Penn Medicine

AANP 2023 DIAGNOSTIC SLIDE SESSION

2023-8

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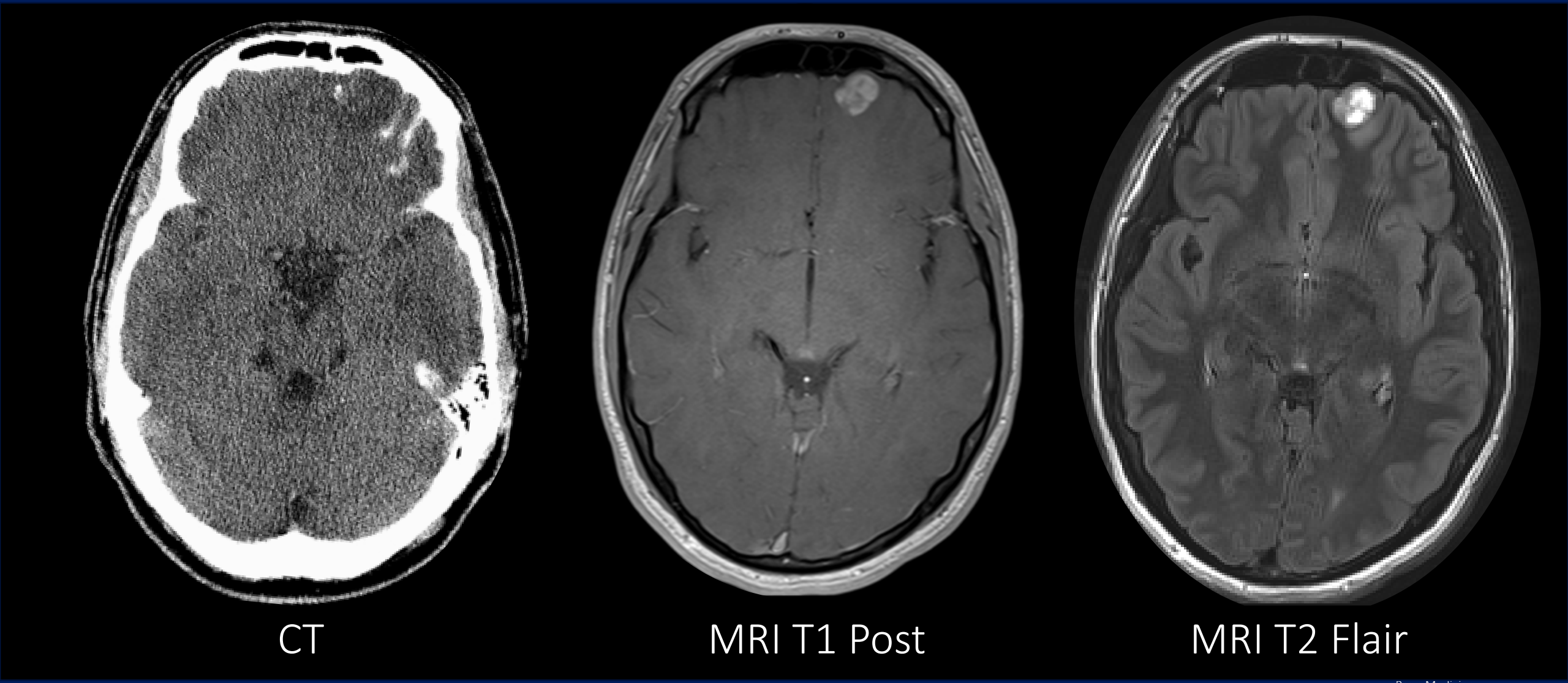
June 11, 2023

Presentation

- 20 y.o. male with no significant past medical history
- Recent forgetfulness and “zoning out”
- Presented to E.D. following syncopal episode
- Had a witnessed seizure in the E.D.

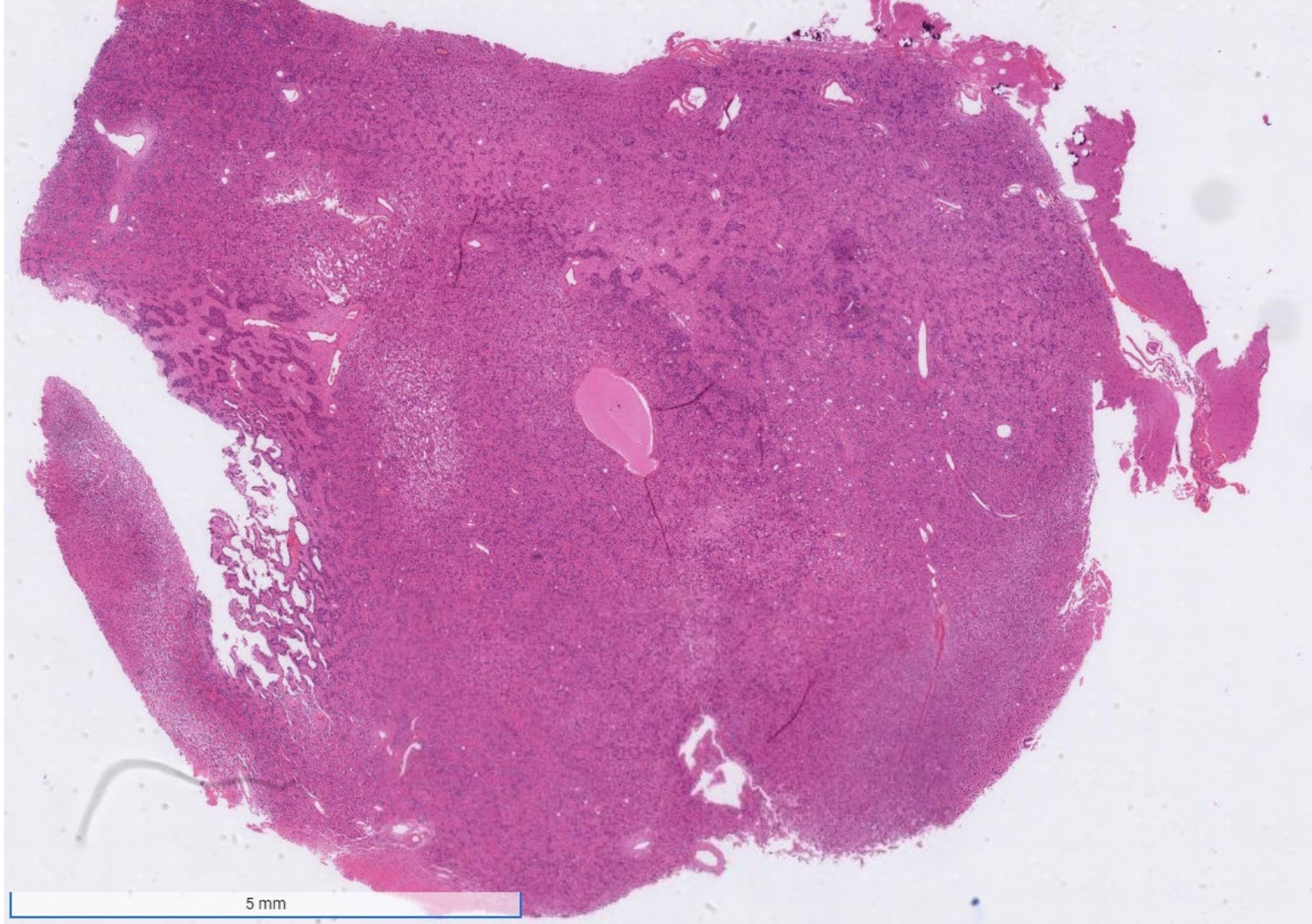
Imaging Findings

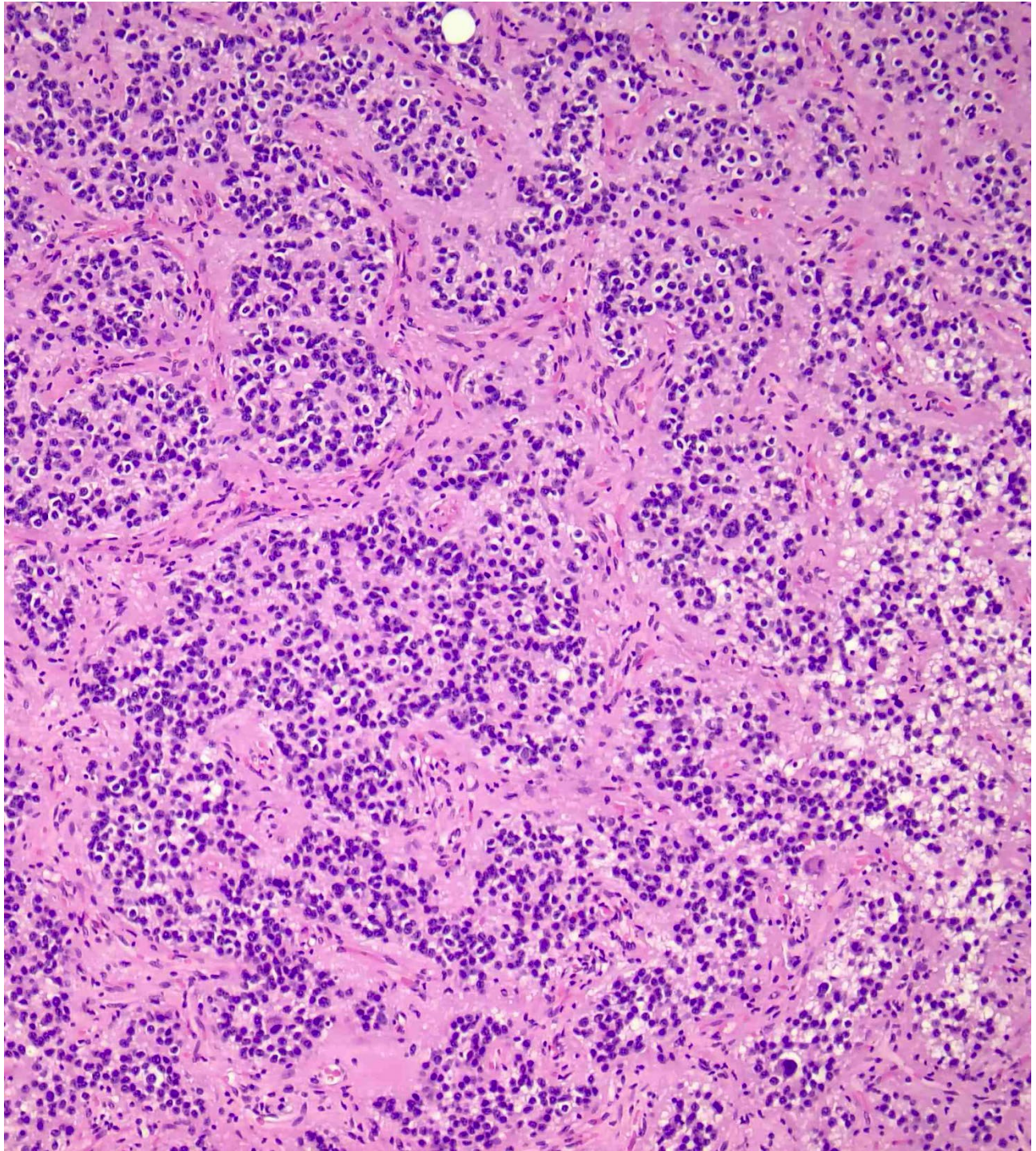


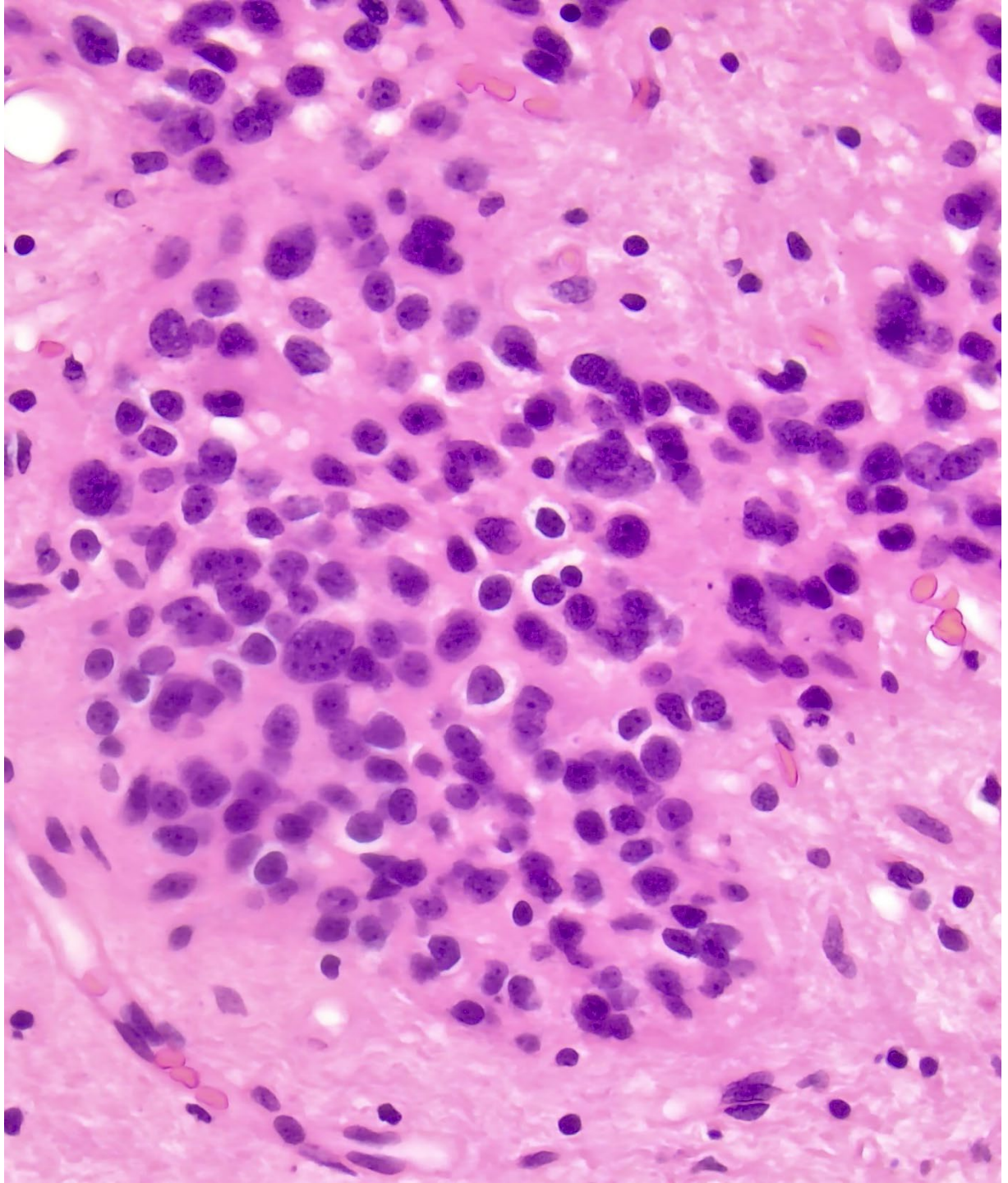
CT

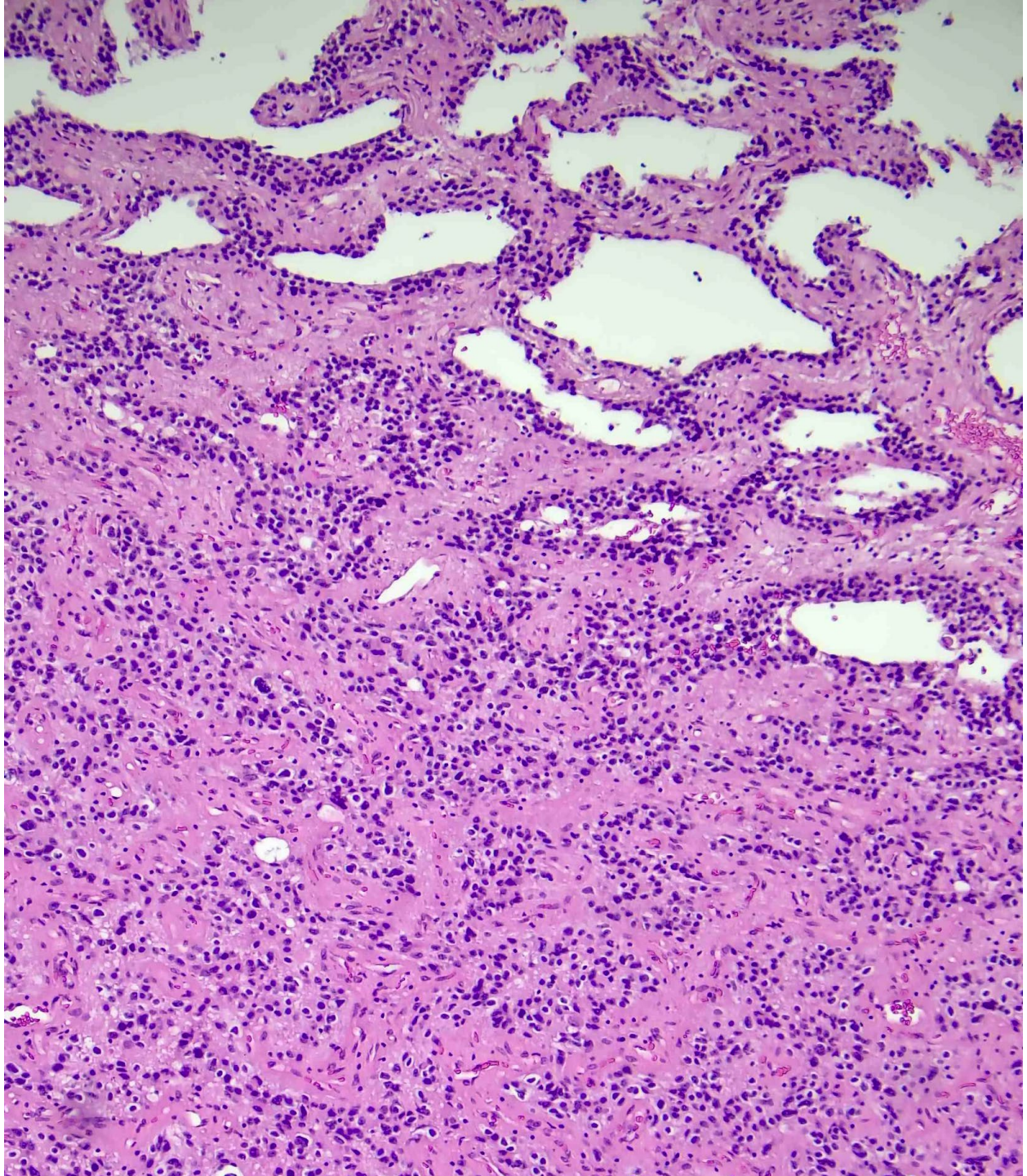
MRI T1 Post

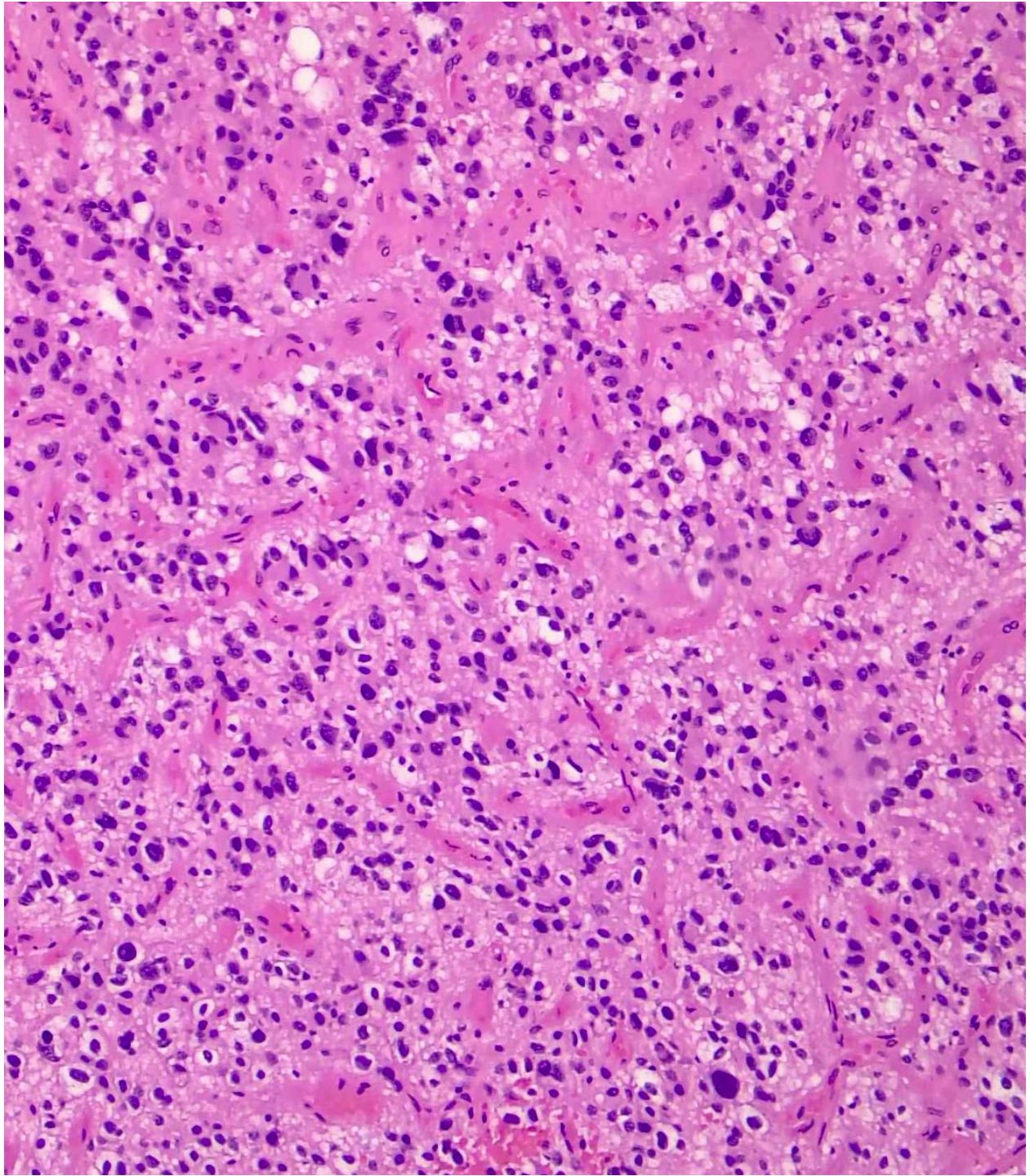
MRI T2 Flair

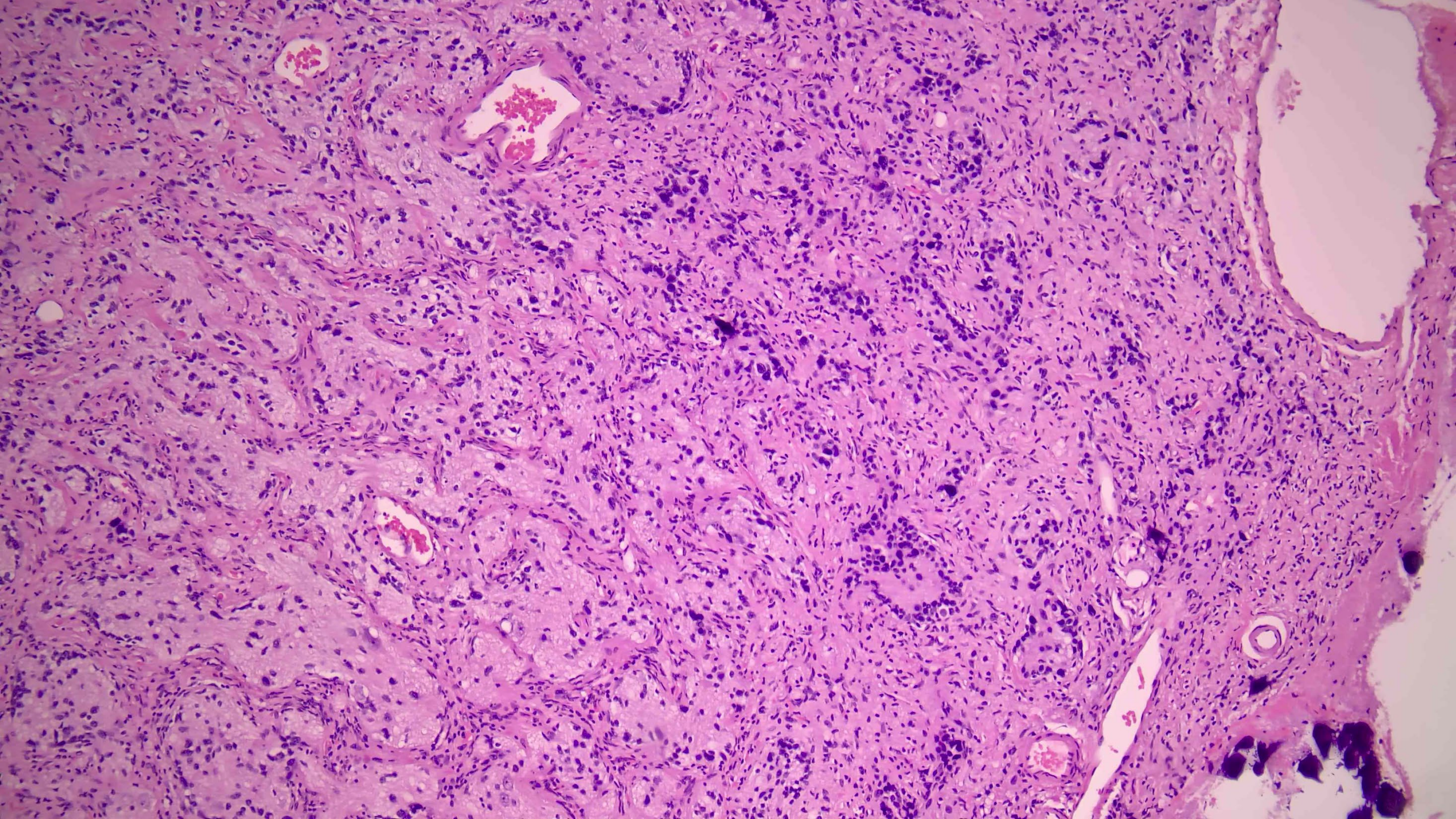

5 mm





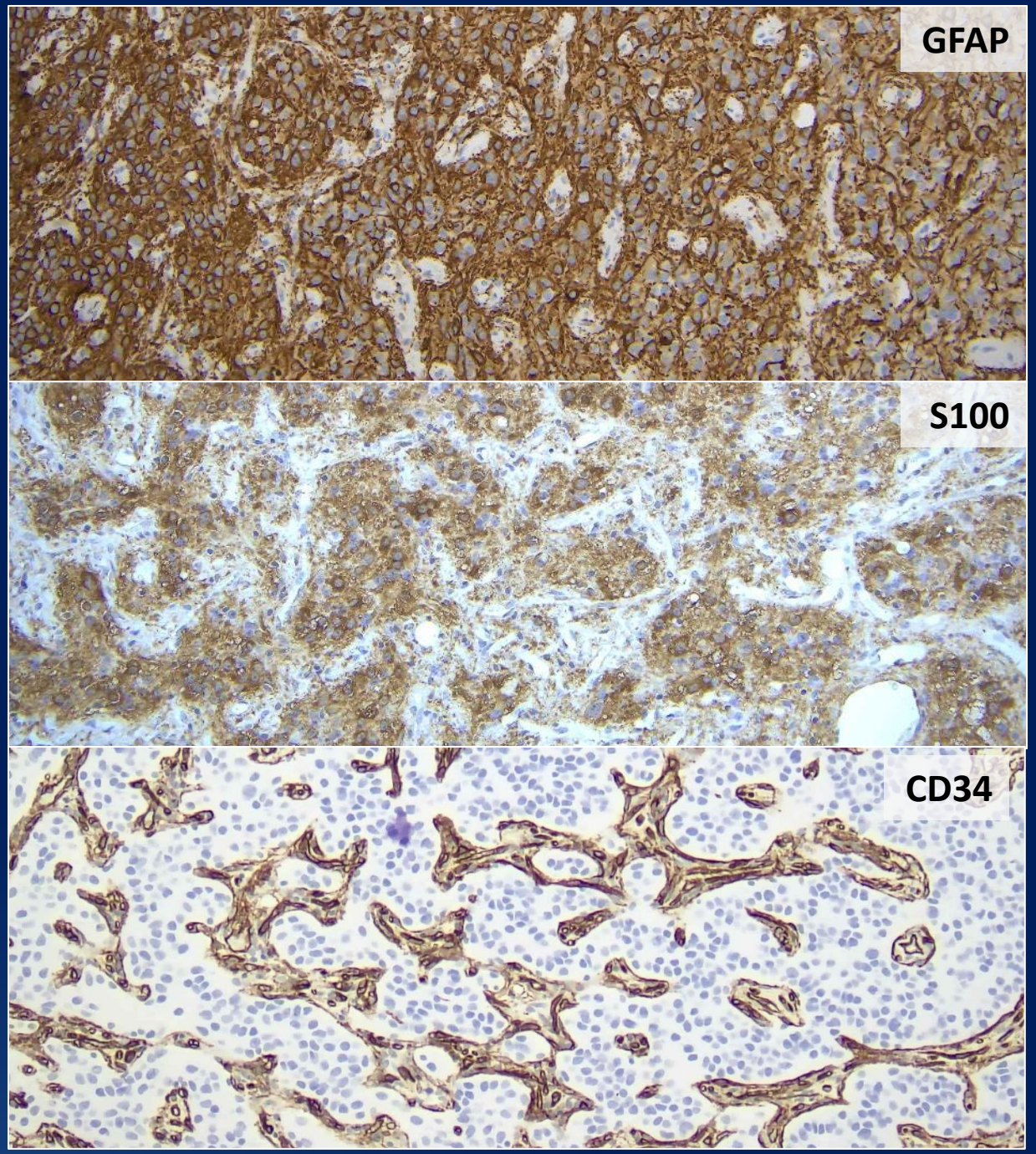






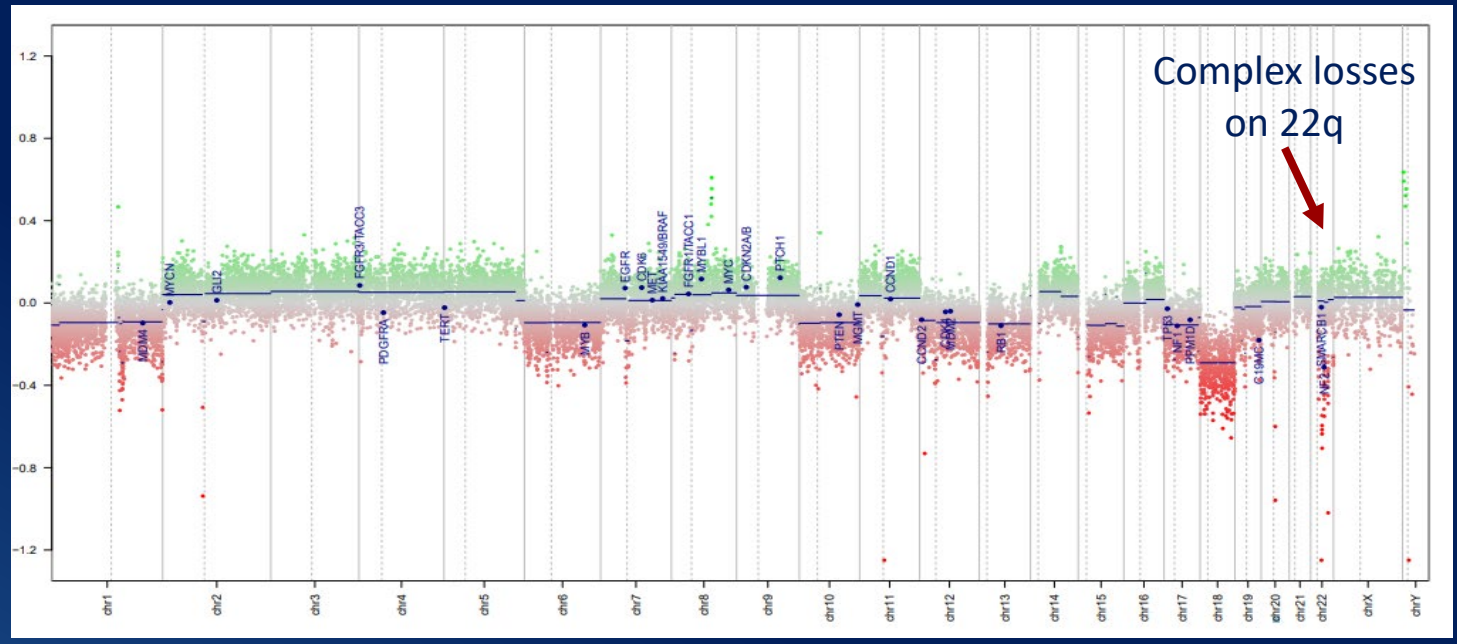
Diagnosis?

Immunohistochemical studies	
GFAP	Positive
S100	
EMA	Negative
IDH1-R132H	
Cam5.2	
Synaptophysin	
NeuN	
Neurofilament	
BRAF V600E	
CD34	
D2-40	Non-specific granular
ATRX	Retained
INI1	
H3K27me3	
Ki-67	Low (Up to 2-3%)



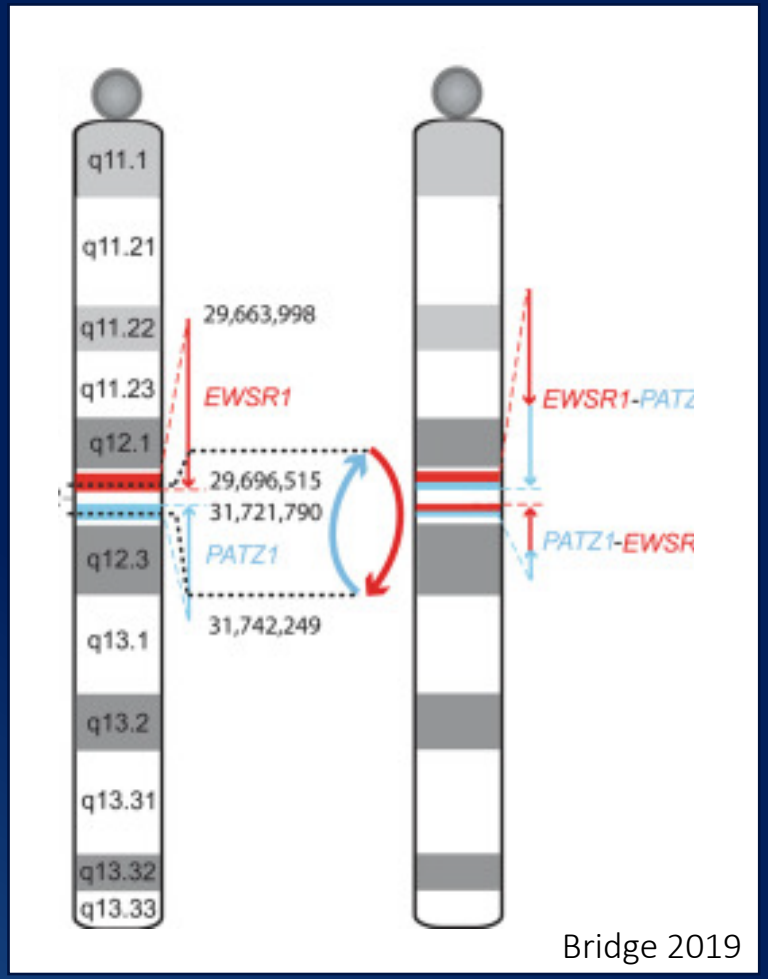
Molecular Studies

- Single nucleotide variants
  - No clinically significant variants
- Copy number analysis



Molecular Studies

- *EWSR1*:: *PATZ1* fusion



Bridge 2019

DNA Methylation Profiling (NIH)

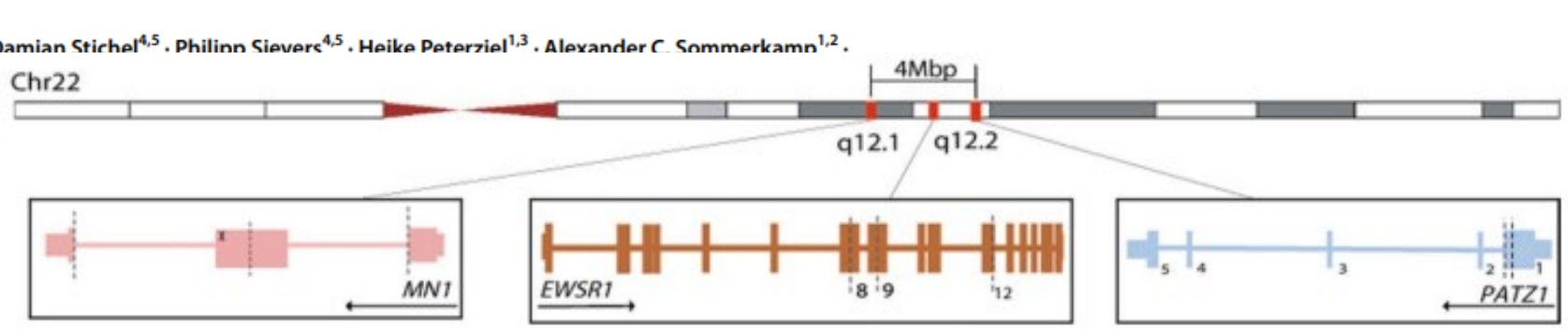
DNA METHYLATION-BASED TUMOR CLASSIFICATION	
Methylation Class Name	Neuroepithelial tumor with PATZ1 fusion
Methylation Class Confidence Score	High confidence
Methylation Class Description:	The “mc Neuroepithelial tumor with PATZ1 fusion (novel)” is comprised of histologically heterogeneous tumors of different grades including high- and low-grade glioma, ependymoma and several others. While the single most common diagnosis was glioblastoma (GBM), clinical data of PATZ1-fused tumors seem to show a better prognosis than typical GBM. Molecularly, these tumors are characterized by highly recurrent MN1:PATZ1 or EWSR1:PATZ1 fusions related to (often extensive) copy number variations on chromosome 22. The median age at diagnosis is around 11 years (range 0–80), with 74% of tumors occurring in patients under 18 years of age. Most tumors occur in the supratentorial region but may rarely also be found in the posterior fossa.

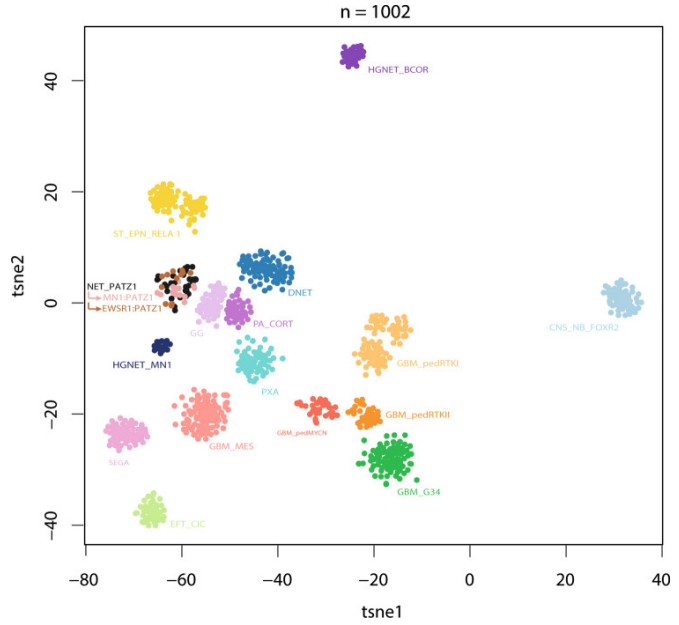
Acta Neuropathologica (2021) 142:841–857
https://doi.org/10.1007/s00401-021-02354-8

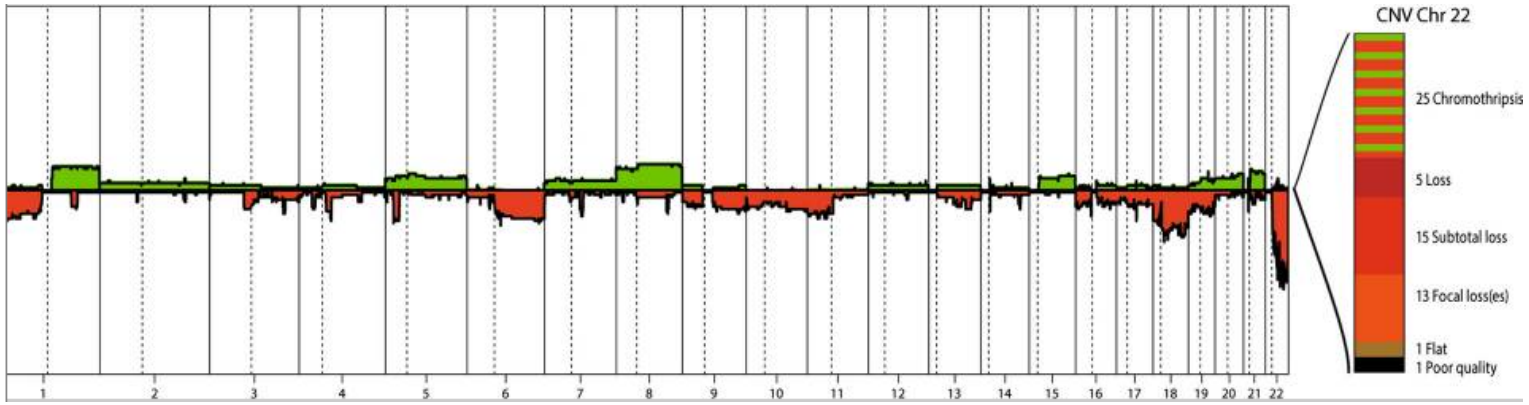
ORIGINAL PAPER

PATZ1 fusions define a novel molecularly distinct neuroepithelial tumor entity with a broad histological spectrum

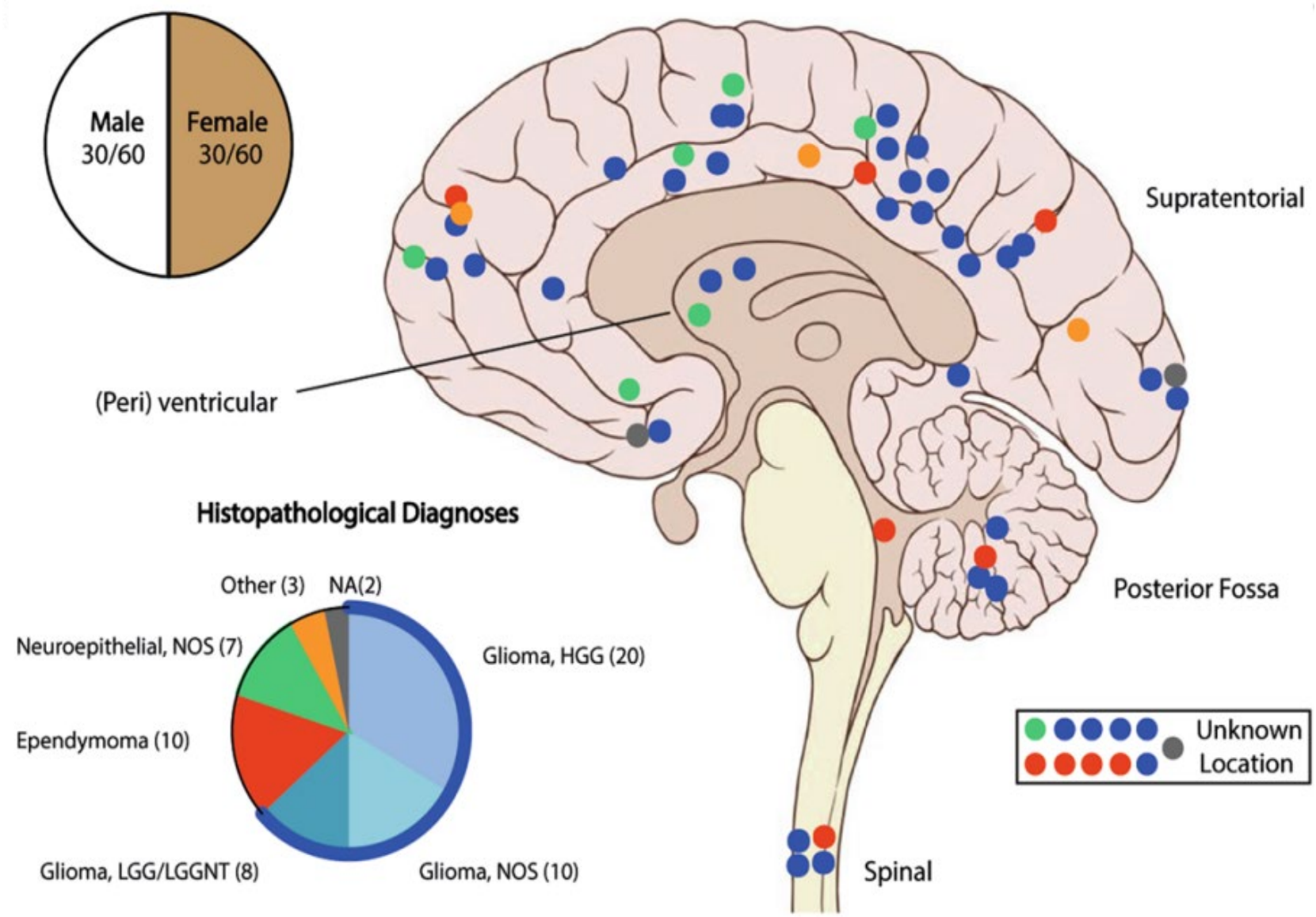
Karam T. Alhalabi[1,2,3] · Damian Stichel[4,5] · Philipp Sievers[4,5] · Heike Peterziel[1,3] · Alexander C. Sommerkamp[1,2] · Dominik Sturm[1,2,7] · An… Matija Snuderl[9] · Georg… Jordan R. Hansford[13] · N… Catherine Godfraind[19,2… Antonis Kattamis[25] · Ch… David Sumerauer[29] · Da… Mariëtte E. G. Kranendo… Hildegard Dohmen[39] · T… Lidija Kitanovski[45] · Len… Florian Selt[1,7,8] · Till Milde… Andrey Korshunov[1,4,5] · Stefan M. Pfister[1,6,7] · Felix Sahm[1,4,5] · David T. W. Jones[1,2]

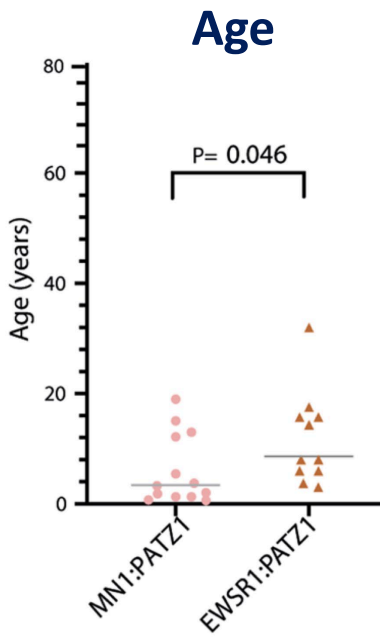






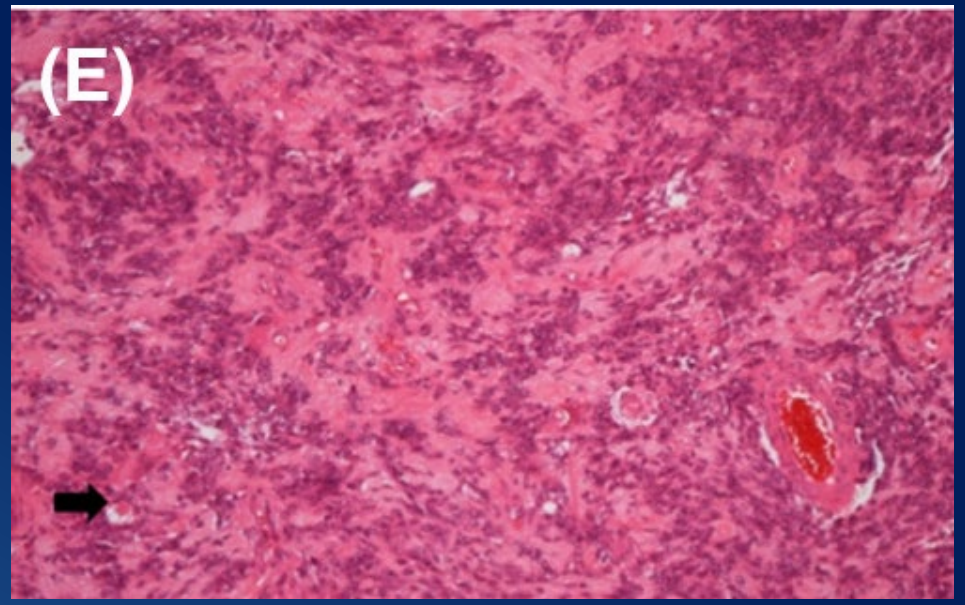
Alhalabi 2021



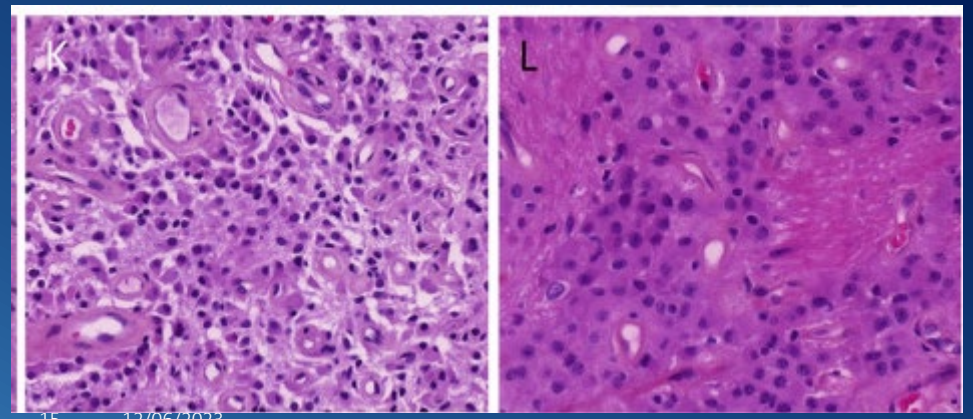


Alhalabi 2021

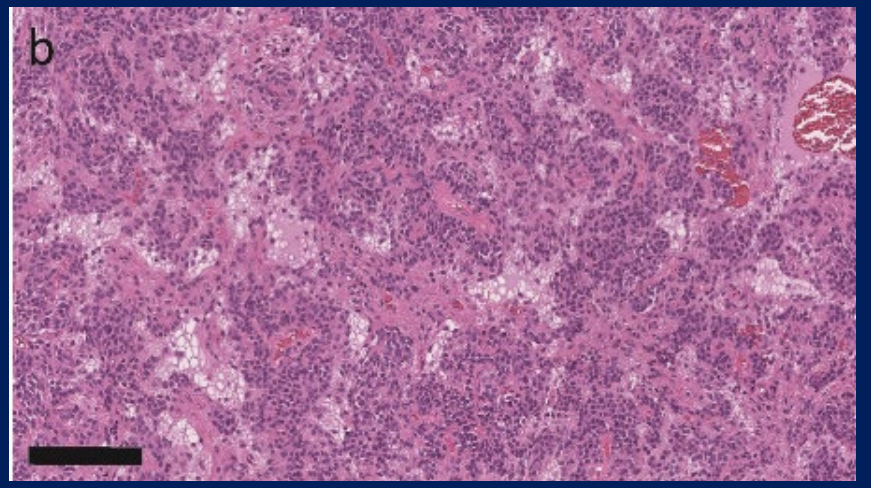
A subset of PATZ1-fused cases mimic astroblastoma & ependymoma morphologically



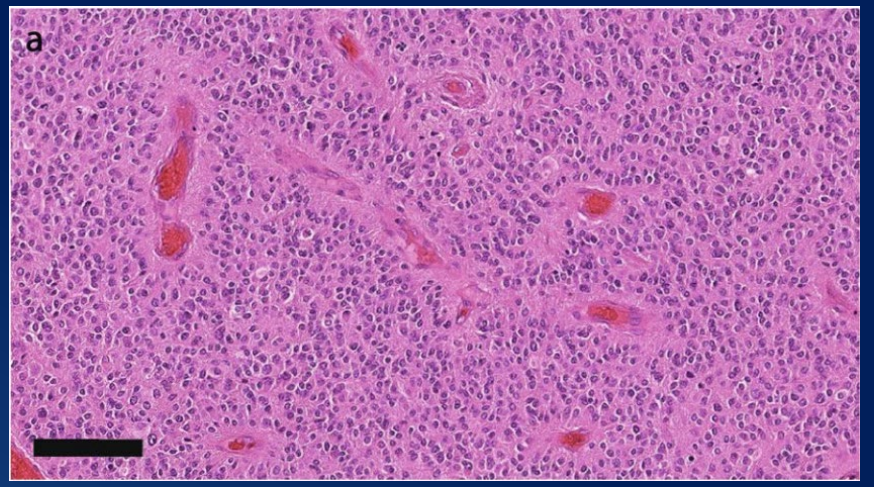
Chadda 2021



Siegfried 2019

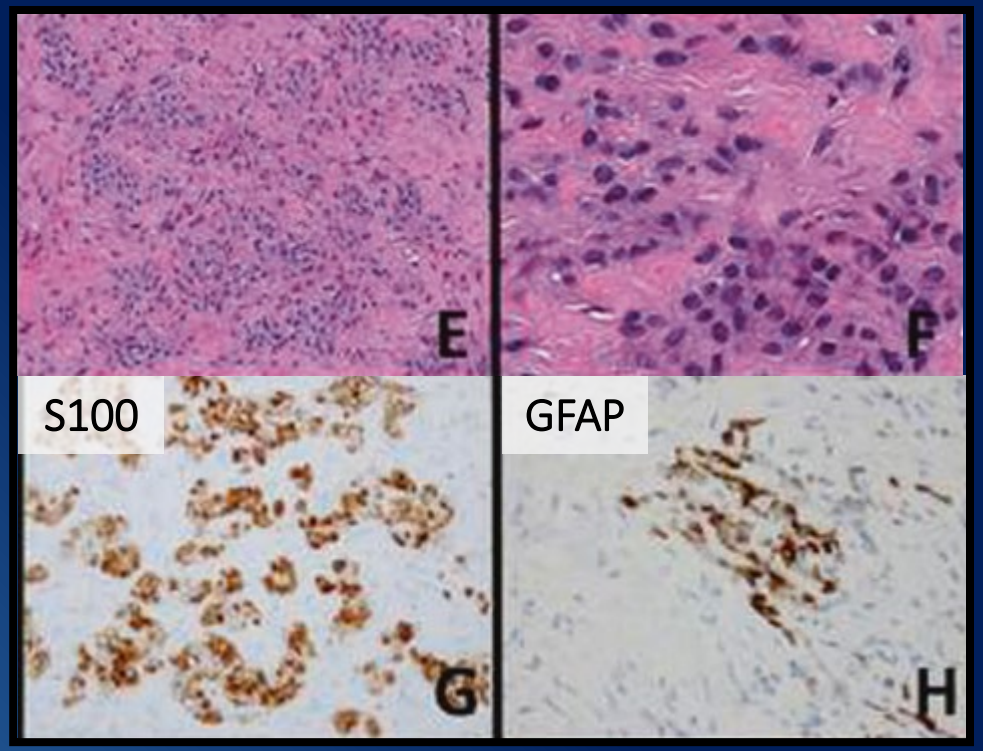


Alhalabi 2021



Alhalabi 2021

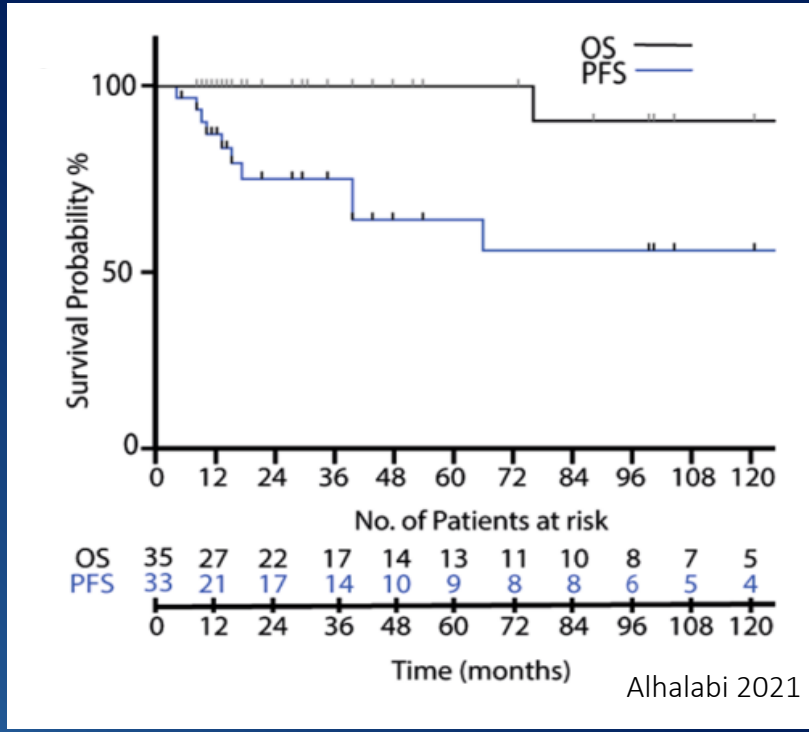
Parallels in Soft Tissue



Bridge 2019

- PATZ1::EWSR1 fusions identified in a subset of spindled and round cell tumors
- Thoracic wall location commonly
- “Hemangioma like” vasculature described
- Subset are immunoreactive for GFAP, S100, synaptophysin

Clinical Follow up



Alhalabi 2021

- Gross total resection on post-op MRI
- Under surveillance
- No additional interventions to date

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Acknowledgements

Penn Neuropathology
Amir Banihashemi
Zissimos Mourelatos
MacLean Nasrallah
Edward Lee
Maria Gubbiotti

NIH Laboratory of Pathology

CHOP Division of Genomic Diagnostics