



Chief's Rounds

Theodore Bowe, PGY-2


October 29th, 2021

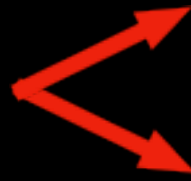



47 yo M presents for a second opinion of four weeks of progressive painless left eye fullness





V_{cc}  20/30
20/20

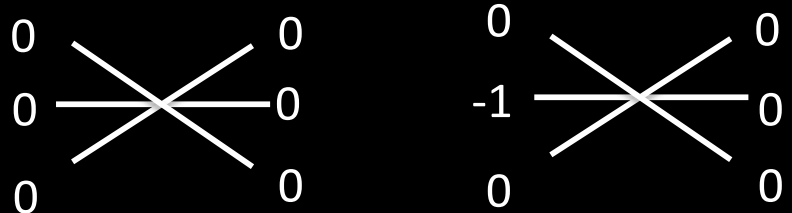
T  18
18

P  No APD
No APD

CVF: Full

Hertel: 16/21
base 97

Motility



DFE: Choroidal
Folds OS



Past Medical History

- **PMHx:** low testosterone (self-dx)
- **POHx:** None
- **ROS:** No constitutional symptoms, no recent illness, no headaches
- **FHx:** Father – MI, Mother – unspecified cancer
- **Allergies:** Penicillin (Rash)
- **Rx:** OTC Testosterone supplementation
- **Social Hx:** No relevant SHx

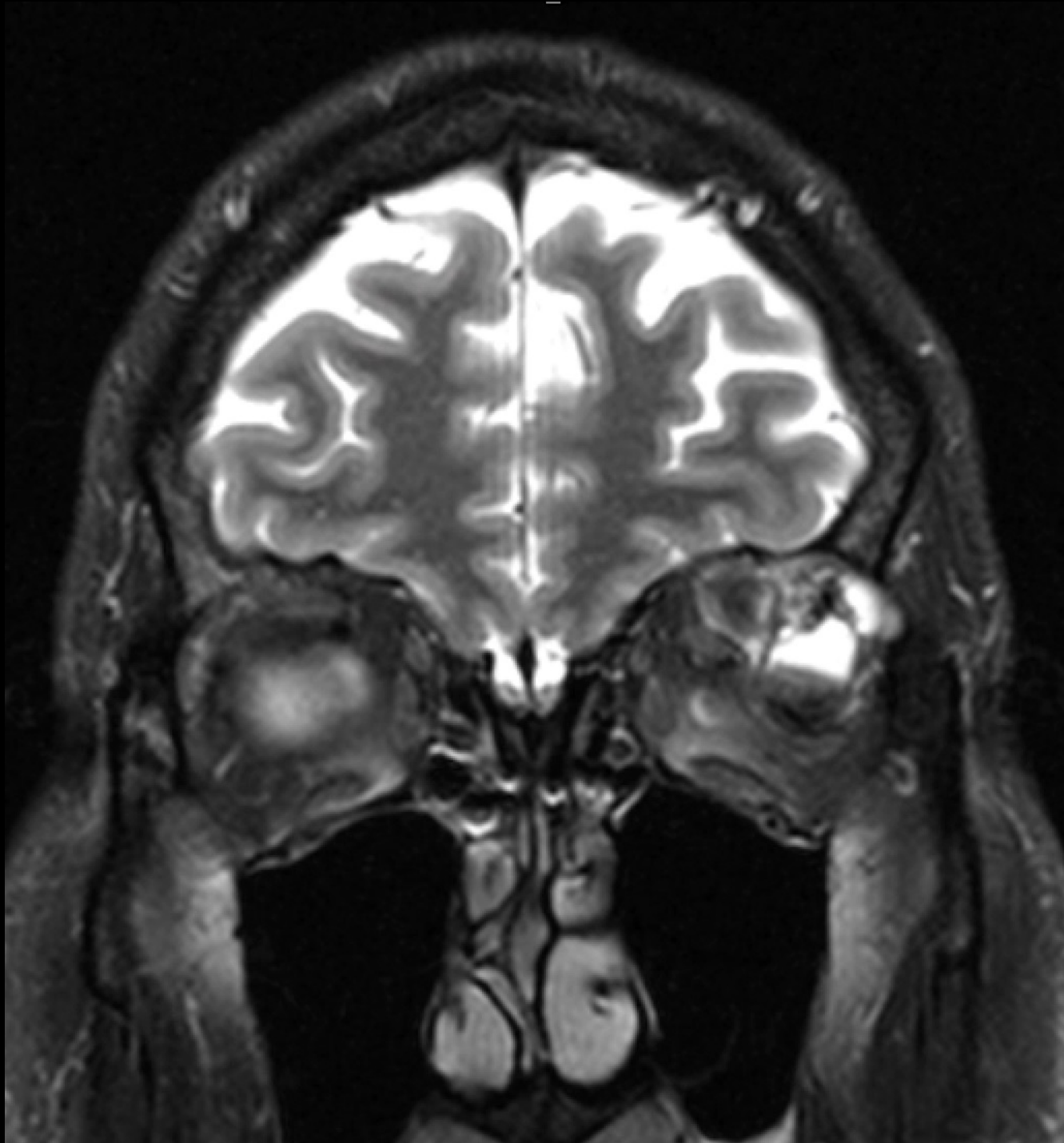


Differential Diagnosis



- Inflammatory
 - Thyroid eye disease
 - Idiopathic orbital inflammatory syndrome
 - Sarcoidosis
 - Granulomatosis with polyangiitis
 - IgG4-related systemic disease
- Neoplastic
 - Lacrimal gland tumor
 - Lymphoproliferative
 - Meningioma
 - Peripheral nerve sheath tumors
 - Solitary fibrous tumor
 - Metastatic lesion
- Vascular
 - Cavernous venous malformation (cavernous hemangioma)
 - Indirect carotid cavernous-fistula
 - Venous abnormalities (distensible or non-distensible)
 - Venous-lymphatic malformation





15:32:51

R

OV: 180.0 mm
MNI350
Vp: 120
IA: 240
xp time: 912
ilt: 0.000000
rww/wl 400/40

Imag
Locat
S
HELICA



Differential Diagnosis

- ~~Inflammatory~~

- ~~— Thyroid eye disease~~
- ~~— Idiopathic orbital inflammatory syndrome~~
- ~~— Sarcoidosis~~
- ~~— Granulomatosis with polyangiitis~~
- ~~— IgG4-related systemic disease~~

- Neoplastic

- Lacrimal gland tumor
- Lymphoproliferative
- ~~— Meningioma~~
- ~~— Peripheral nerve sheath tumors~~
- ~~— Solitary fibrous tumor~~
- Metastatic lesion

- Vascular

- Cavernous venous malformation (cavernous hemangioma)
- Indirect carotid cavernous-fistula
- Venous abnormalities (distensible or non-distensible)
- Venous-lymphatic malformation




Neurosurgical Evaluation

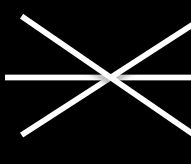
- Initial appointment with NSGY telemedicine
- Follow up for diagnostic cerebral angiogram
- No high flow vascular lesion
- Plan for staged direct puncture onyx embolization followed by orbitotomy

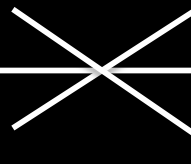



POD 1 Embolization, POD 0 Orbitotomy


V_{cc}  20/20
20/70

Motility


0 0
0 0
0 0


-2 0
-1 -0.5
0 0

T  14
22

P  3mm/2mm, no APD
4mm/3mm, no APD



Left Orbitotomy

- Lesion was multiloculated, with pockets of white cloudy fluid and white toothpaste-like material. Lesion did not appear to be vascular
- Mass was adherent to the lateral rectus, optic nerve, and globe and was impossible to resect completely



A high-magnification histological micrograph showing a dense field of pink-stained tissue. Large, dark, irregular clusters of black pigment are scattered throughout the field, particularly in the upper left and lower left. The background is a complex matrix of pink-stained cells and fibers, with several large, pale, amorphous areas that appear to be degenerated debris or necrotic tissue. Two prominent, elongated, reddish-brown structures are visible in the lower right quadrant. The overall texture is granular and heterogeneous.

**Onyx with
degenerated debris**



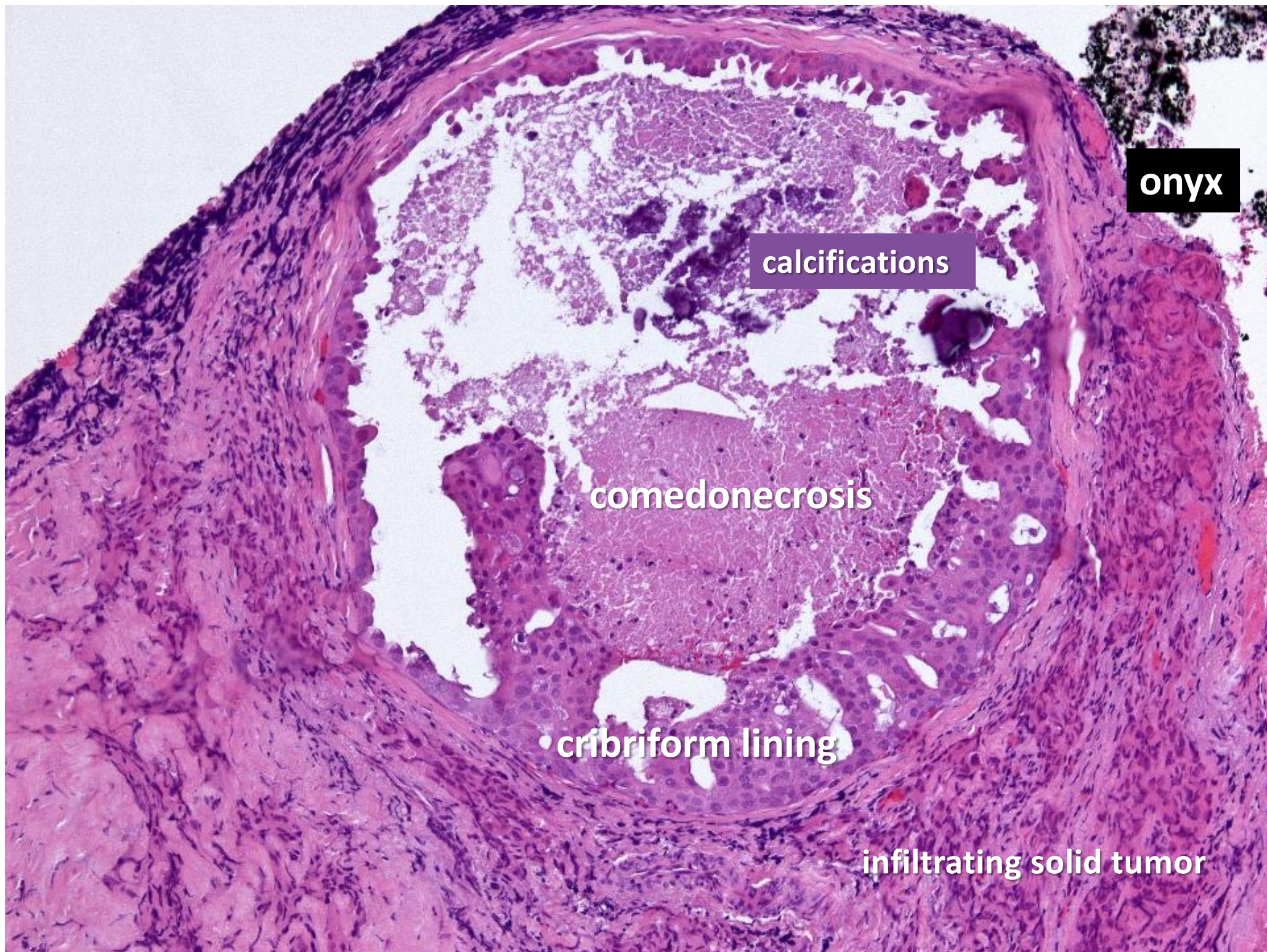


calcifications

This histological section of breast tissue, stained with hematoxylin and eosin (H&E), shows several key pathological features. At the top, there are clusters of dark, irregularly shaped calcifications. Below these, a large area of dense fibrosis is visible, characterized by thick, pink-stained collagenous tissue. In the lower portion of the image, there are infiltrating ductules, which are small, irregular glandular structures with varying degrees of cellular atypia and architectural disorganization. The overall architecture is disrupted, with the normal ductal and lobular structures replaced by these pathological changes.

dense fibrosis

infiltrating ductules



onyx

calcifications

comedonecrosis

cribriform lining

infiltrating solid tumor



A histological section of breast tissue stained with hematoxylin and eosin (H&E). The image shows a ductal structure filled with a solid mass of cells, characteristic of ductal carcinoma in situ (DCIS). The central area of the duct is filled with necrotic debris, labeled as 'comedonecrosis'. Surrounding this central area are clusters of cells with enlarged, hyperchromatic nuclei, indicating 'moderate to severe nuclear atypia'. In the upper right portion of the duct, there are small, dark, amorphous deposits labeled as 'calcification'.

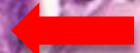
calcification

comedonecrosis

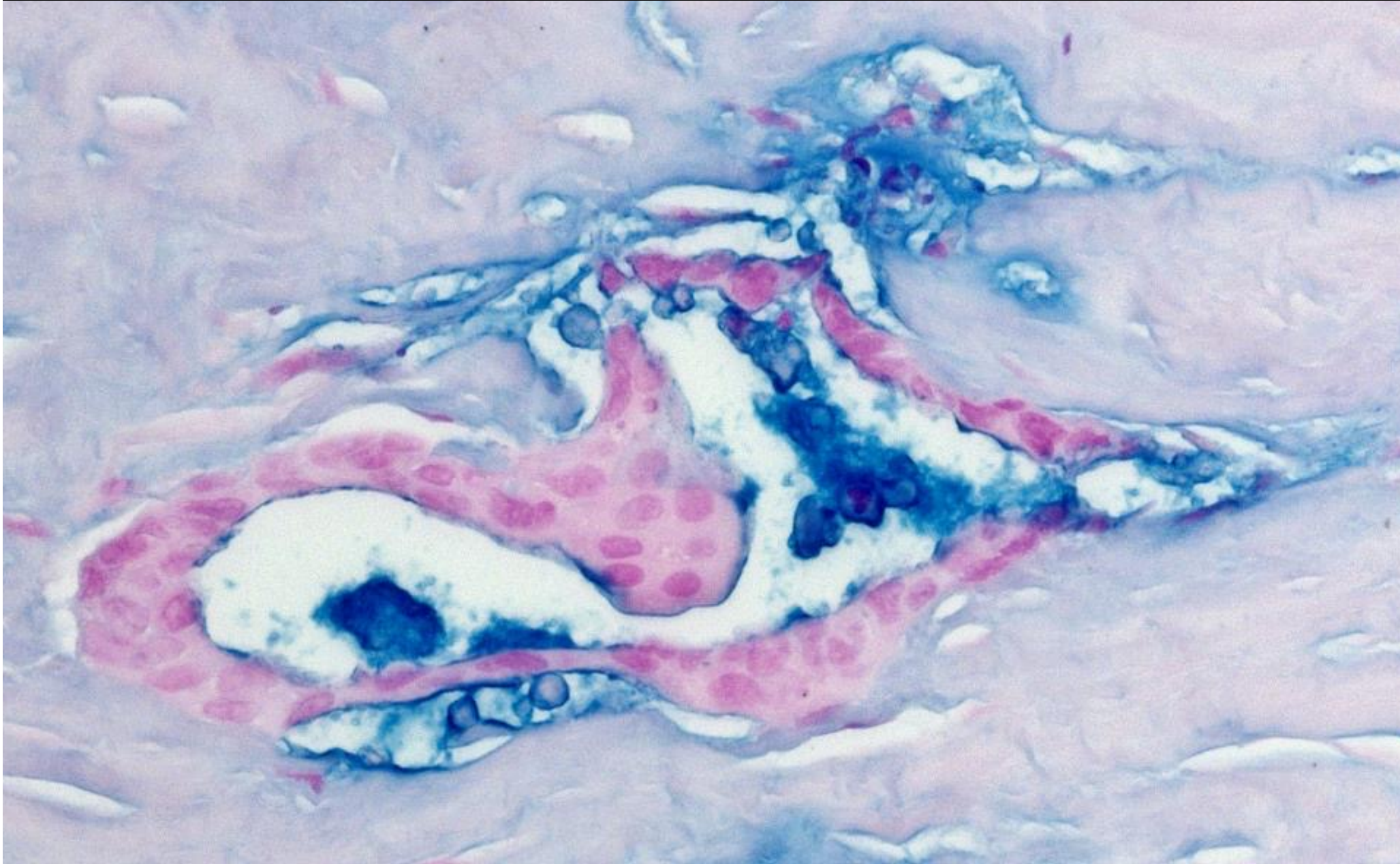
moderate to severe
nuclear atypia

calcifications

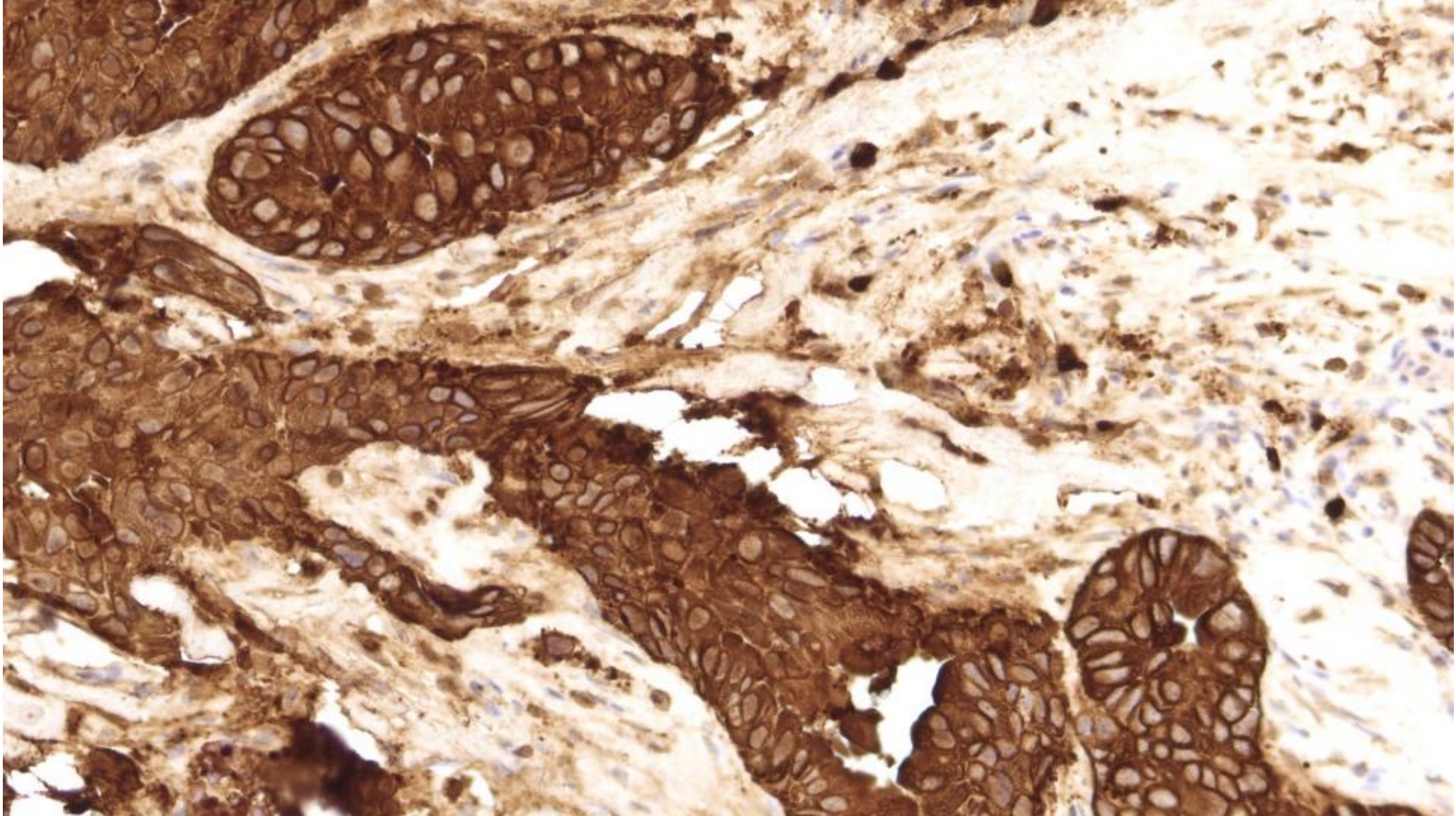
high-grade nuclei



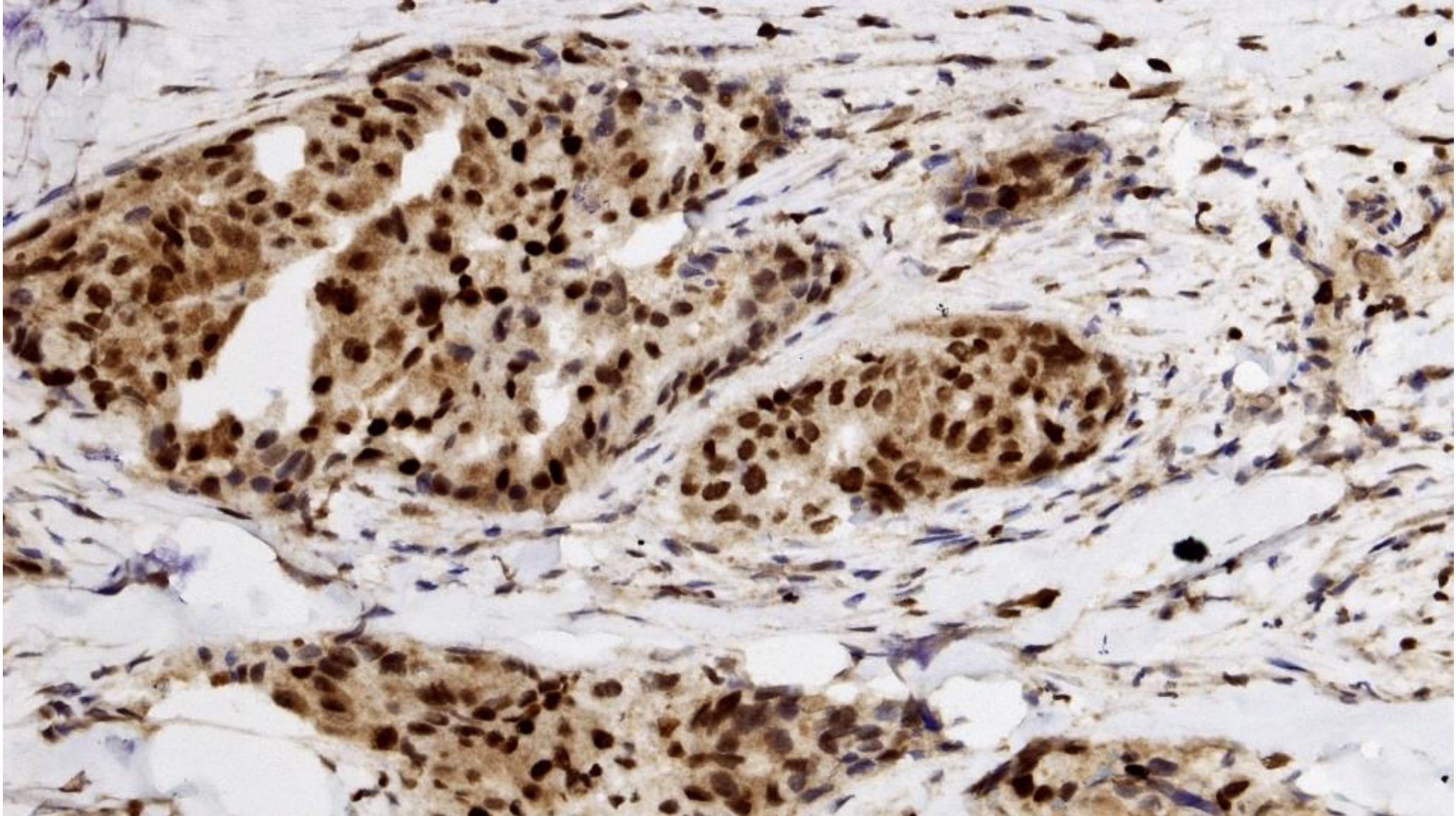
Alcian blue stain for mucin



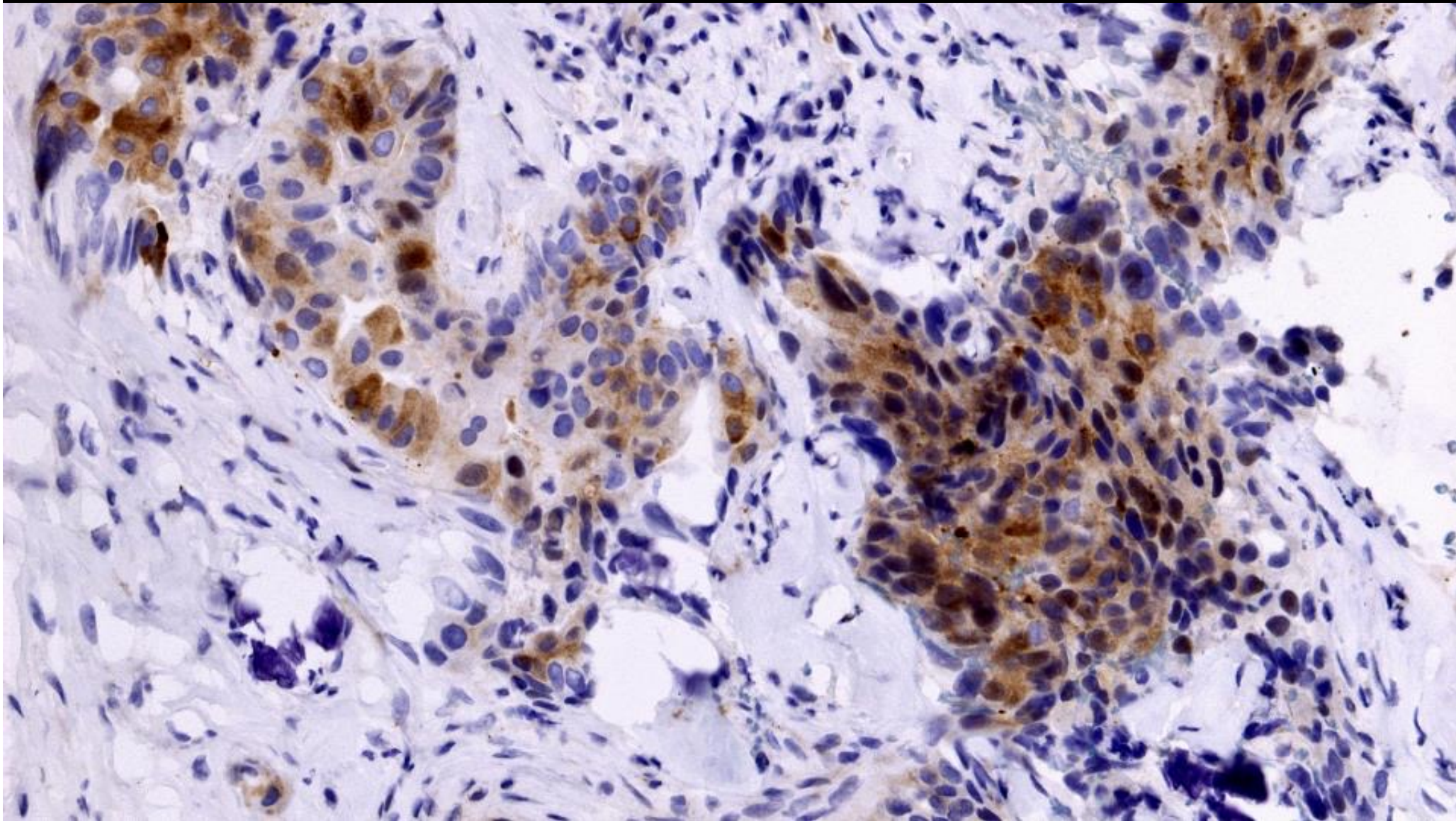
Cytokeratin 7



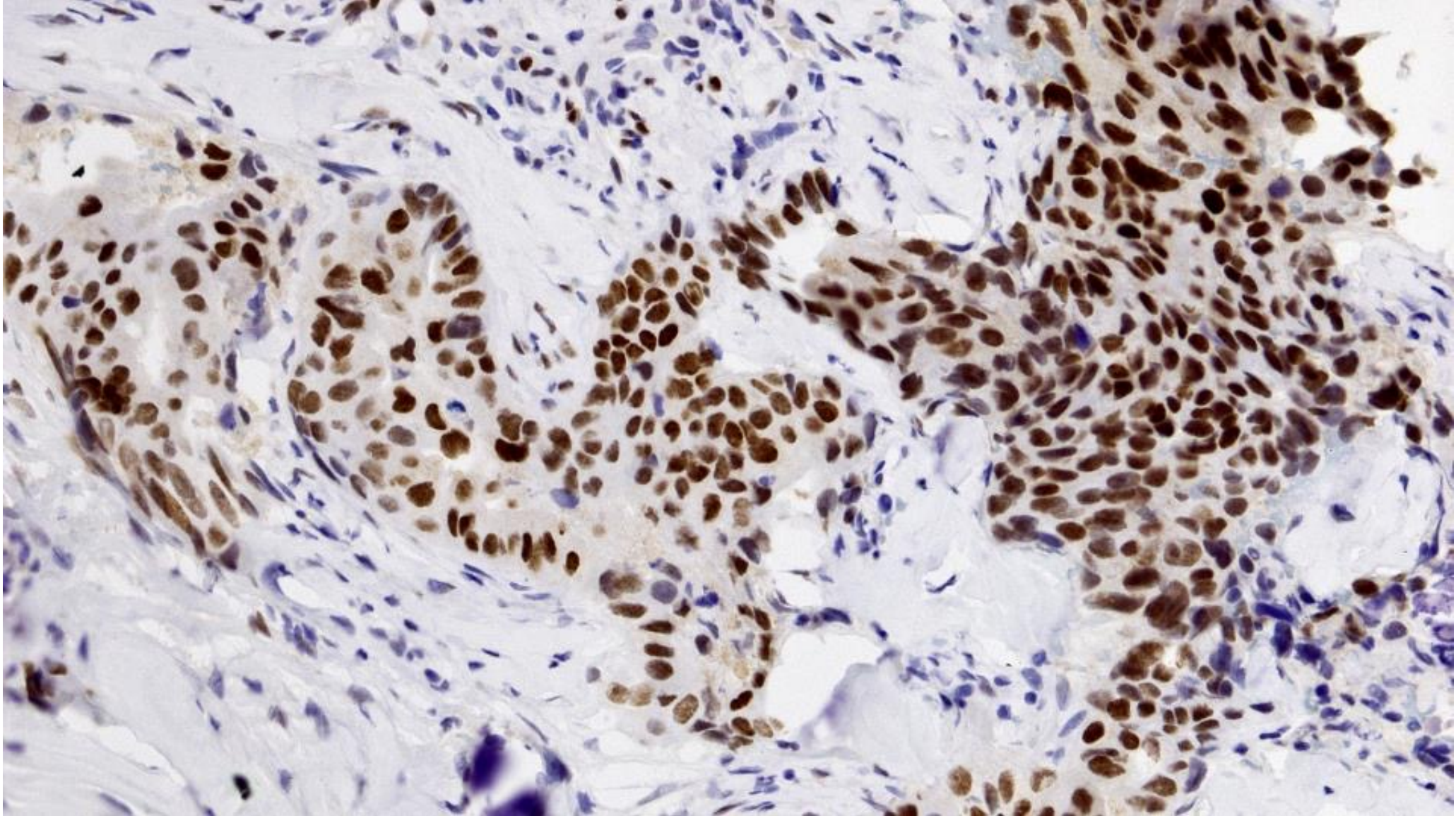
GATA-3



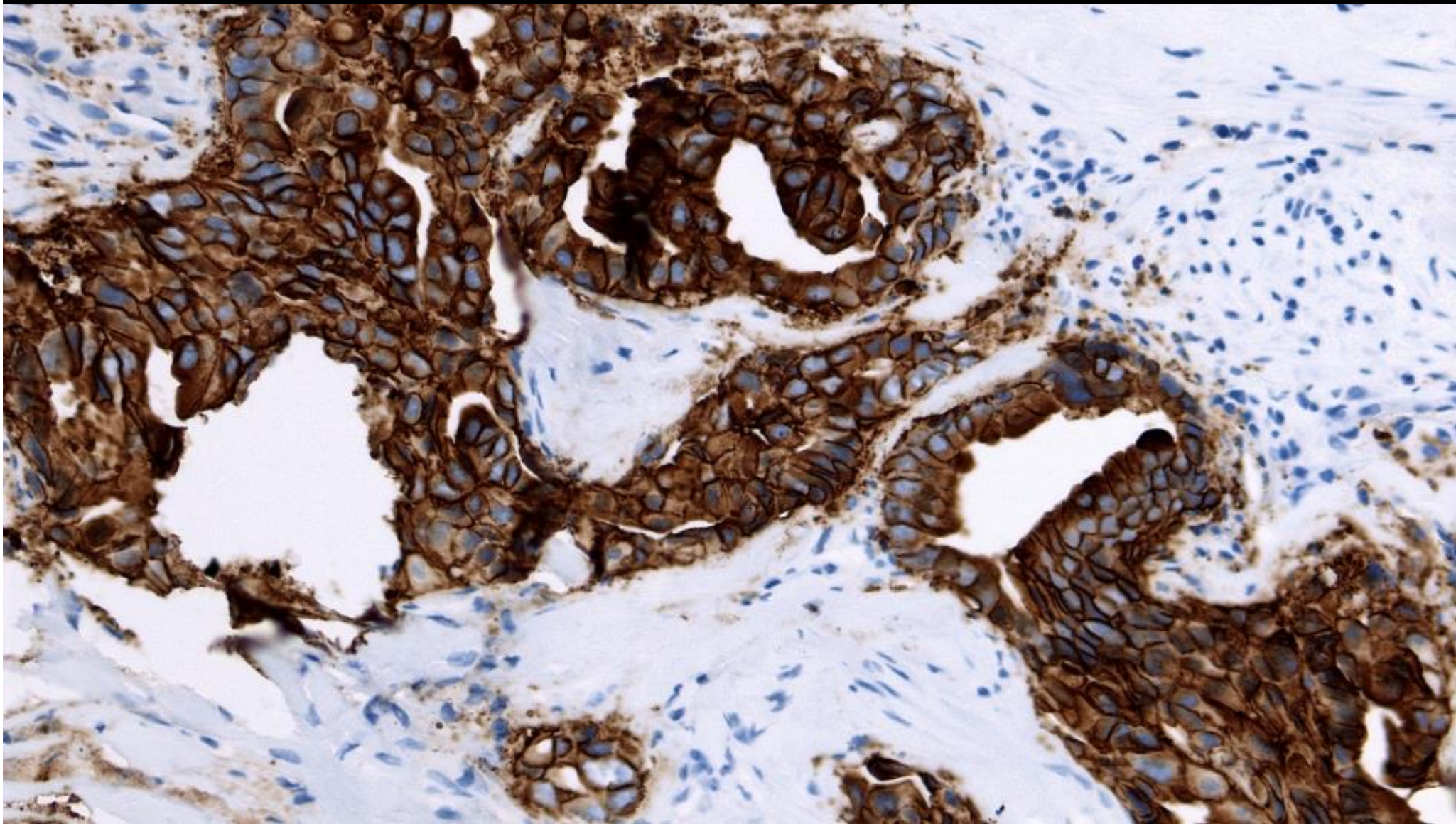
mammaglobin



androgen receptors

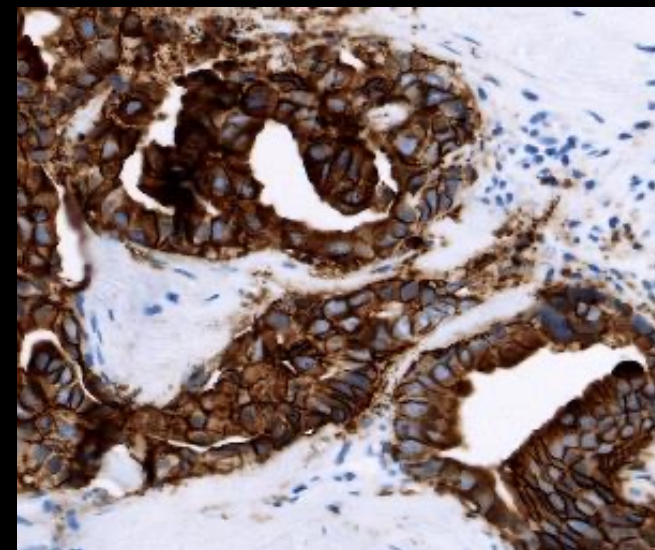
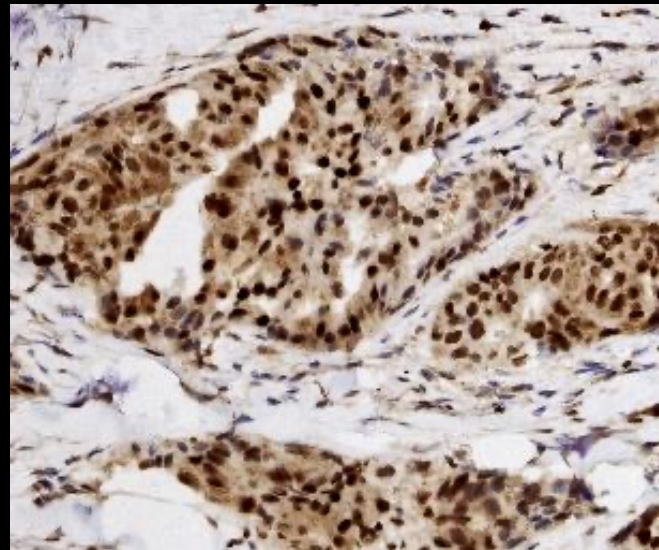
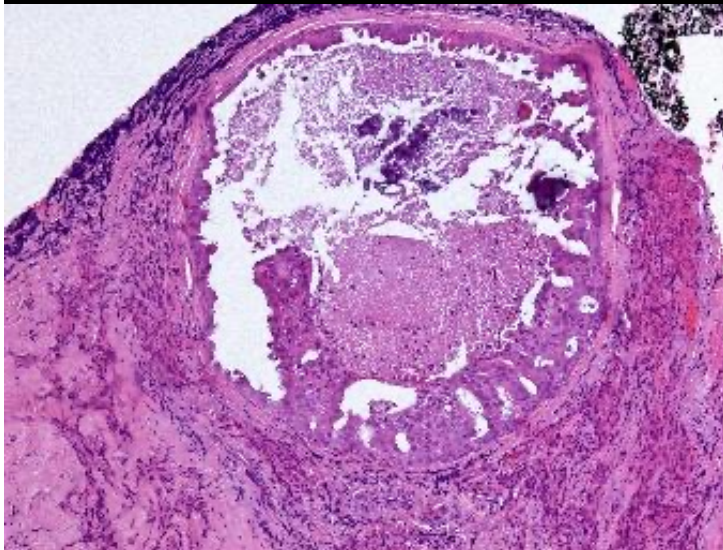


Her2/neu



Pathologic diagnosis

Ductal adenocarcinoma of lacrimal gland (r/o metastases)



Adenocarcinoma of Lacrimal Gland

- Rare malignancy first reported in 1996
- 4:1 male to female predominance
- Median age at diagnosis at 64
- Radiographically, histologically, phenotypically, and genotypically like salivary gland adenocarcinoma



Oncologic Plan

- PET-CT for consideration of occult primary
- Genomic profiling
- Hold further testosterone supplementation



Continued Course

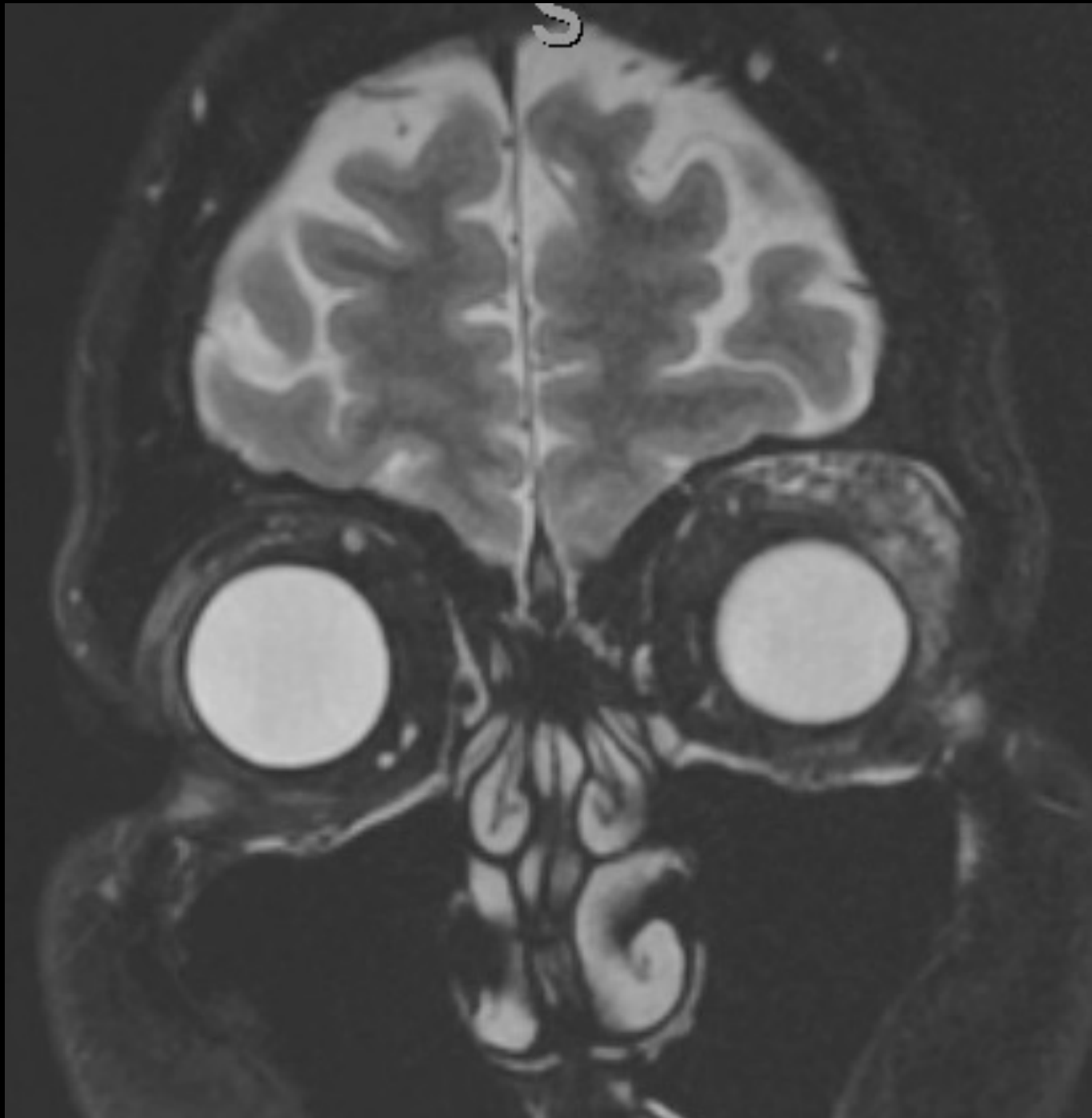
- Patient tested positive for COVID, delaying PET-CT/further imaging
- One month later CT Chest showed multiple Pulmonary Emboli, patient started Xarelto
- ENT took for sentinel node biopsy, which was negative
- Referred to radiation oncology to discuss adjuvant radiation

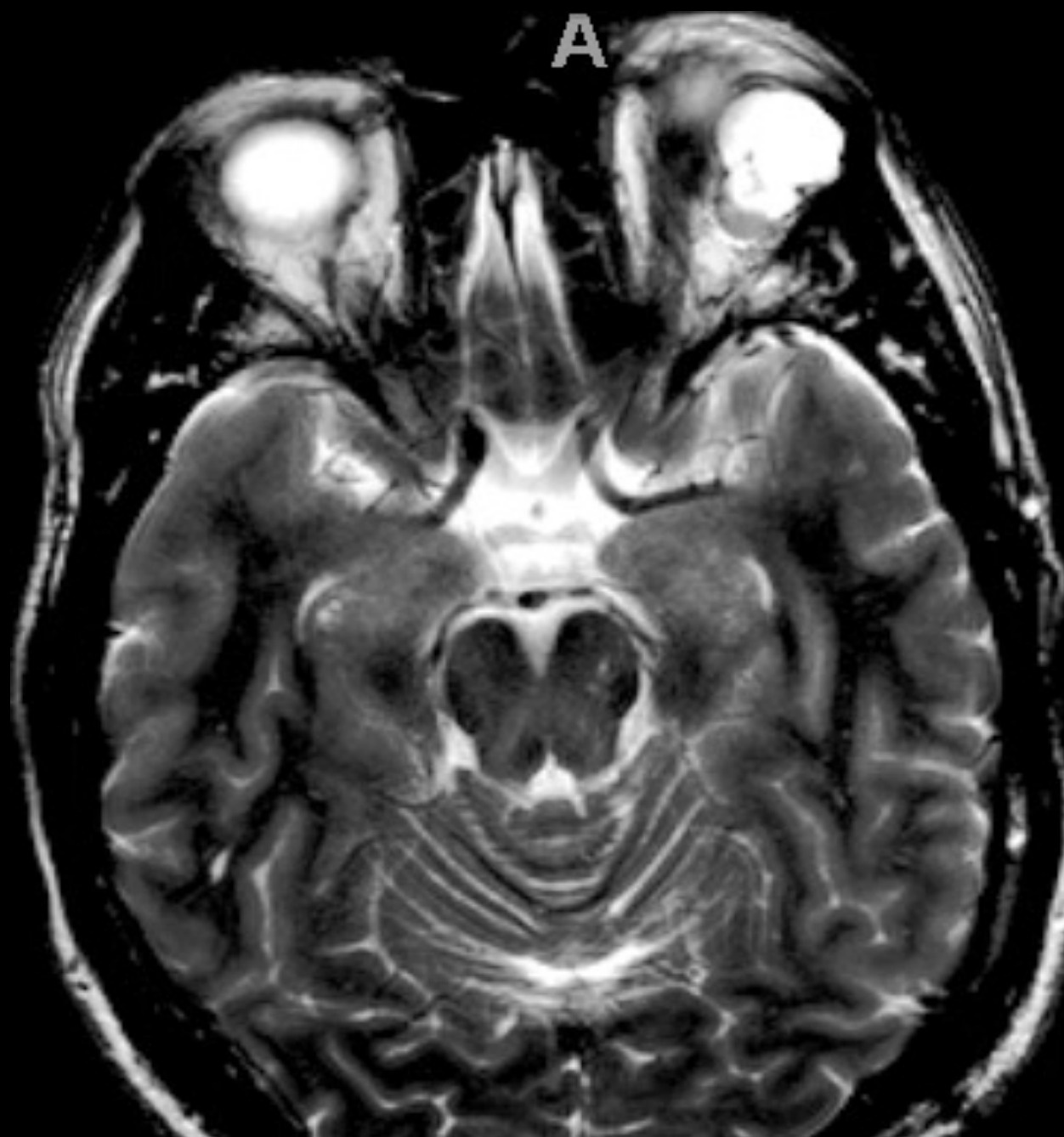


Continued Course

- Plan for radiation treatment to the residual disease and surgical bed, with repeat MRI before treatment







Continued Course

- Due to significant gross residual/recurrent disease, patient elected to undergo orbital exenteration



Exenteration

- Carried out without difficulty with identification of tumor posterolateral to the superior aspect of the globe
- All margins free from tumor cell
- Plans for radiation to the surgical bed



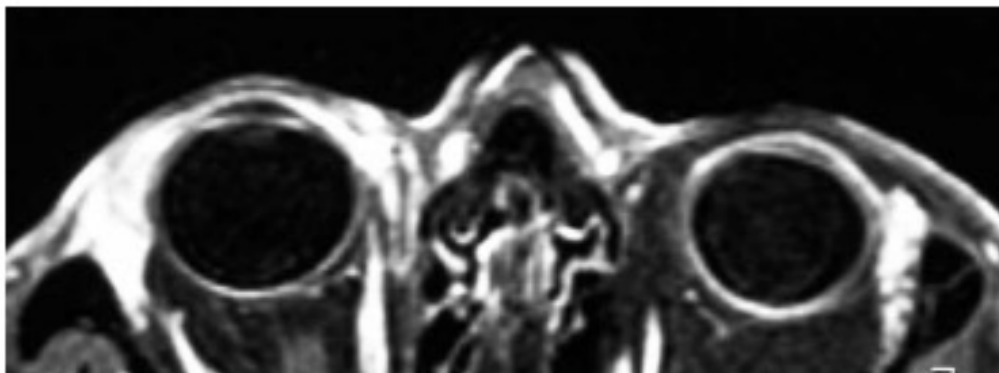
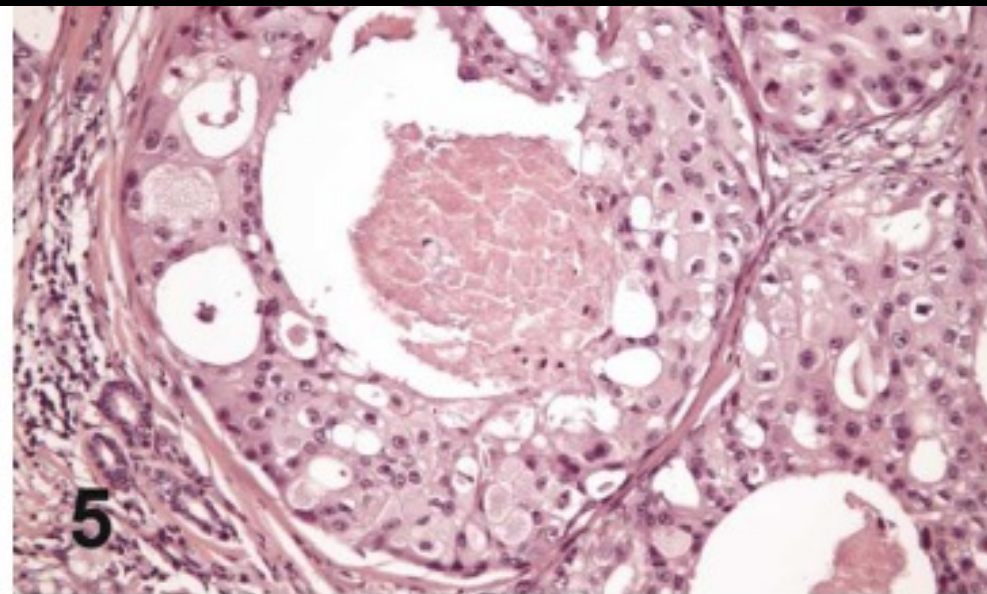
Summary

- 47 yo man with progressive painless left eye fullness
- Imaging initially suggested a vascular lesion
- Ductal adenocarcinoma of the lacrimal gland is a rare malignancy – treatment plans draw heavily from the literature on salivary gland carcinoma and require multi-disciplinary management
- Patient is now s/p exenteration and undergoing adjuvant radiotherapy



Primary Ductal Adenocarcinoma of the Lacrimal Gland

Tatyana Milman, MD,¹ Jerry A. Shields, MD,² Michael Husson, MD,³ Brian P. Marr, MD,²
Carol L. Shields, MD,² Ralph C. Eagle, Jr, MD¹



Ophthalmology 2005;112:2048 –2051

Lacrimal gland ductal carcinomas: Clinical, Morphological and Genetic characterization and implications for targeted treatment

Simon Andreassen,^{1,2,3} Morten Grauslund⁴ and Steffen Heegaard^{4,5}

Primary ductal adenocarcinoma of lacrimal gland: Two case reports and review of the literature

[Hsin-Yu Yang](#),^{1,2} [Cheng-Hsien Wu](#),^{3,4} [Chieh-Chih Tsai](#),^{1,2} [Wei-Kuang Yu](#),^{1,2} [Shu-Ching Kao](#),^{1,2} and [Catherine Jui-Ling Liu](#)^{1,2}

- Lacrimal Gland Adenocarcinoma is extremely rare
- Histologically and genotypically like salivary duct adenocarcinoma
- Treatment is staging and local resection +/- radiotherapy
- Presentation with metastatic disease unusual but development is not uncommon



HER2 Positivity in Histological Subtypes of Salivary Gland Carcinoma: A Systematic Review and Meta-Analysis

Kristian Egebjerg^{1}, Cecilie Dupont Harwood², Nina Claire Woller³,
Claus Andrup Kristensen¹ and Morten Mau-Sørensen¹*

- Like SGC and ductal carcinoma of the breast, LDC frequently has amplification of HER2
- Trastuzumab is a monoclonal antibody that targets this amplification
- Insufficient data, but has not shown a significant effect of HER2 positive salivary ductal carcinoma



A prospective phase II study of combined androgen blockade in patients with androgen receptor-positive metastatic or locally advanced unresectable salivary gland carcinoma

C Fushimi ¹, Y Tada ², H Takahashi ¹, T Nagao ³, H Ojiri ⁴, T Masubuchi ¹, T Matsuki ¹,
K Miura ¹, D Kawakita ⁵, H Hirai ³, E Hoshino ⁶, S Kamata ¹, T Saotome ⁷

- Phase II study suggesting that androgen deprivation therapy is a viable option for treatment of recurrent or metastatic salivary gland carcinoma



Thank You!

- Dr. Penne
- Dr. Milman
- Dr. Johnson
- Wills Co-residents



References

- Milman T, Shields JA, Husson M, Marr BP, Shields CL, Eagle RC Jr. Primary ductal adenocarcinoma of the lacrimal gland. *Ophthalmology*. 2005 Nov;112(11):2048-51. doi: 10.1016/j.opthta.2005.04.029. PMID: 16271319.
- Andreassen S, Grauslund M, Heegaard S. Lacrimal gland ductal carcinomas: Clinical, Morphological and Genetic characterization and implications for targeted treatment. *Acta Ophthalmol*. 2017 May;95(3):299-306. doi: 10.1111/aos.13310. Epub 2016 Nov 3.
- Yang HY, Wu CH, Tsai CC, Yu WK, Kao SC, Liu CJ. Primary ductal adenocarcinoma of lacrimal gland: Two case reports and review of the literature. *Taiwan J Ophthalmol*. 2018 Jan-Mar;8(1):42-48.
- Egebjerg K, Harwood CD, Woller NC, Kristensen CA, Mau-Sørensen M. HER2 Positivity in Histological Subtypes of Salivary Gland Carcinoma: A Systematic Review and Meta-Analysis. *Front Oncol*. 2021 Jun 24;11:693394.
- Fushimi C, Tada Y, Takahashi H, Nagao T, Ojiri H, Masubuchi T, Matsuki T, Miura K, Kawakita D, Hirai H, Hoshino E, Kamata S, Saotome T. A prospective phase II study of combined androgen blockade in patients with androgen receptor-positive metastatic or locally advanced unresectable salivary gland carcinoma. *Ann Oncol*. 2018 Apr 1;29(4):979-984. doi: 10.1093/annonc/mdx771. PMID: 29211833; PMCID: PMC5913639.