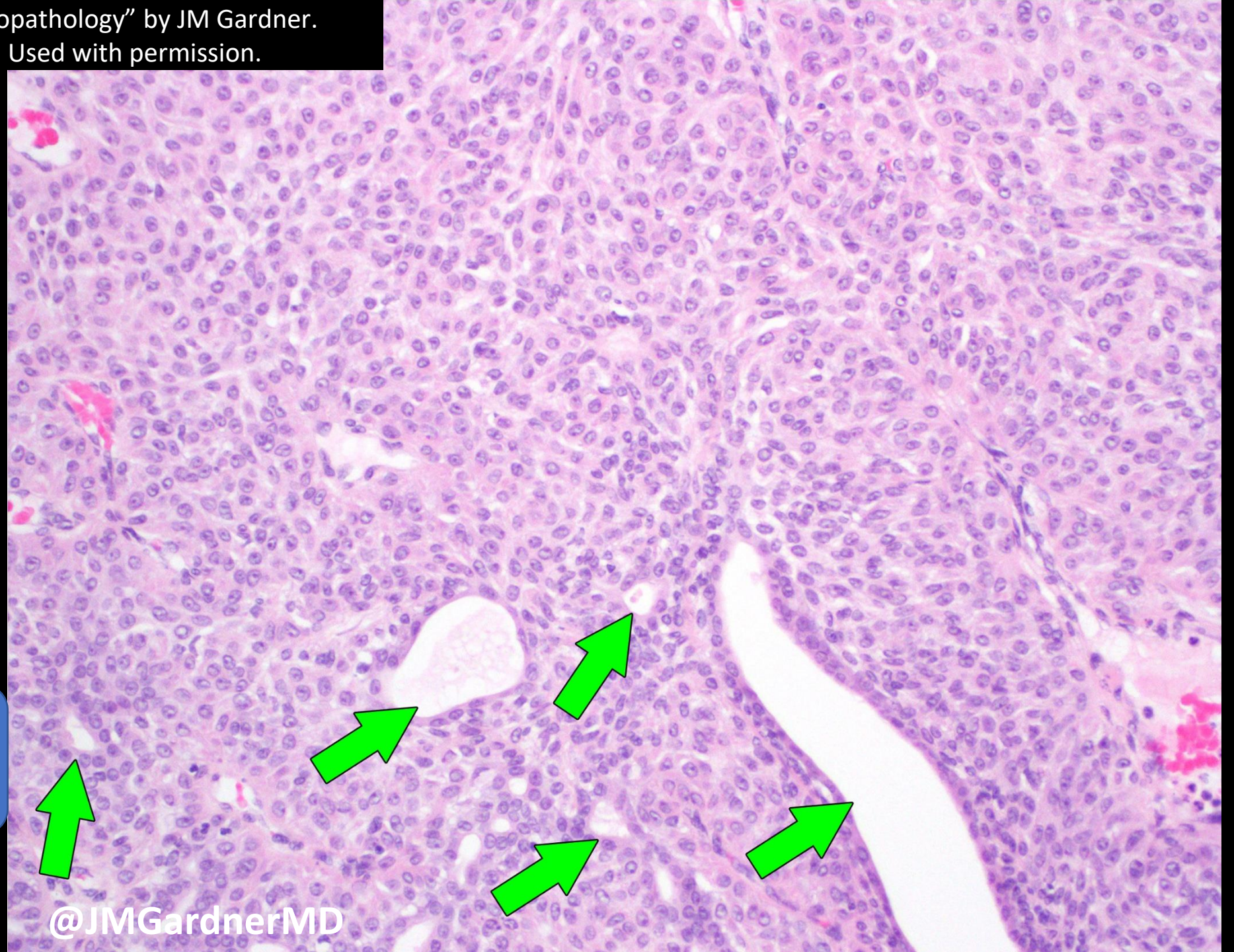
YAP1-NUTM1 fusion transcripts have been recently reported in poroma and porocarcinoma. NUTM1 translocation can be screened by nuclear protein in testis (NUT) immunohistochemistry in various malignancies, but its diagnostic performance has not been thoroughly validated on a large cohort of cutaneous epithelial neoplasms. We have evaluated NUT immunohistochemical expression in a large cohort encompassing 835 cases of various cutaneous epidermal or adnexal epithelial neoplasms. NUT expression was specific to eccrine poromas and porocarcinoma, with 32% of

Hidradenoma
(solid pink pattern)

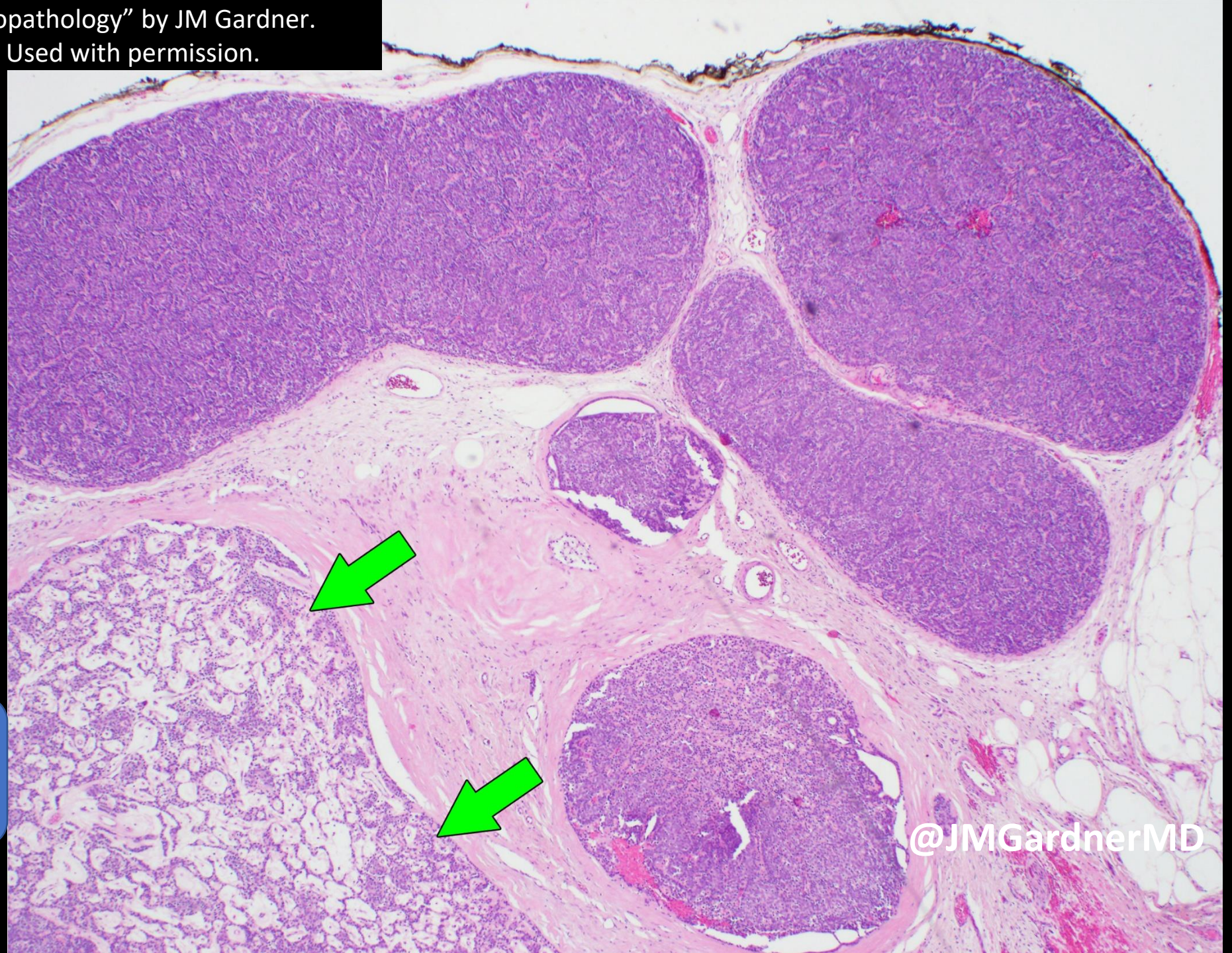


Hidradenoma
(solid pink pattern)

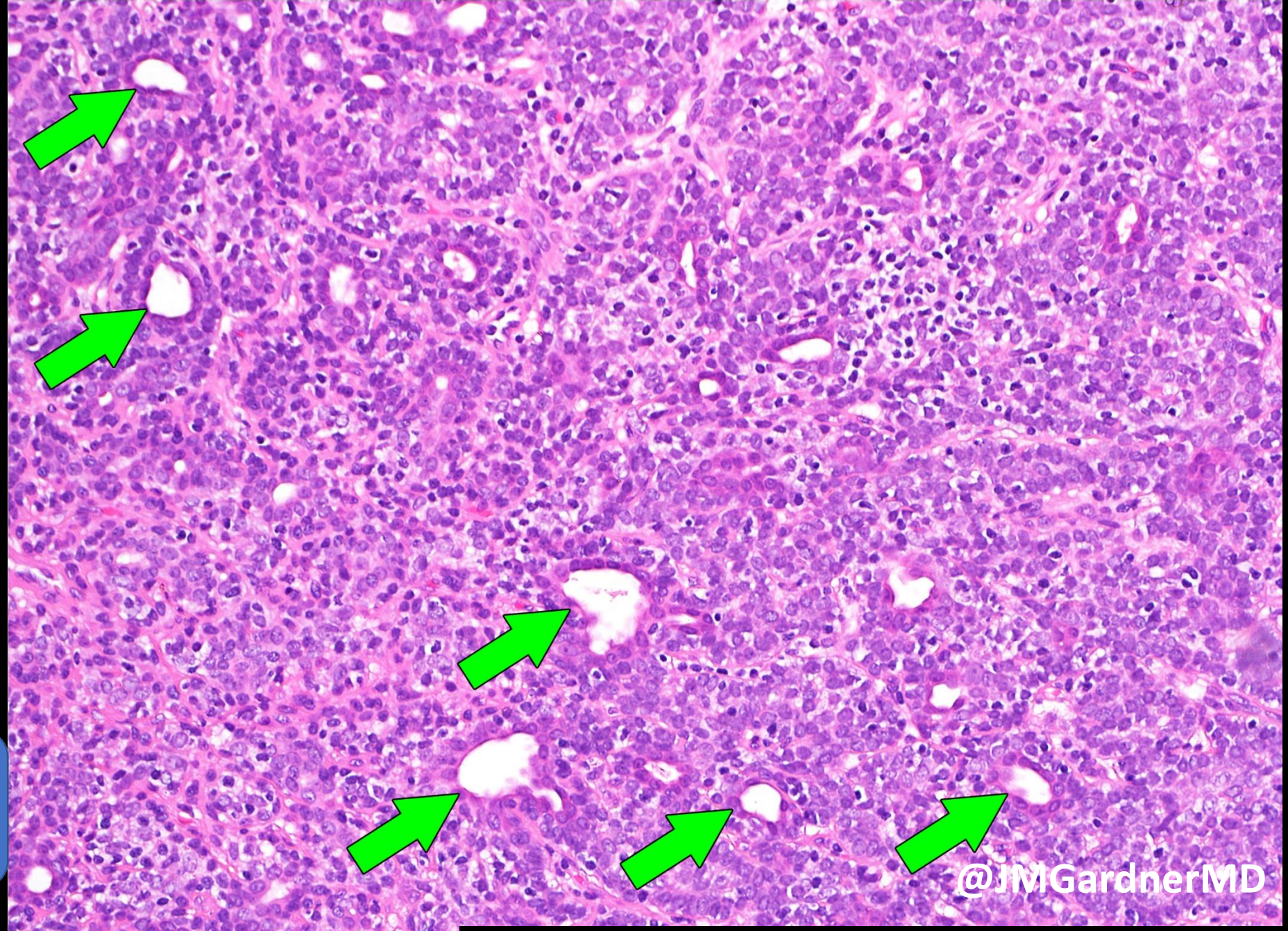




Hidradenoma
(solid pink pattern)



Spiradenoma (blue basaloid pattern)



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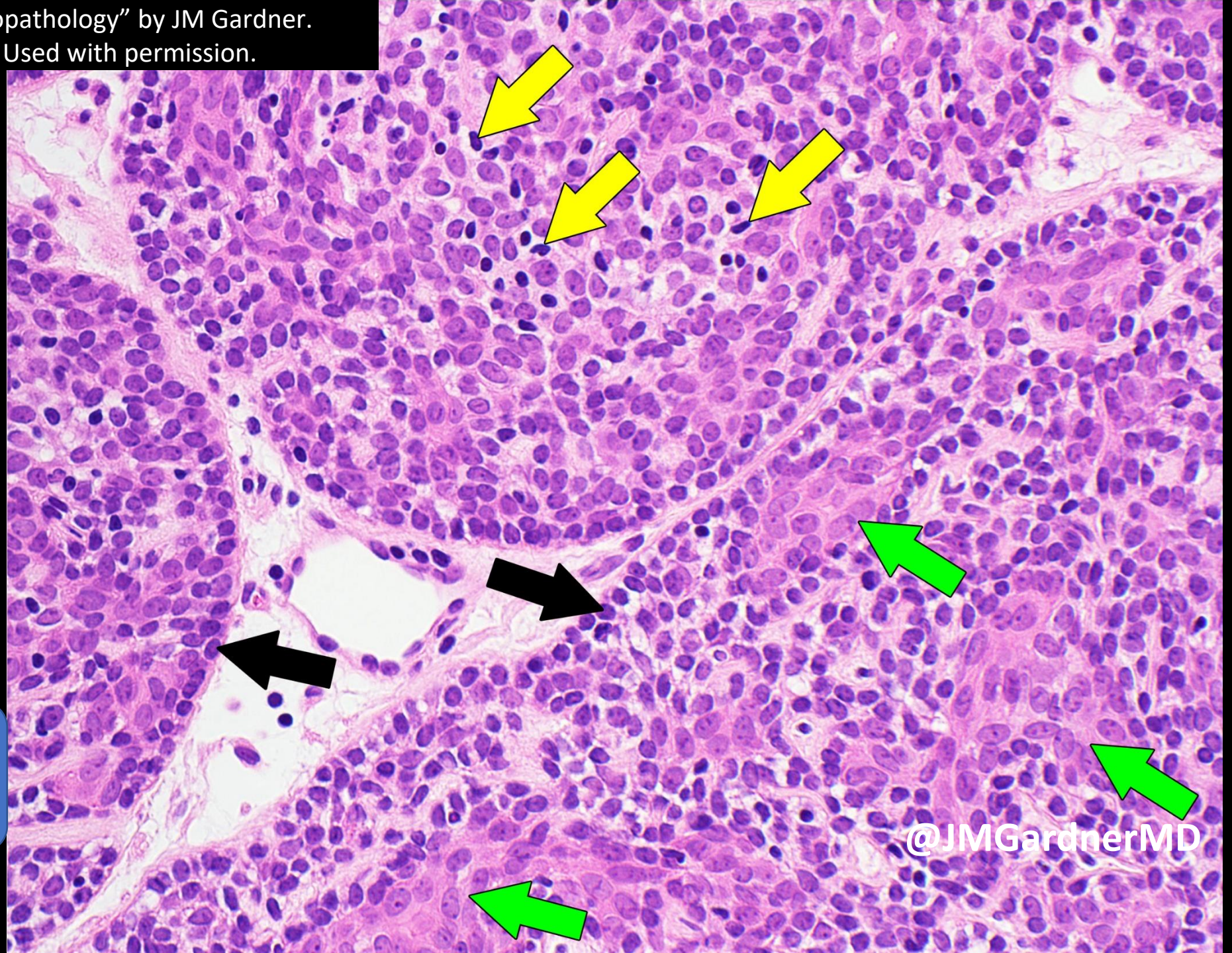
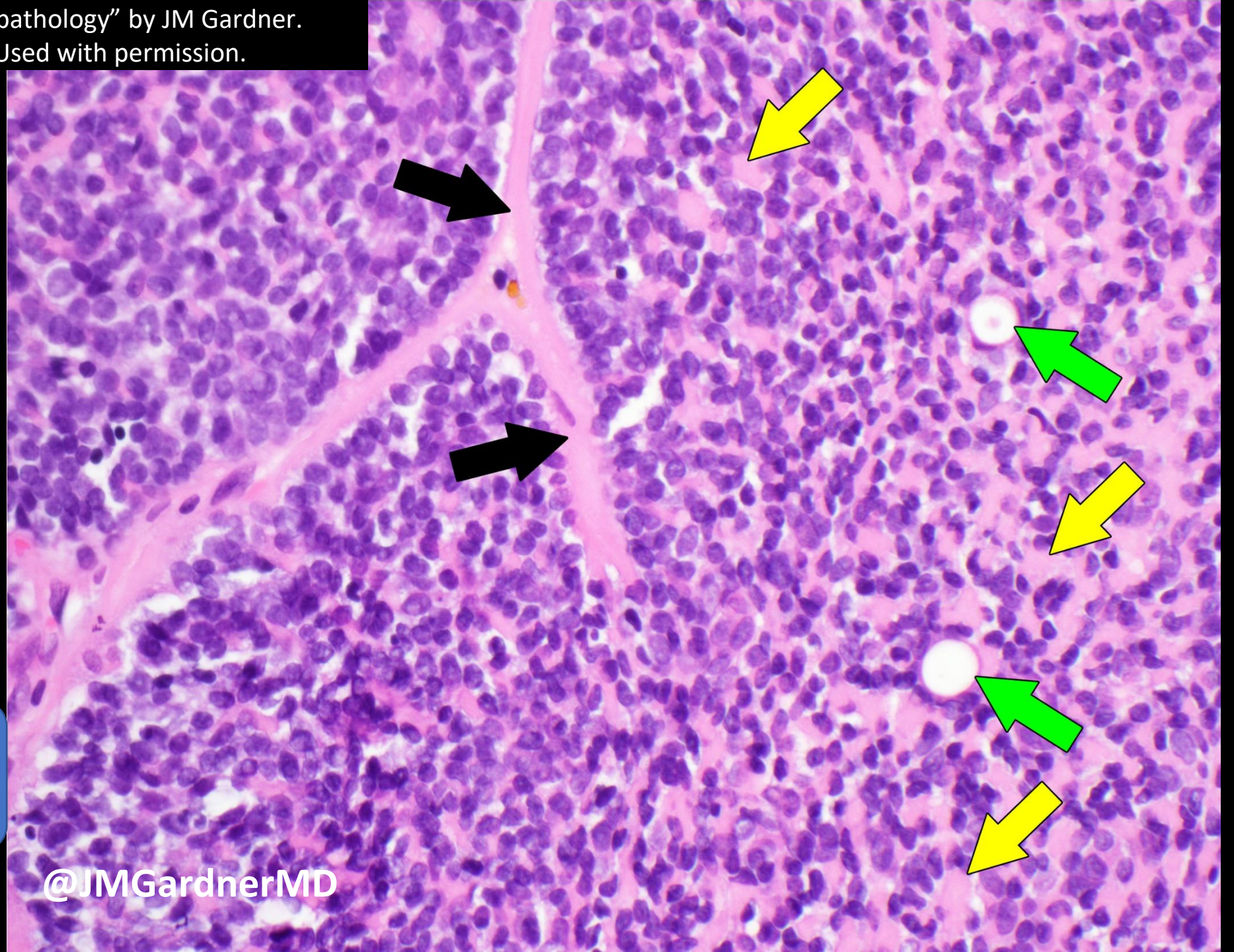
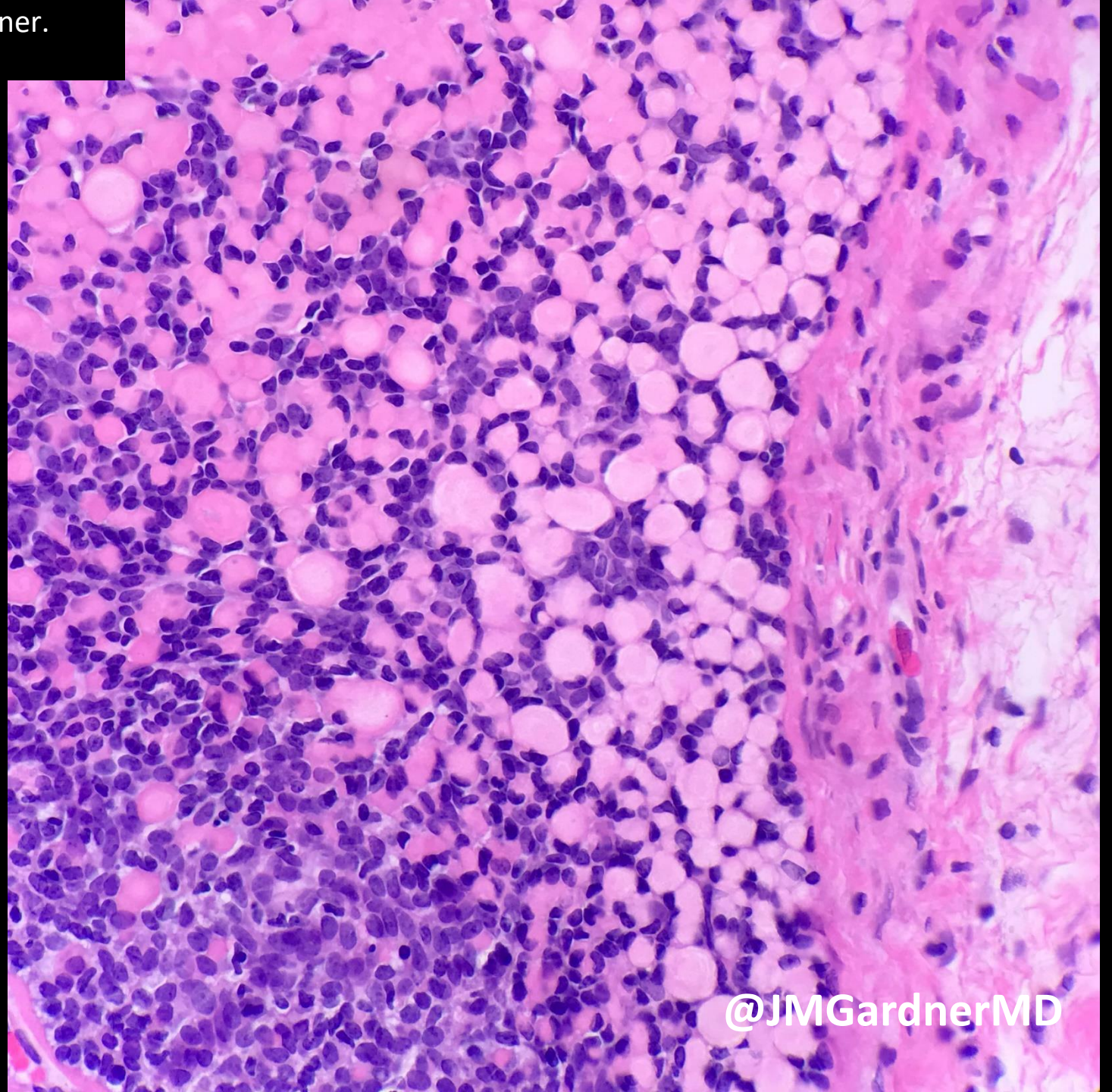


Spiradenoma (blue basaloid pattern)

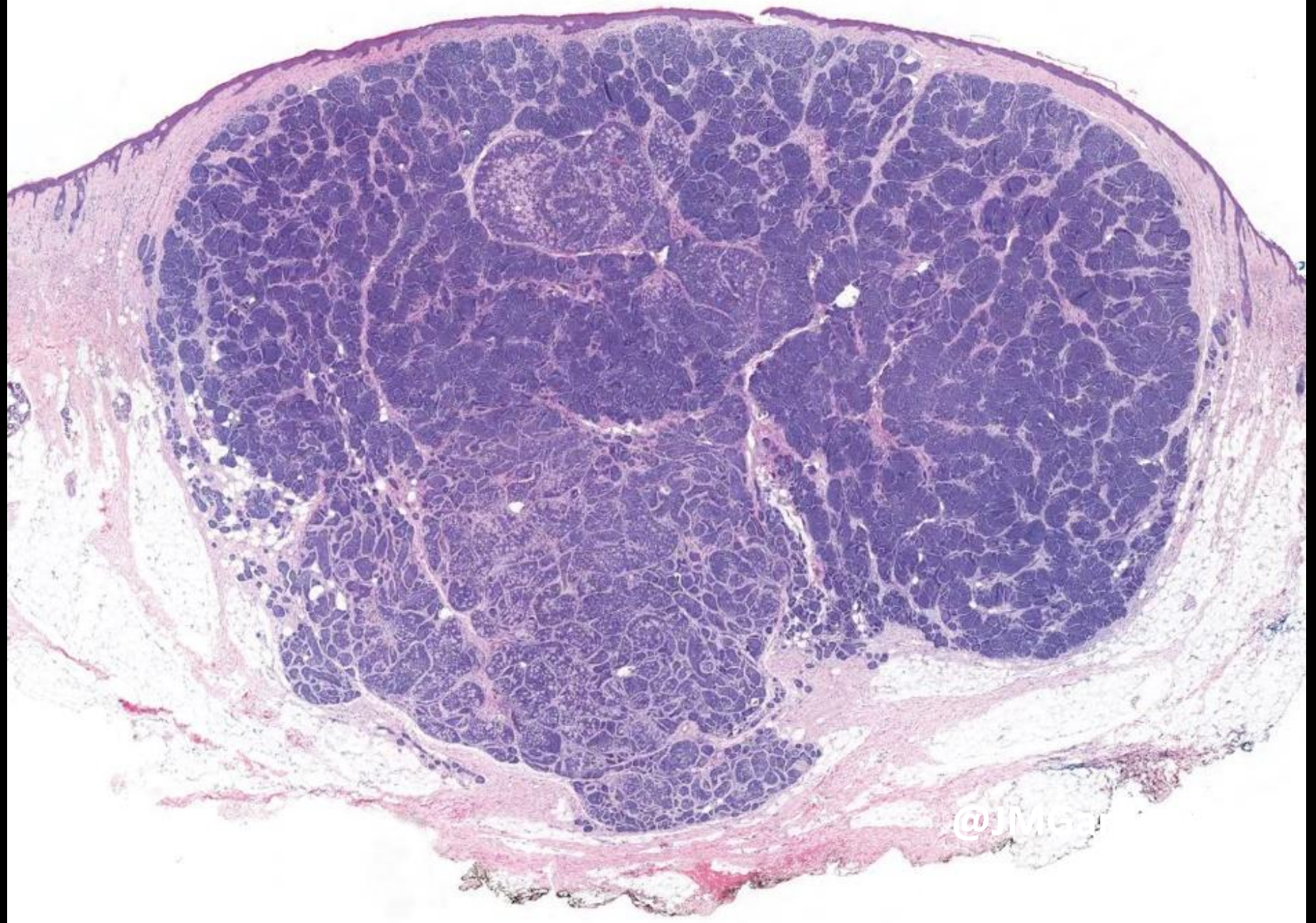


Spiradenoma (blue basaloid pattern)

Note: Spiradenoma is SOX-10 positive.

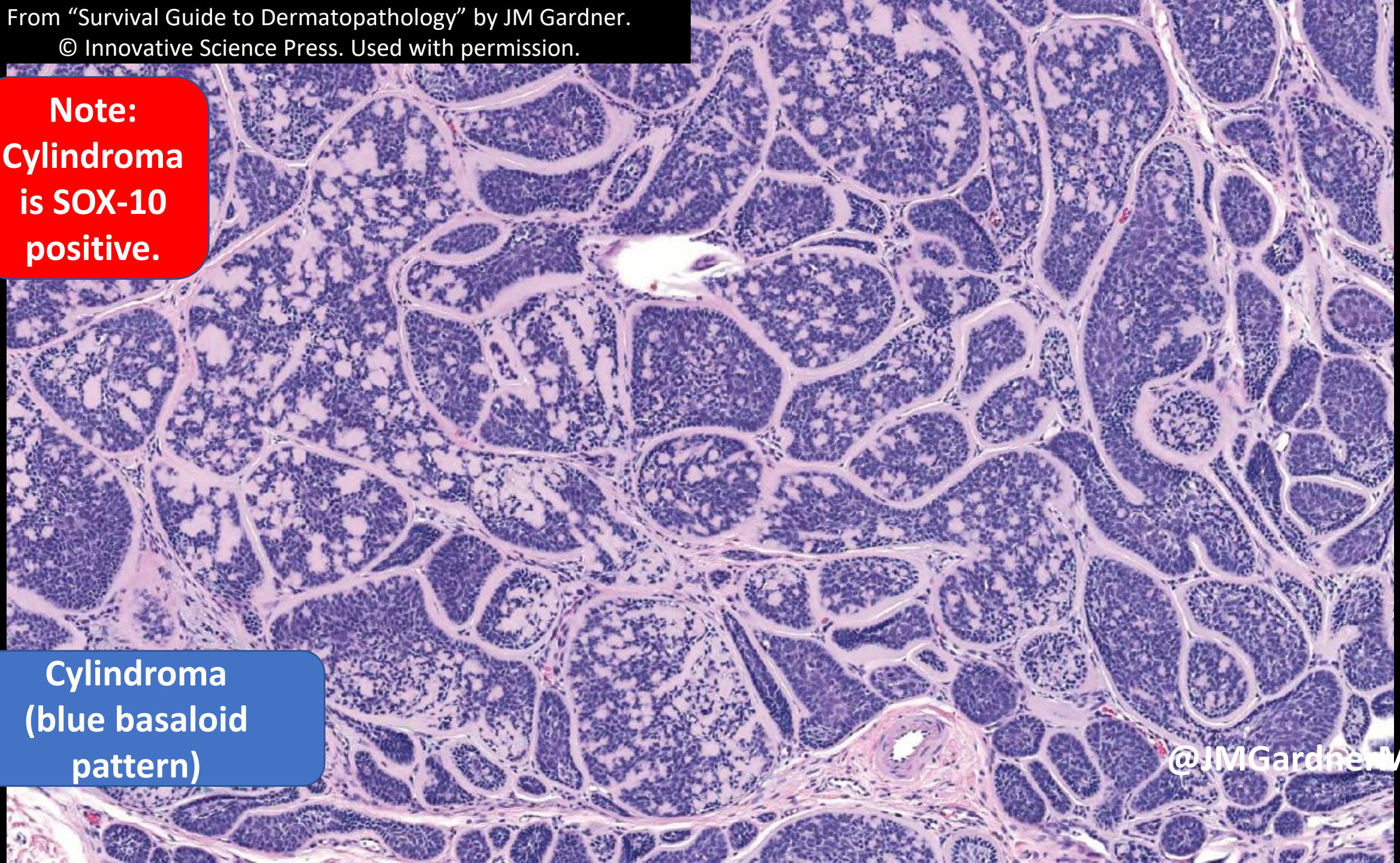


Spiradenoma (blue basaloid pattern)

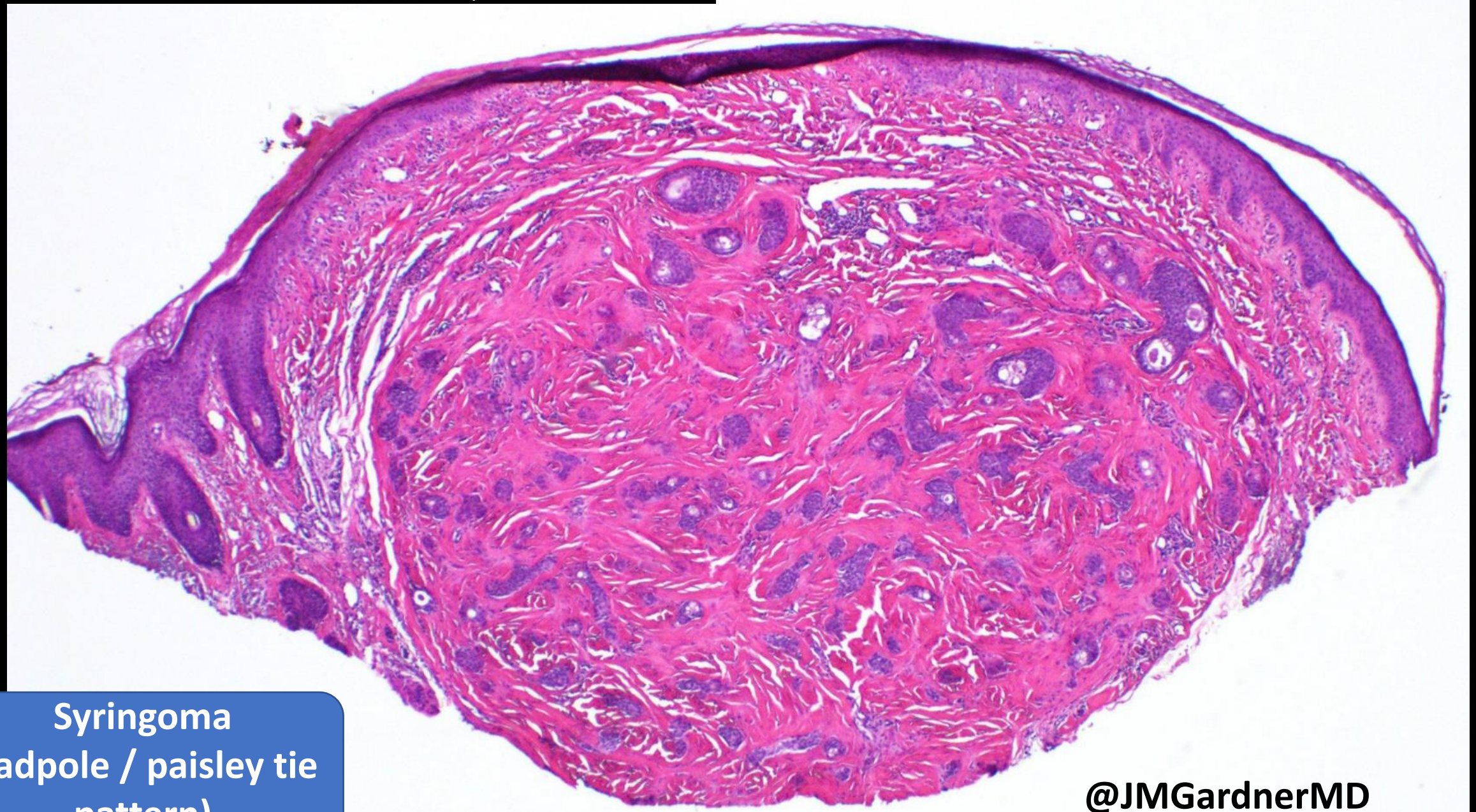


Cylindroma (blue basaloid pattern)

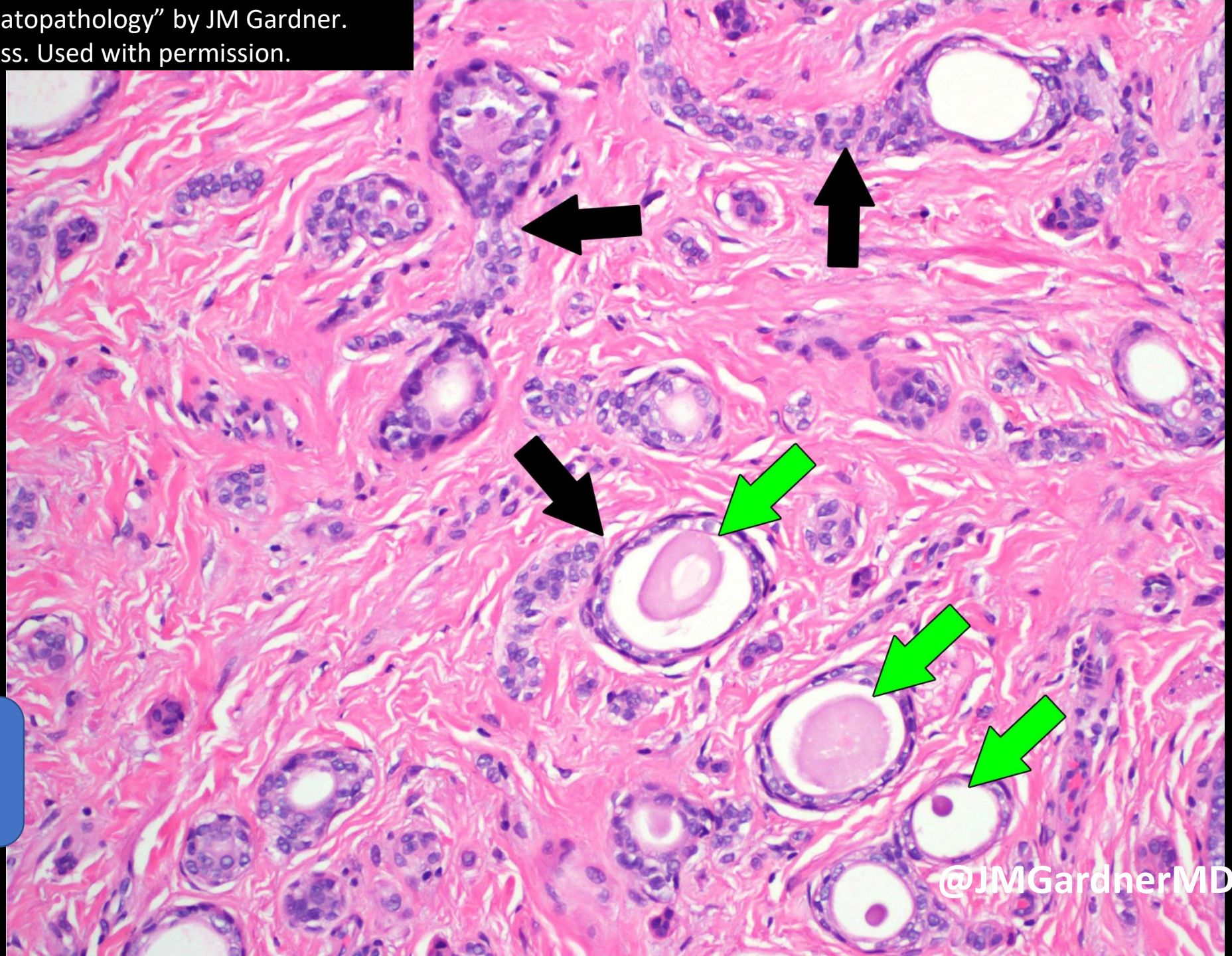
Note: Cylindroma is SOX-10 positive.



Cylindroma (blue basaloid pattern)

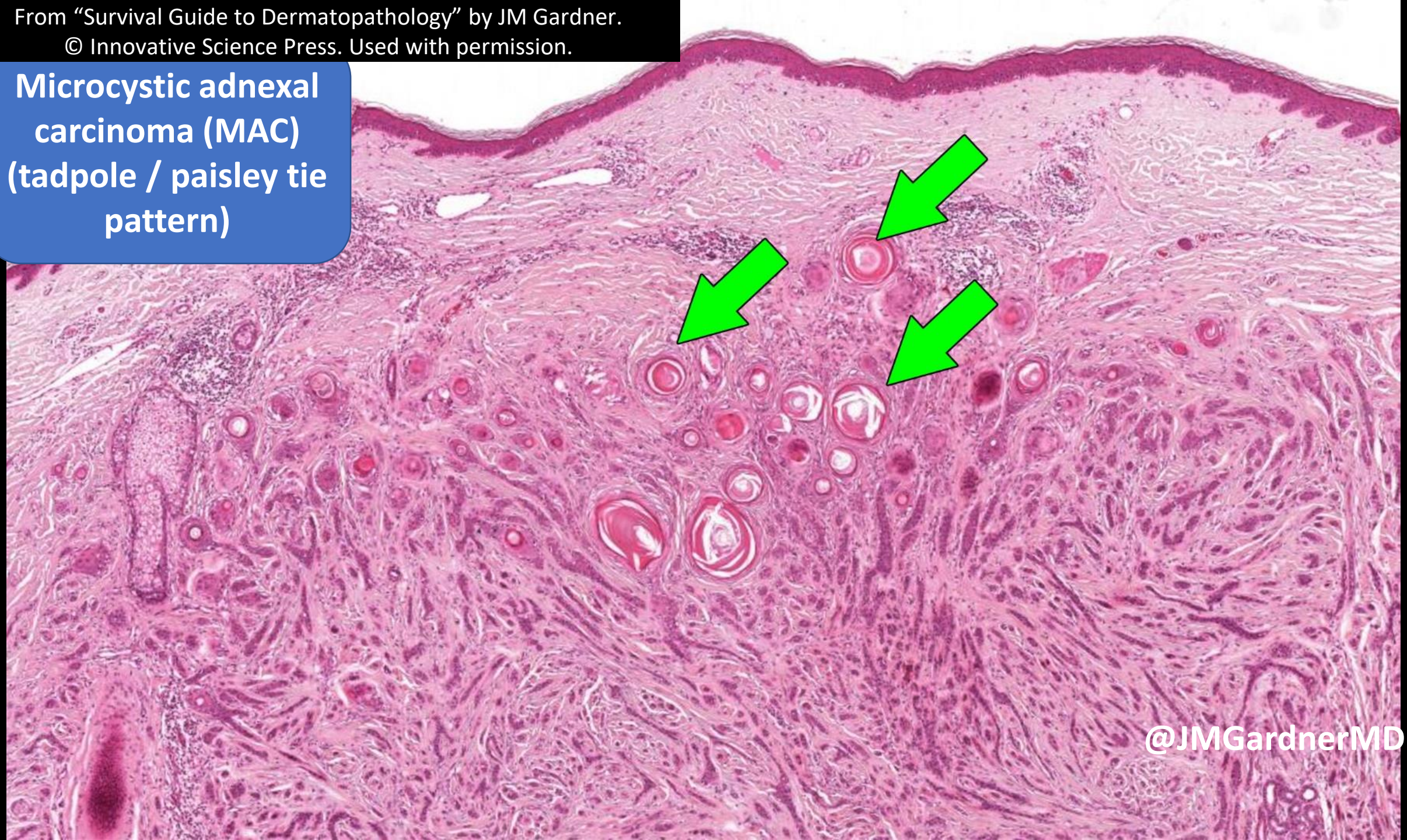


Syringoma (tadpole / paisley tie pattern)

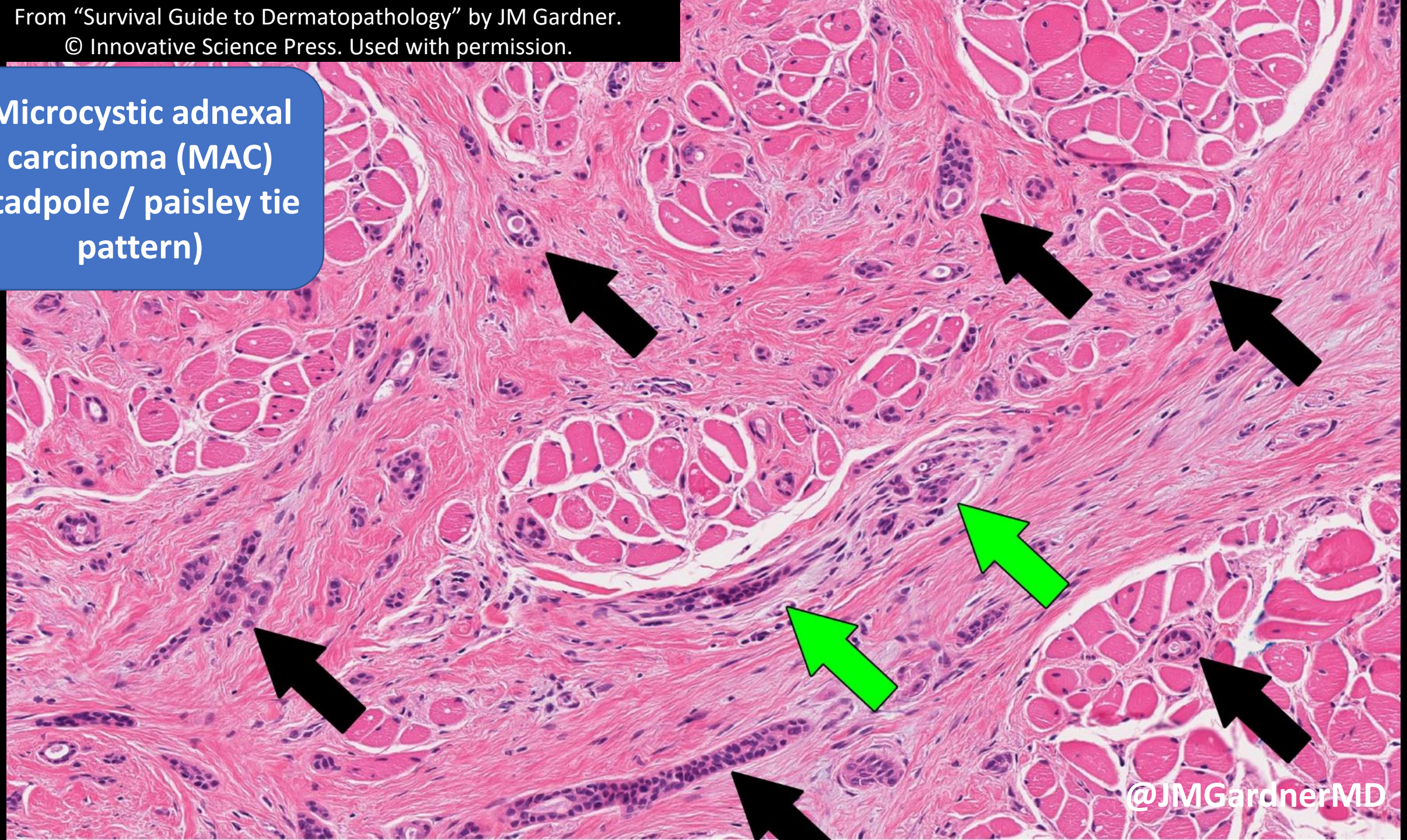


Syringoma (tadpole / paisley tie pattern)

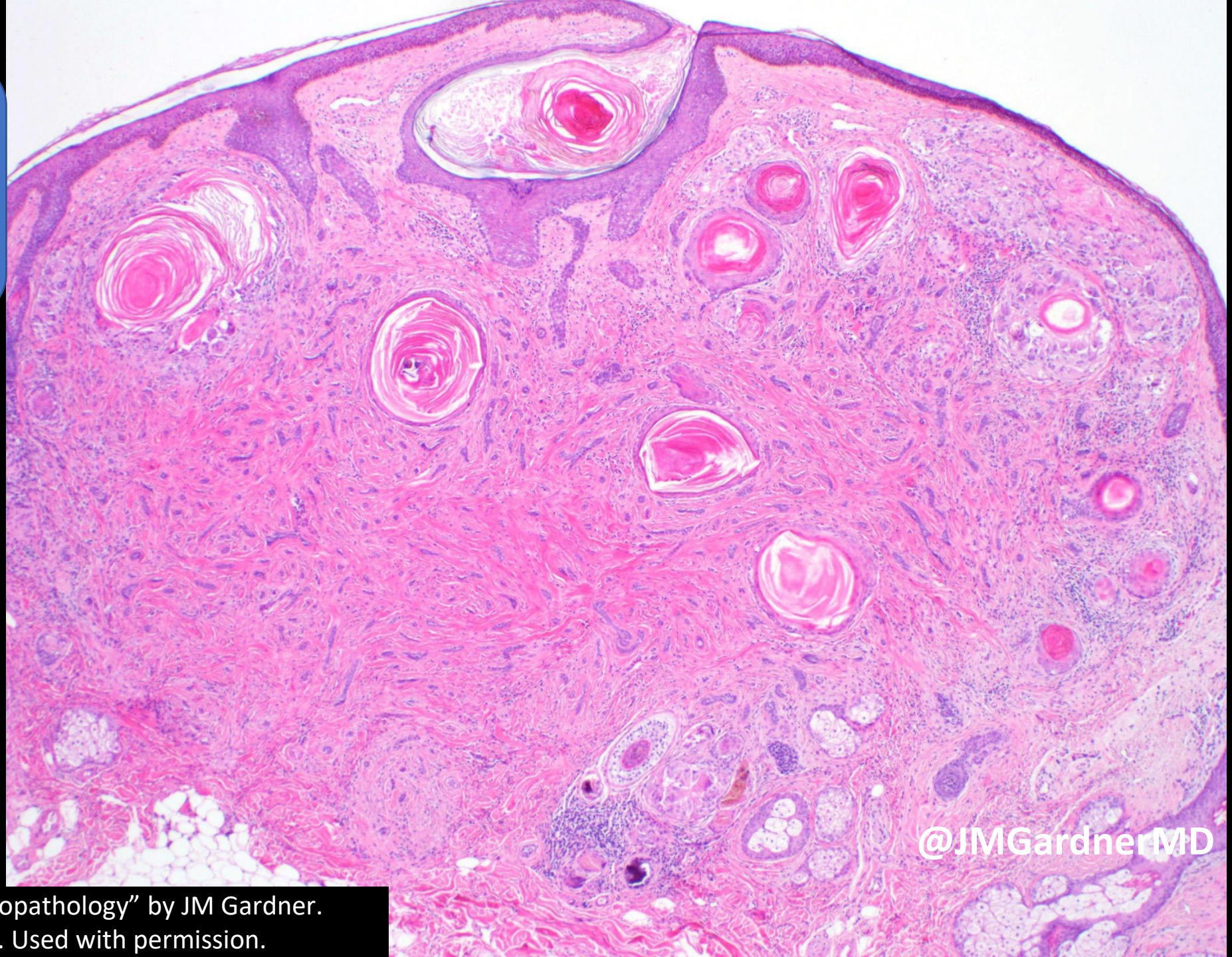
Microcystic adnexal carcinoma (MAC) (tadpole / paisley tie pattern)



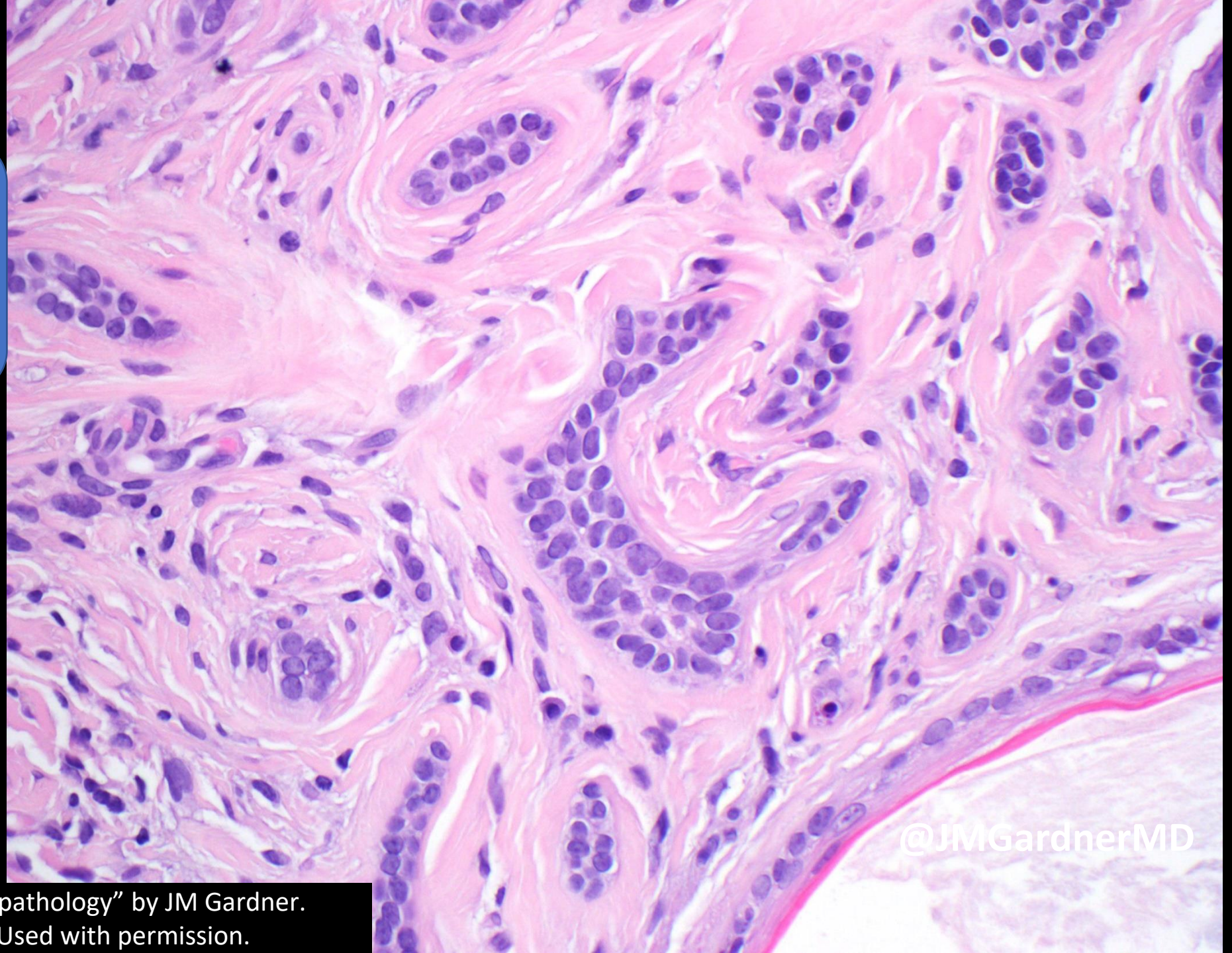
Microcystic adnexal carcinoma (MAC) (tadpole / paisley tie pattern)



Desmoplastic trichoepithelioma (tadpole / paisley tie pattern)



Desmoplastic trichoepithelioma (tadpole / paisley tie pattern)



Case Reports > J Cutan Pathol. 2012 Mar;39(3):317-23.
doi: 10.1111/j.1600-0560.2012.01876.x.

Desmoplastic trichoepithelioma with perineural involvement: a series of seven cases

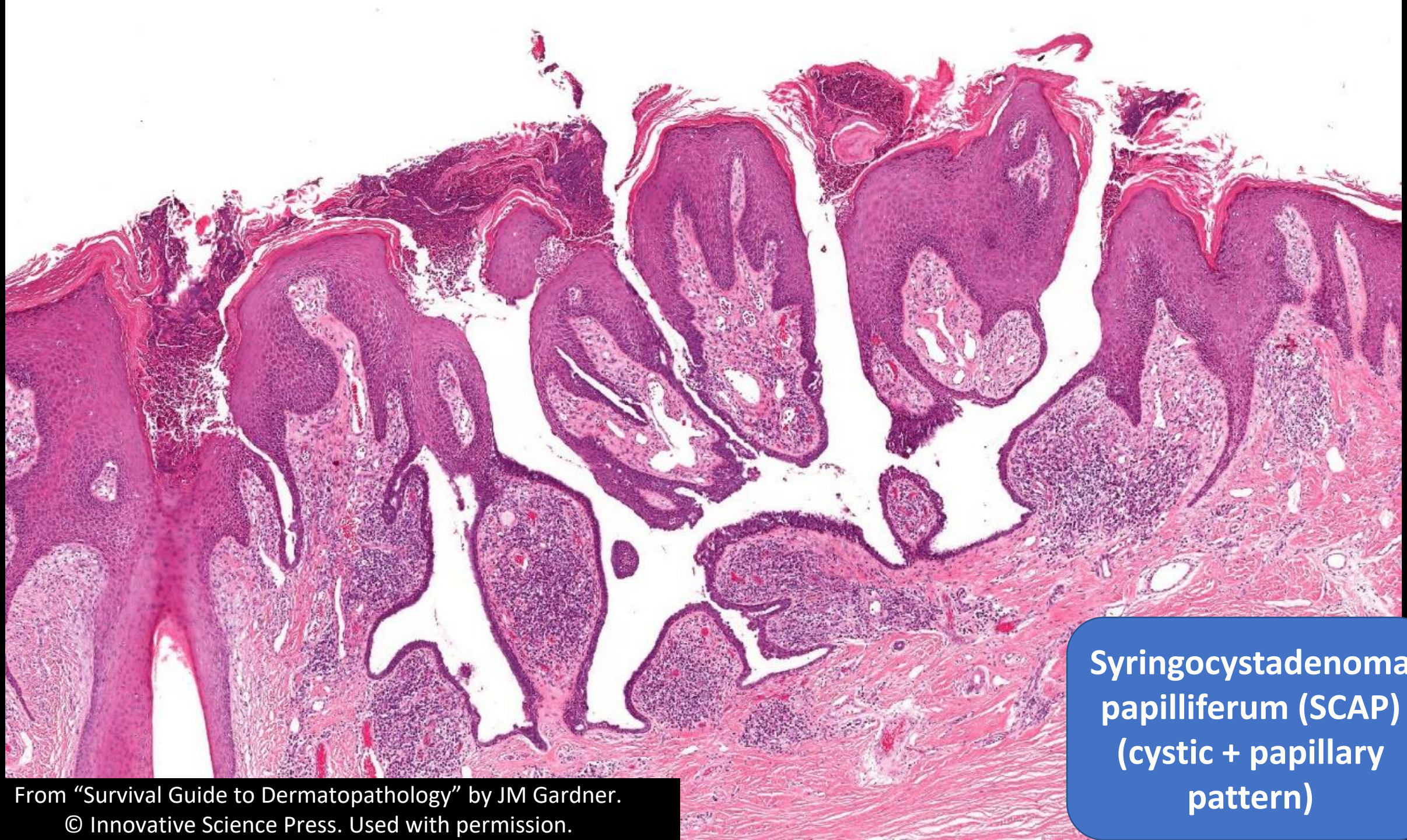
Jaroslaw Jedrych [1], David Leffell, Jennifer M McNiff

Affiliations + expand

PMID: 22335590 DOI: 10.1111/j.1600-0560.2012.01876.x

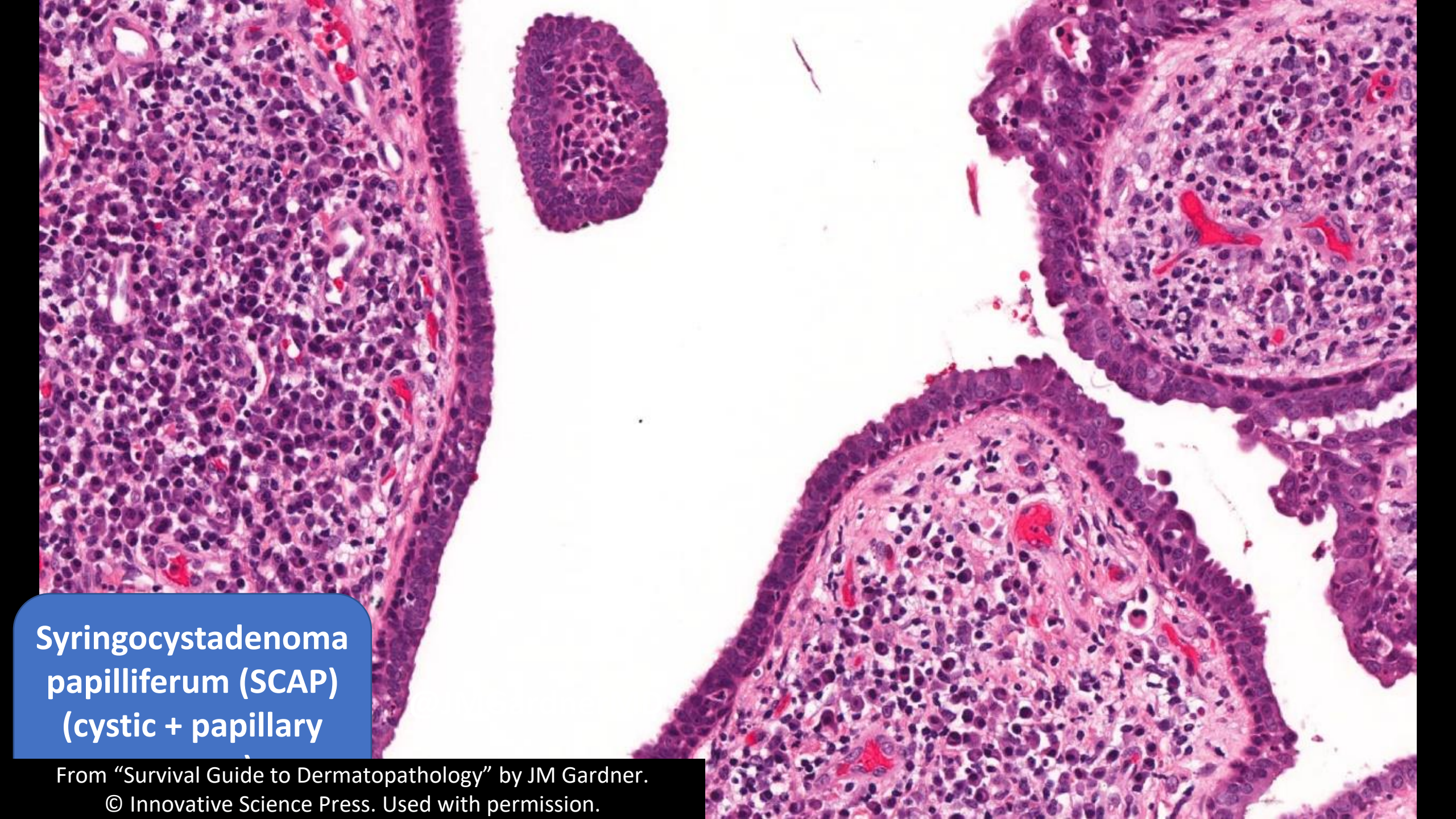
Abstract

Desmoplastic trichoepithelioma (DTE) is a benign follicular tumor occurring most commonly within facial skin of young and middle-aged women, morphologically characterized by a superficial dermal proliferation of basaloid cells growing in narrow strands embedded in a desmoplastic stroma associated with small keratinizing cysts. DTE must be distinguished from other benign epithelial proliferations such as syringoma, microcystic adnexal carcinoma and infiltrating basal cell carcinoma. Among morphological features useful in that distinction, perineural involvement is considered a feature indicative of malignancy. We present a series of seven DTEs with otherwise typical presentation and morphology, nevertheless showing epithelium present in the perineural spaces of adjacent small dermal nerves. Patients ranged in age from 14 to 66 years (mean 44

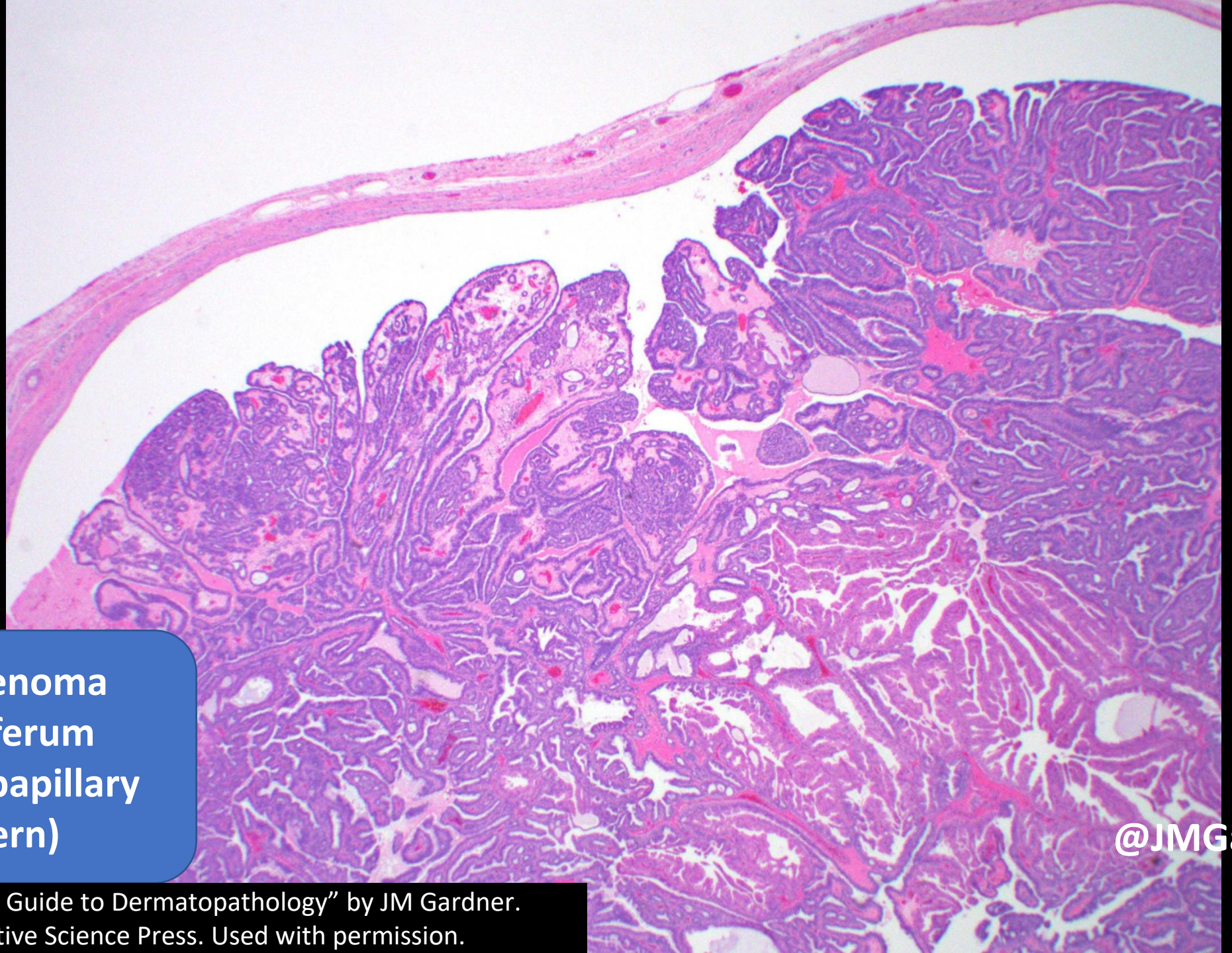


From “Survival Guide to Dermatopathology” by JM Gardner.

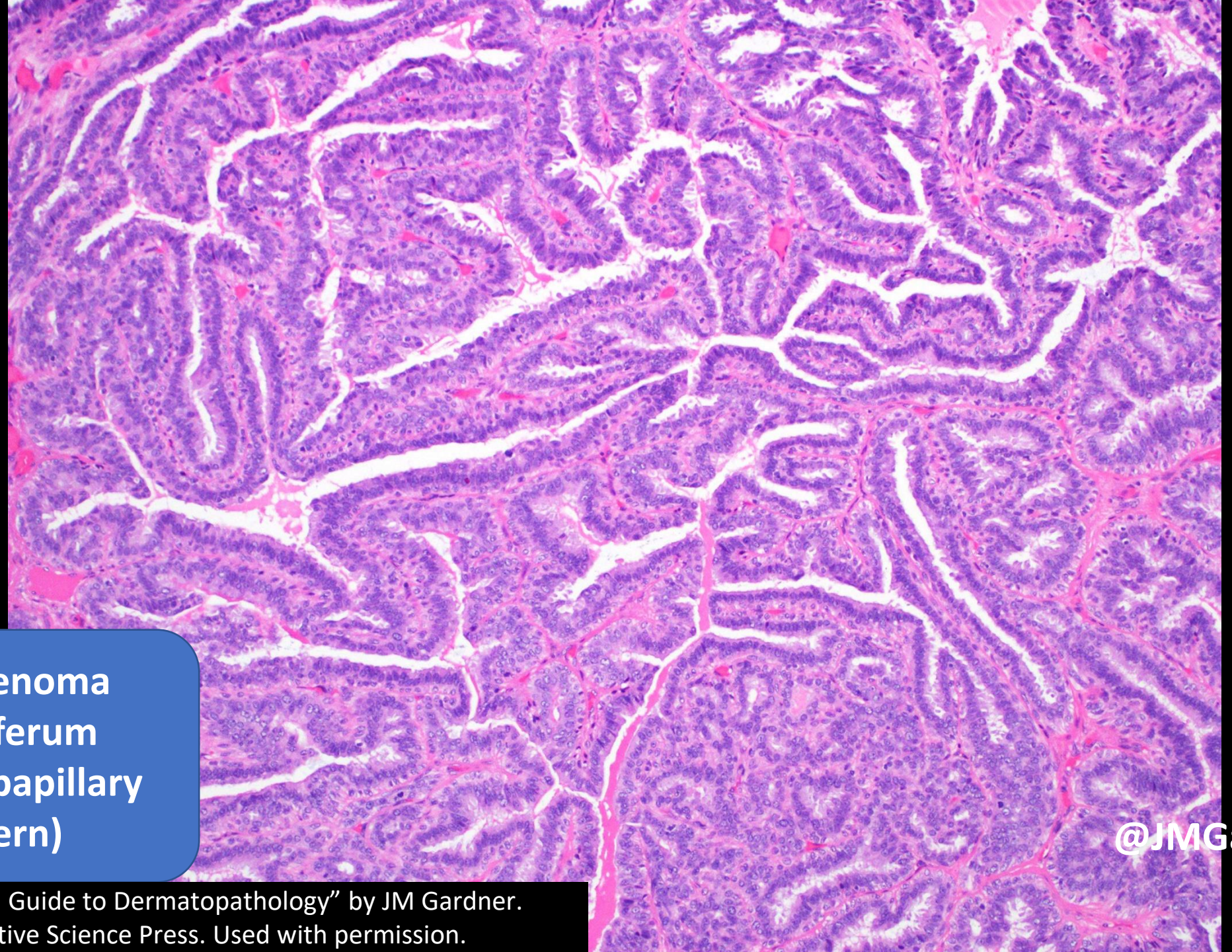
Syringocystadenoma papilliferum (SCAP) (cystic + papillary pattern)



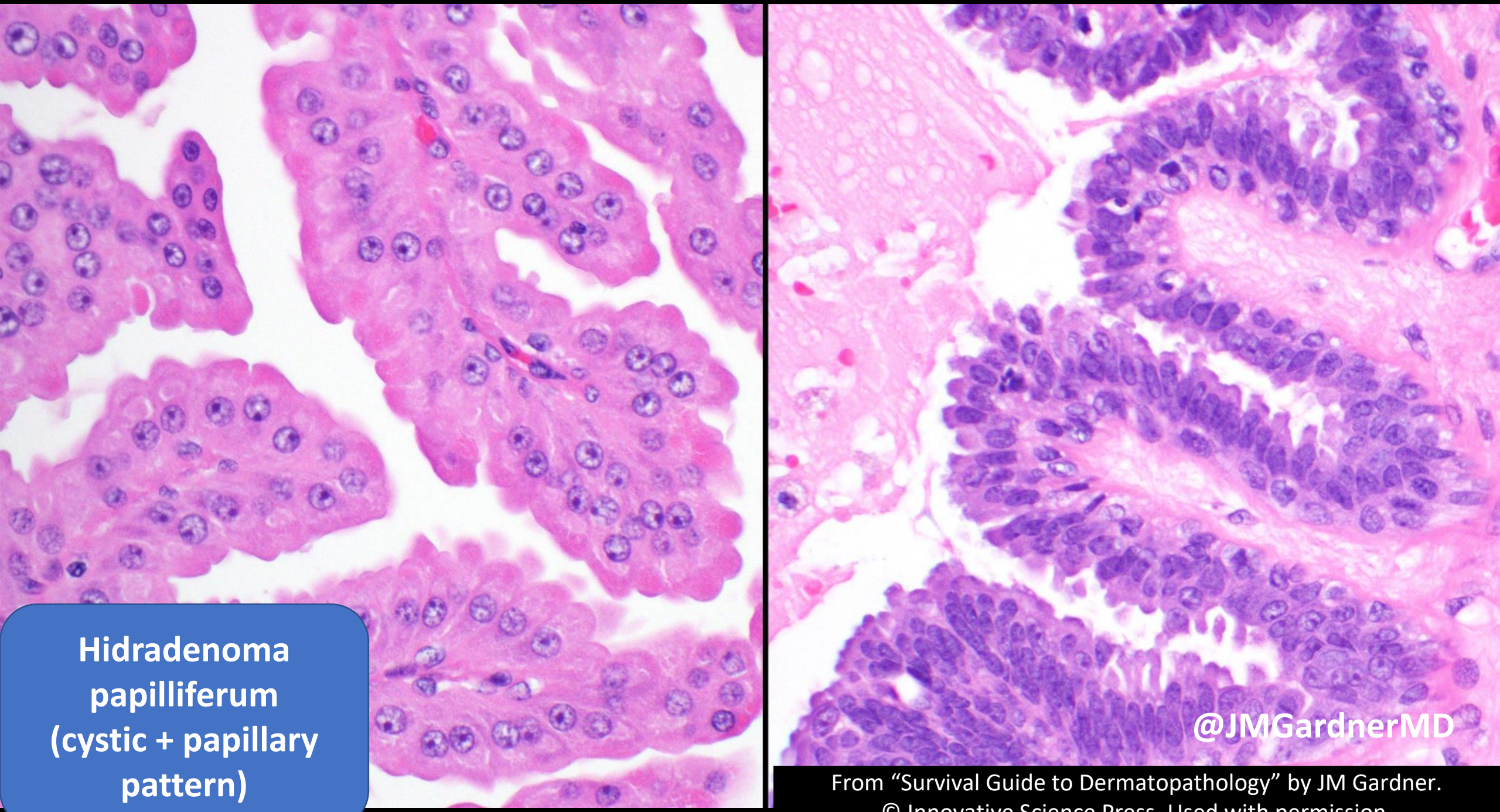
Syringocystadenoma papilliferum (SCAP) (cystic + papillary



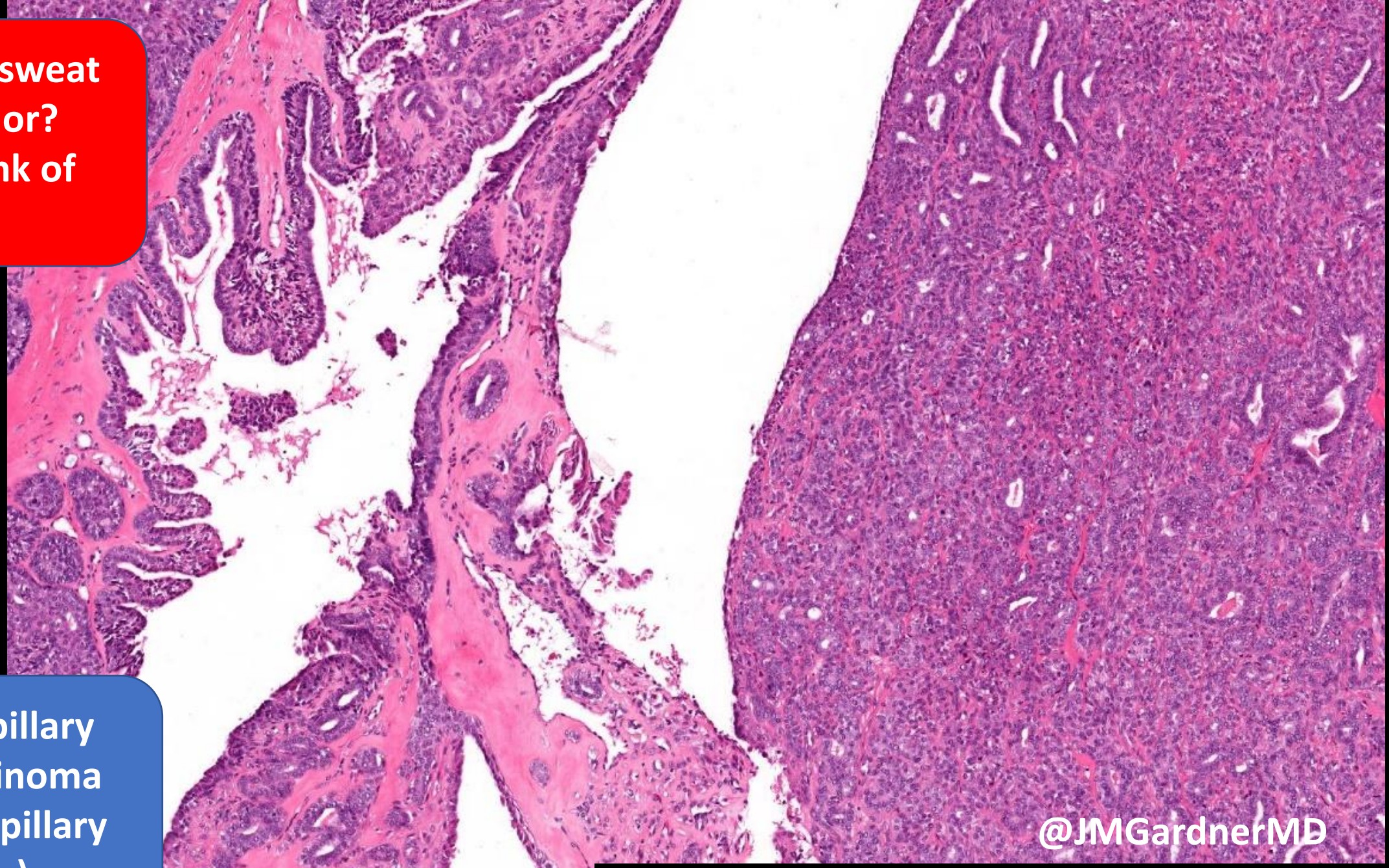
Hidradenoma papilliferum (cystic + papillary pattern)



Hidradenoma papilliferum (cystic + papillary pattern)

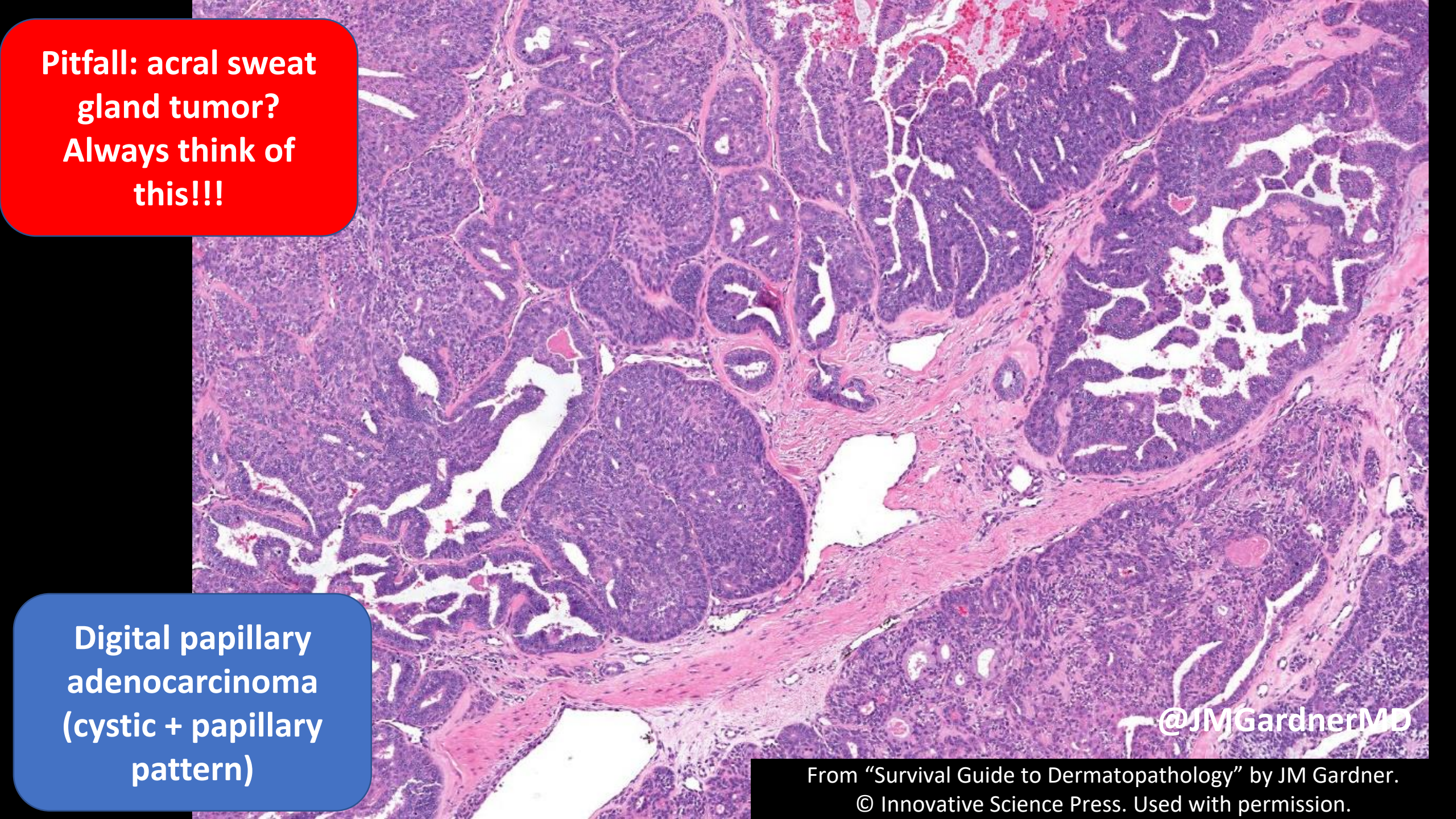


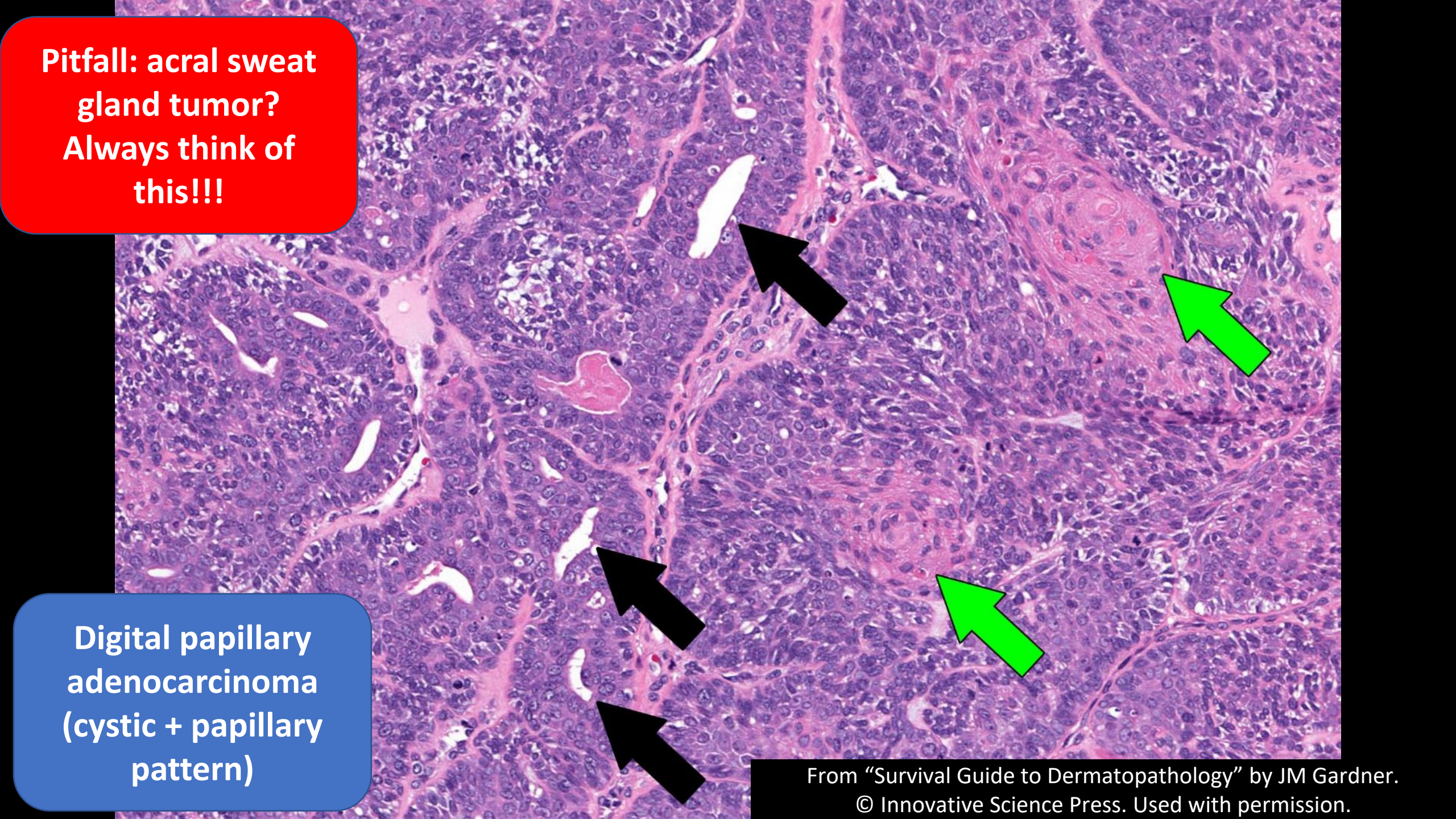
Pitfall: acral sweat gland tumor? Always think of this!!!



Digital papillary adenocarcinoma (cystic + papillary pattern)

@JMGardnerMD





Smooth muscle actin (5 of 6) and calponin (6 of 6) highlighted a **myoepithelial layer** around tubular/glandular structures, as did p63 (2 of 2) and podoplanin (5 of 5).

Multicenter Study > Am J Surg Pathol. 2012 Dec;36(12):1883-91.
doi: 10.1097/PAS.0b013e31826320ec.

Cutaneous digital papillary adenocarcinoma: a clinicopathologic study of 31 cases of a rare neoplasm with new observations

Ravi Suchak [1], Wei-Lien Wang, Victor G Prieto, Doina Ivan, Alexander J Lazar, Thomas Brenn, Eduardo Calonje

Affiliations + expand

PMID: 23026931 DOI: 10.1097/PAS.0b013e31826320ec

Abstract

Aggressive digital papillary adenocarcinoma is a rare tumor predominantly involving the distal end of digits. We examined 31 cases of this distinctive tumor for clinicopathologic, immunohistochemical, and follow-up data where available. Males were predominantly affected (n=29), with a mean age of 43 years (range, 14 to 67 y). Three lesions were reported in patients below the age of 20 years. All cases involved a finger (n=26) or a toe (n=5), with most involving the distal portion of the digit (n=29). Two lesions involved the base of the digit/webspace. Histopathologically, all tumors involved the dermis with subcutaneous extension in 14 cases. The lesions demonstrated a multinodular solid and/or cystic pattern, with focally infiltrative architecture

Human papillomavirus 42 (HPV42) is the oncogenic driver of digital papillary adenocarcinoma and is present in 96% of cases.

J Mol Diagn. 2022 May;24(5):515-528. doi: 10.1016/j.jmoldx.2022.01.011. Epub 2022 Mar 22.

Defining Novel DNA Virus–Tumor Associations and Genomic Correlates Using Prospective Clinical Tumor/Normal Matched Sequencing Data

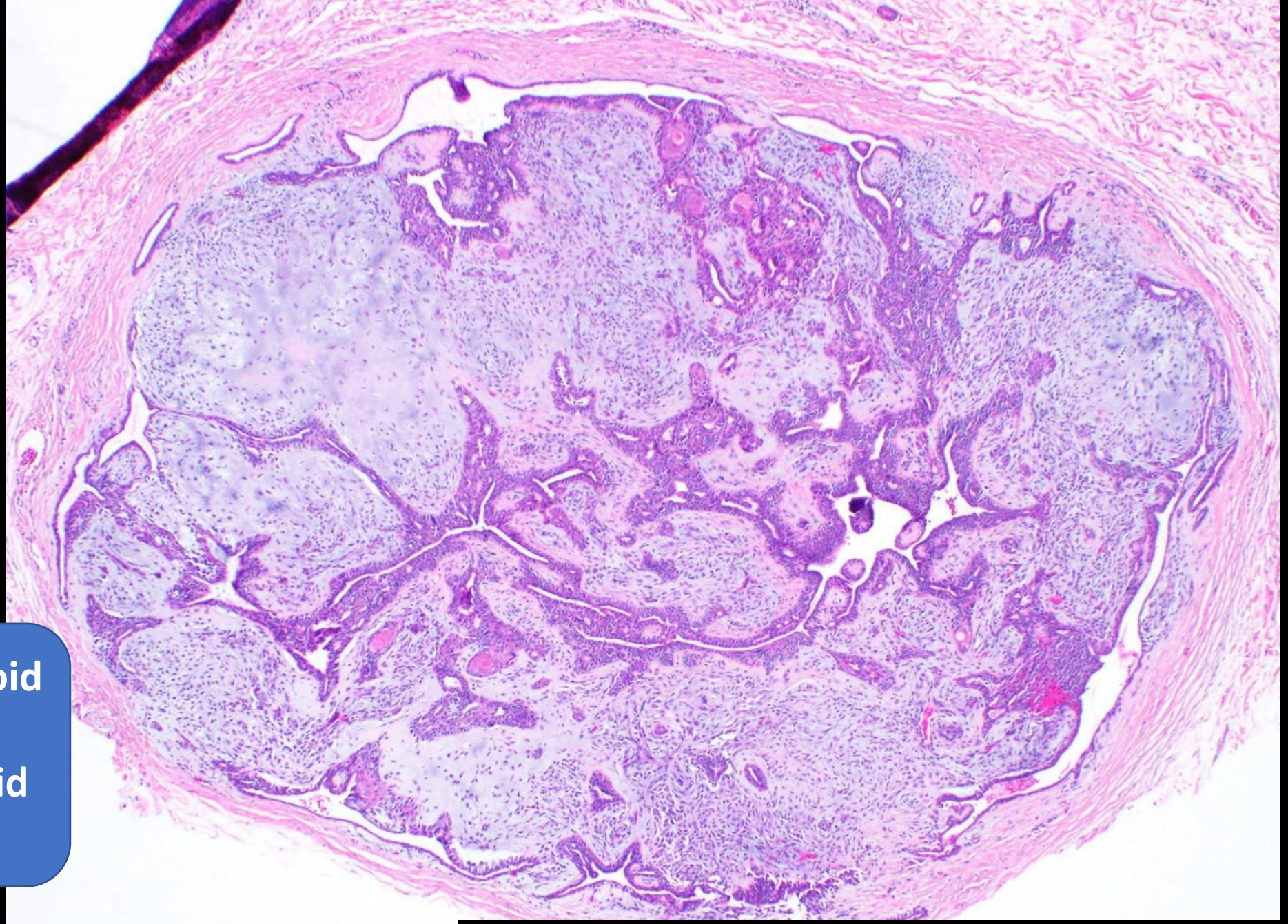
Chad M Vanderbilt [1], Anita S Bowman [2], Sumit Middha [2], Kseniya Petrova-Drus [2], Yi-Wei Tang [2], Xin Chen [3], Youxiang Wang [3], Jason Chang [2], Natasha Rekhtman [2], Klaus J Busam [2], Sounak Gupta [4], Meera Hameed [2], Maria E Arcila [2], Marc Ladanyi [2], Michael F Berger [2], Snjezana Dogan [2], Ahmet Zehir [2]

Affiliations + expand

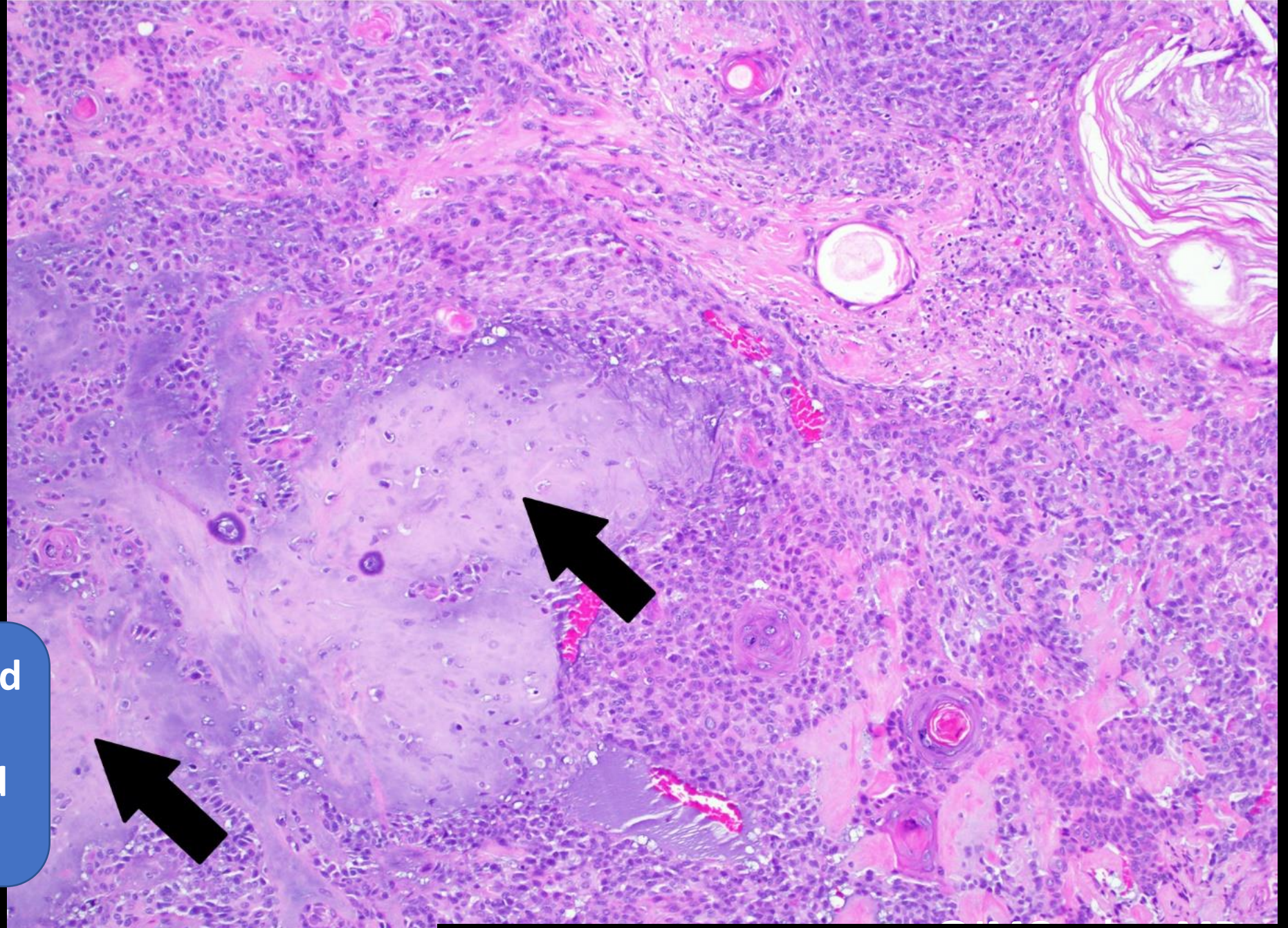
PMID: 35331965 PMCID: PMC9127461 DOI: 10.1016/j.jmoldx.2022.01.011

Abstract

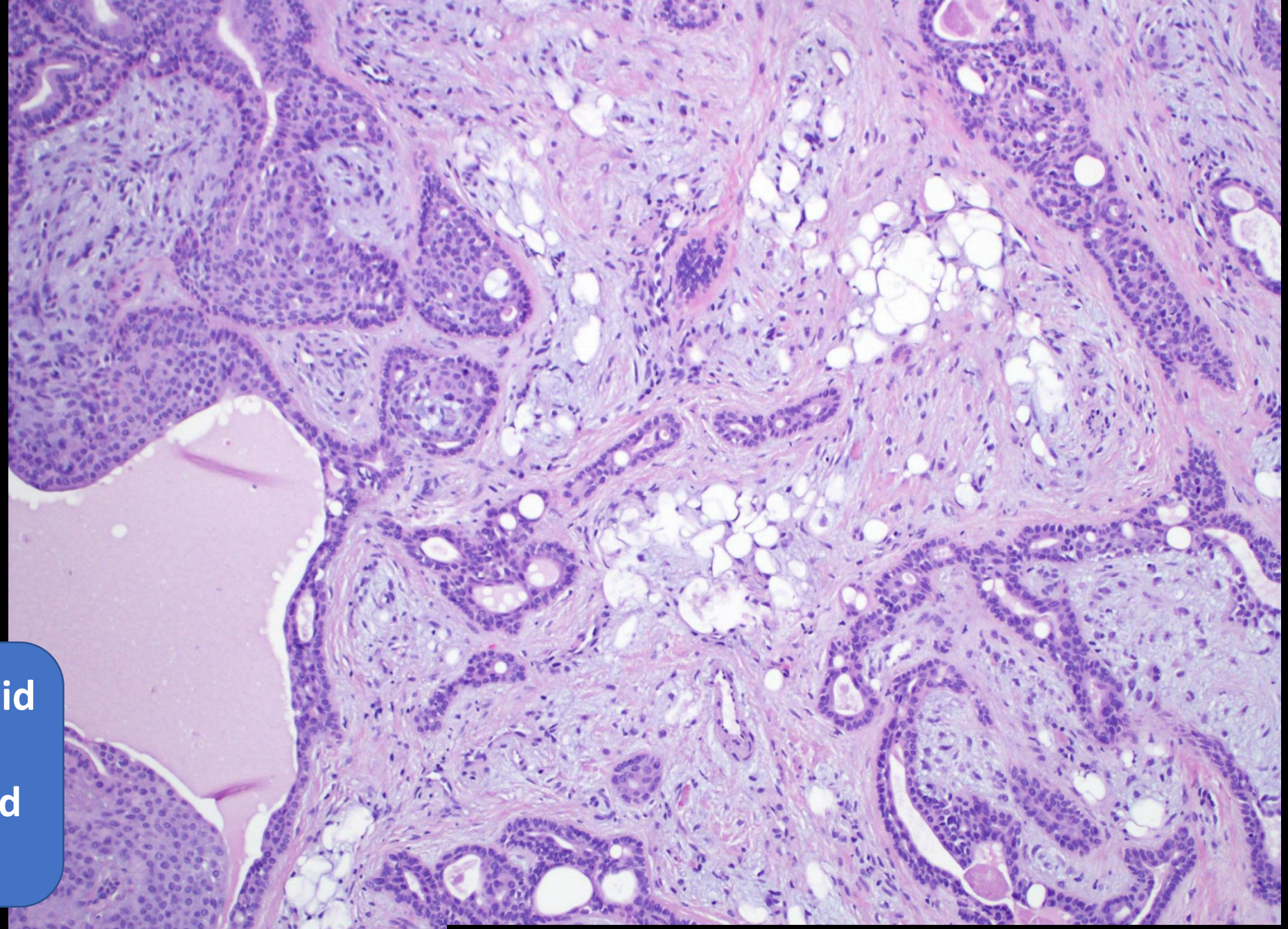
This study is the largest analysis of DNA viruses in solid tumors with associated genomics. To achieve this, a novel method for discovery of DNA viruses from matched tumor/normal next-generation sequencing samples was developed and validated. This method performed comparably to reference methods for the detection of high-risk (HR) human papilloma virus (HPV) (area under the receiver operating characteristic curve = 0.953). After virus identification in 48,148 consecutives samples from 42,846 unique patients, novel virus tumor associations were established by segregating tumor types to determine whether each DNA virus was enriched in each



Mixed tumor (chondroid syringoma) (cords/tubules/myxoid pattern)



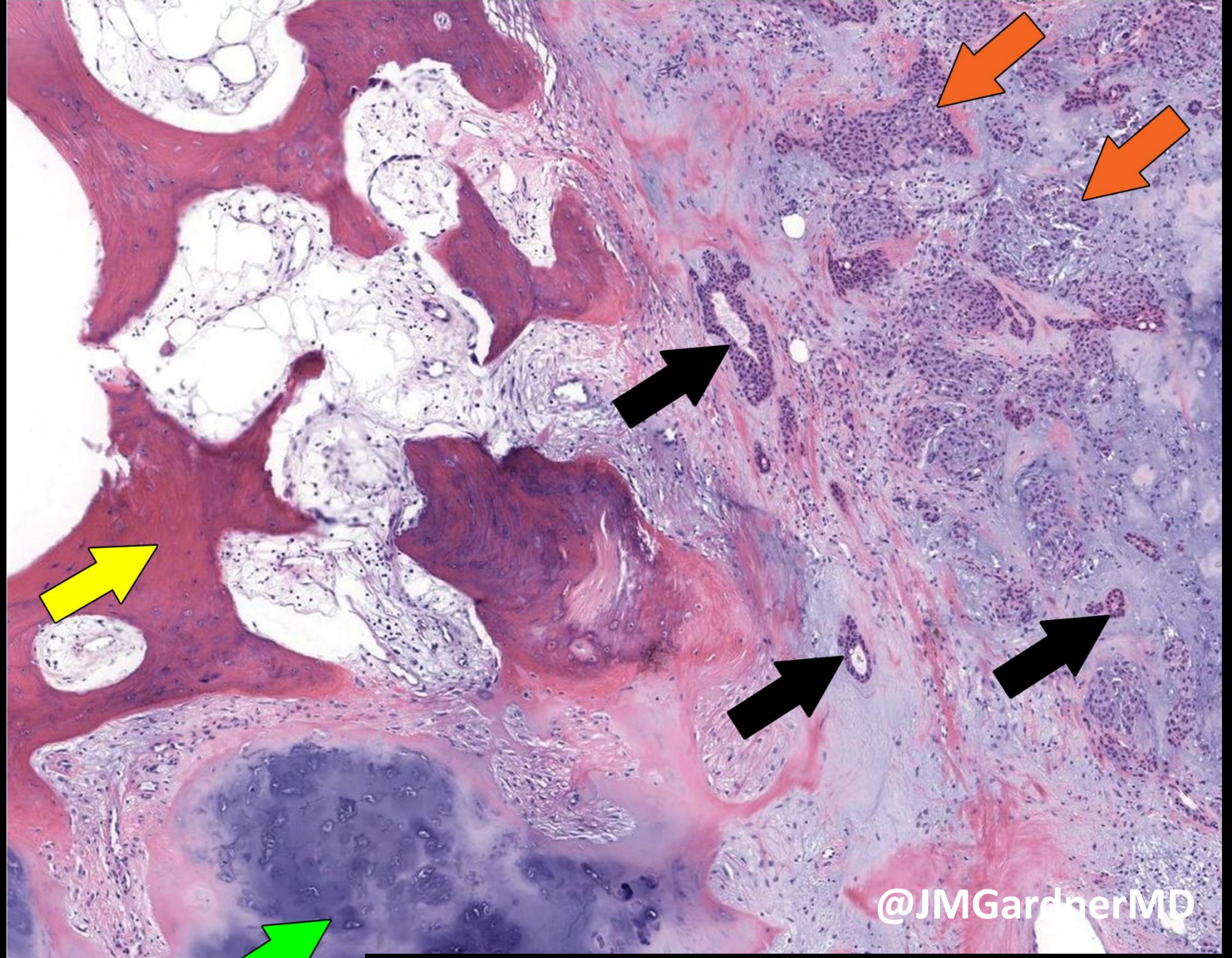
Mixed tumor (chondroid syringoma) (cords/tubules/myxoid pattern)



Mixed tumor (chondroid syringoma) (cords/tubules/myxoid pattern)

Myoepithelial cells co-express S100 & Keratin. Also may stain with SOX-10, calponin, SMA.

Mixed tumor (chondroid syringoma) (cords/tubules/myxoid pattern)



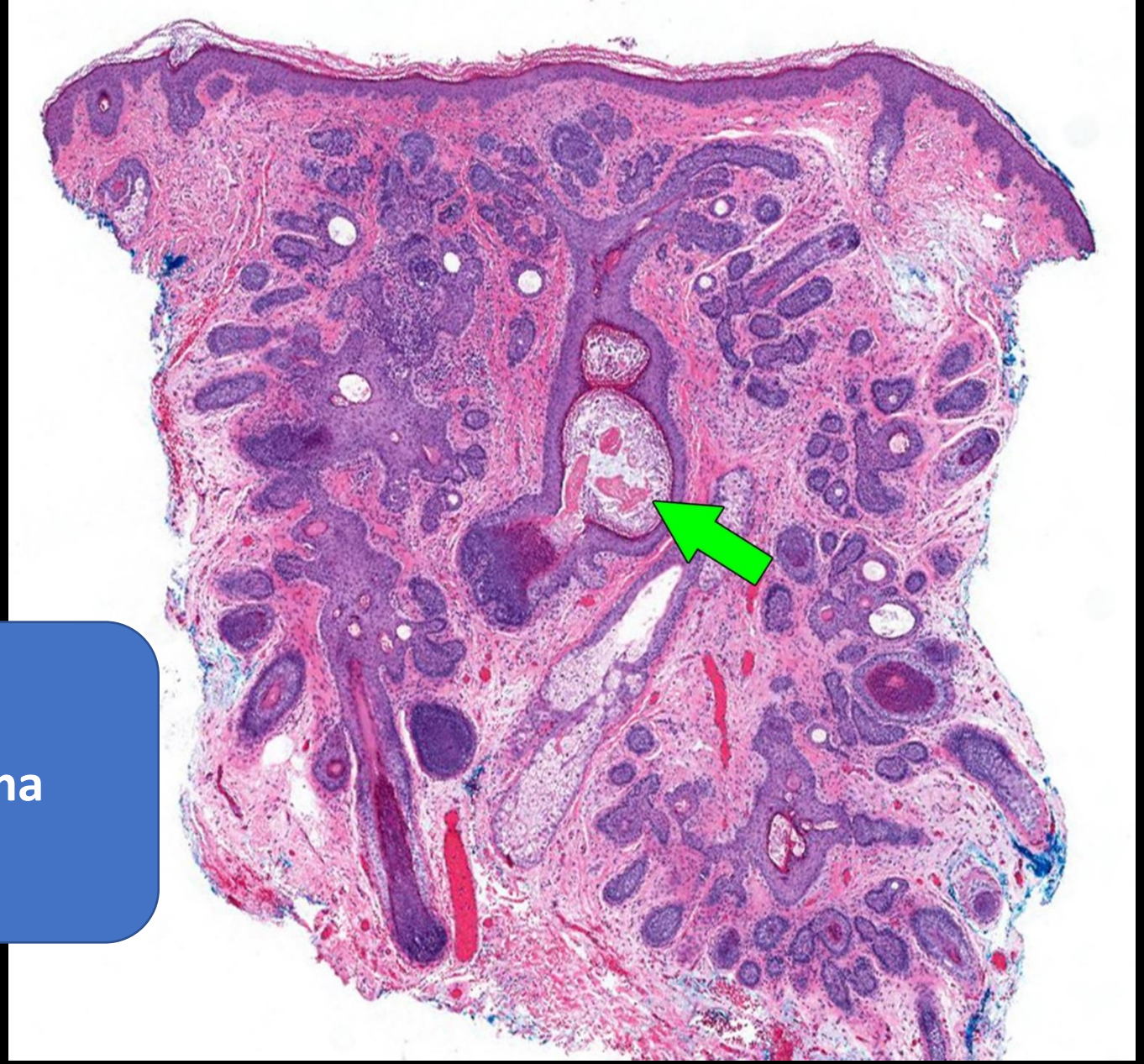
Follicular proliferations

- They are many
- They are unique like snowflakes

  …each case looks a bit different from next

@JMGardnerMD

Trichofolliculoma



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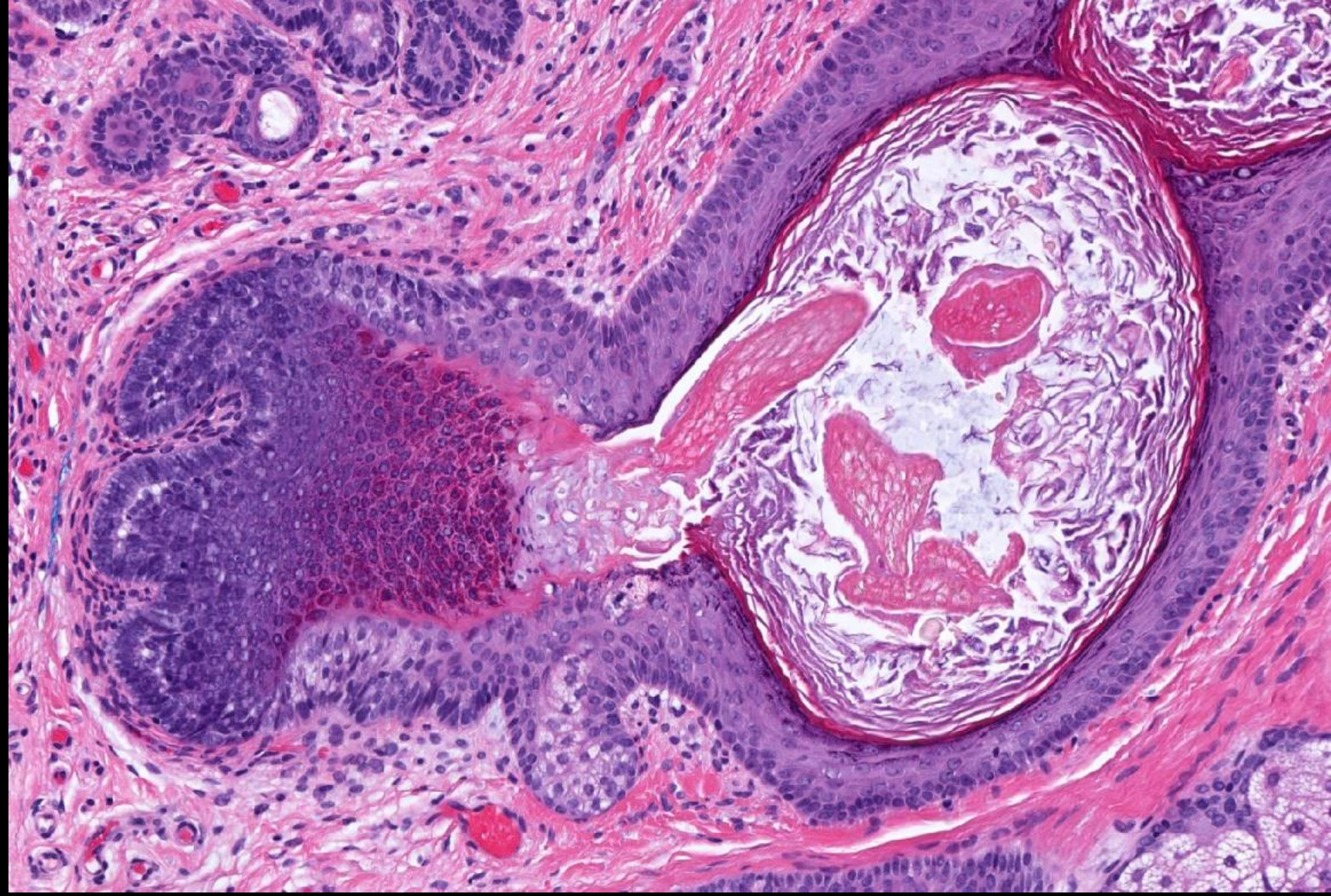
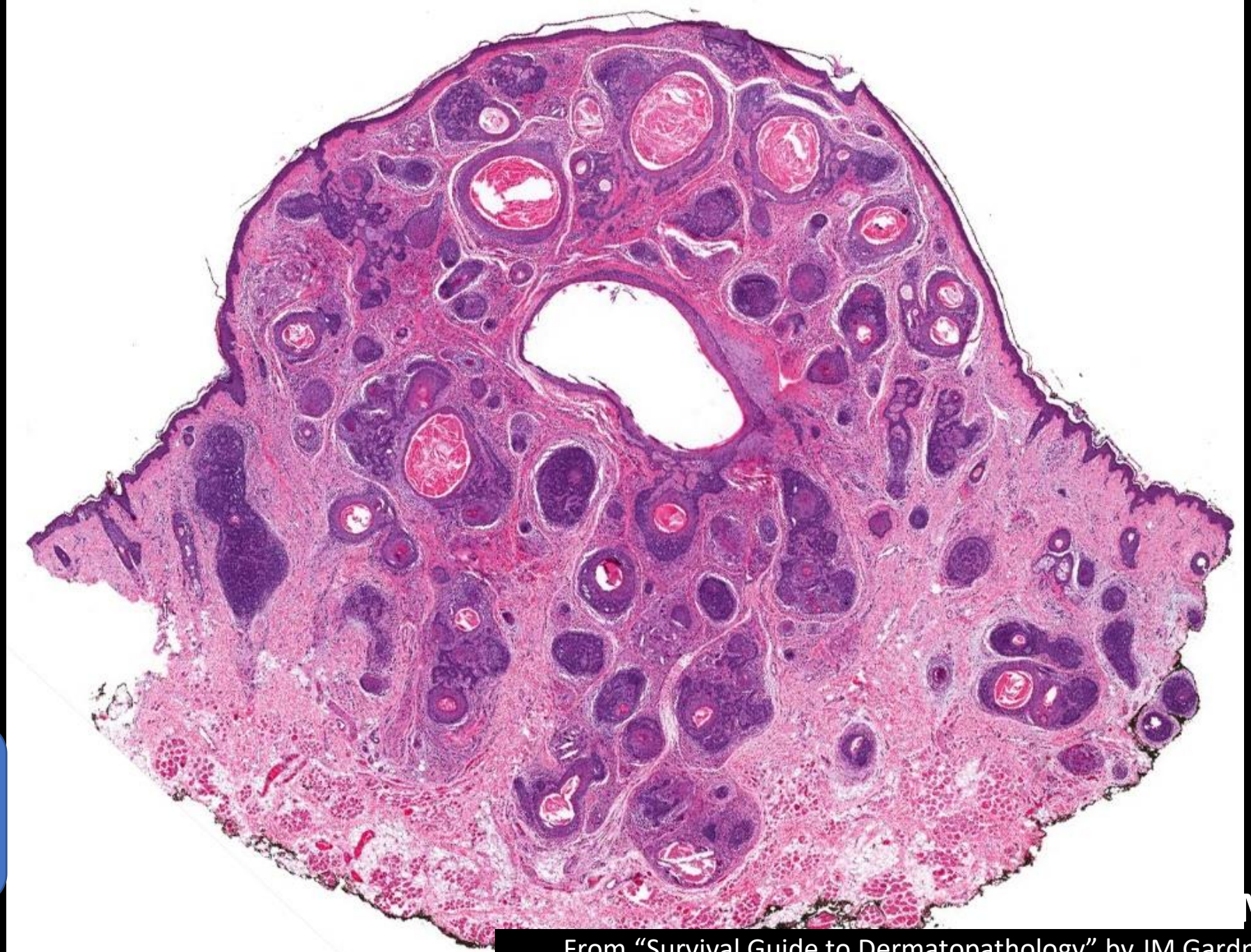


Trichofolliculoma

@JMGardnerMD

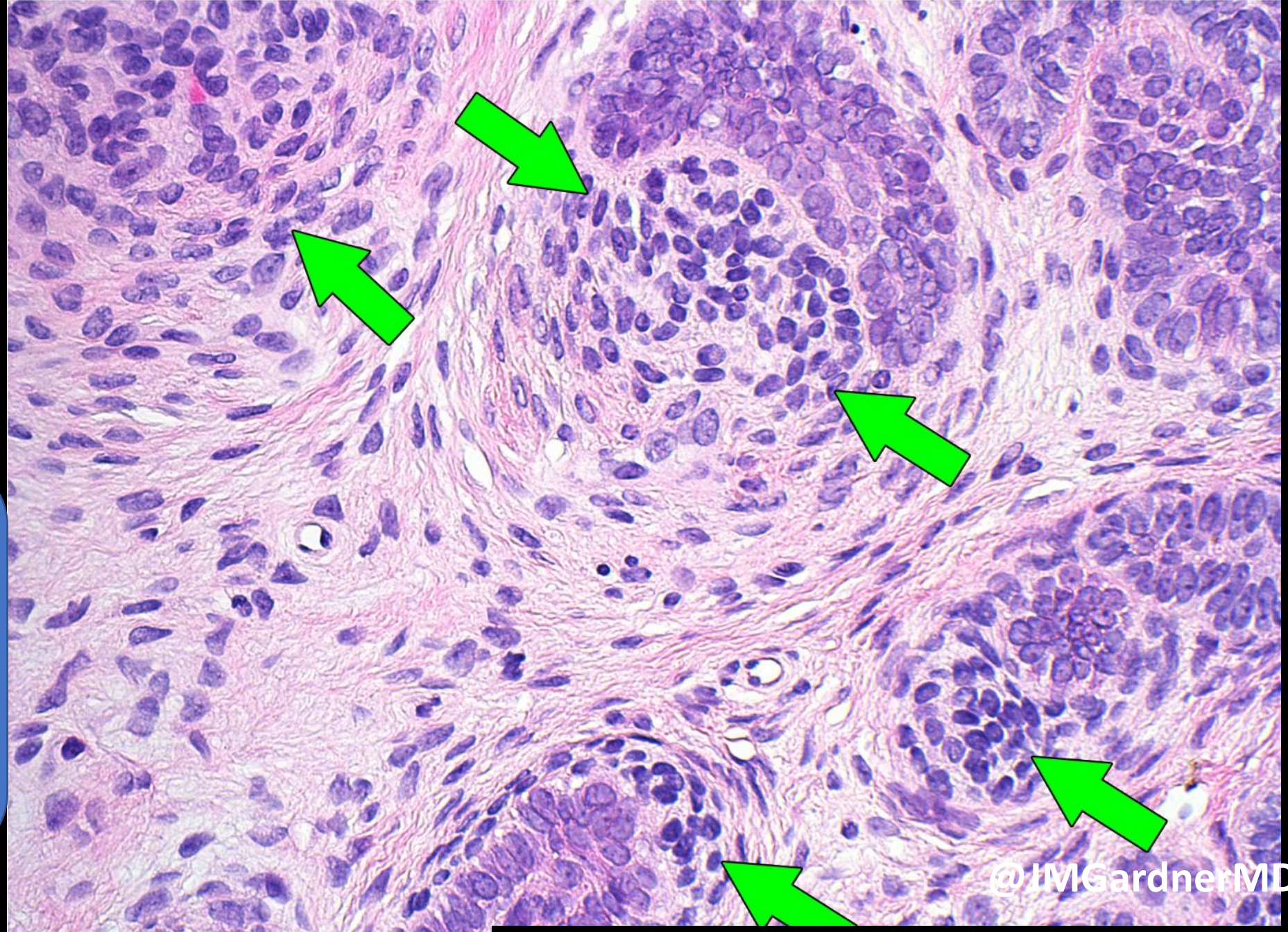
Trichoepithelioma



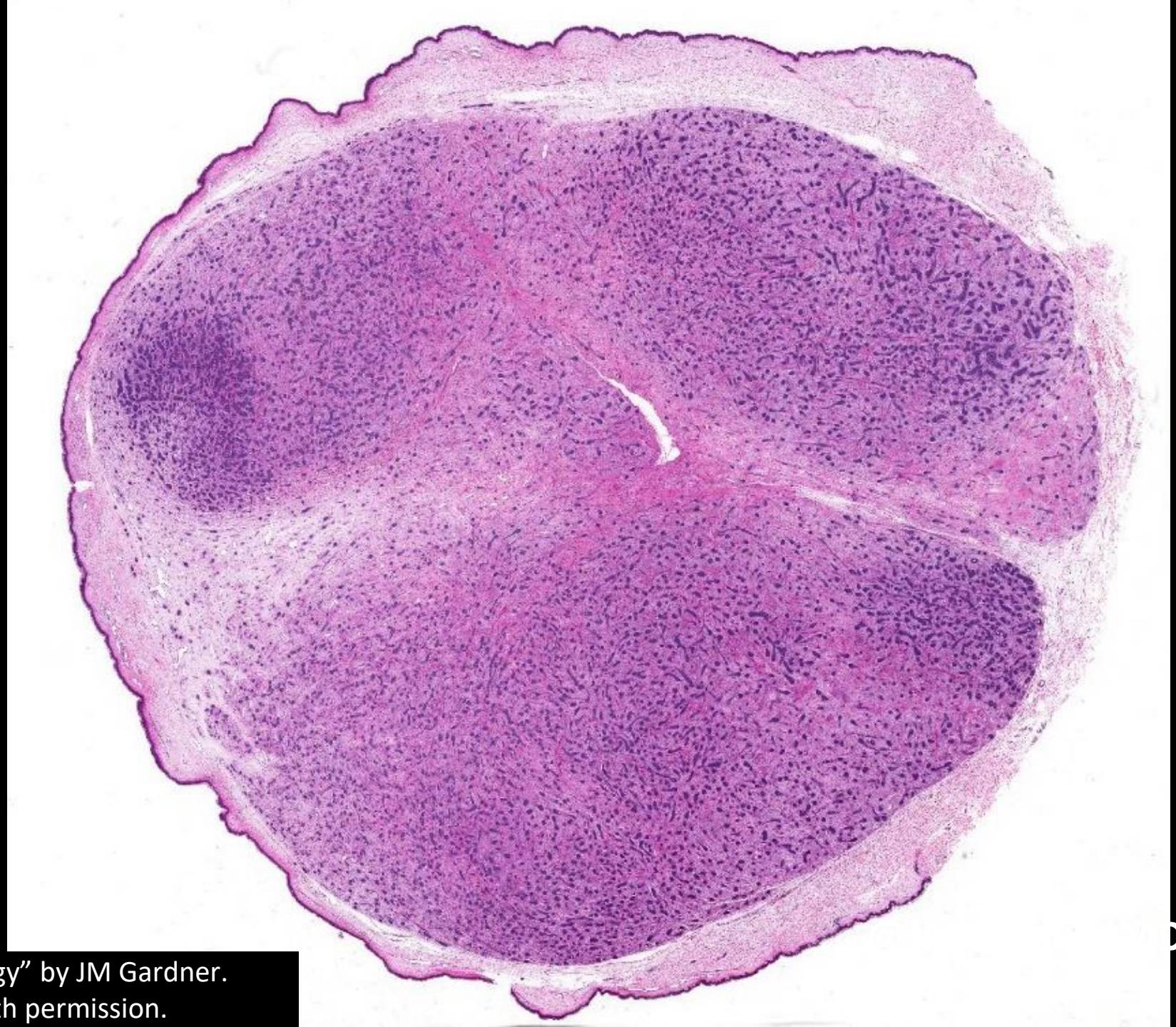
MD

Trichoepithelioma

Papillary mesenchymal bodies = classic finding

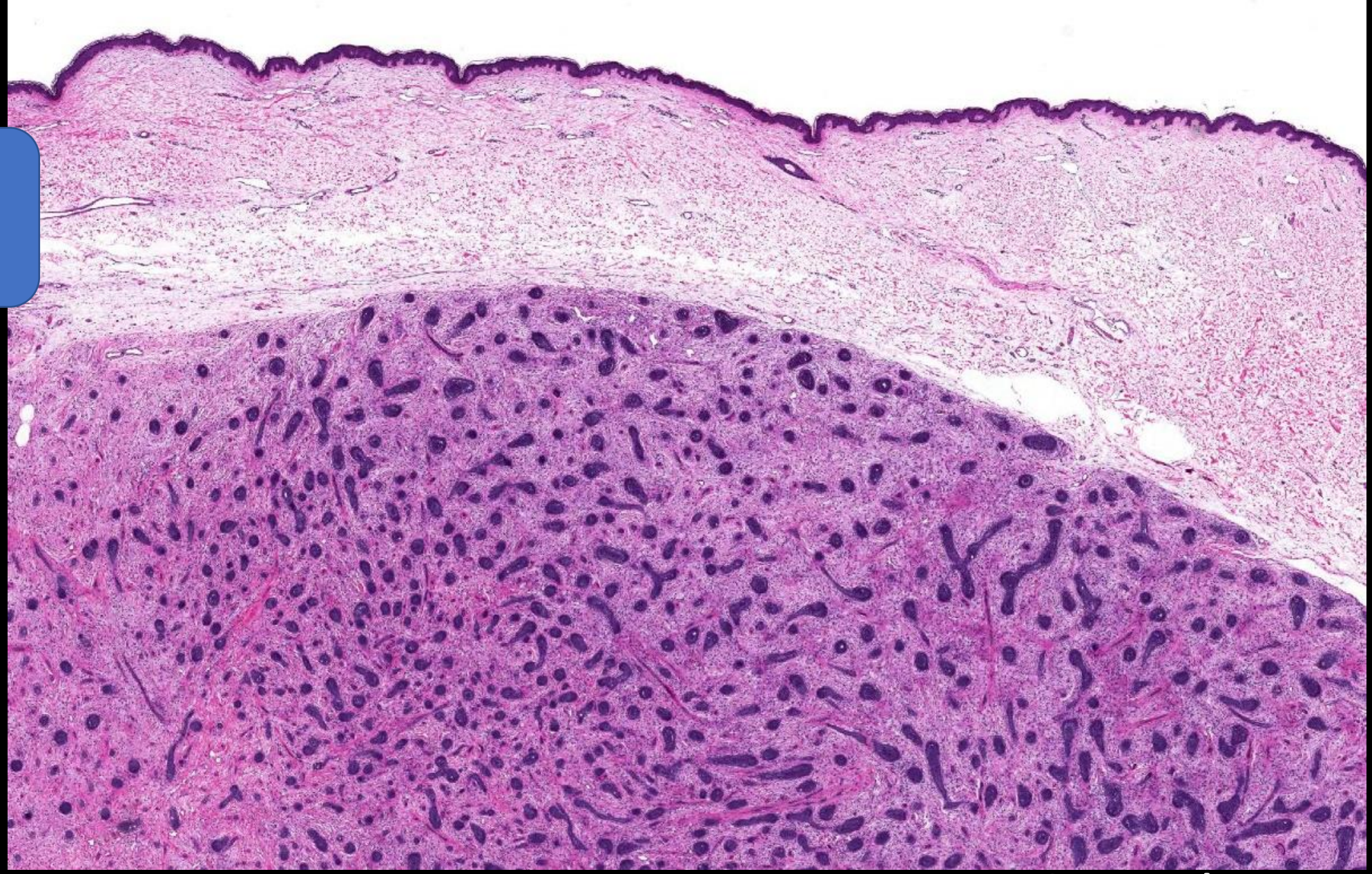


Trichoblastoma



From “Survival Guide to Dermatopathology” by JM Gardner.

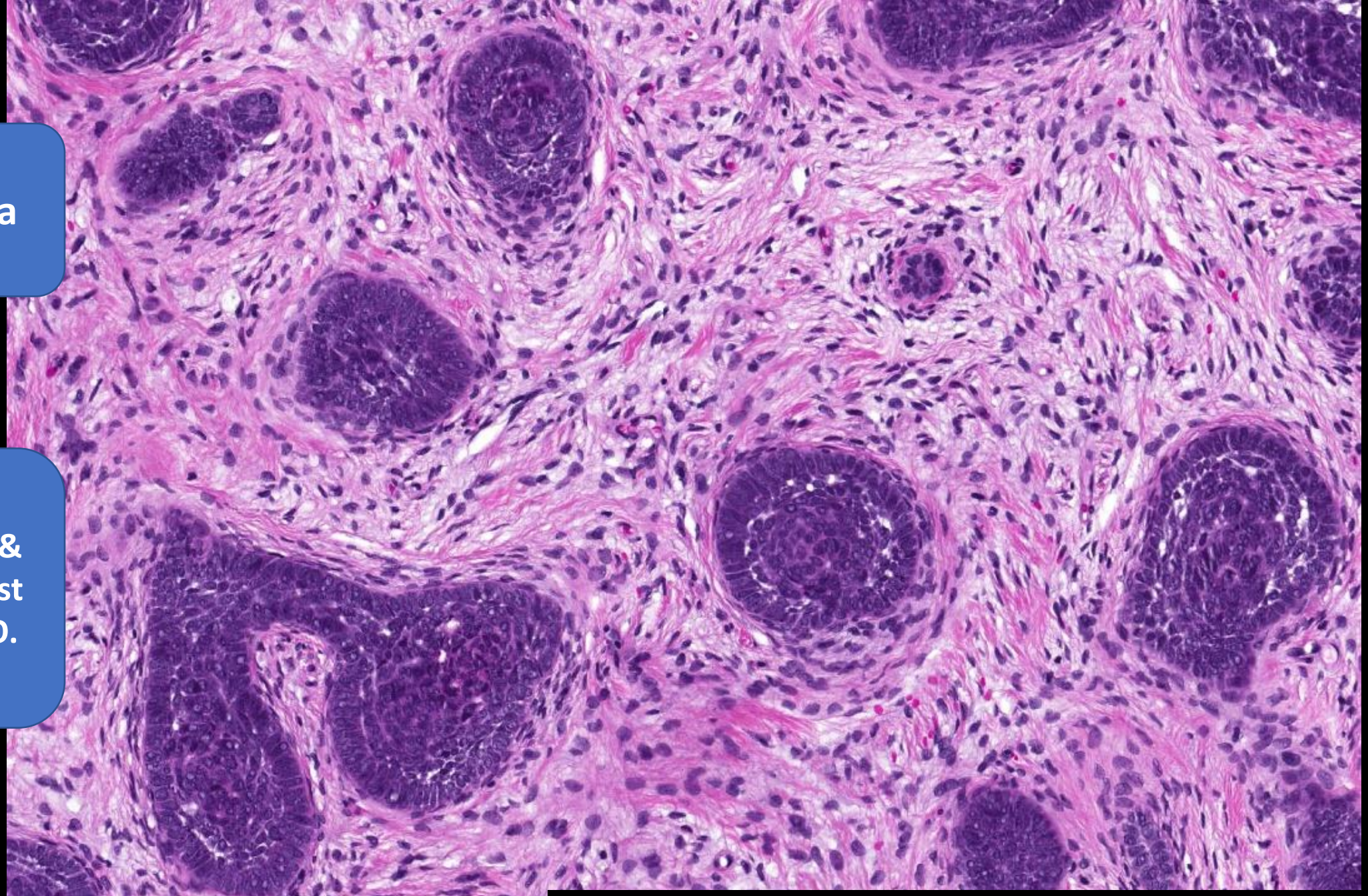
Trichoblastoma



@JMGardnerMD

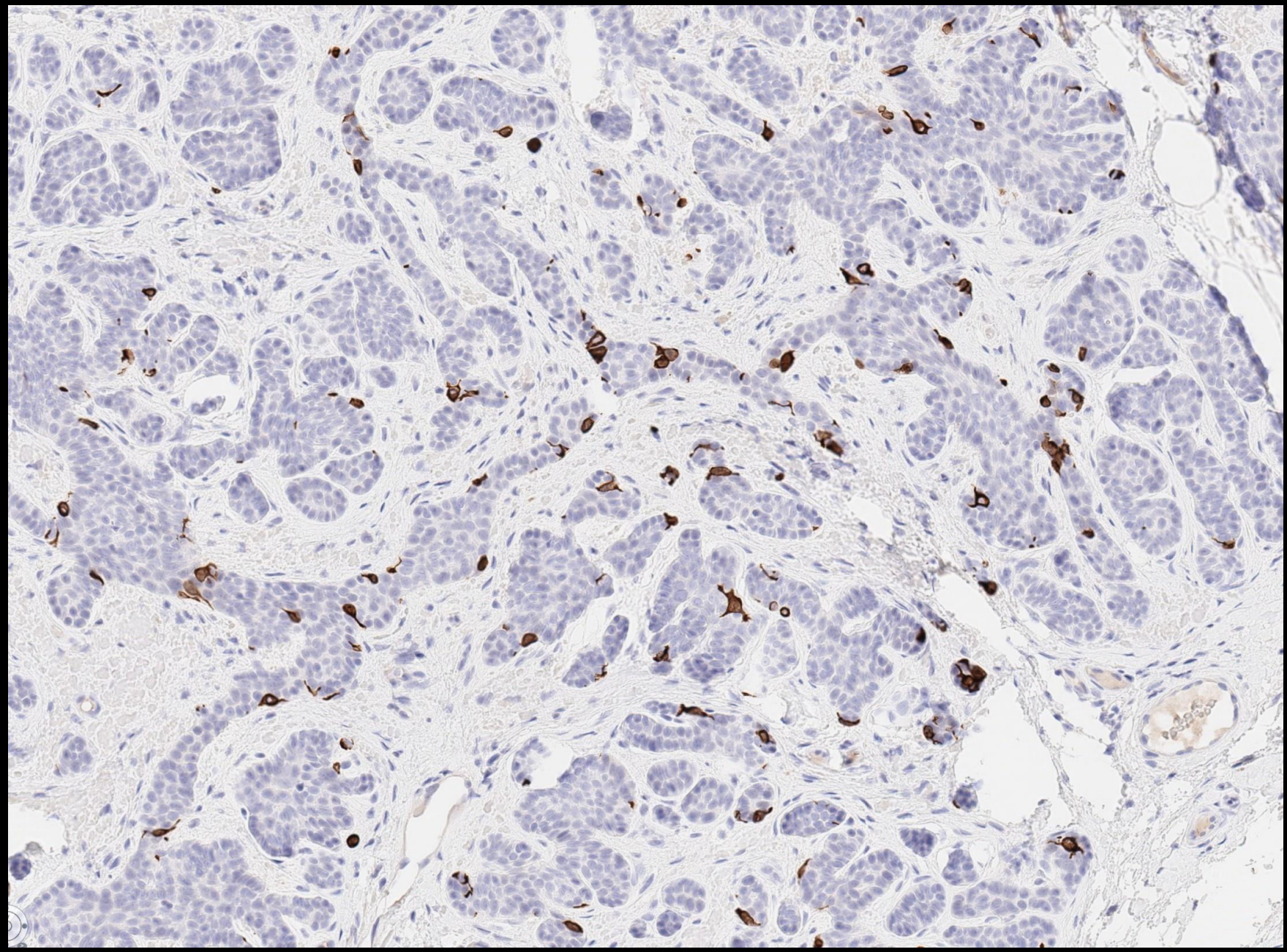
Trichoblastoma

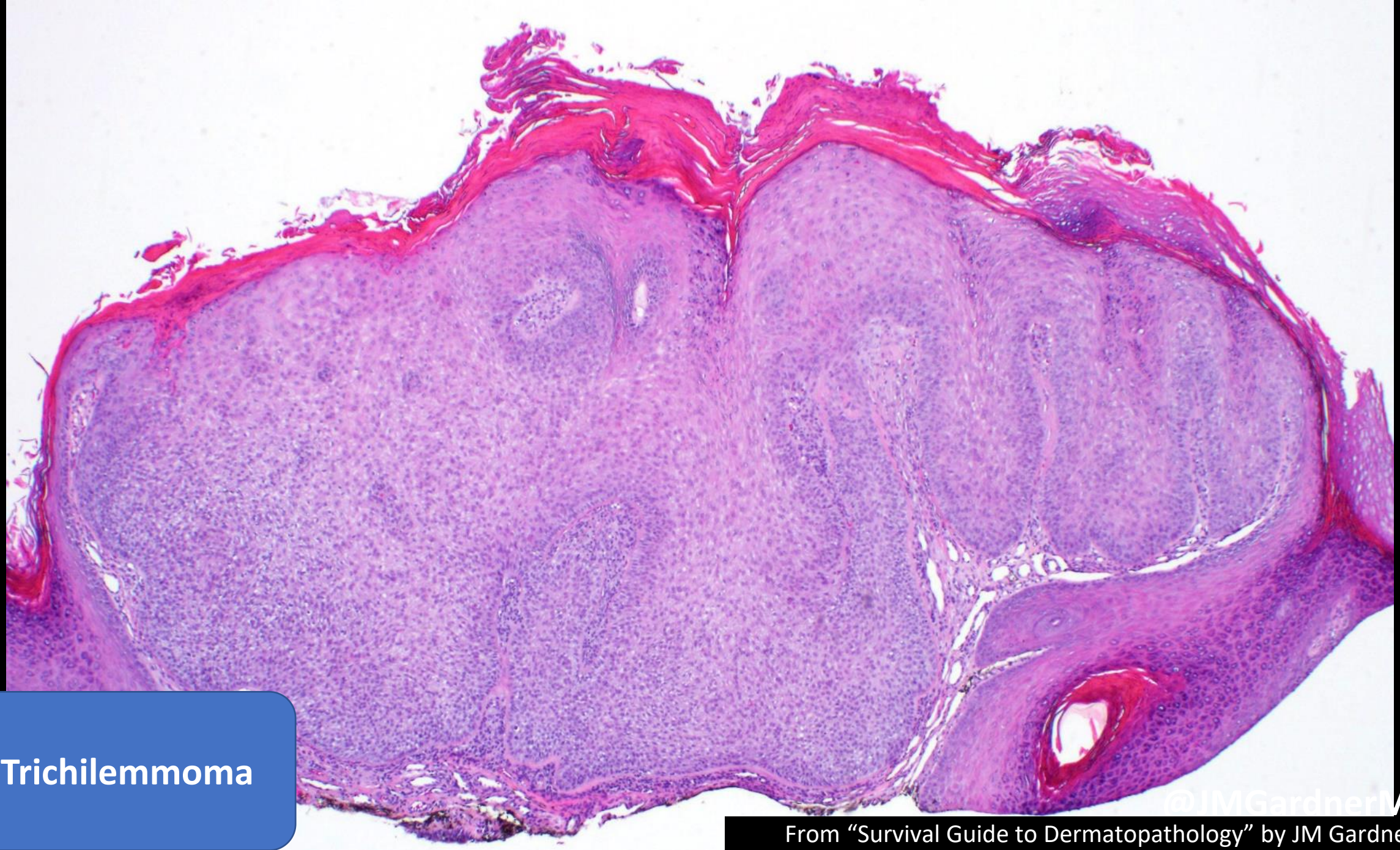
Trichoepithelioma & Trichoblastoma exist on a spectrum IMO.



Trichoepithelioma & Trichoblastoma usually have scattered benign “passenger” Merkel cells colonizing the basaloid tumor islands. CK20 immunostain can highlight these.

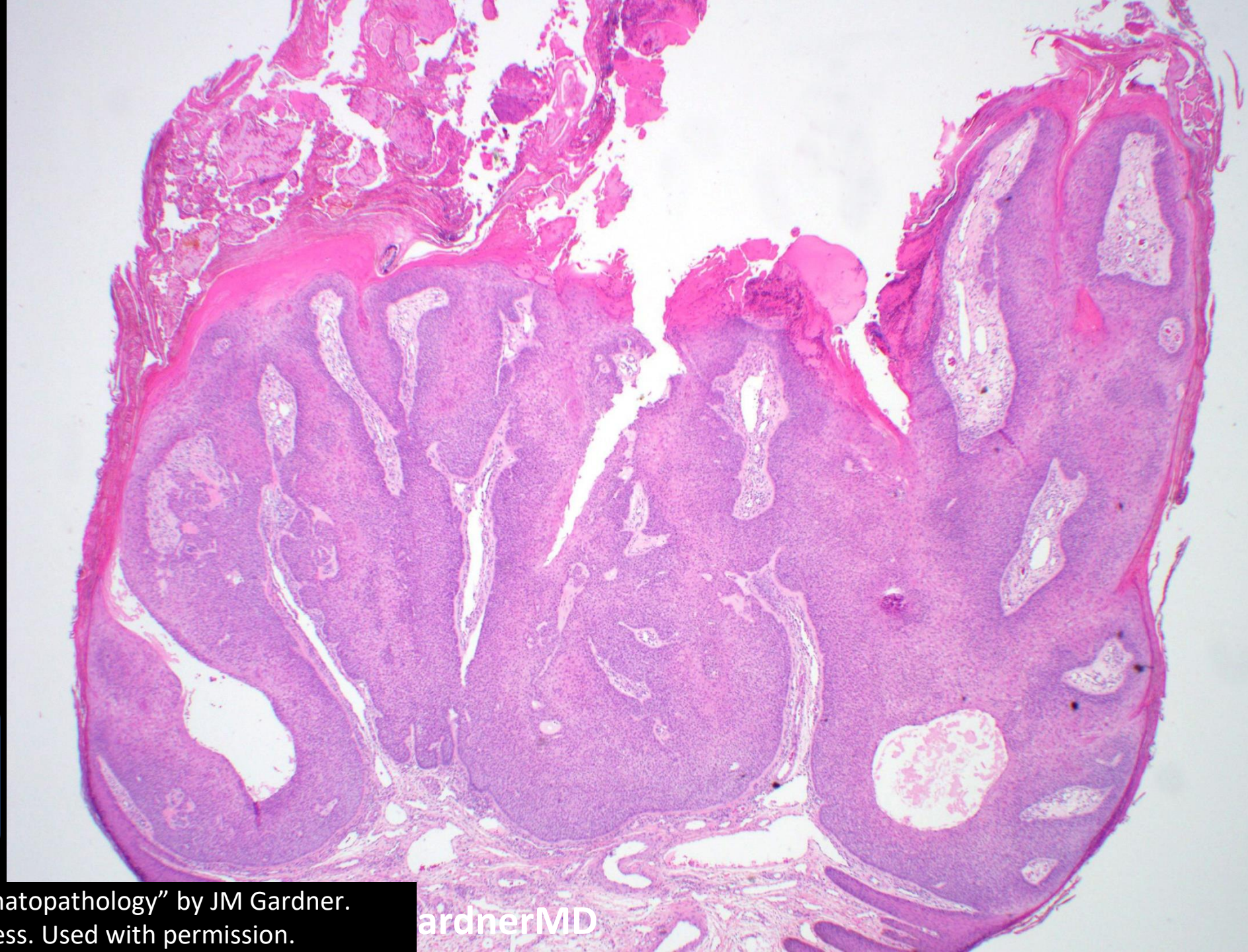
BCC & MAC usually don’t have these Merkel cells.



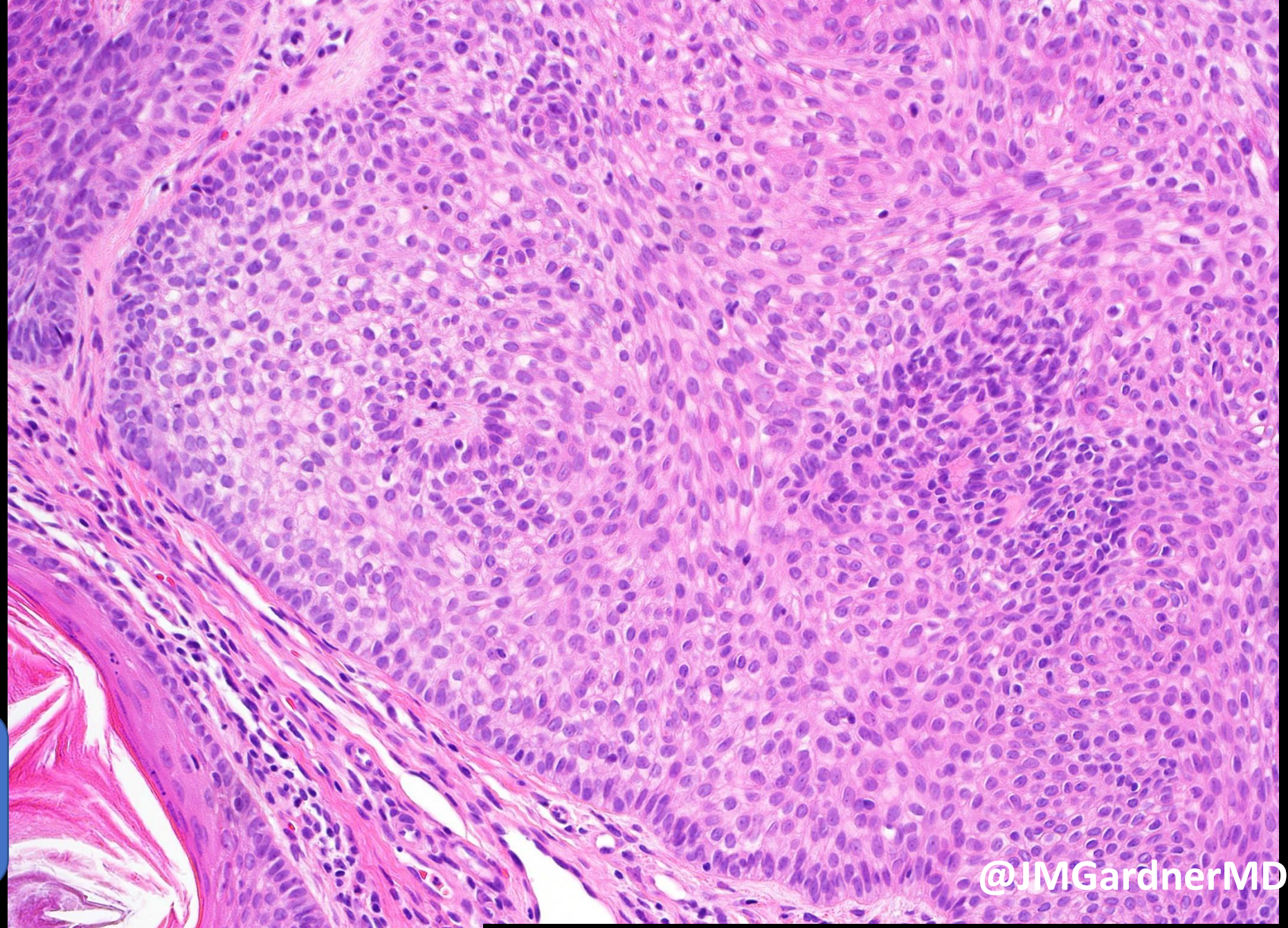


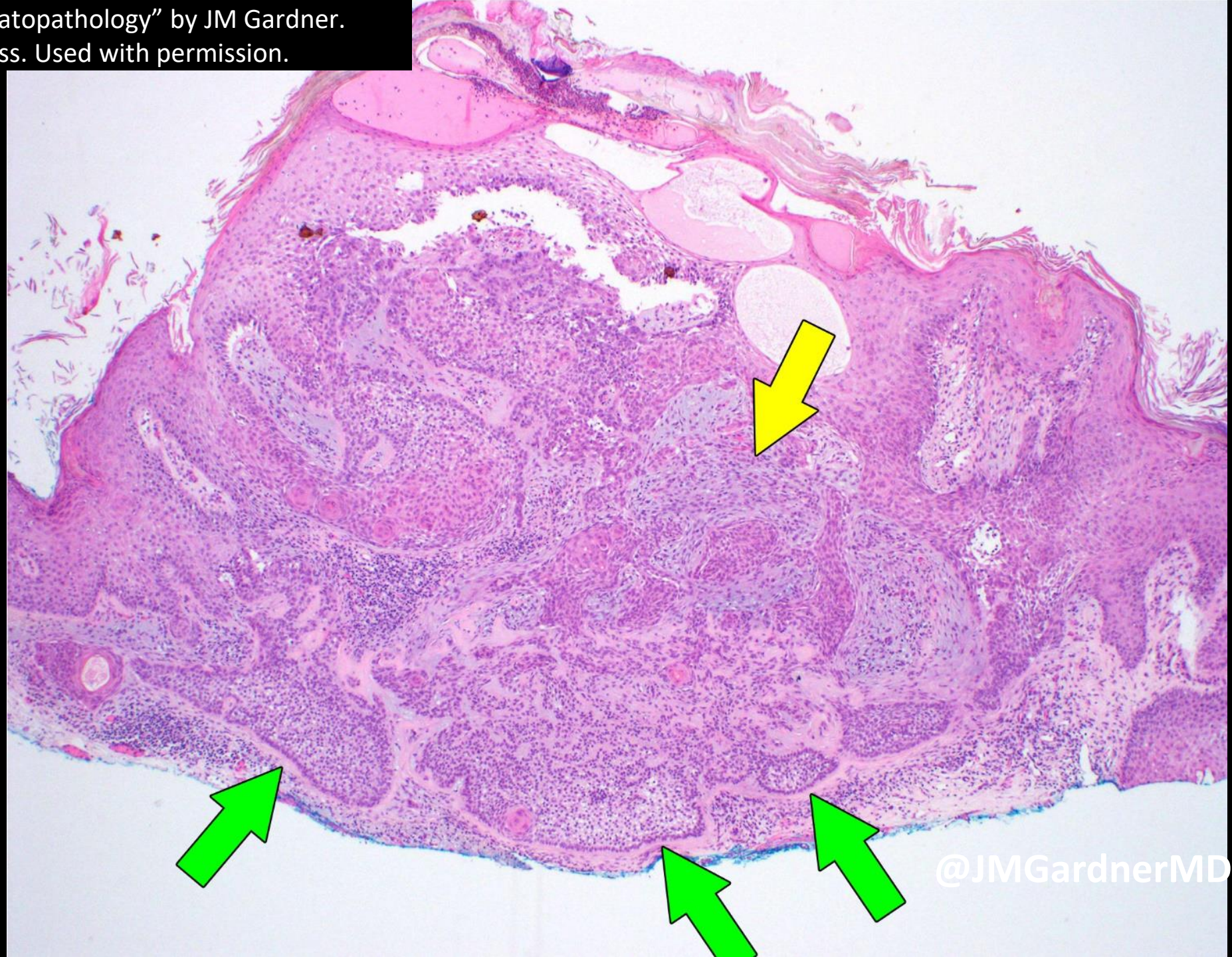
Trichilemmoma

Trichilemmoma

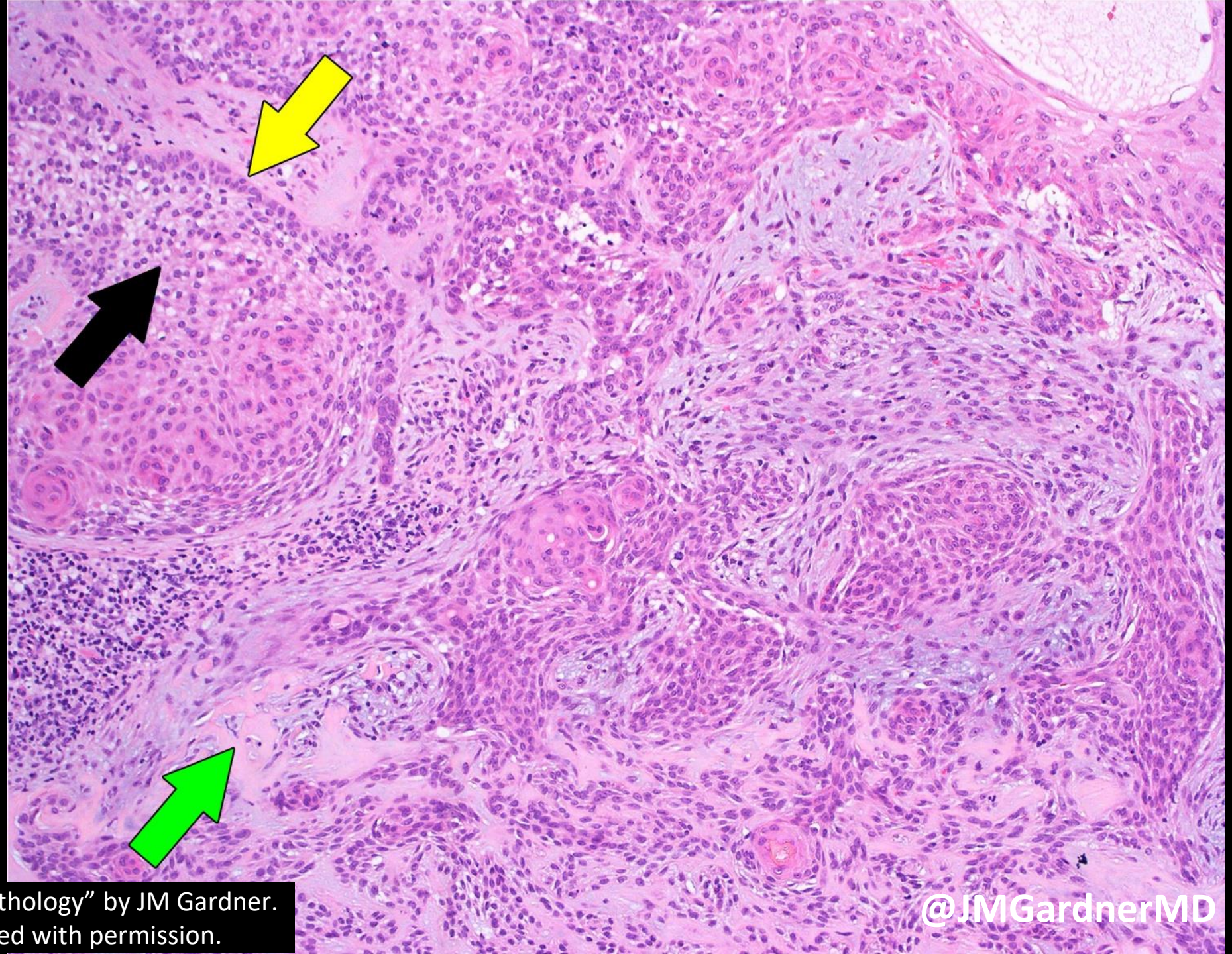


Trichilemmoma



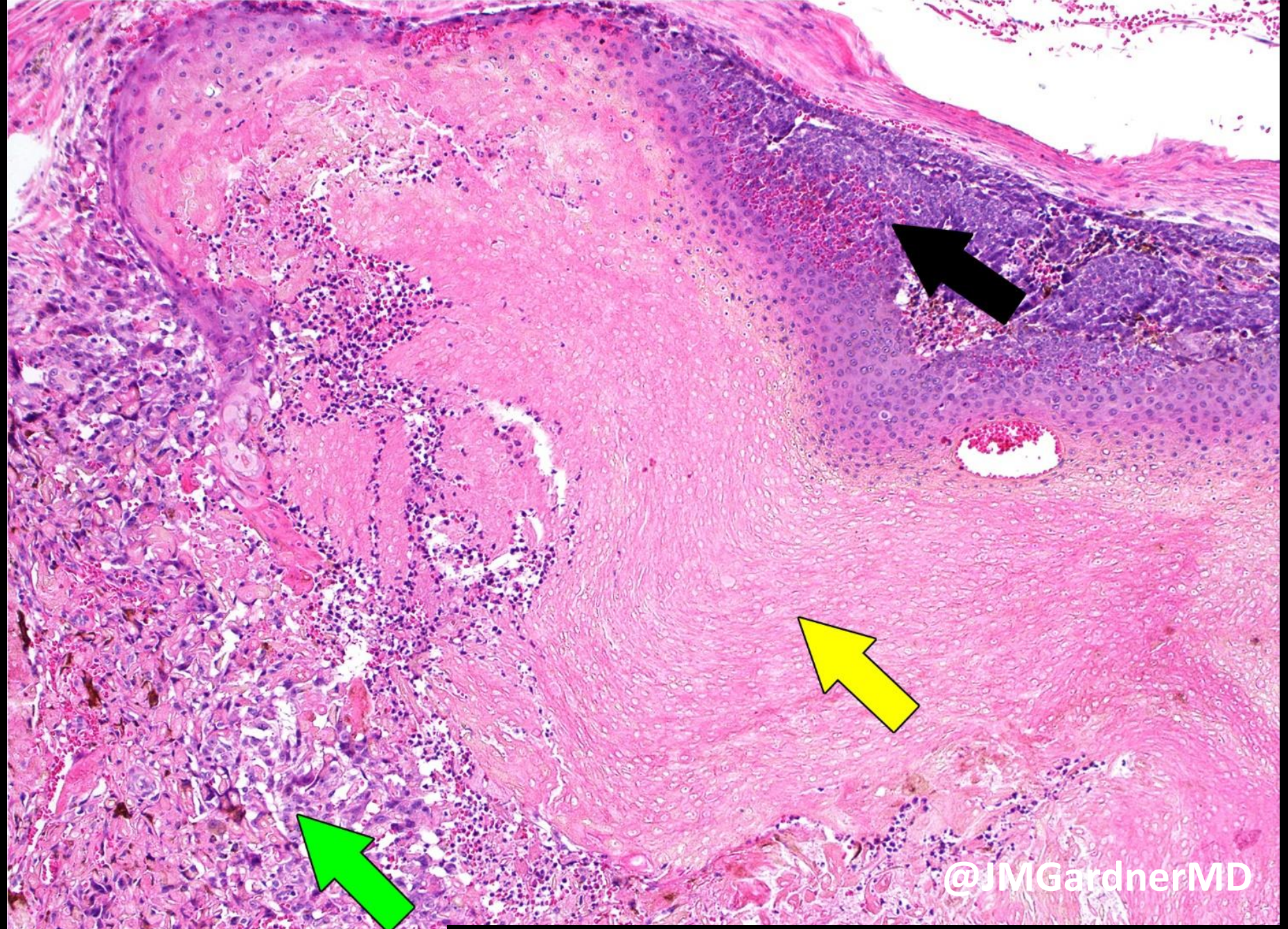


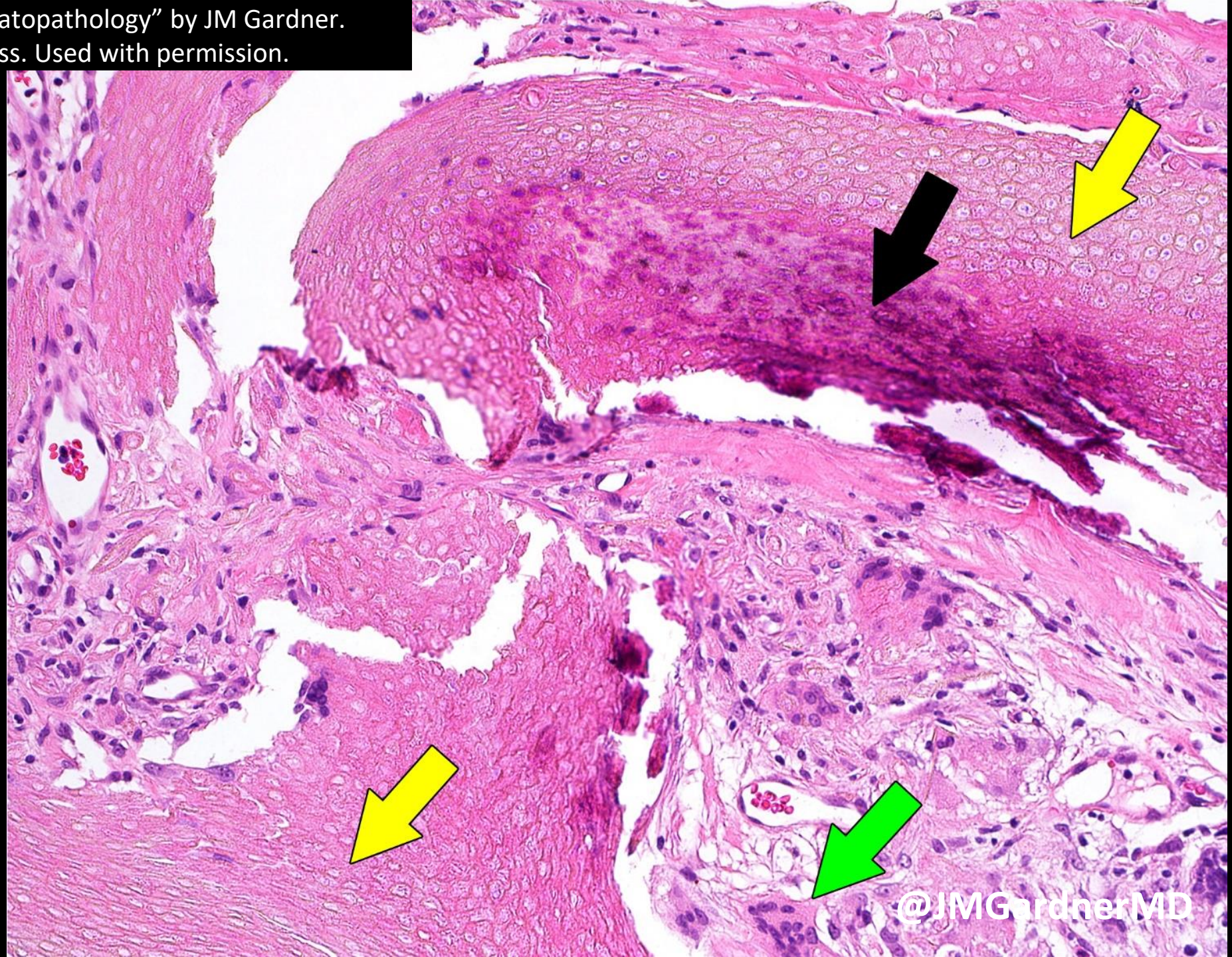
Desmoplastic Trichilemmoma



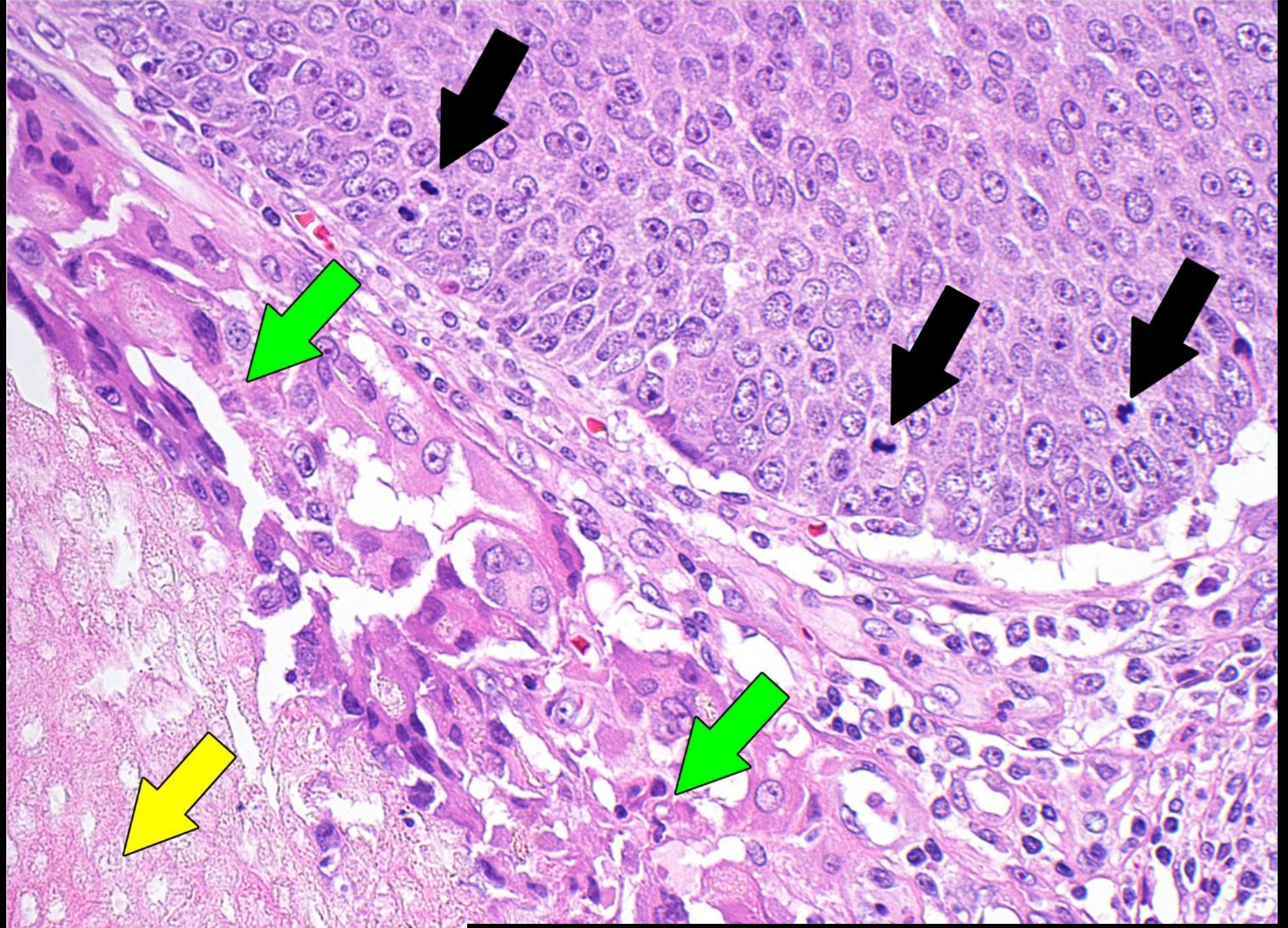
Desmoplastic Trichilemmoma

Pilomatricoma





Pilomatricoma



Pilomatricoma

(often have NUMEROUS mitoses!)