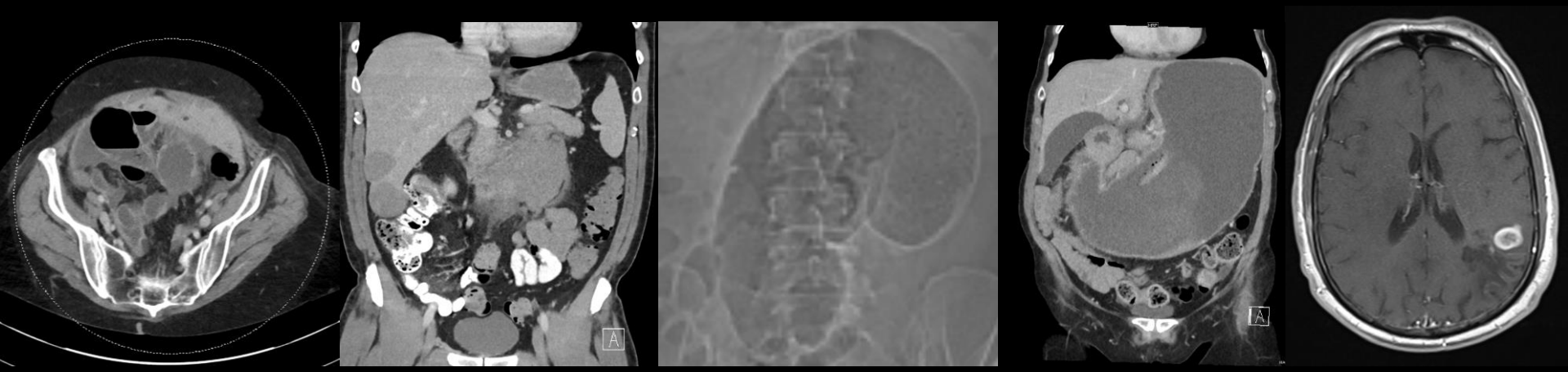
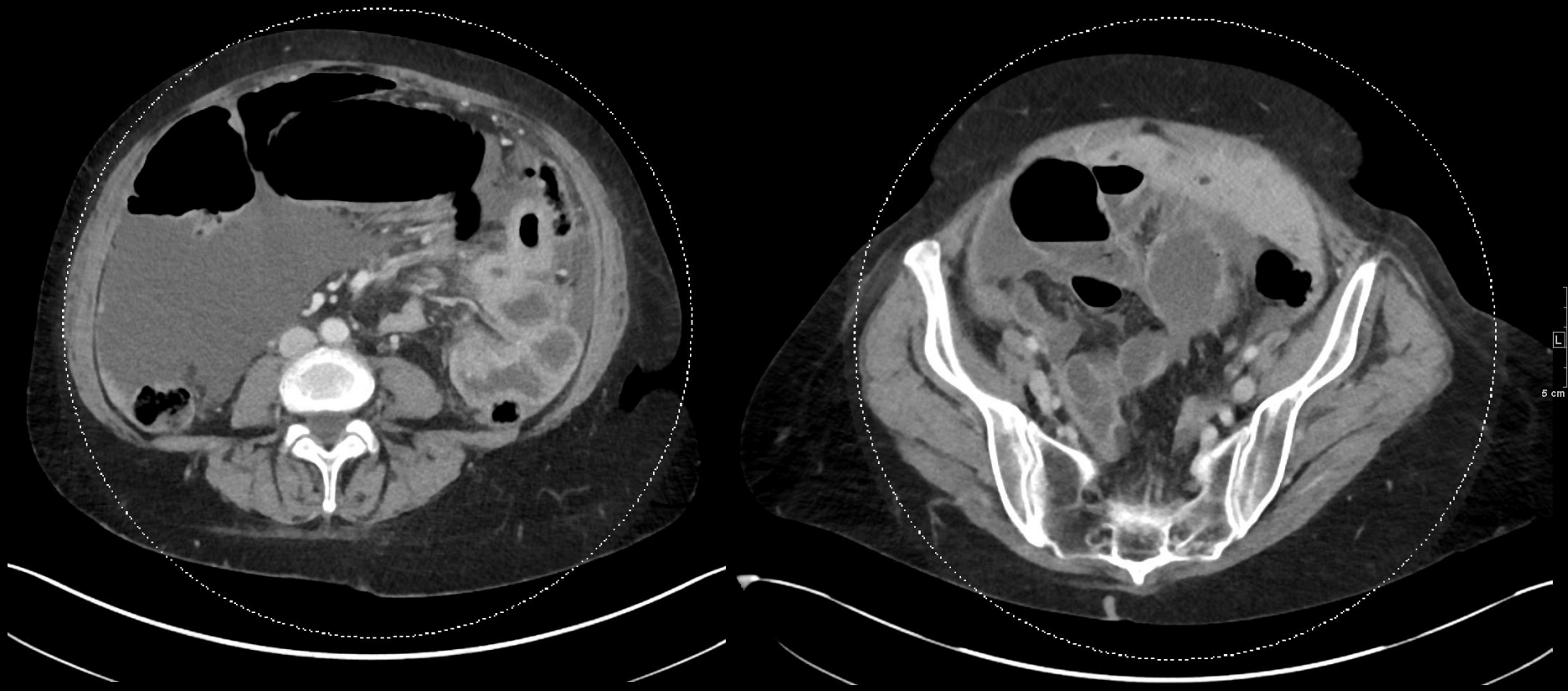
RadPath Conference 5/15/2017: Cool Case Collection

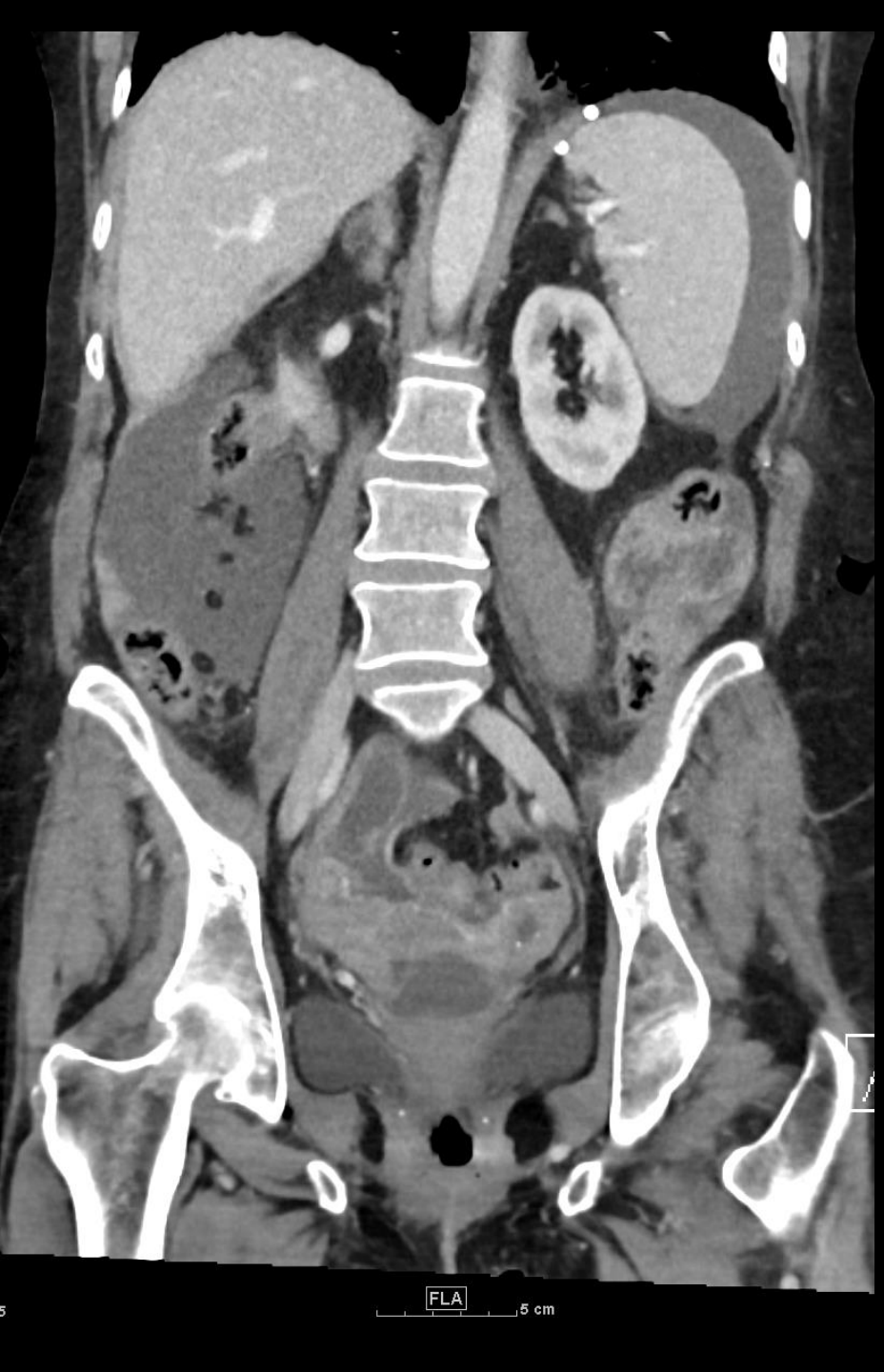


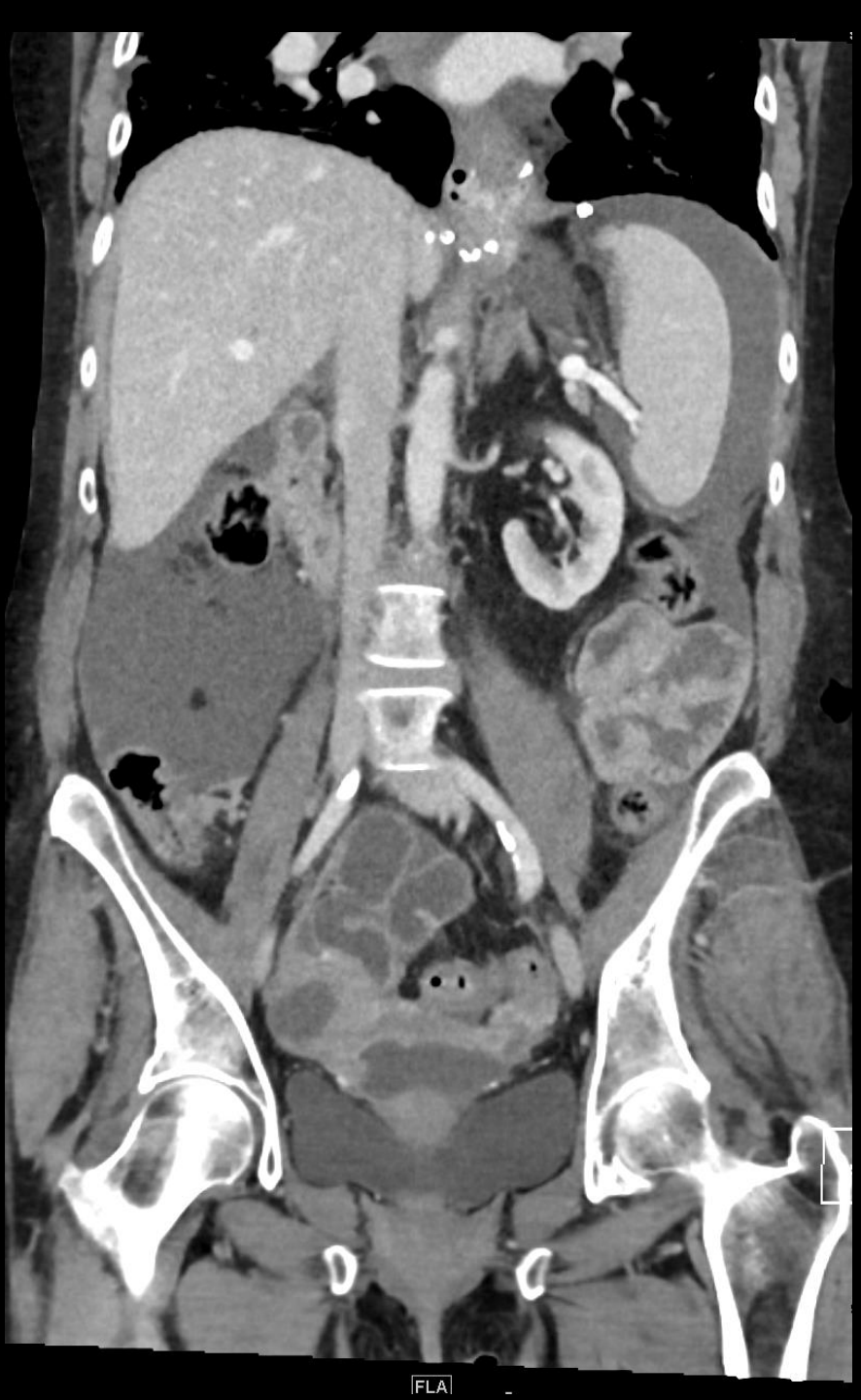
Matthew A. Haber, PGY-2 in Radiology
Sarah Hill, PGY-1 in Pathology
Brigham and Women's Hospital
Harvard Medical School

Case #1

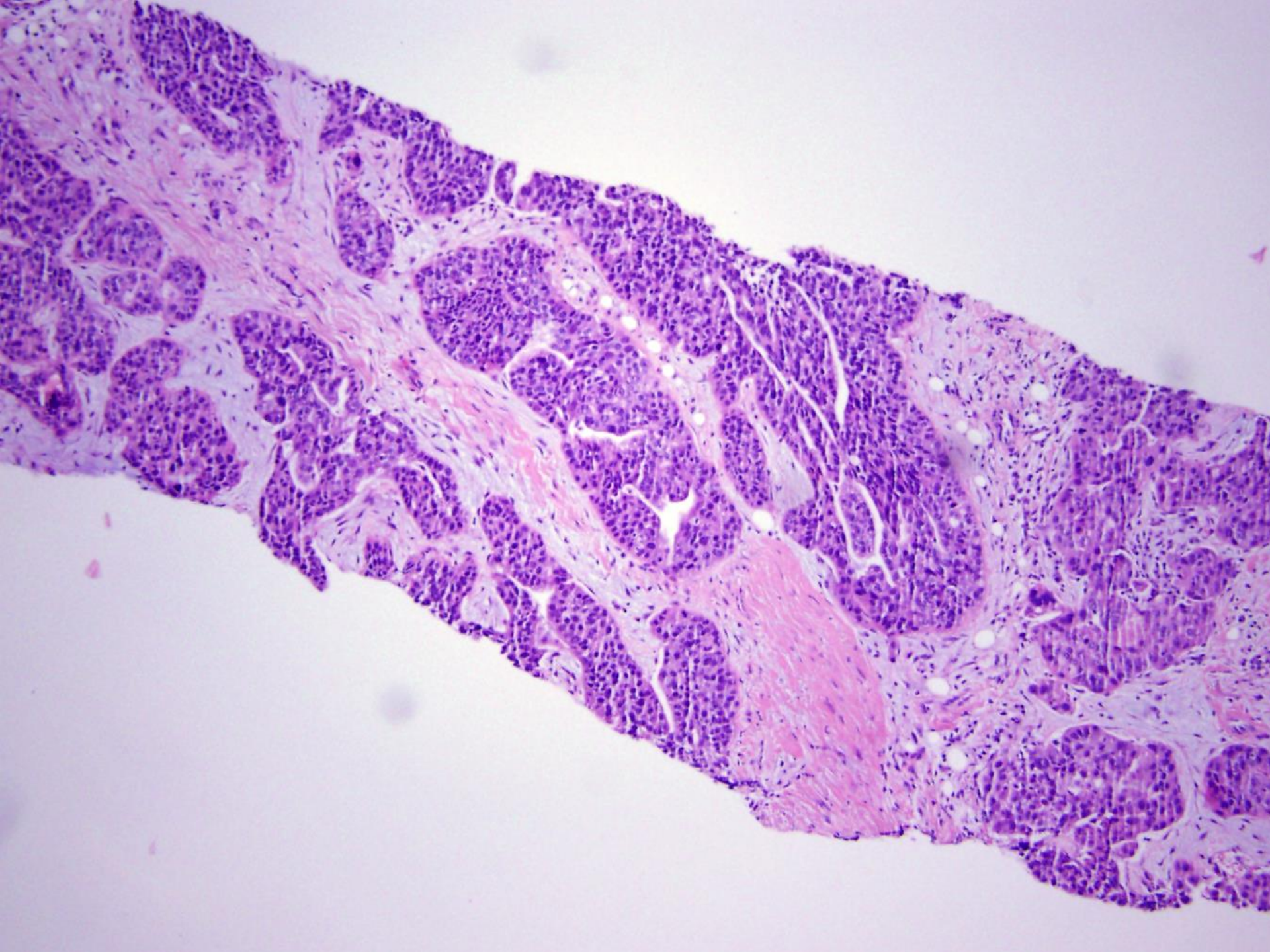
A 65 year old female patient with a history of scleroderma, interstitial lung disease, and psoriatic arthritis presents with 4-5 weeks of abdominal pain and bloating.

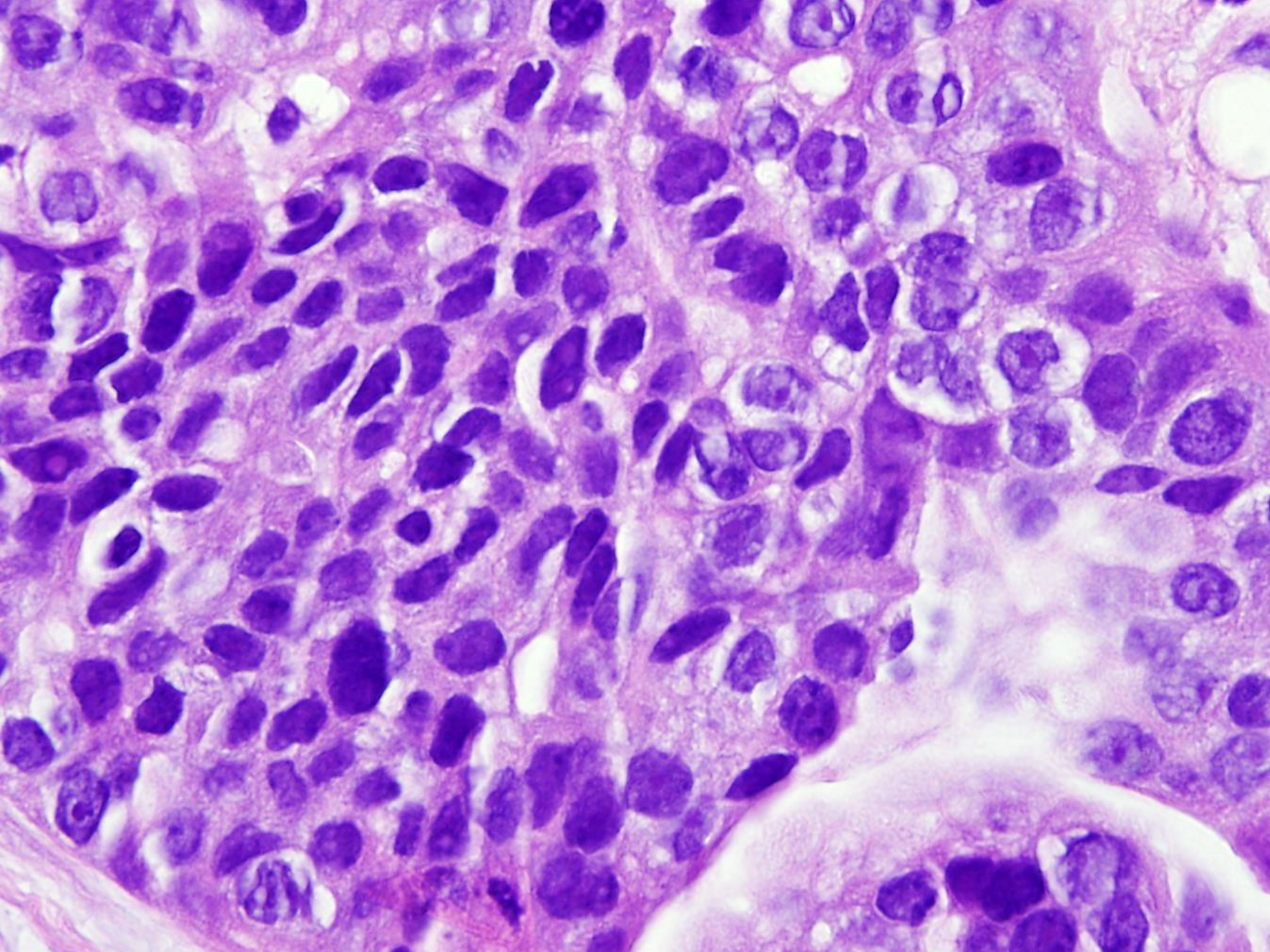

L
5 cm

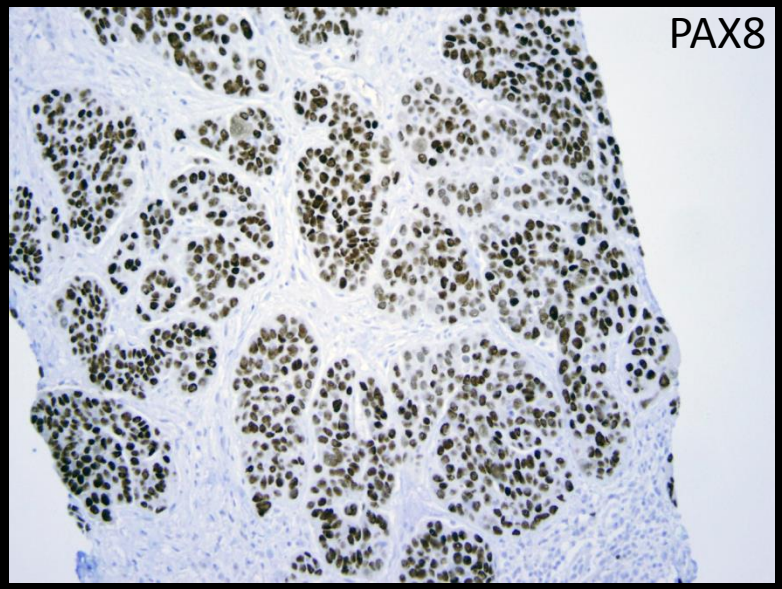

FLA
5 cm

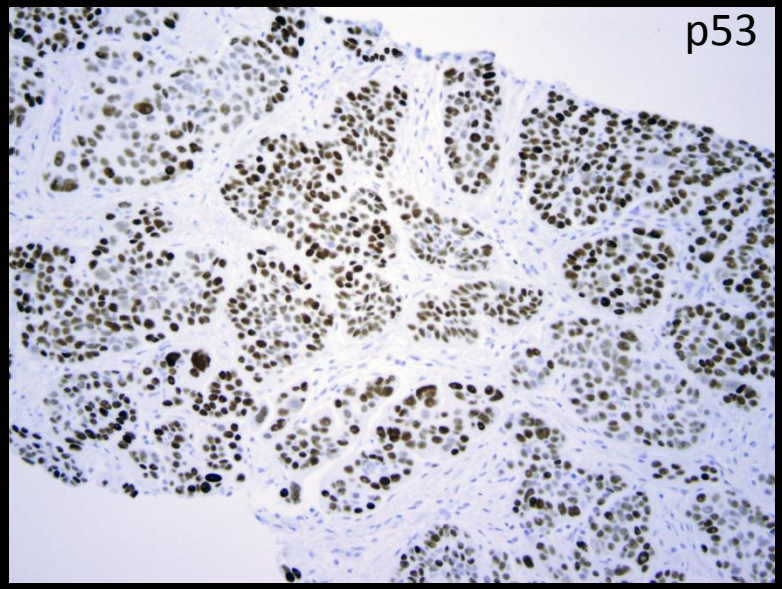

FLA

Pathology: BG-17-70692






PAX8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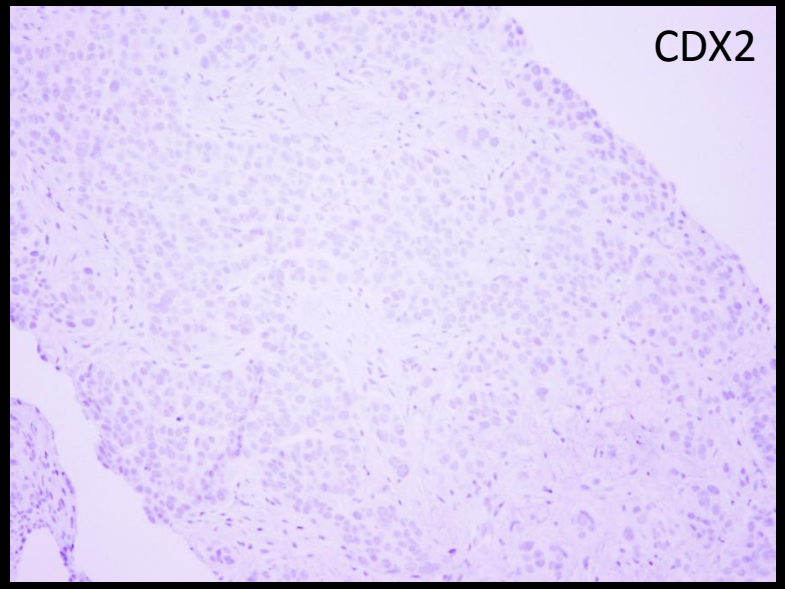
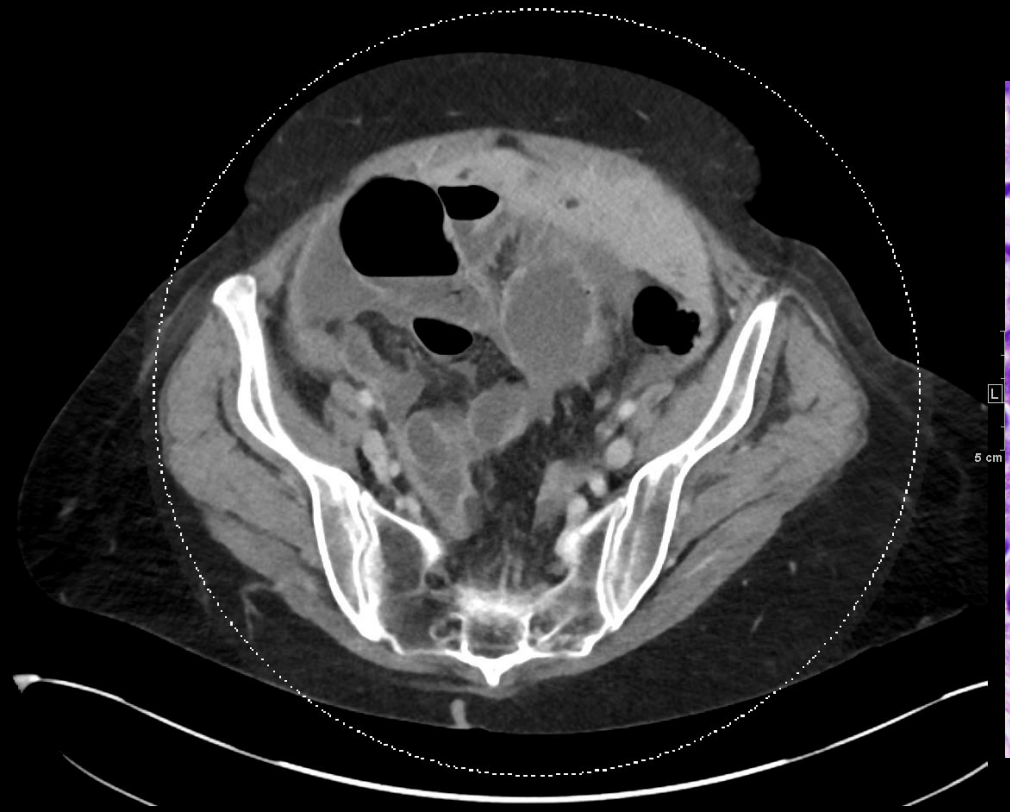
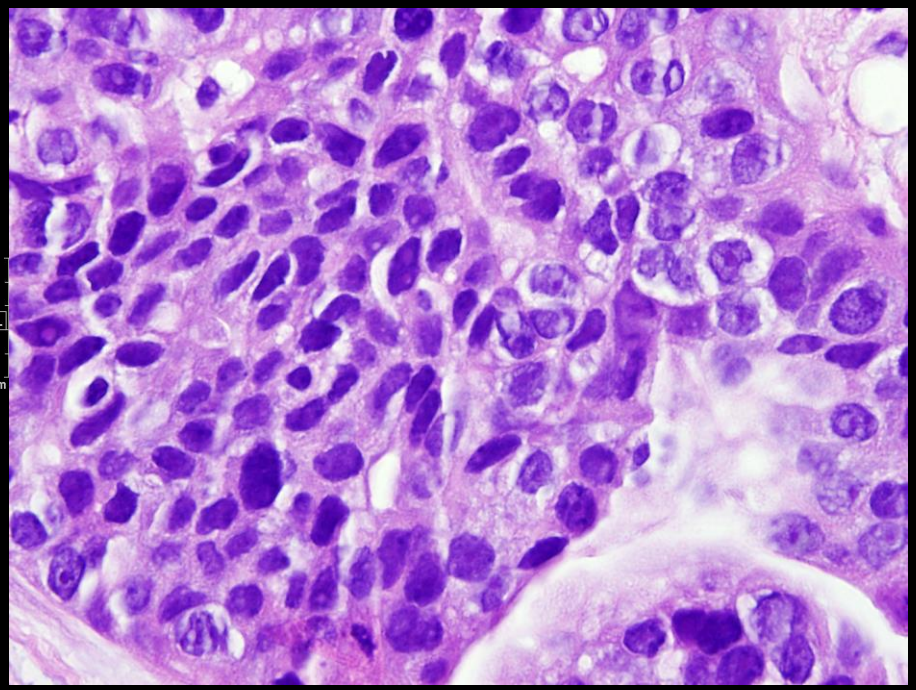

CDX2

Diagnosis: High Grade Serous Ovarian Carcinoma





Question: Which of the following is associated with increased risk of serous ovarian carcinoma?

A. Turcot Syndrome
B. Cowden Syndrome
C. Peutz-Jeghers Syndrome
D. Lynch Syndrome
E. Eldridge-Hoffmann-Buhler Syndrome

Question: Which of the following is associated with increased risk of serous ovarian carcinoma?

A. Turcot Syndrome
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D. Lynch Syndrome
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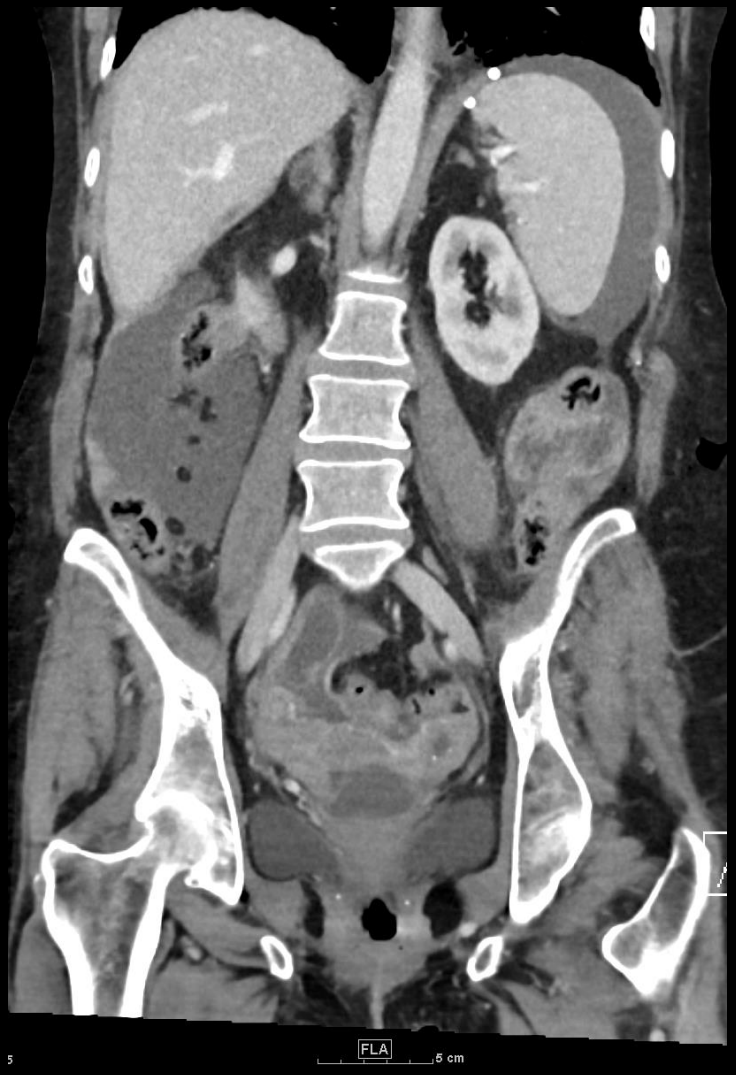
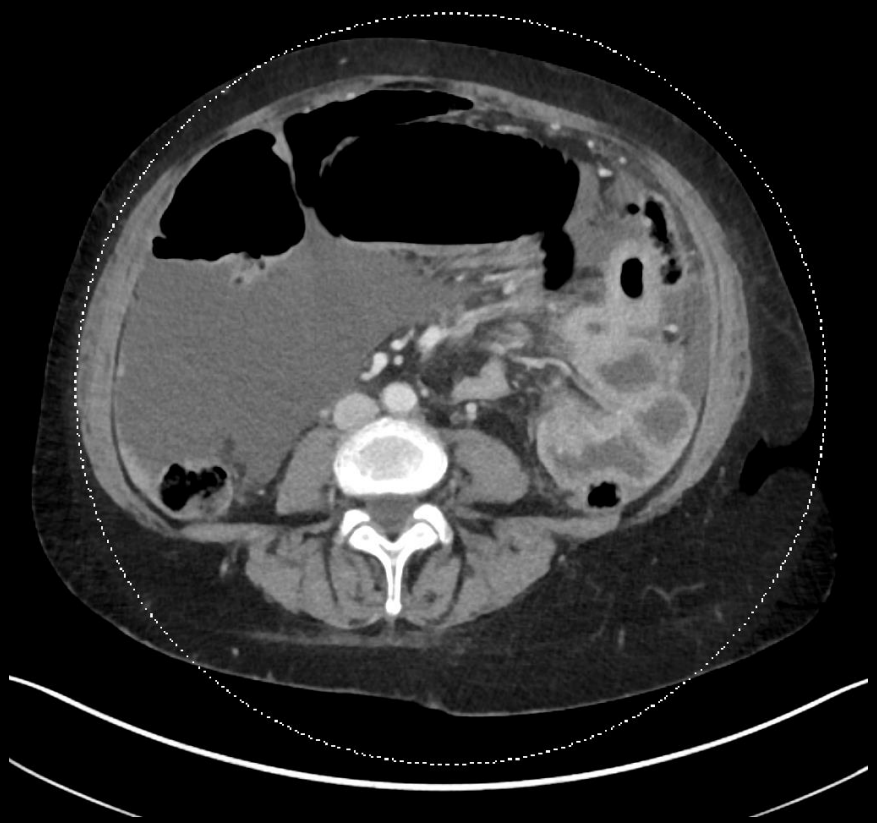
Peritoneal Carcinomatosis: Neoplasms

- Serous > Mucinous Ovarian Cancer
- Krukenberg Tumor
  - Metastases to the ovary
  - Mucin-secreting signet ring cells
  - GI is most common
  - Can look identical to primary ovarian cancer

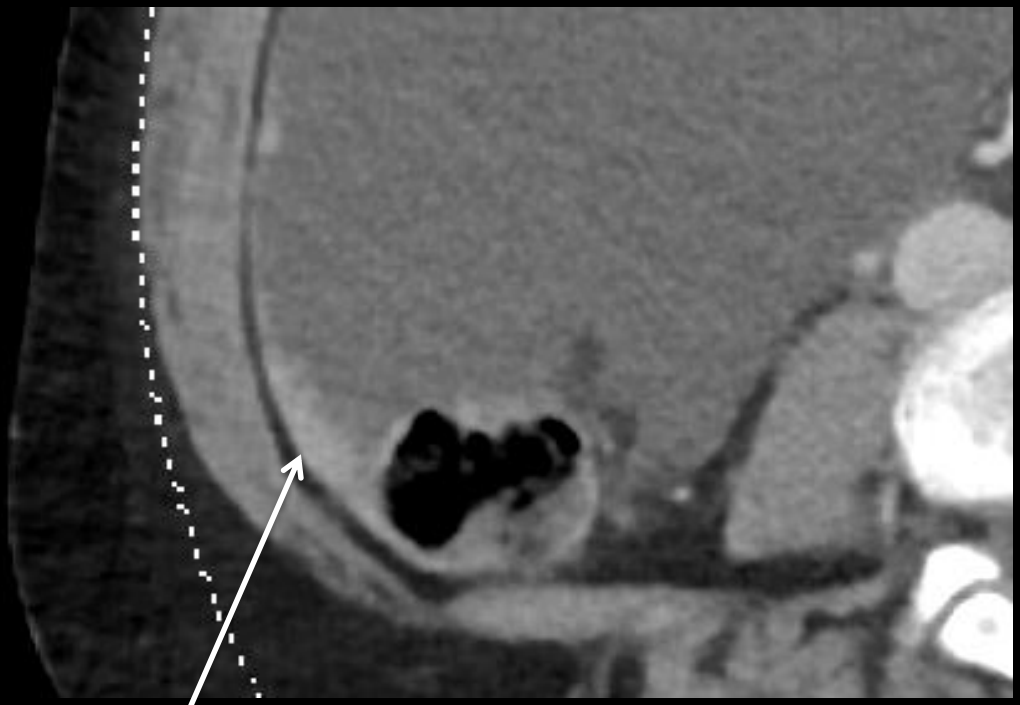


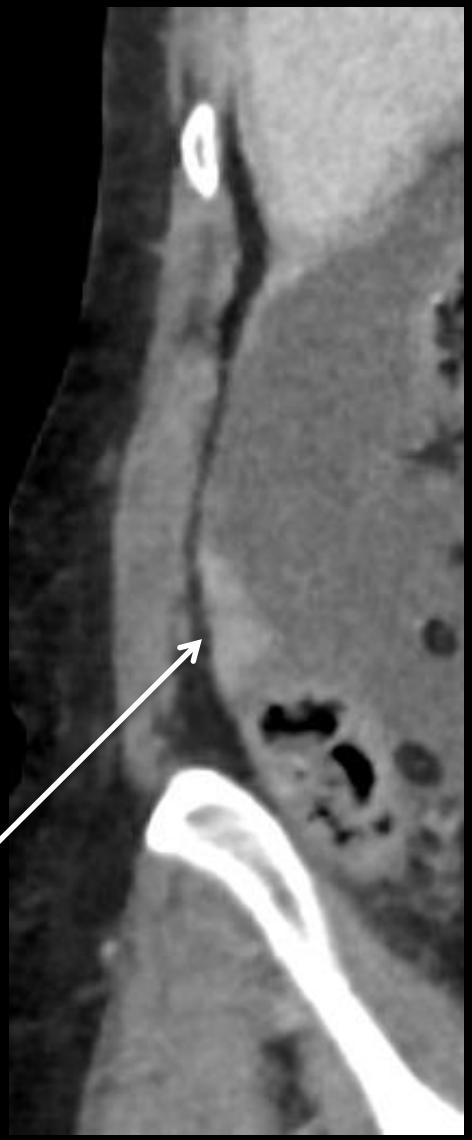
Peritoneal Carcinomatosis: Imaging



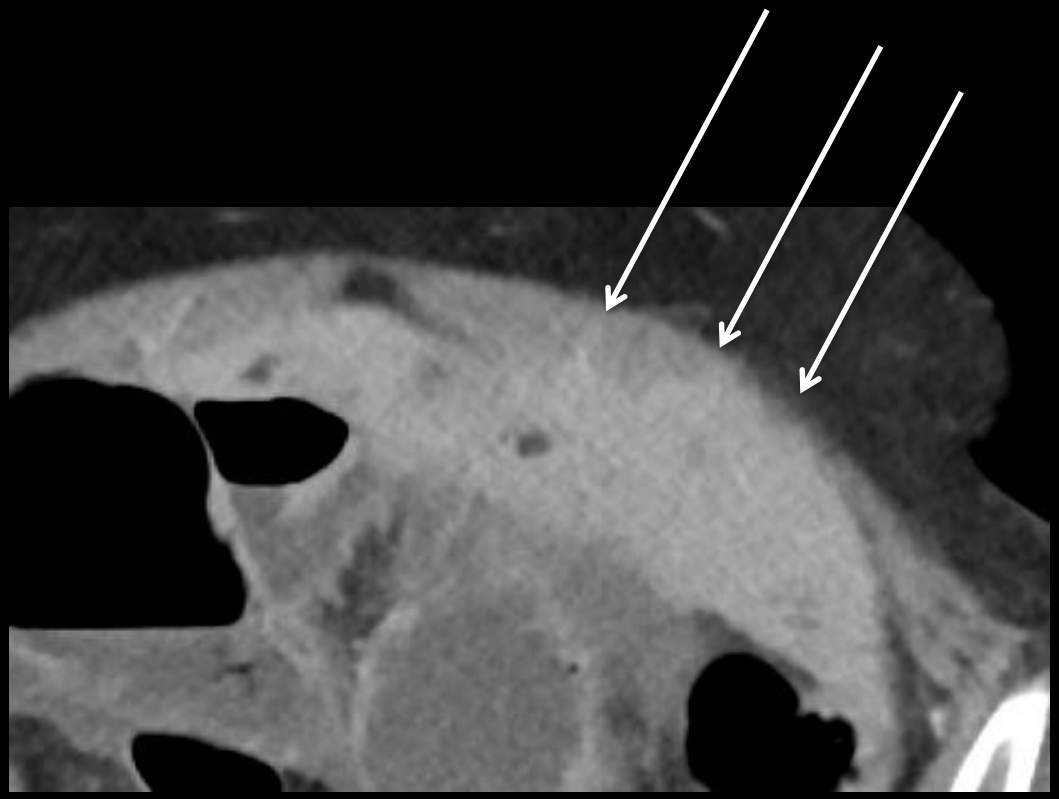
- Loculated Ascites
- Peritoneal Implants
  - CT has limited sensitivity (7-50% if < 1 cm)
- Serosal Bowel Implants
- Omental Caking
- Calcifications (Serous Ovarian)
- Complications:
  - Bowel Obstruction
  - Hydronephrosis

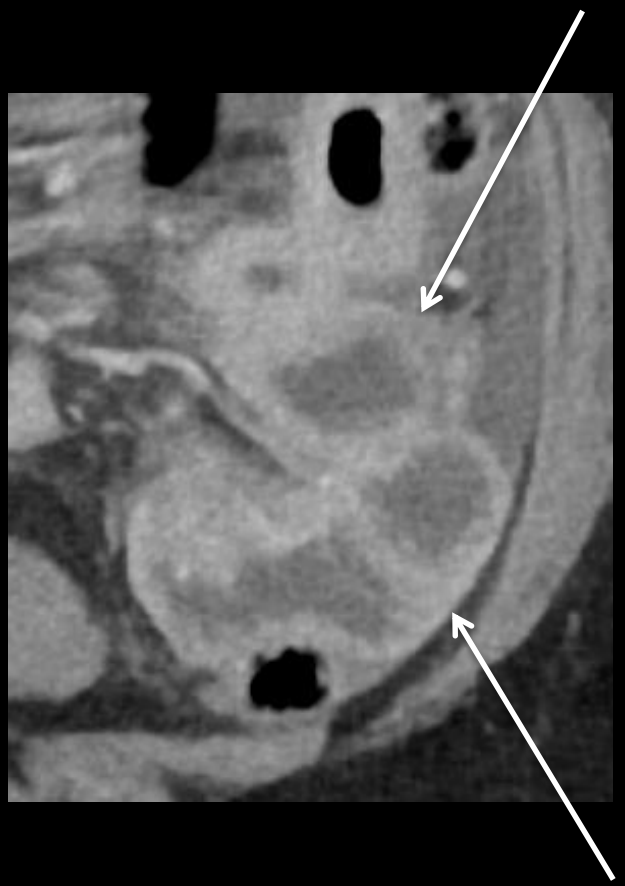
Peritoneal Implants



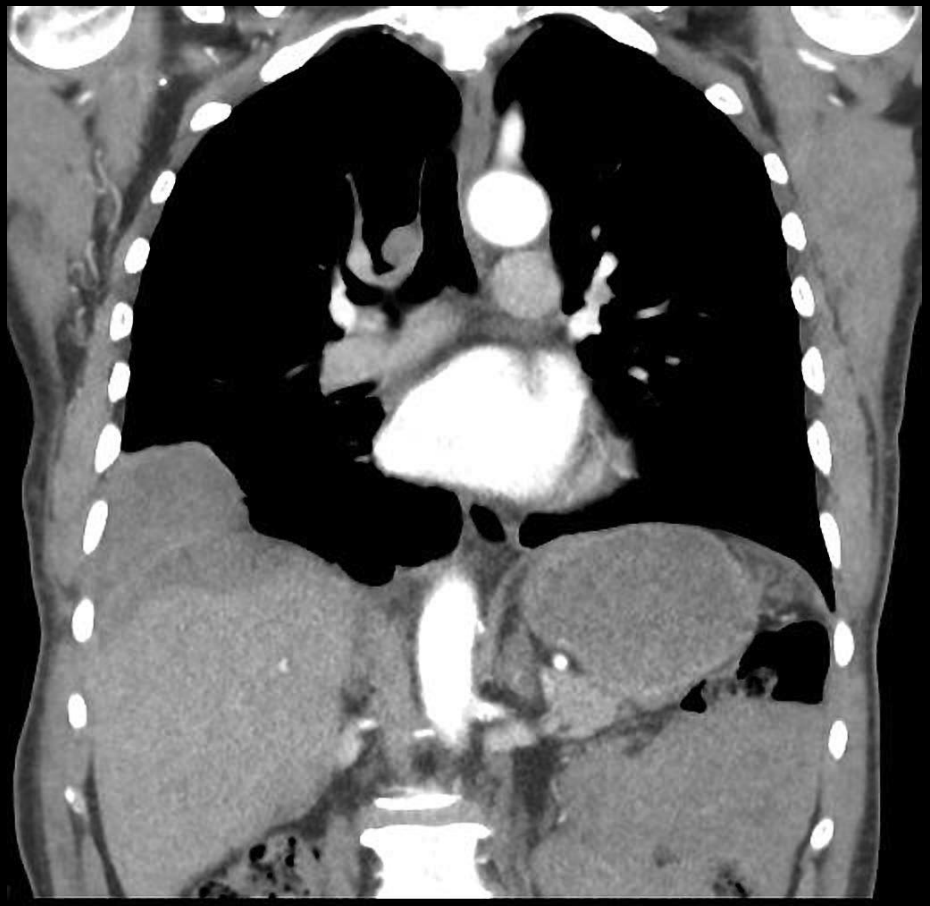


Omental Caking and Serosal Implants





Differential Diagnosis: Primary Peritoneal Mesothelioma

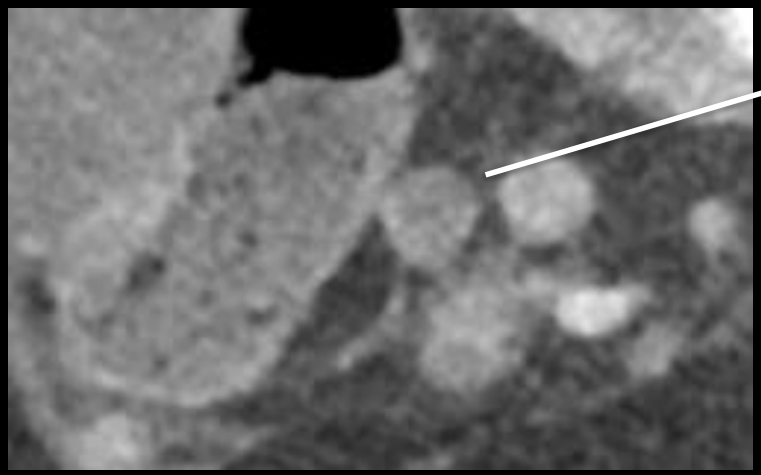


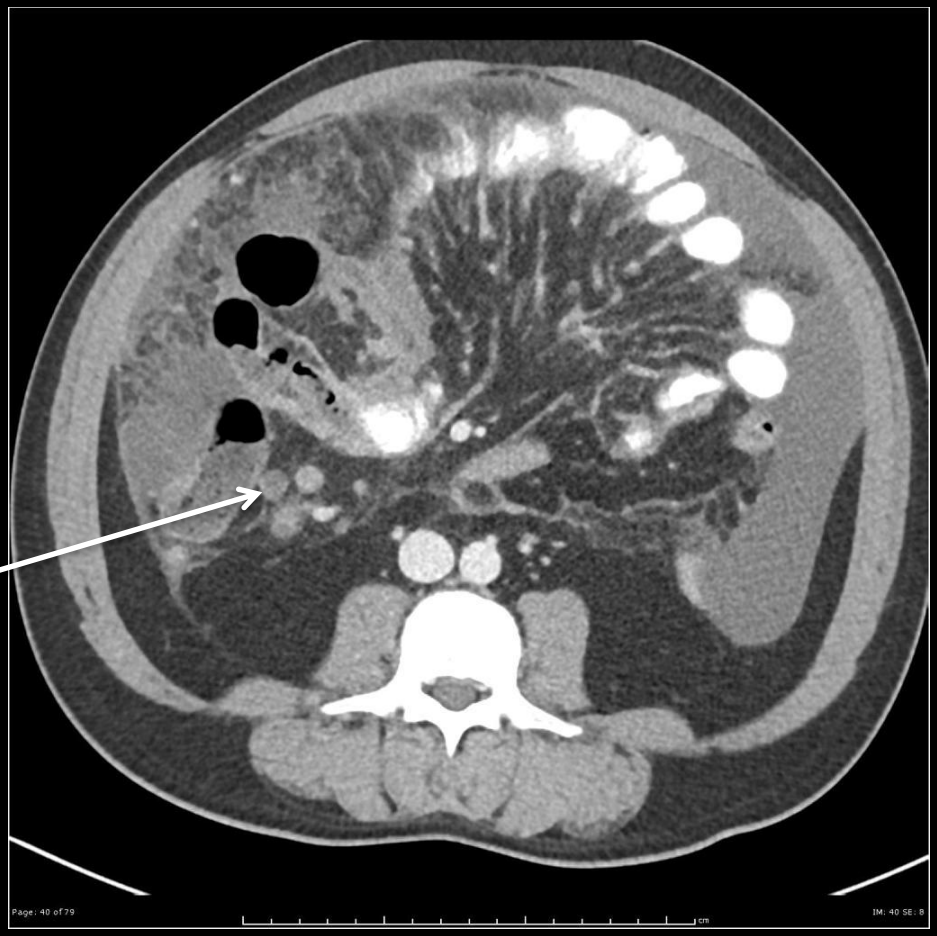
Case courtesy of Dr Jan Frank Gerstenmaier, Radiopaedia.org, rID: 31361

- Can look identical to peritoneal carcinomatosis
- Asbestos Exposure
- Calcified Pleural Plaque
- Concurrent Pleural and Peritoneal Lesions

Differential Diagnosis: Tuberculous Peritonitis

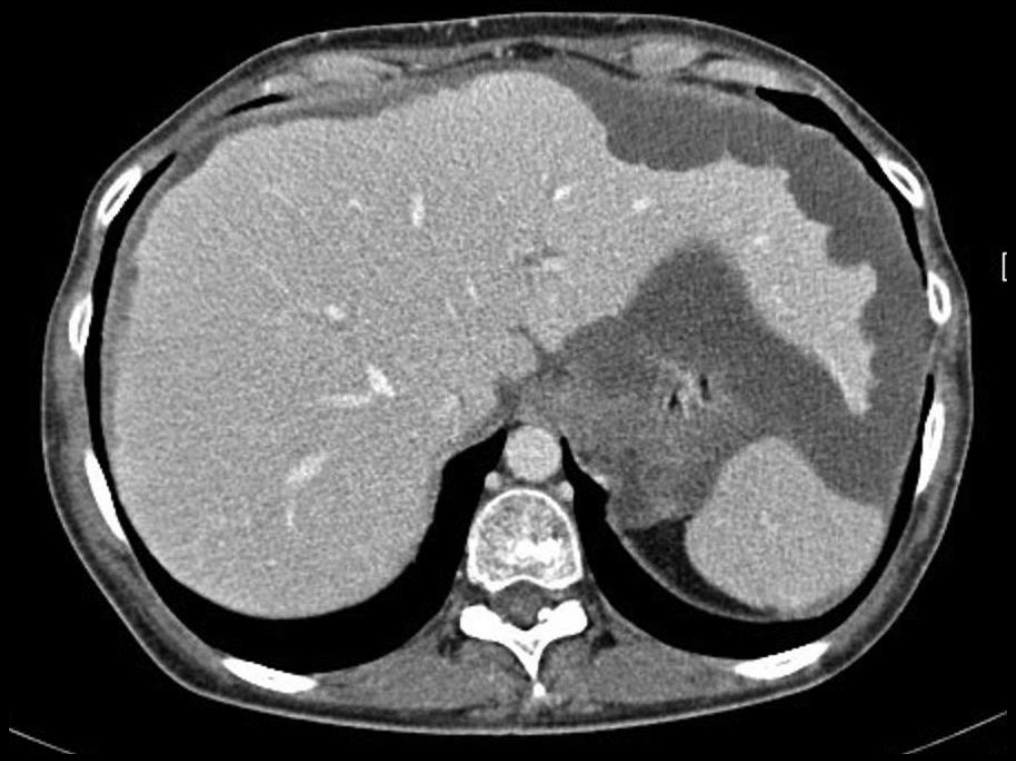
- Immunocompromised
- Low attenuation lymph nodes
- High attenuation ascites





Case courtesy of Dr Paul Leong, Radiopaedia.org, rID: 26474

Differential Diagnosis: Pseudomyxoma Peritonei

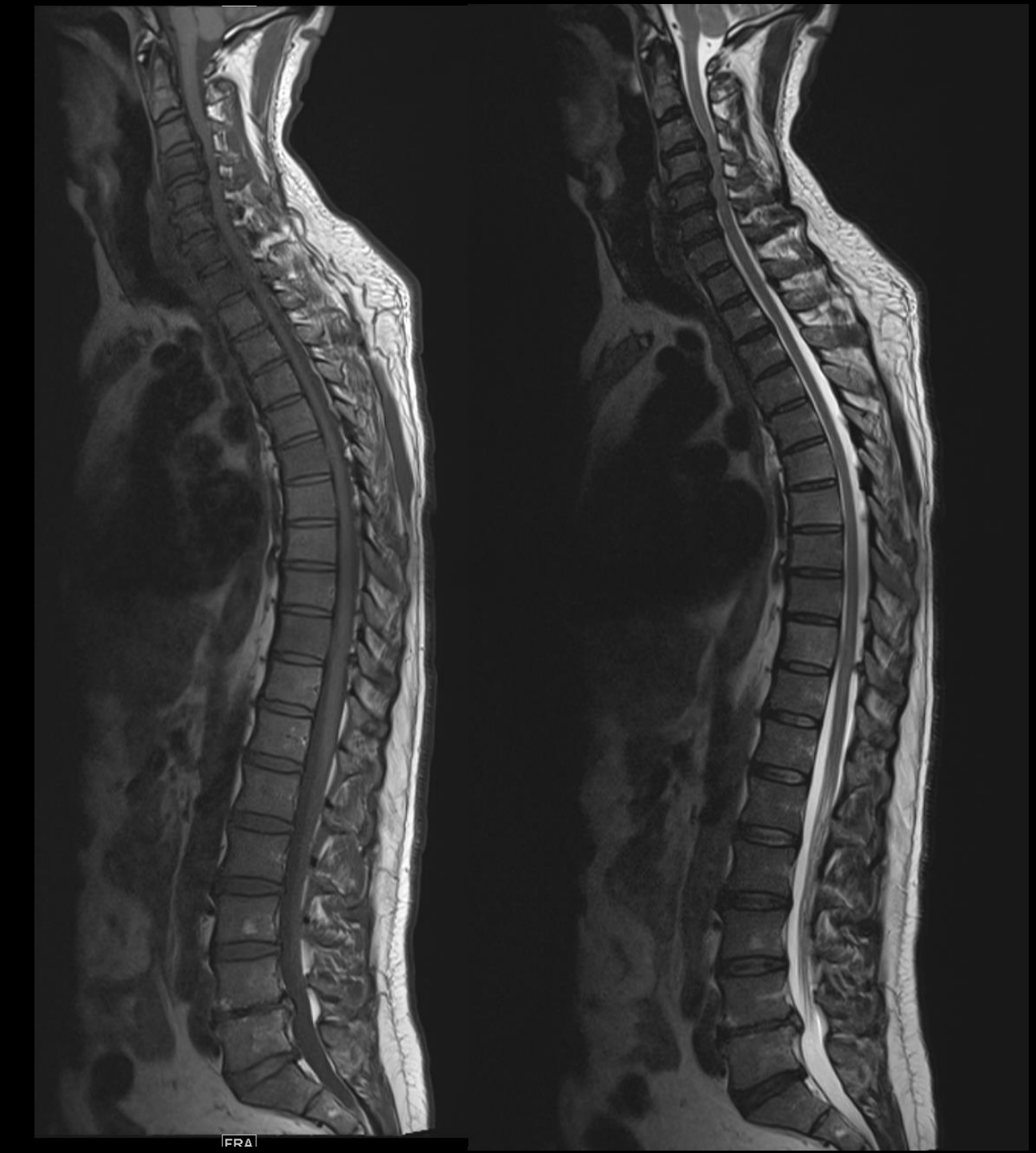
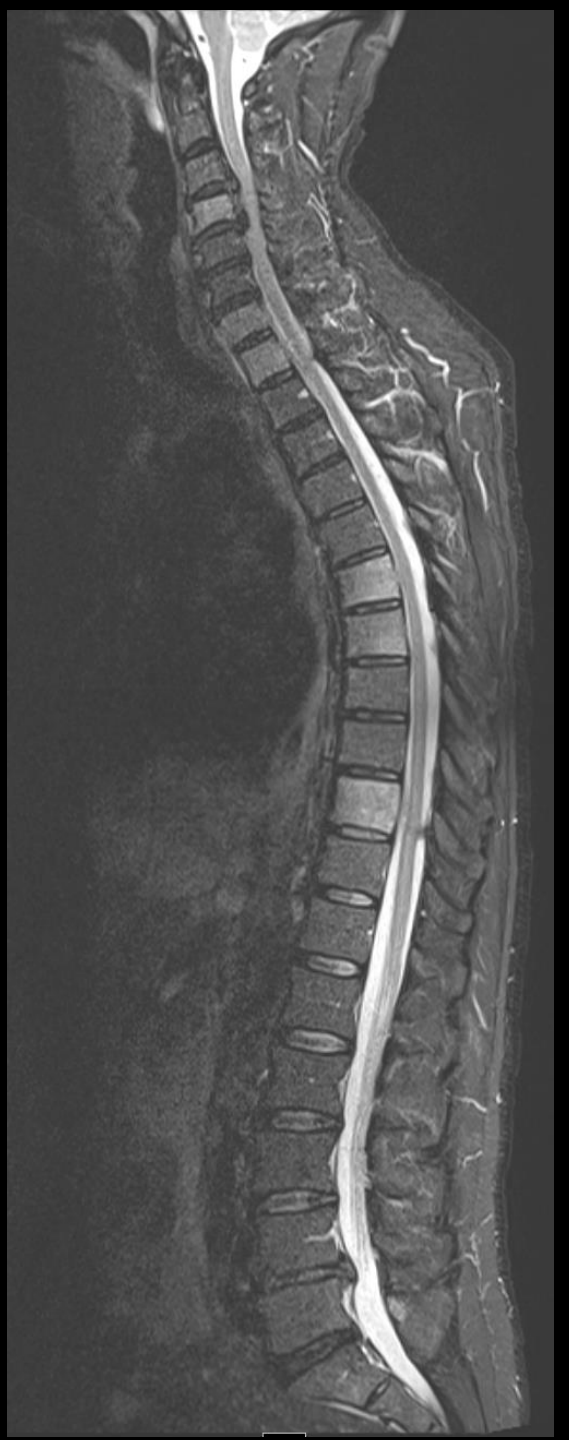


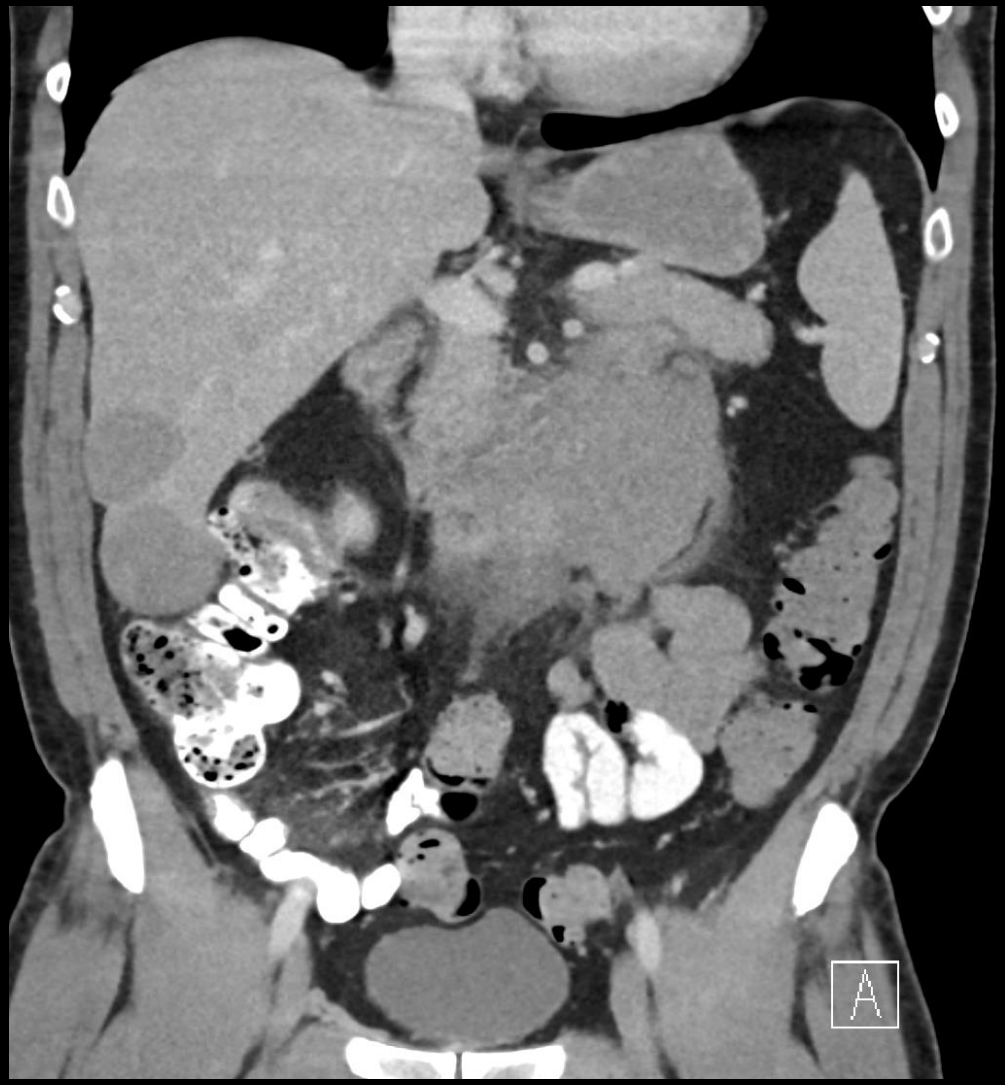
- Due to rupture of a mucinous neoplasm
- Mucinous appendiceal neoplasm is most common
- Low Density Ascites
- Look for Scallloping

Case courtesy of Dr Rajesh Annamalaisamy, Radiopaedia.org, rID: 15366

Case #2

A 58 year old male patient presents with mid back and lower back pain, as well as left shoulder pain, numbness, and tingling radiating down the left arm.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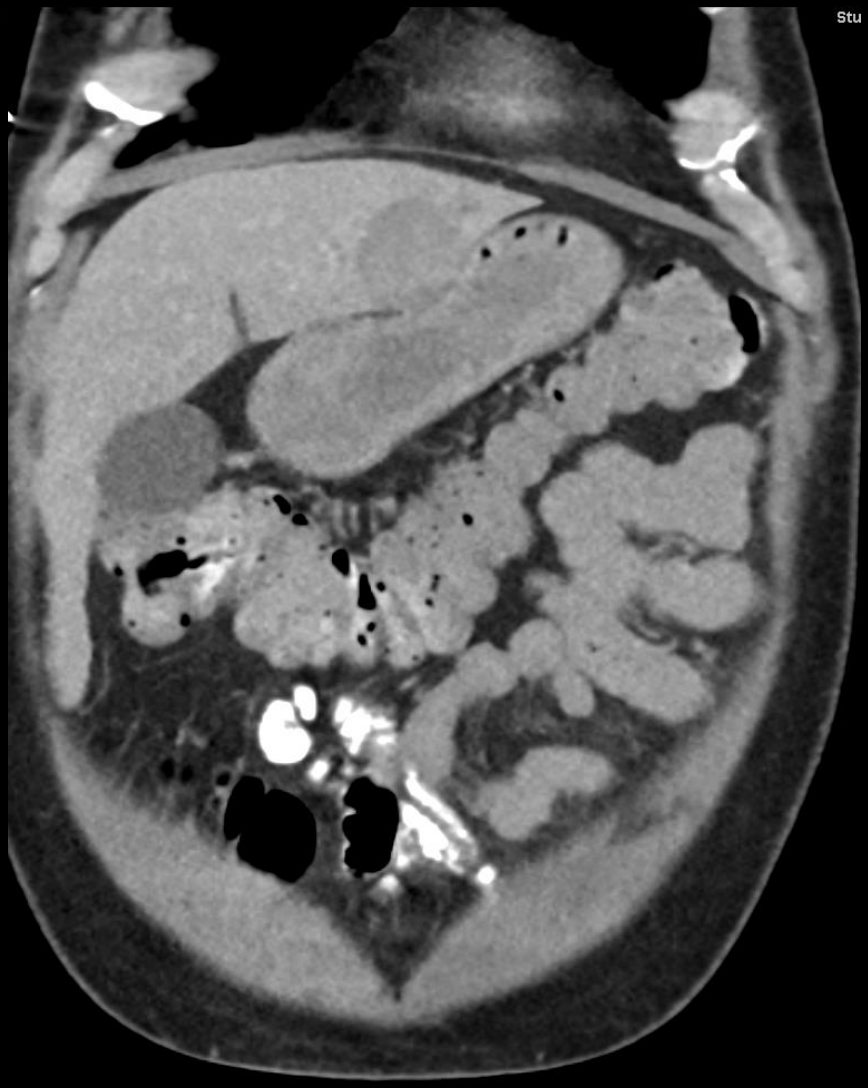
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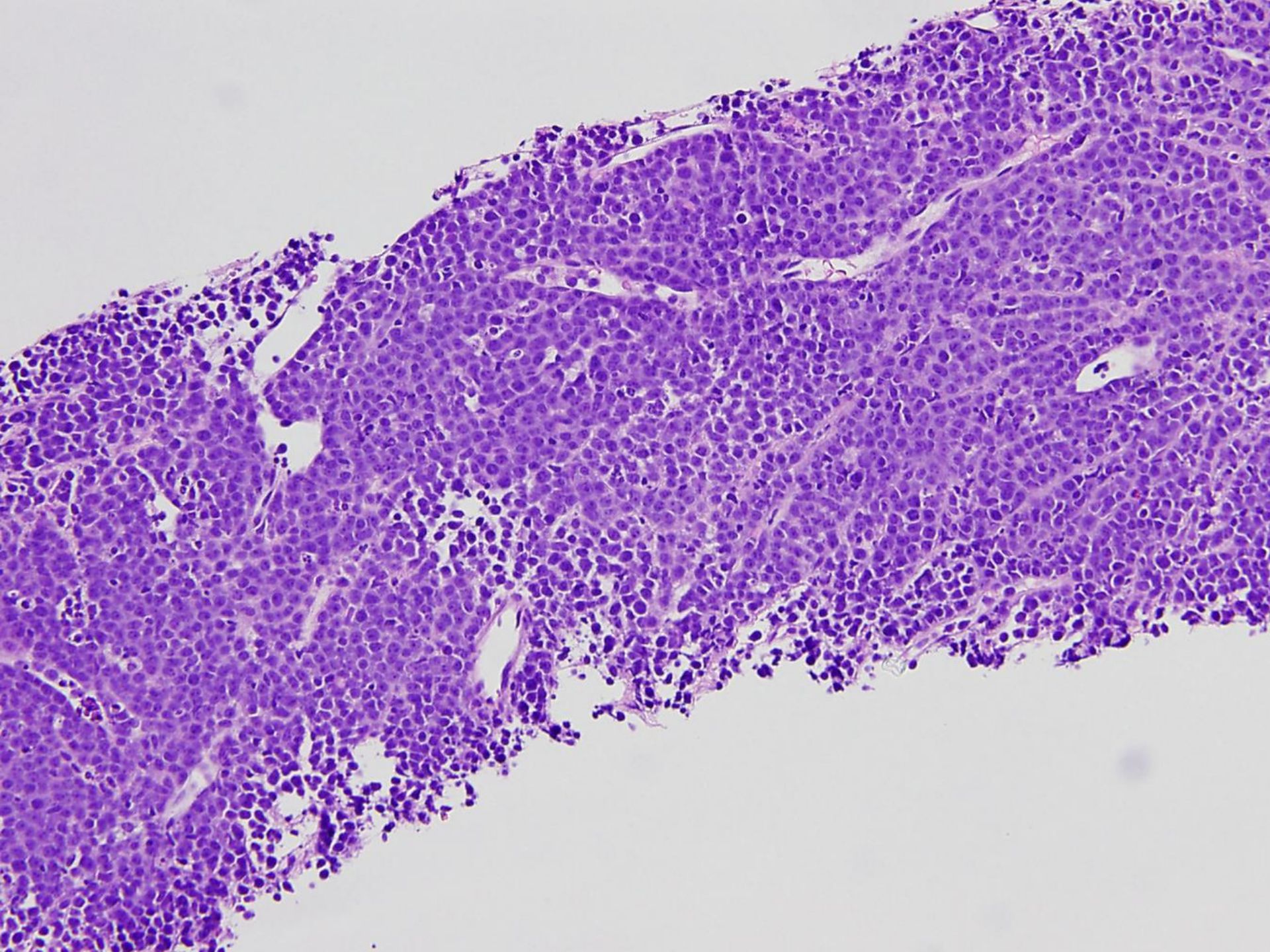
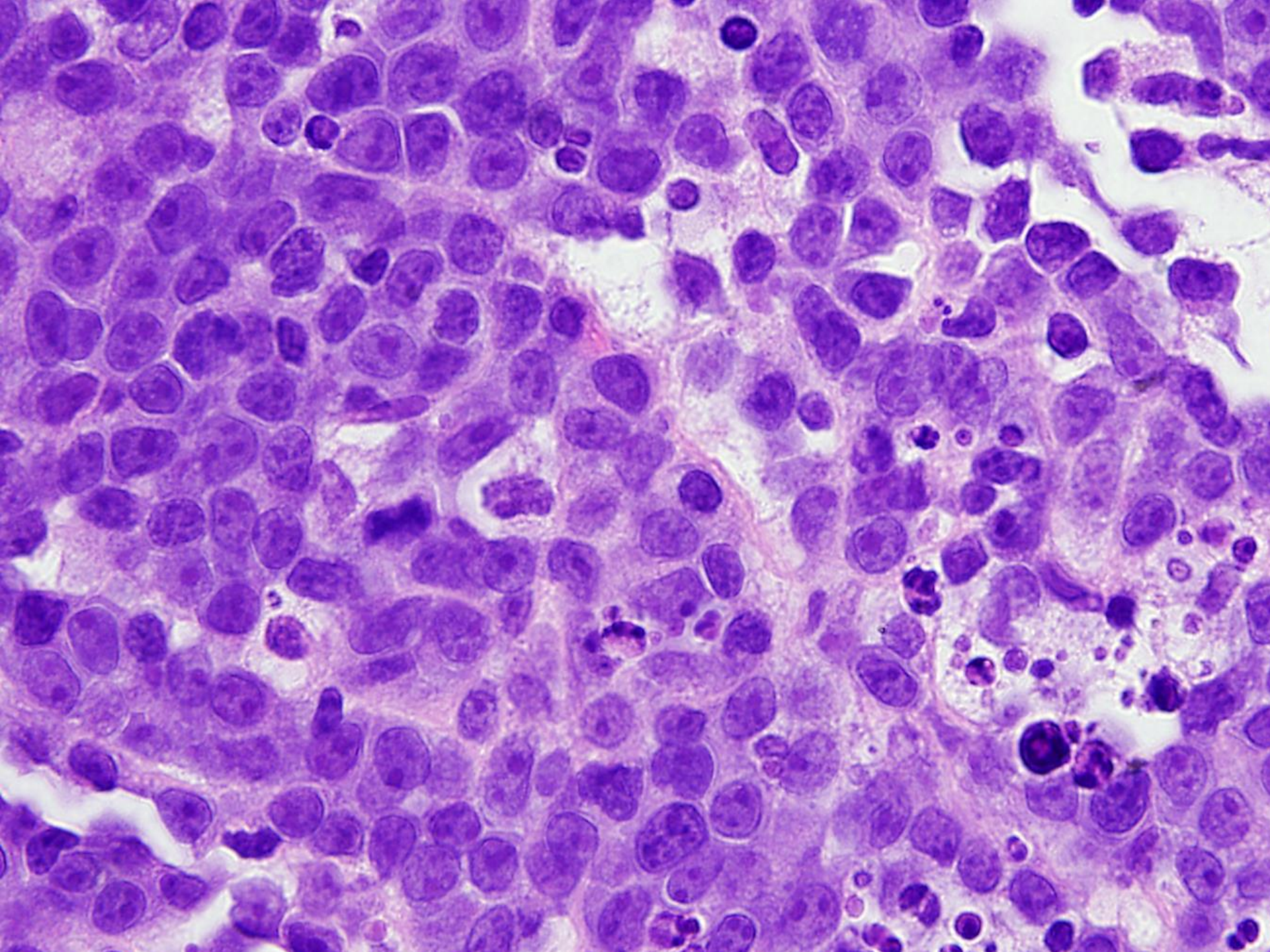
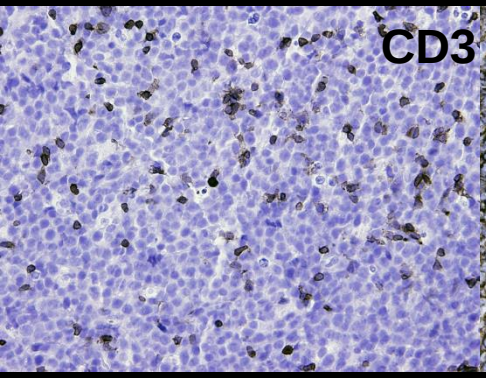
Pathology: BS-16-54836



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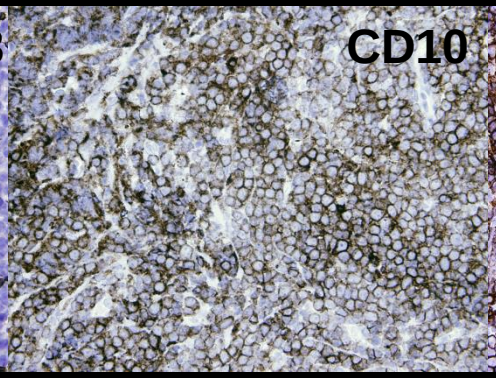
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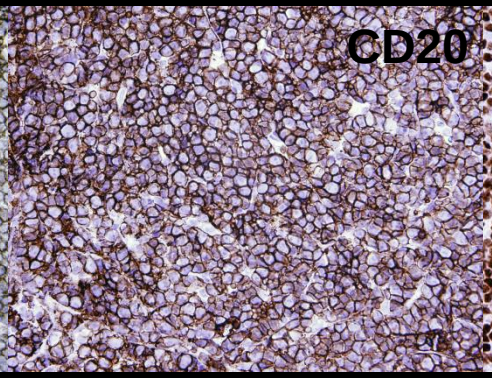
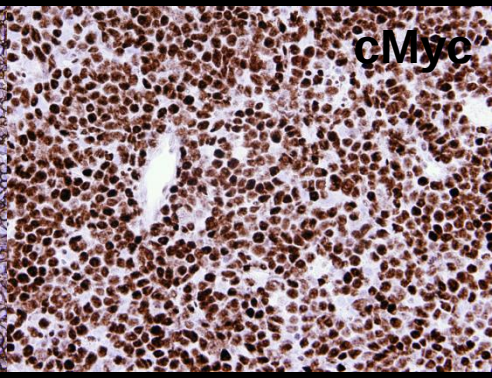

CD20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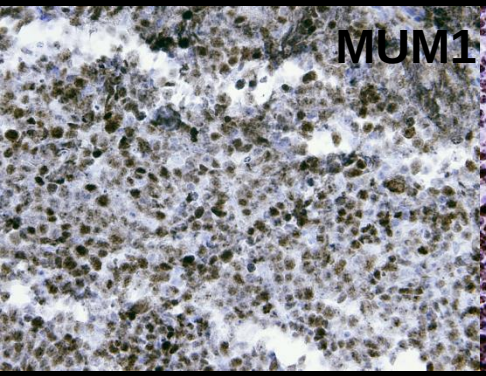
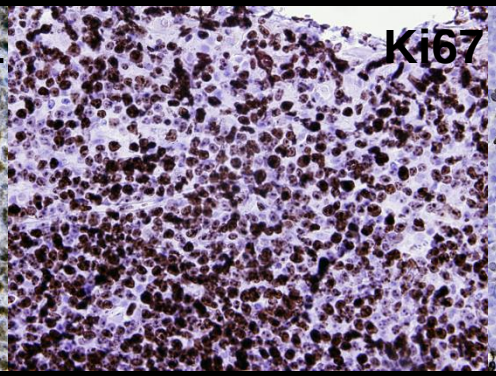

MUM1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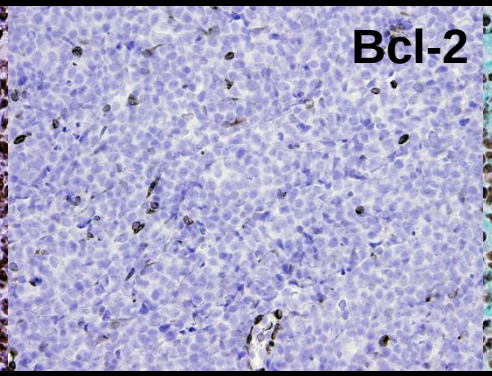
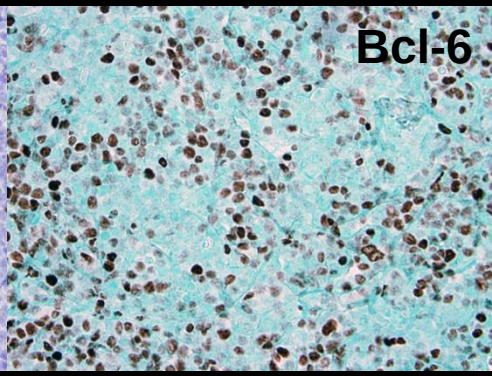
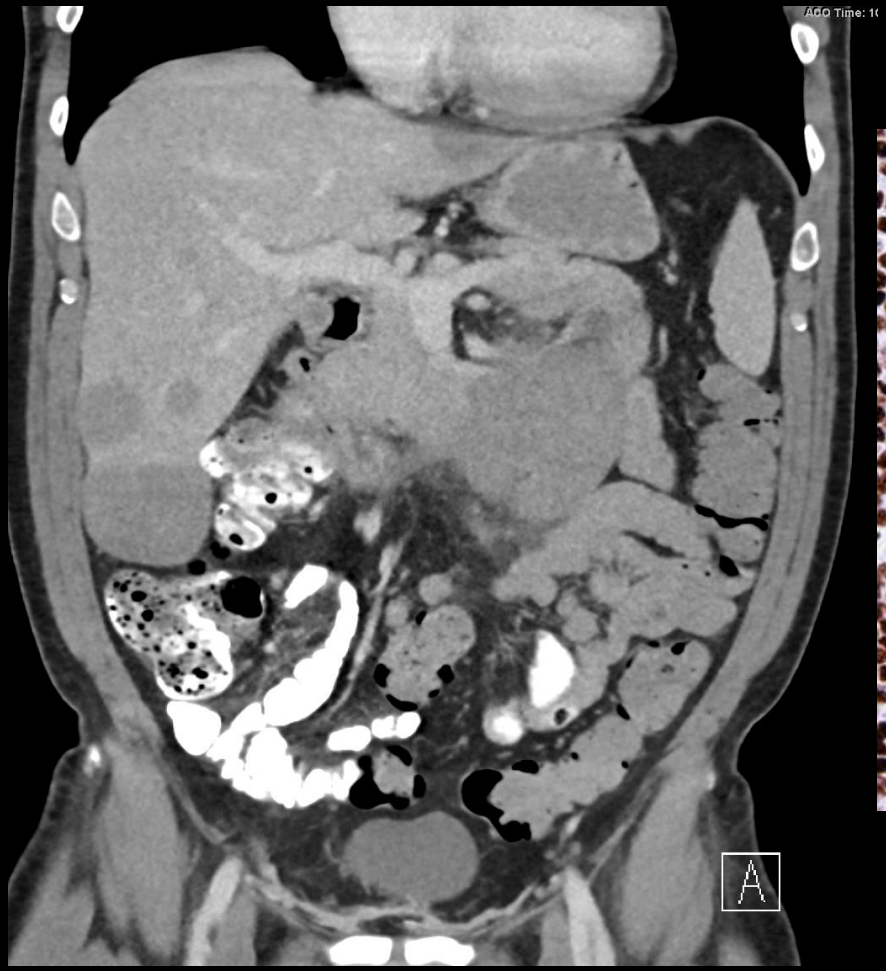
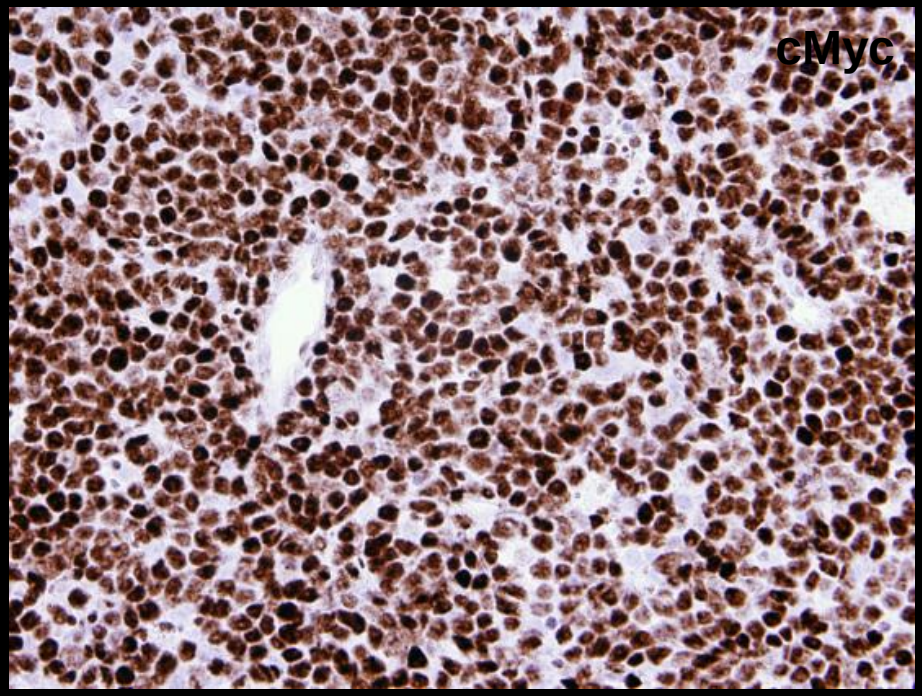

Bcl-2


Bcl-6

Diagnosis: Burkitt's Lymphoma





Question: What is the approximate doubling time of Burkitt's Lymphoma?

A. 24 Hours
B. 3 Days
C. 2 Weeks
D. 3 Months
E. 2 Years

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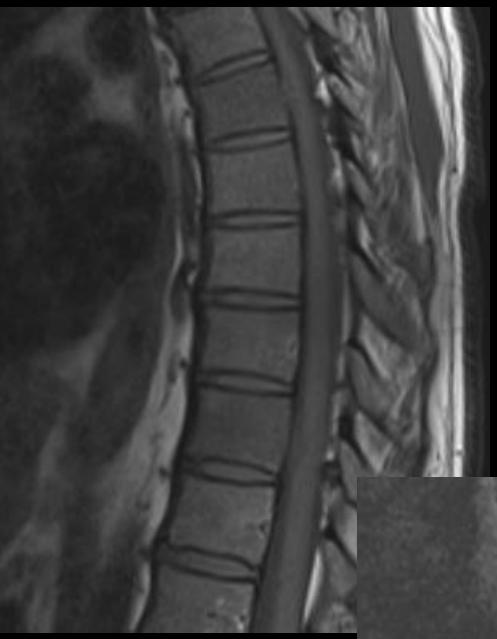
Burkitt's Lymphoma: Background

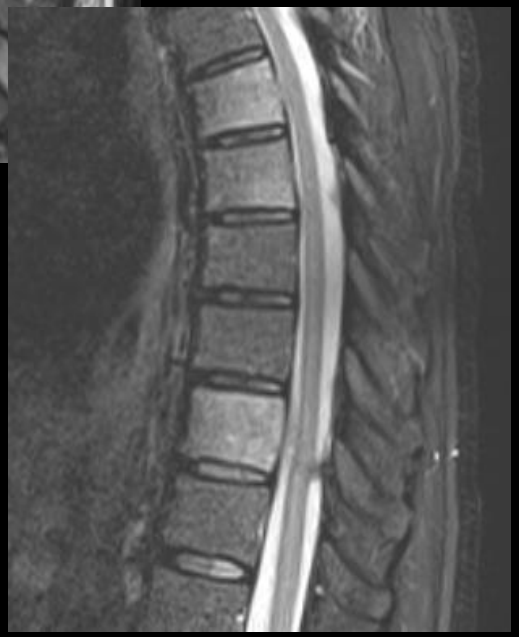
- *c-myc* Translocation
- Fastest Doubling Time!
- Endemic
  - Pediatric
  - EBV/Malaria
  - Head and Neck
- Immunosuppressed
  - HIV
  - Post-Transplant
- Sporadic
  - North America/Europe
  - Rare
  - Abdomen/Solid Organs

Denis Parsons Burkitt

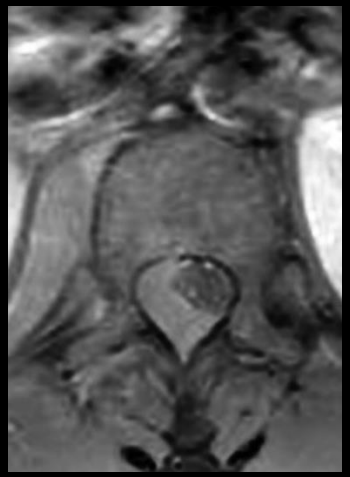
"America is a constipated nation…If you pass small stools, you have to have large hospitals"

Lymphoma and Bone/Spine





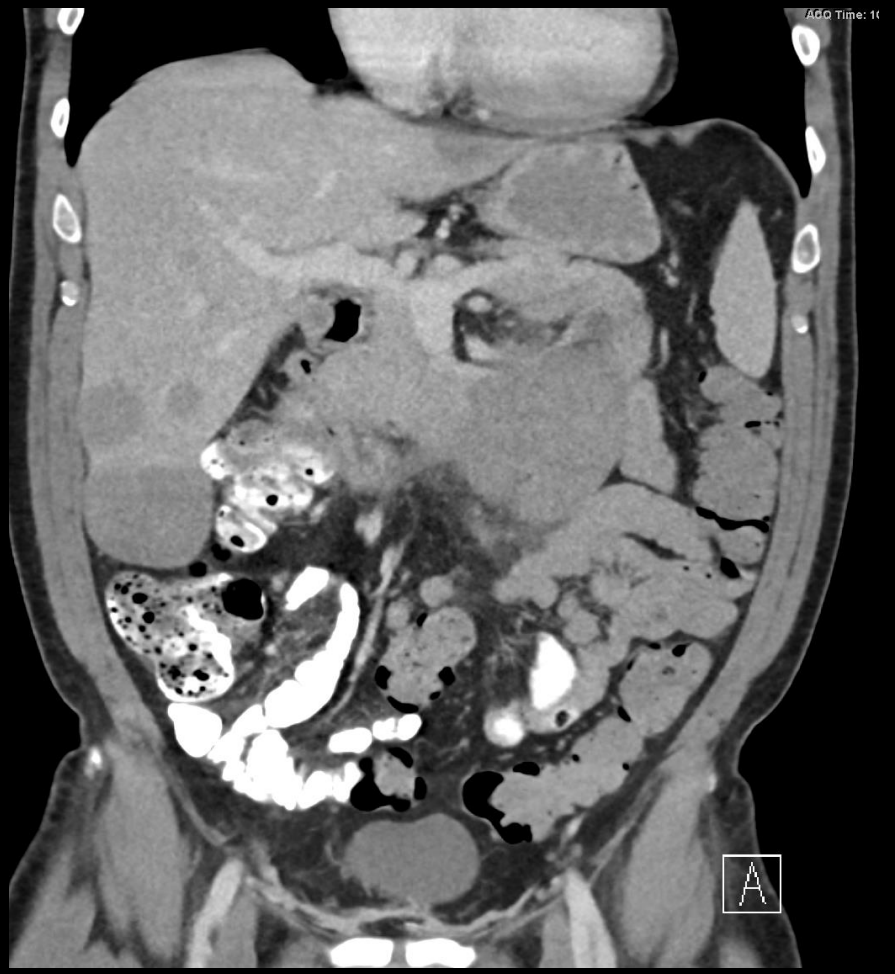
- Osseous Metastases
  - T1 Hypointense
  - STIR Hyperintense
  - Lytic/Permeative on CT
- Epidural Involvement



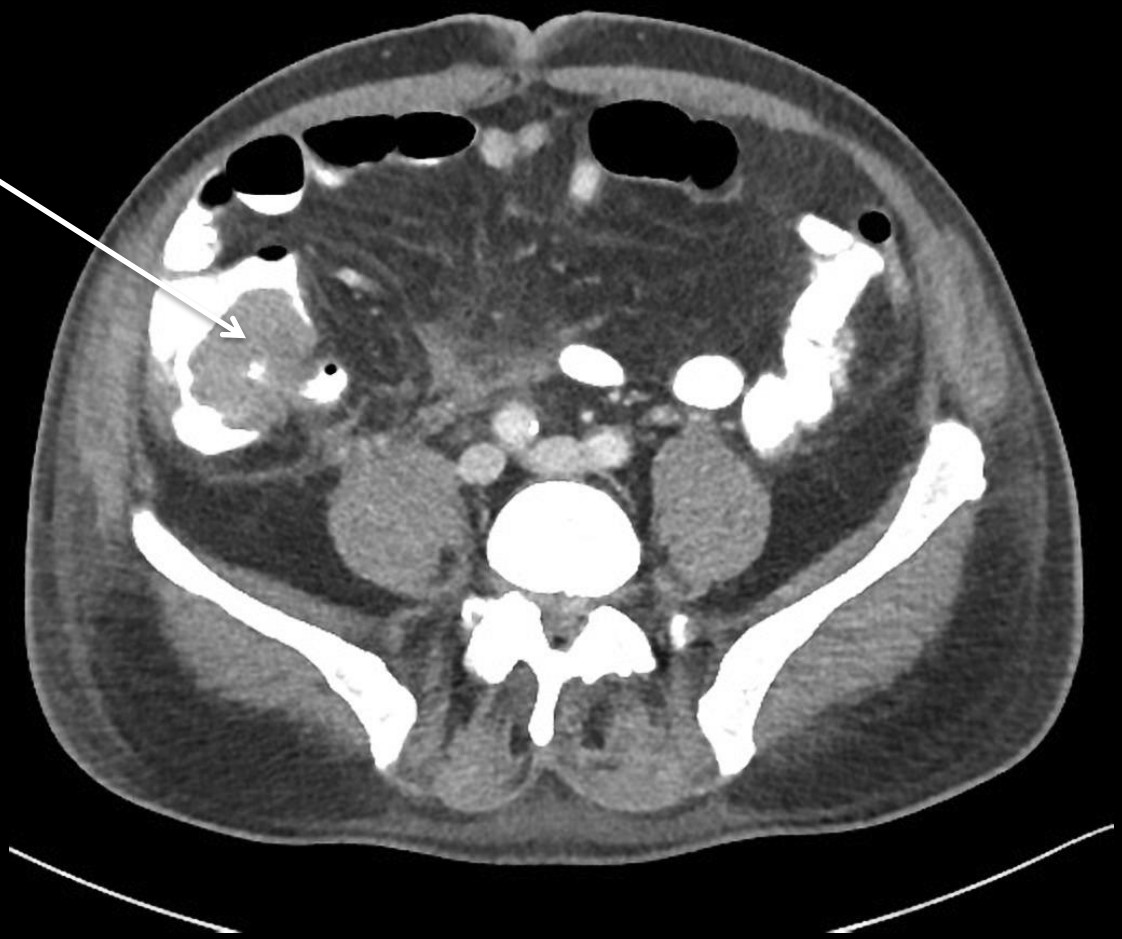
Case courtesy of Dr Dalia Ibrahim, Radiopaedia.org, rID: 48573

Lymphoma and the Abdomen

- Lymphoma looks BORING
- Homogenous
- Monotonous
- Poorly Enhancing
- Encasement without Obstruction
- Exceptions: Intussusception

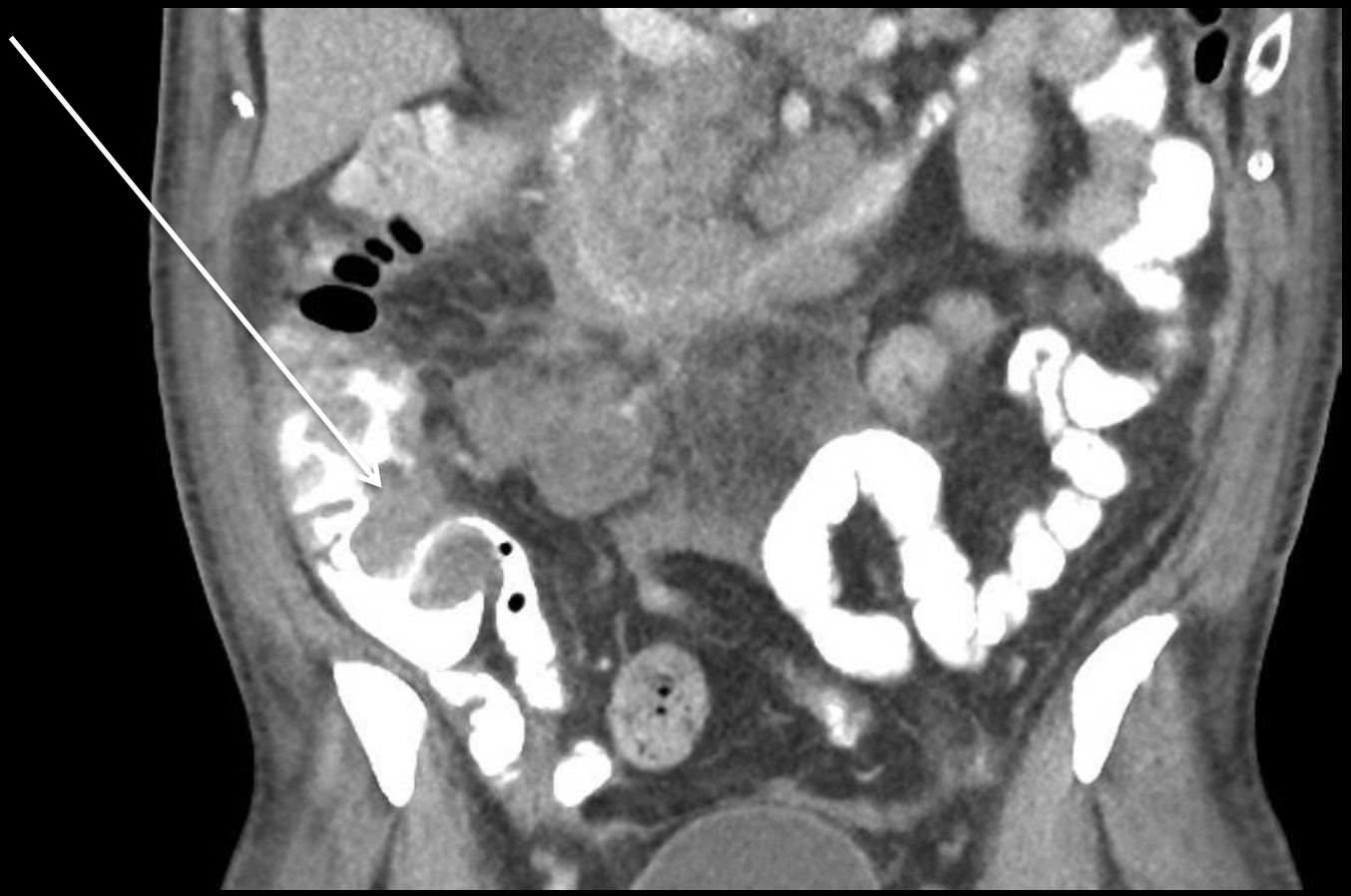


Burkitt's Lymphoma and the Abdomen



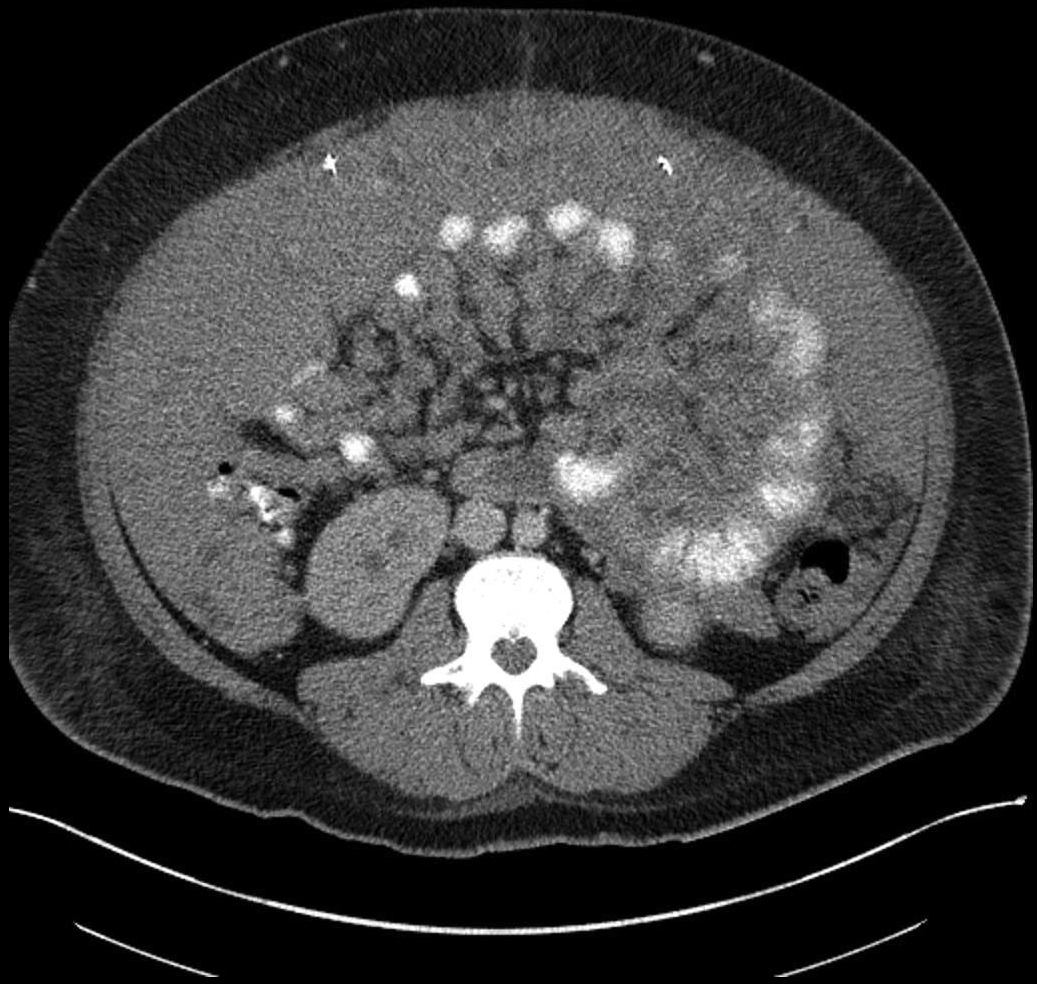
Case courtesy of Dr Henry Knipe, Radiopaedia.org, rID: 39564

Burkitt's Lymphoma and the Abdomen



Case courtesy of Dr Henry Knipe, Radiopaedia.org, rID: 39564

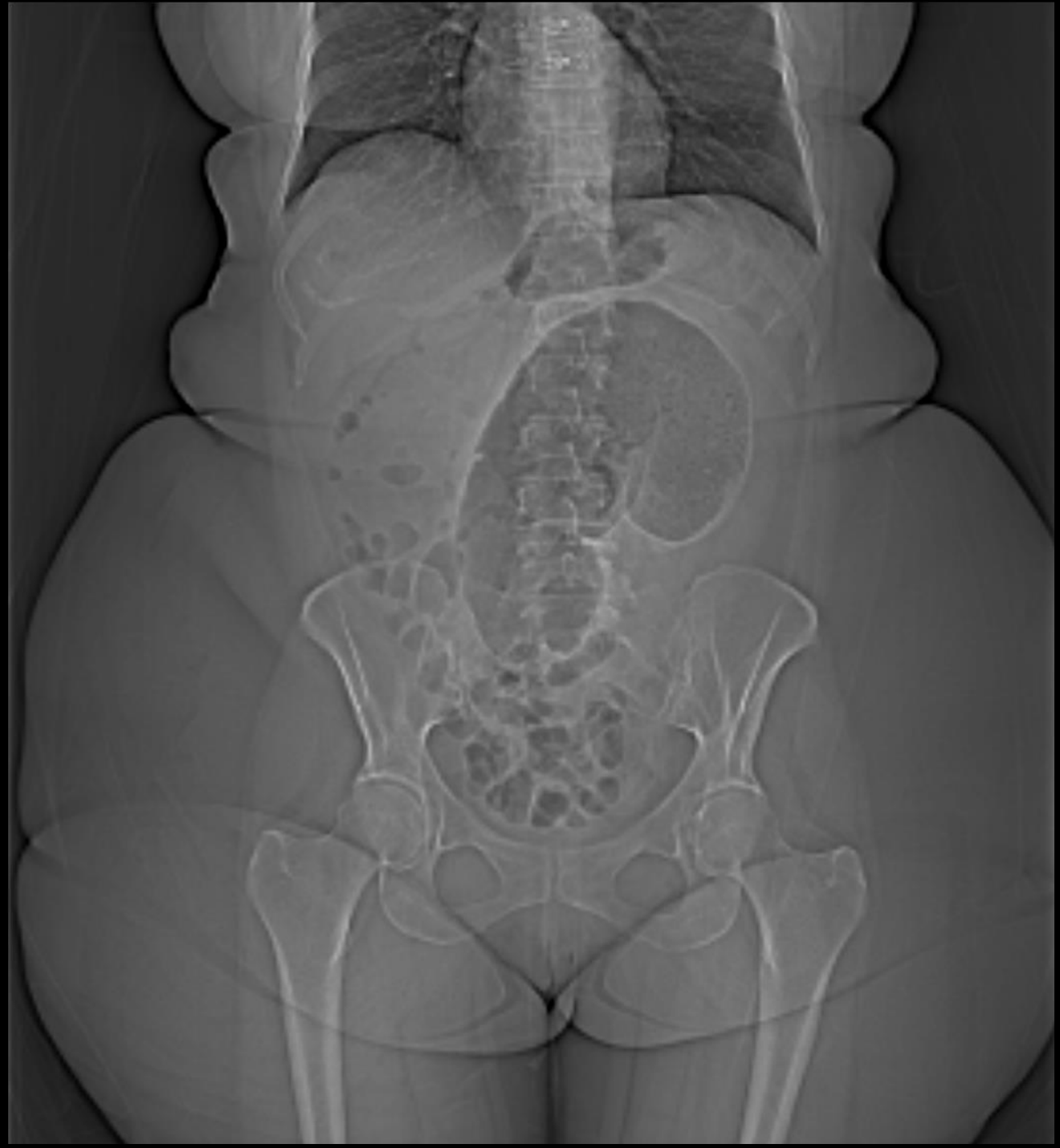
Peritoneal Lymphomatosis

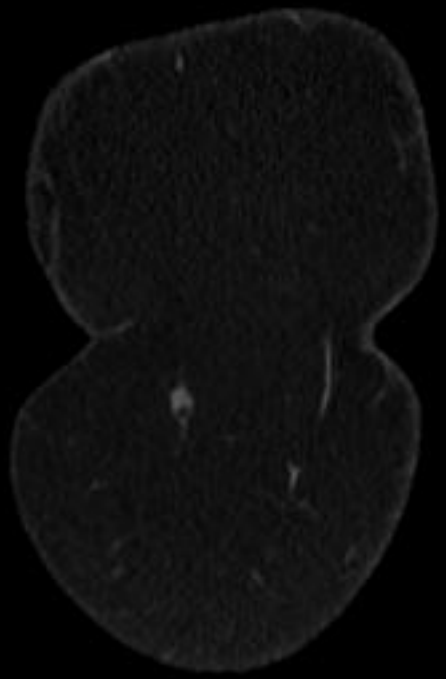


Case courtesy of Dr Alexandra Stanislavsky, Radiopaedia.org, rID: 13995

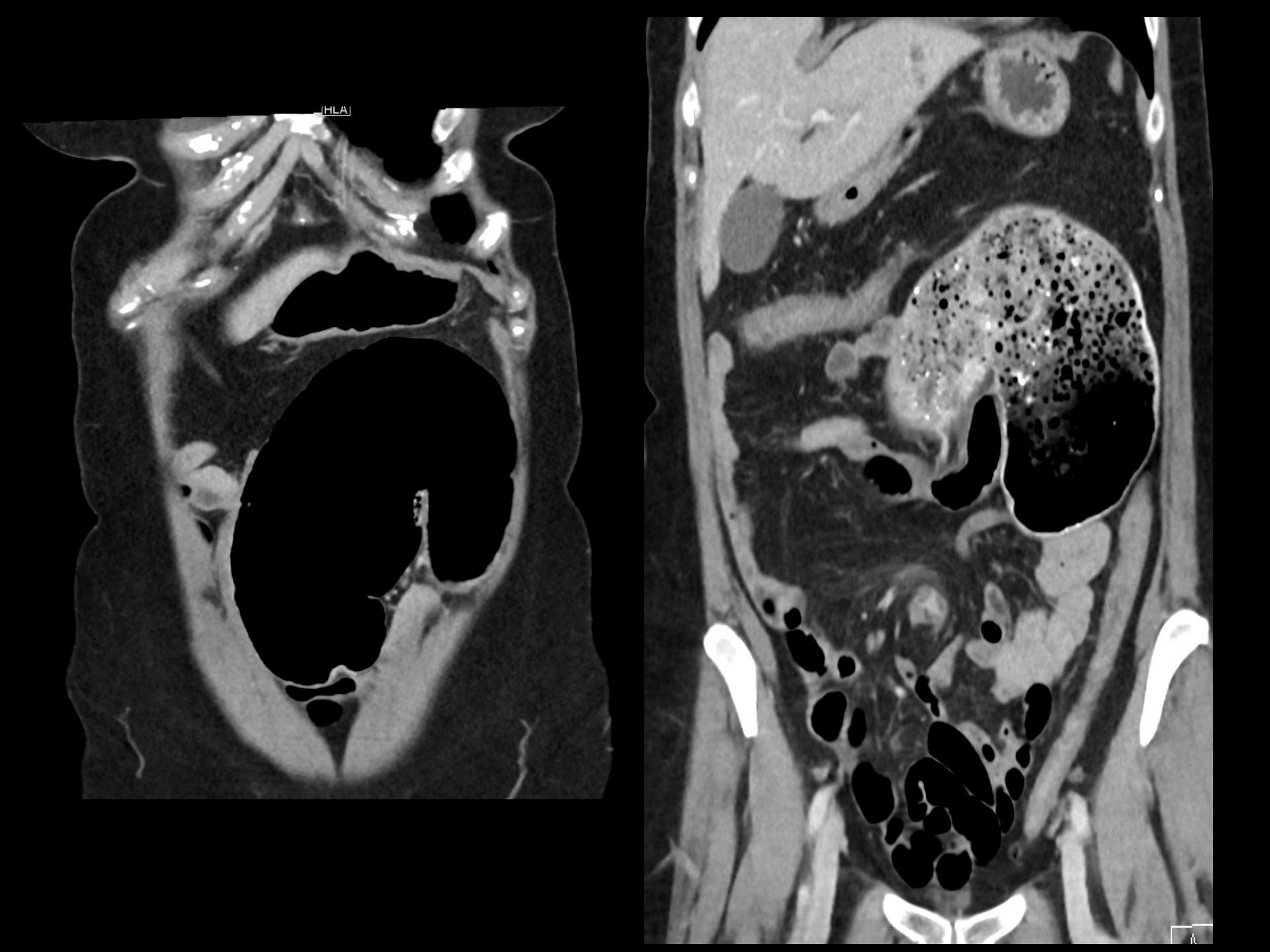
Case #3

A 68 year old female patient presents with 10/10 epigastric pain, nausea, and non-bloody, non-bilious vomiting. She states she ate fish tacos for lunch on the day prior to admission and developed abdominal pain within a few hours.

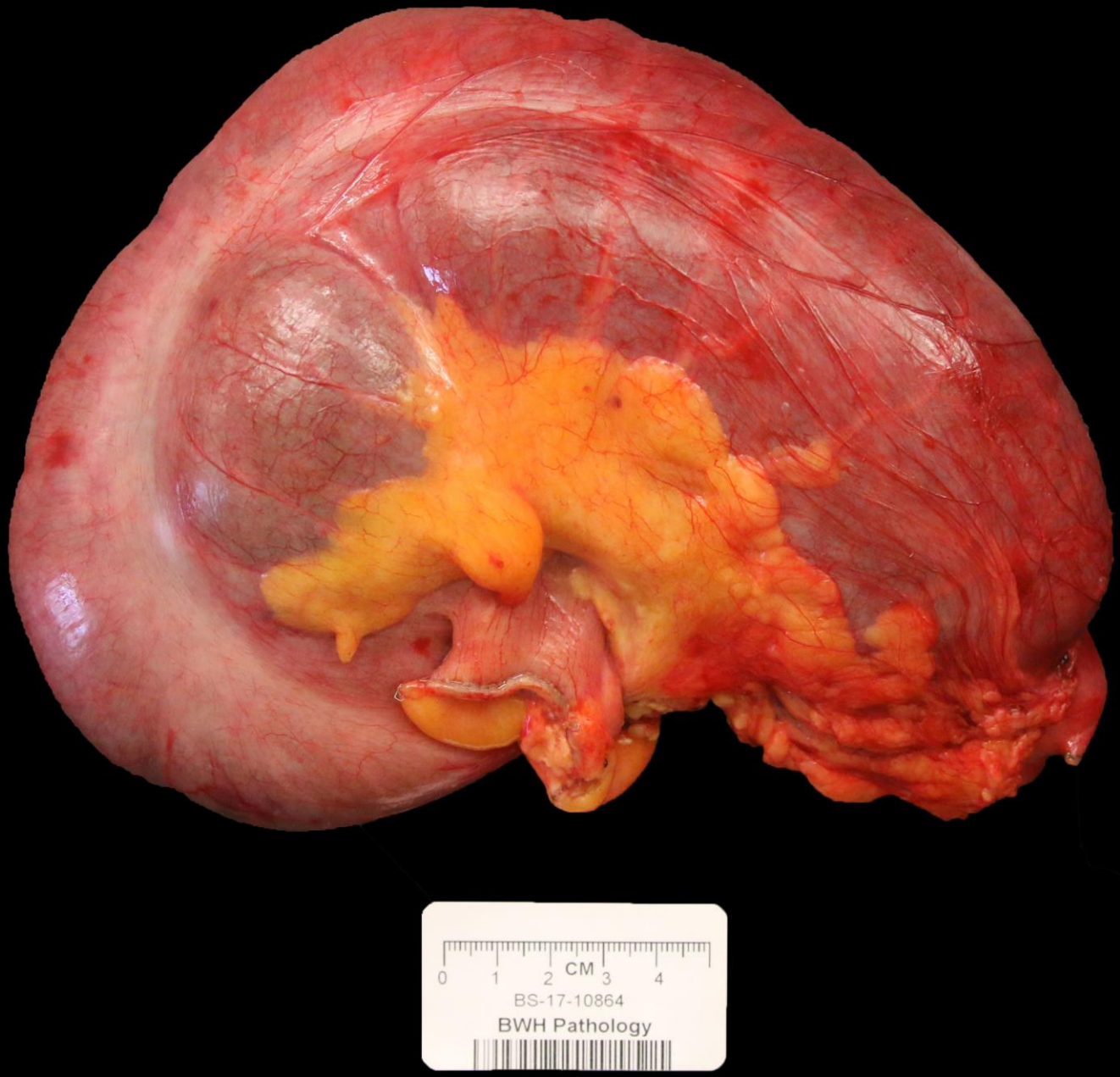




Vitrea®
Zoom:173%
Batch #1
No Filter
W/L:699/170
Oblique 2.49mm Average


HLA

Pathology: BS-17-10864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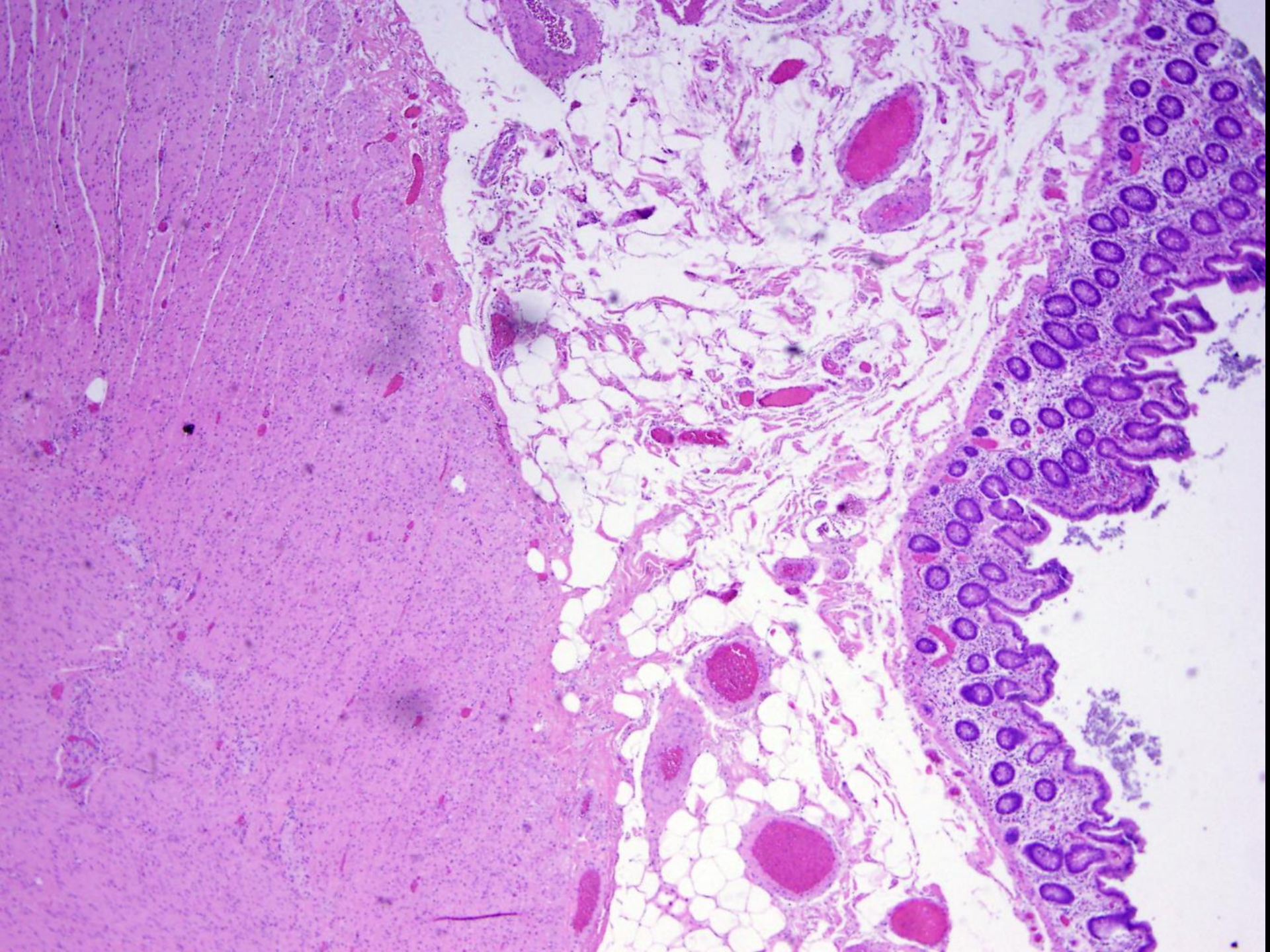
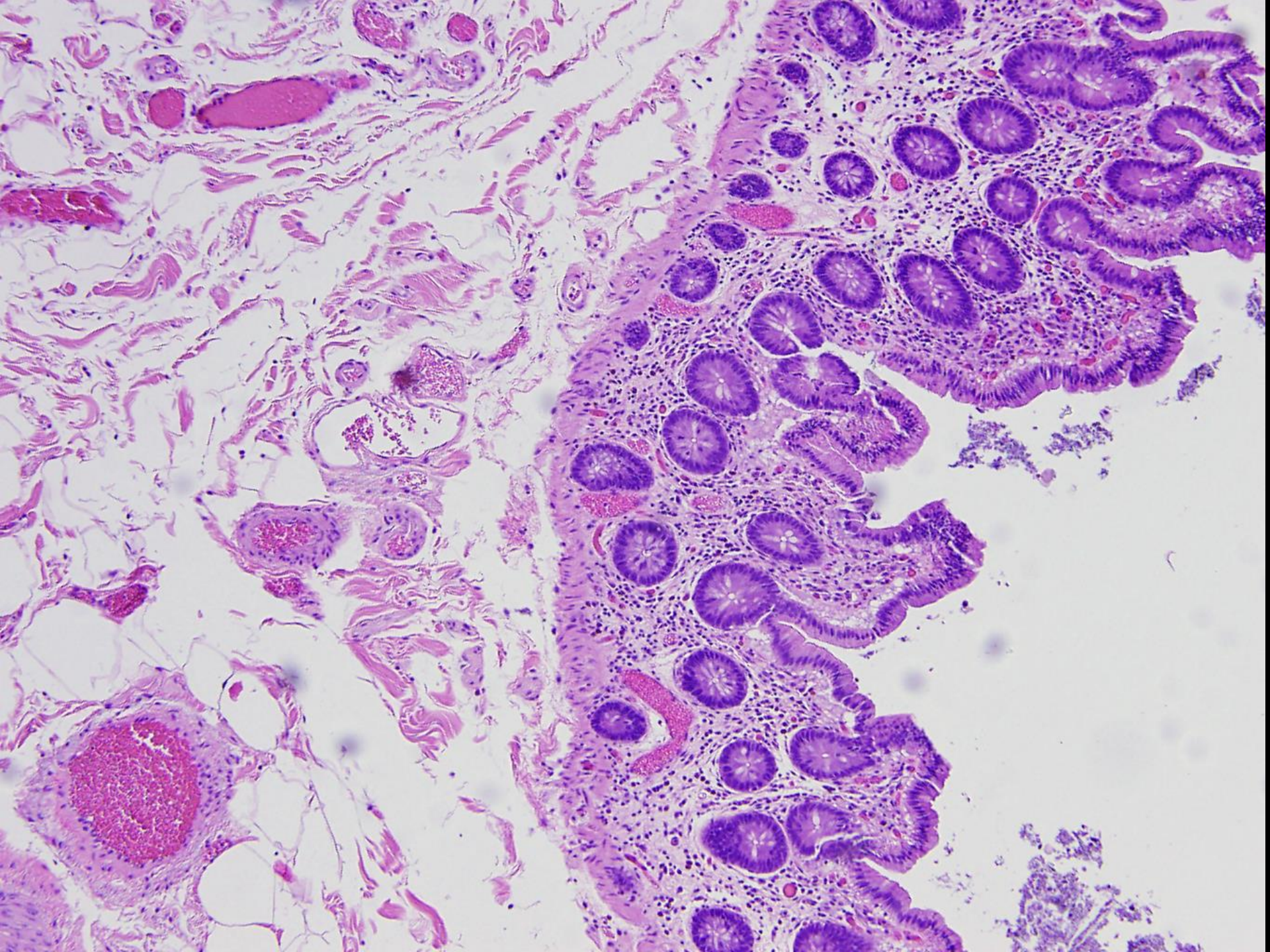
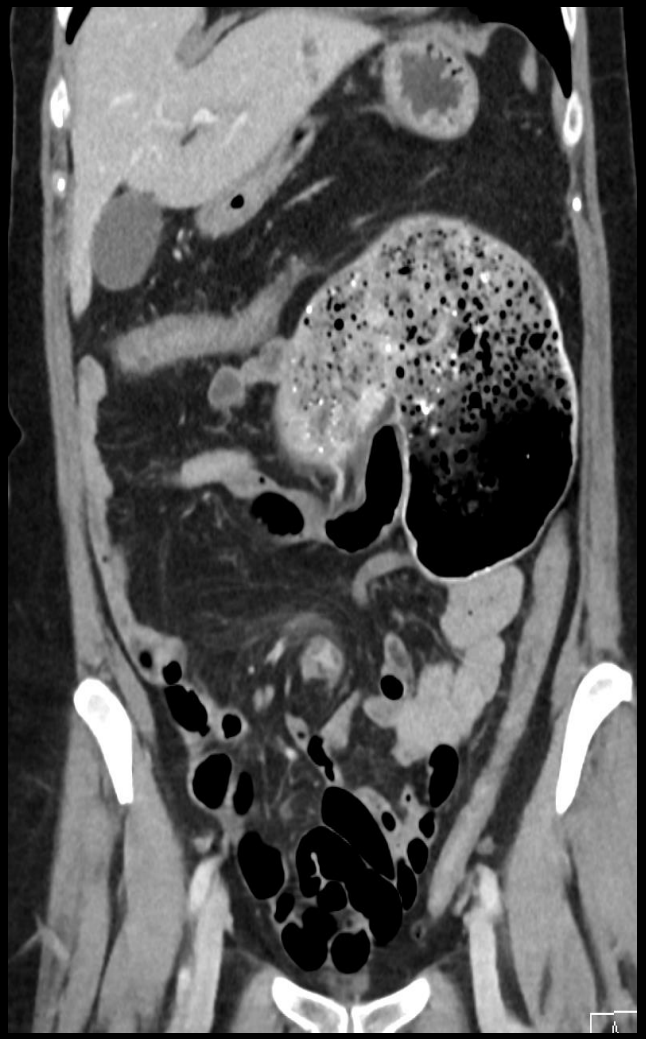
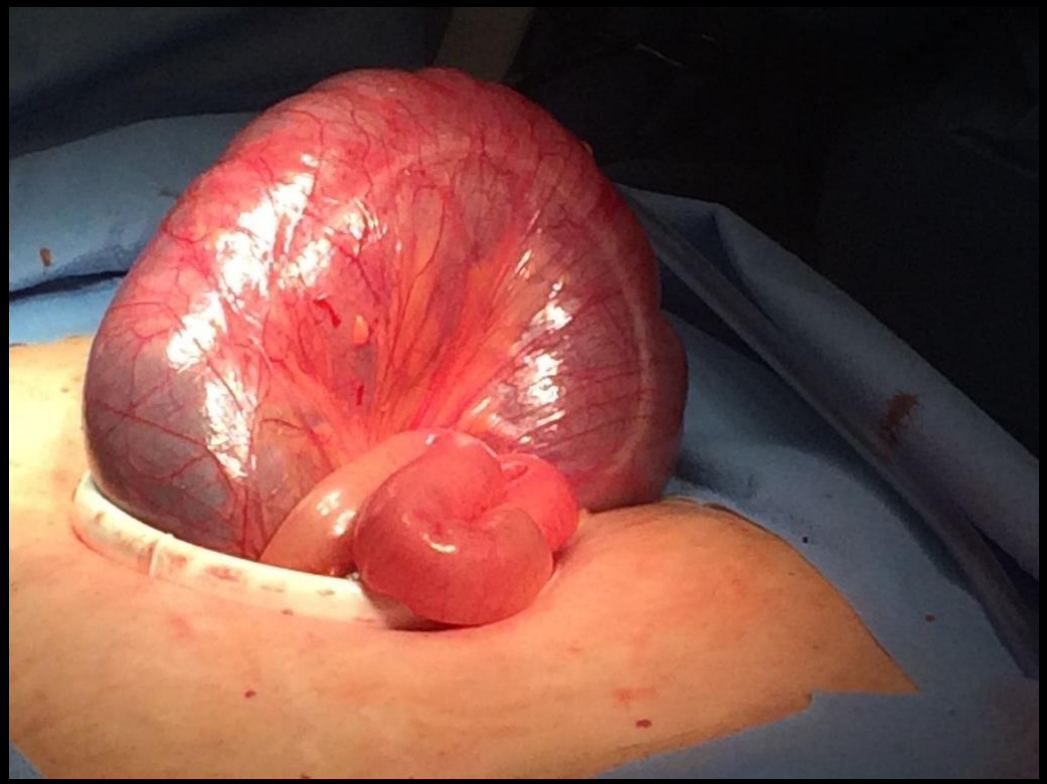
BS-17-10864
BWH Pathology





Diagnosis: Cecal Volvulus





Question: What is the fundamental predisposing etiology of cecal volvulus?

A. Embryologically there is malrotation of the terminal ileum.
B. Hyperactive ileum winds around the pedicle of the cecum.
C. There is ligamentous laxity of the cecum to the parietal peritoneum.
D. There is redundant cecum.
E. A lead point enables twisting around the vascular pedicle.

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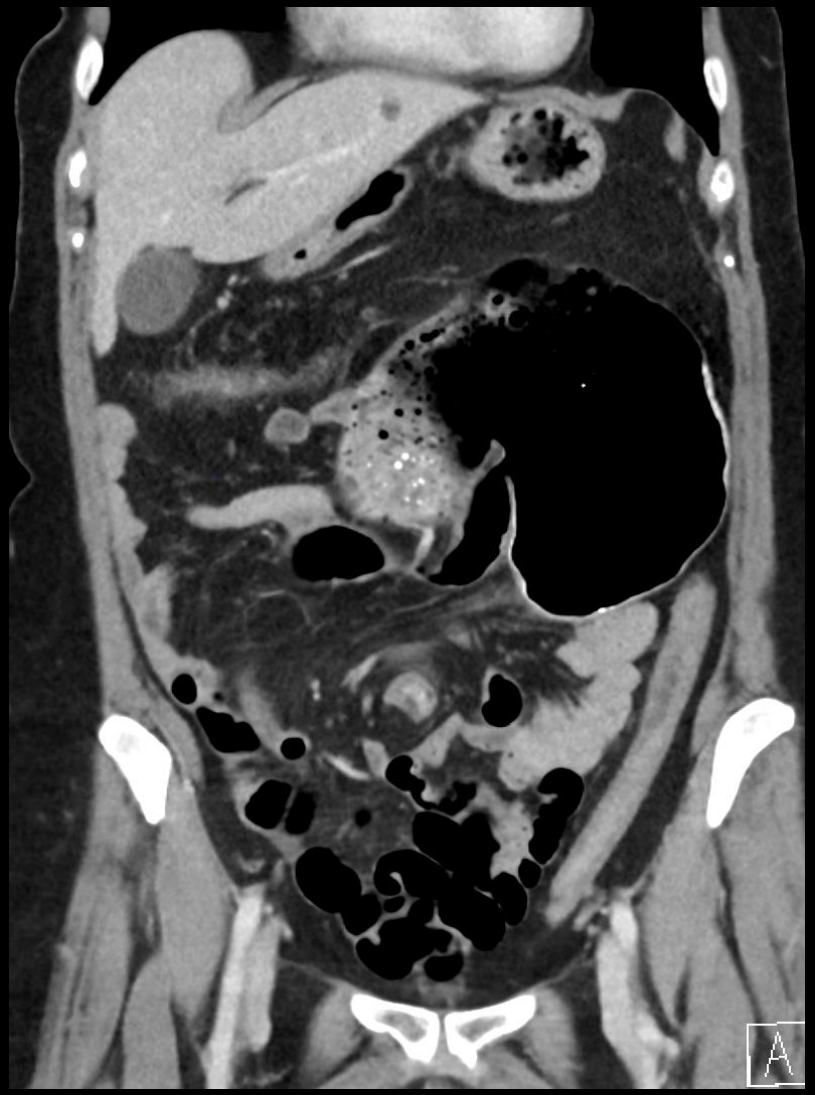
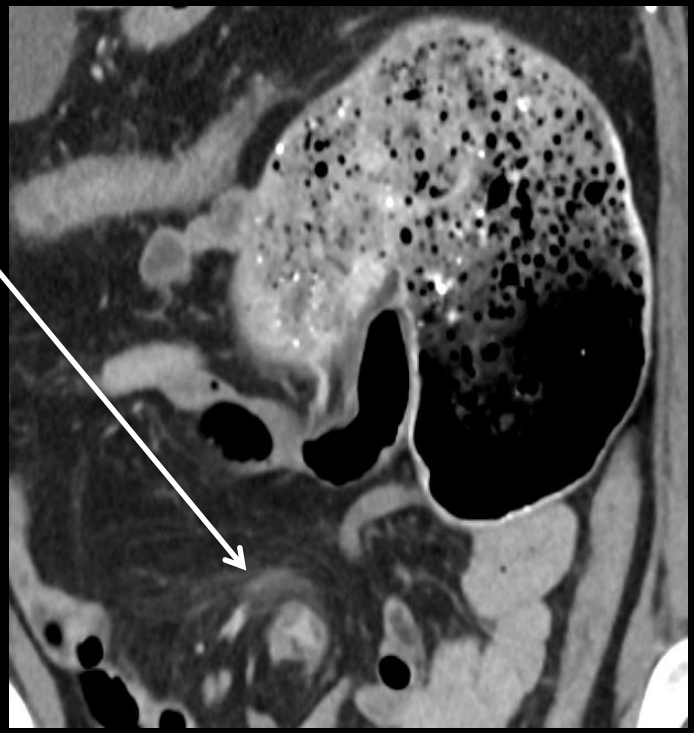
Cecal Volvulus: Background

- Twisting
- Etiology: Peritoneal Laxity
  - Deficient Fixation
  - Prior Surgery
- Age: 30s-60s
- Clinical DDx: The Usual Suspects
- Imaging DDx: Sigmoid Volvulus

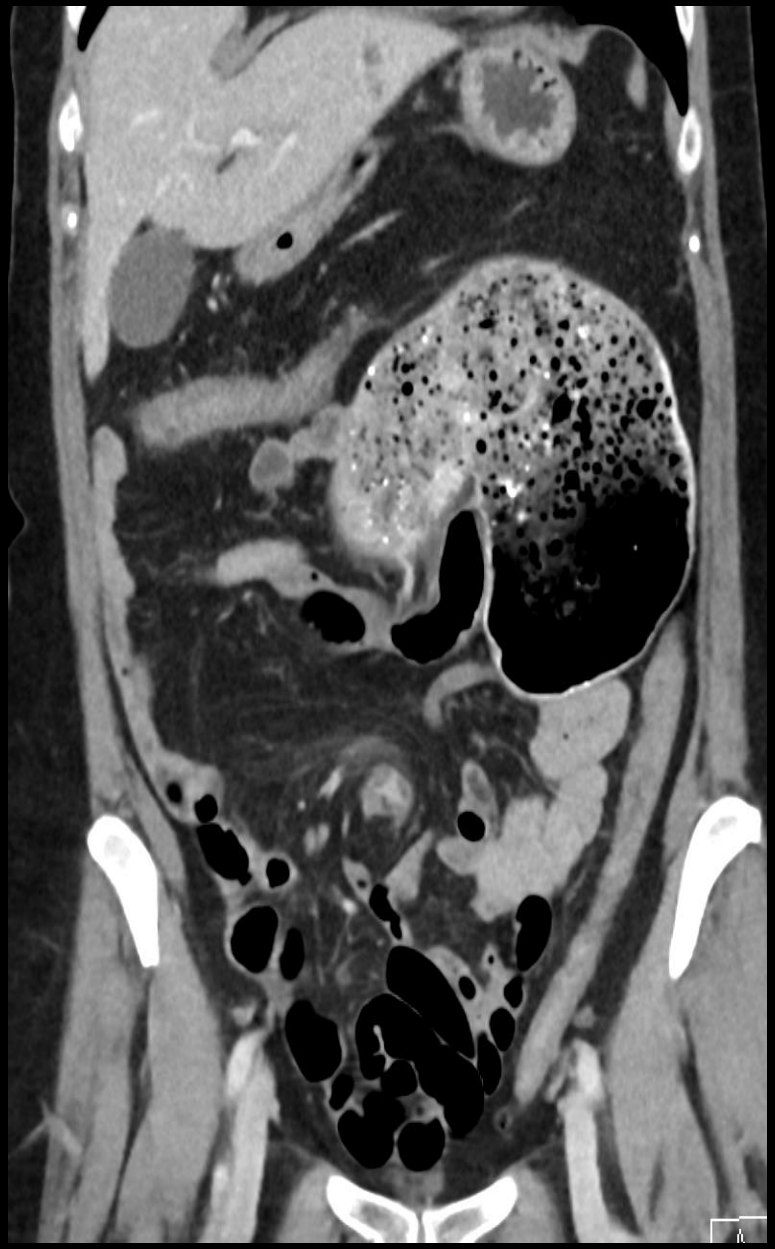


Cecal Volvulus: Imaging Findings



- Location
  - LUQ
  - Midline
- Whirl Sign
  - Mesentery and Engorged Vessels Radiate
  - "Eye" = Source
  - *Highly Suggestive*
- Morphology: <u>Haustral</u>

The Cecum Declares Itself!



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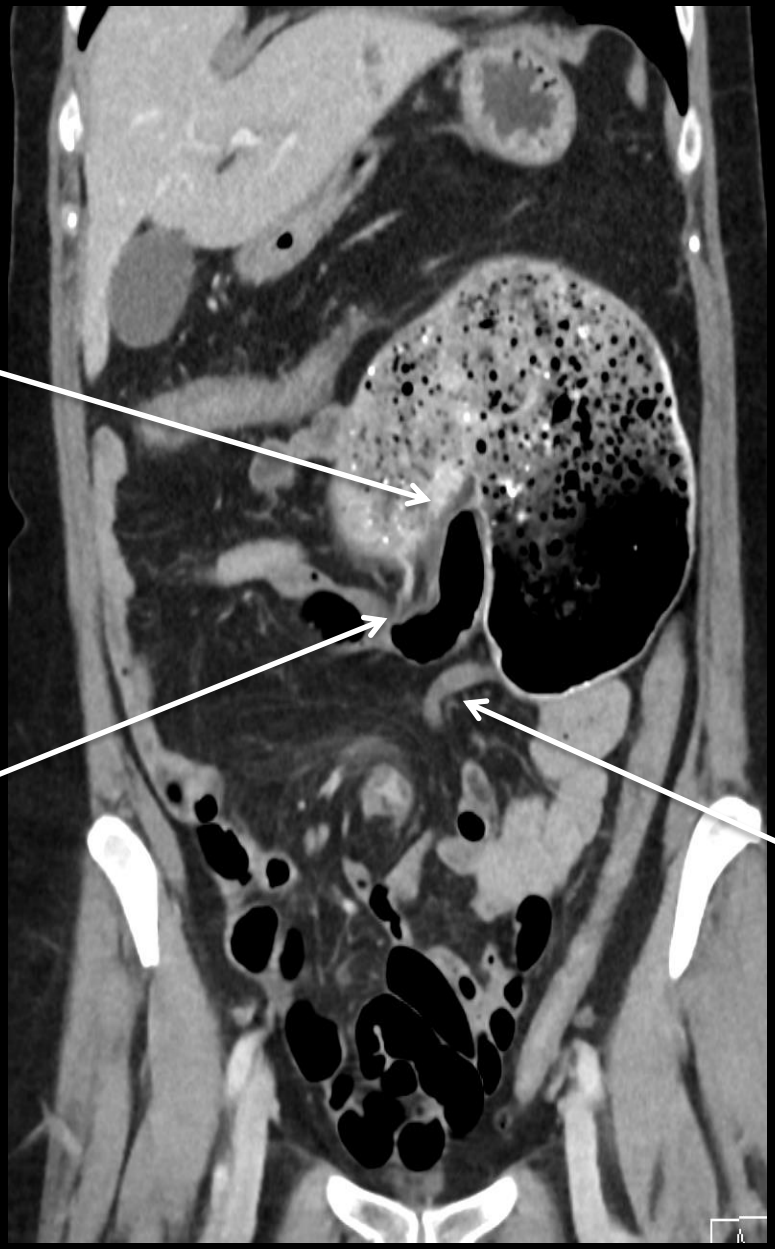
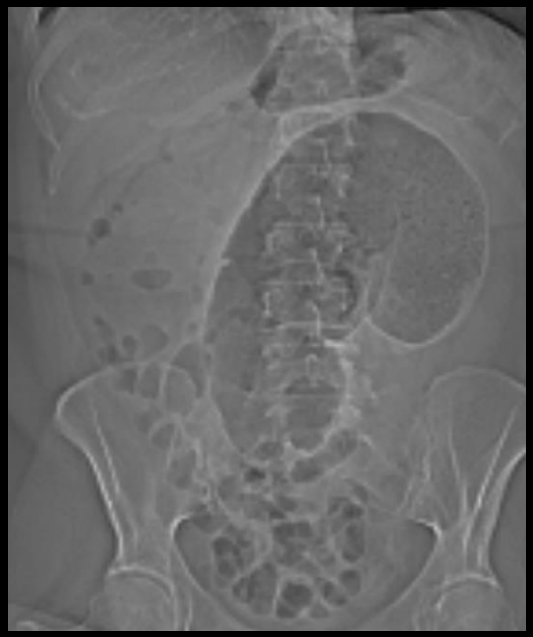
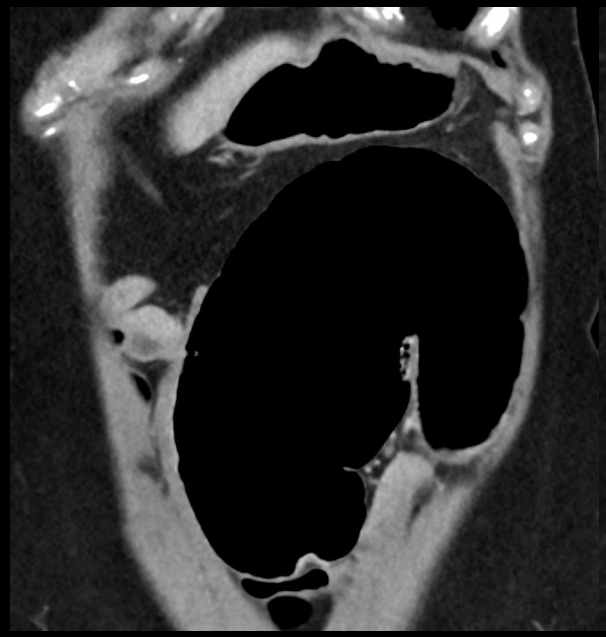
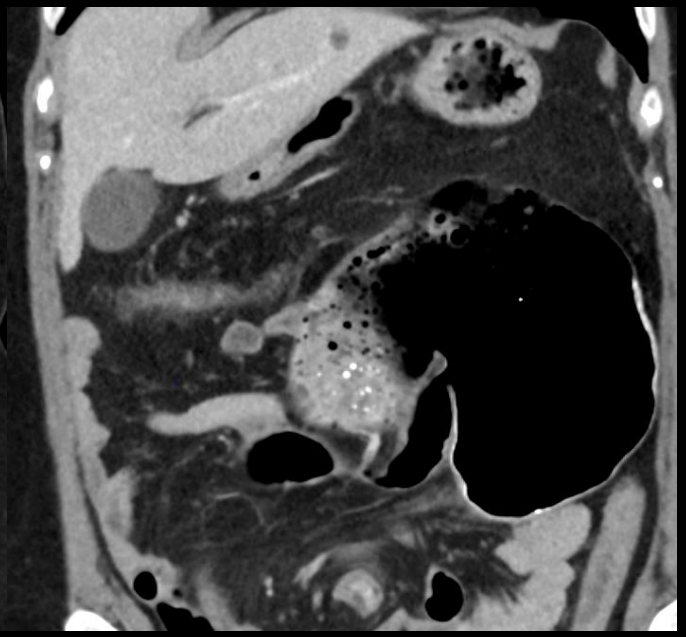


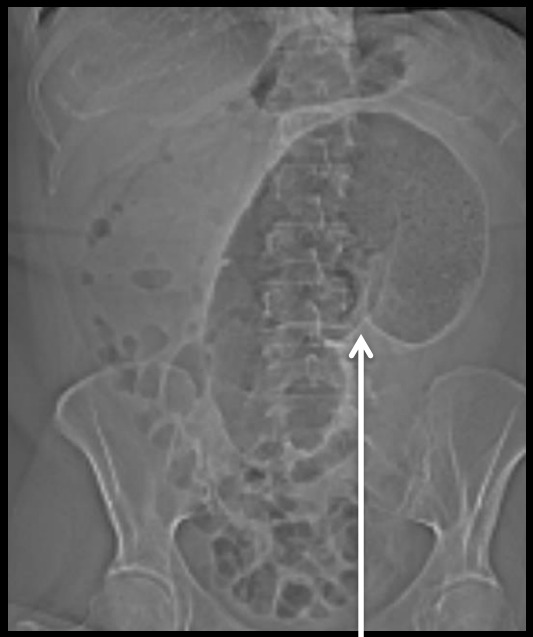
The Topogram is your Friend!

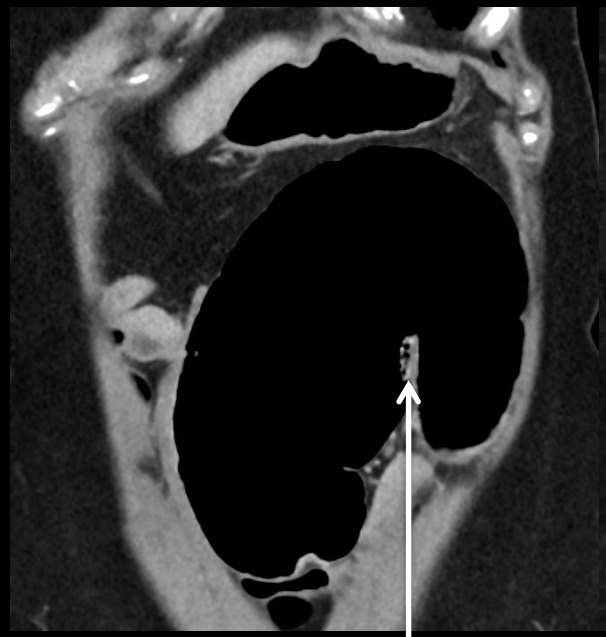


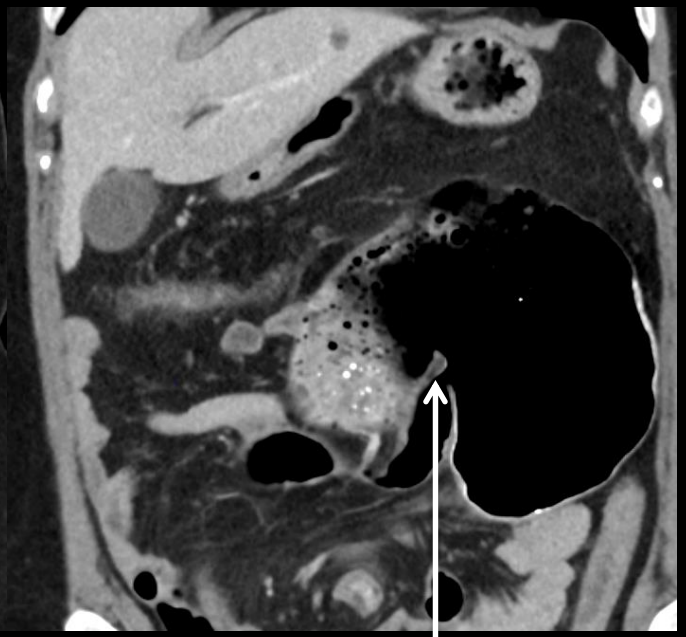




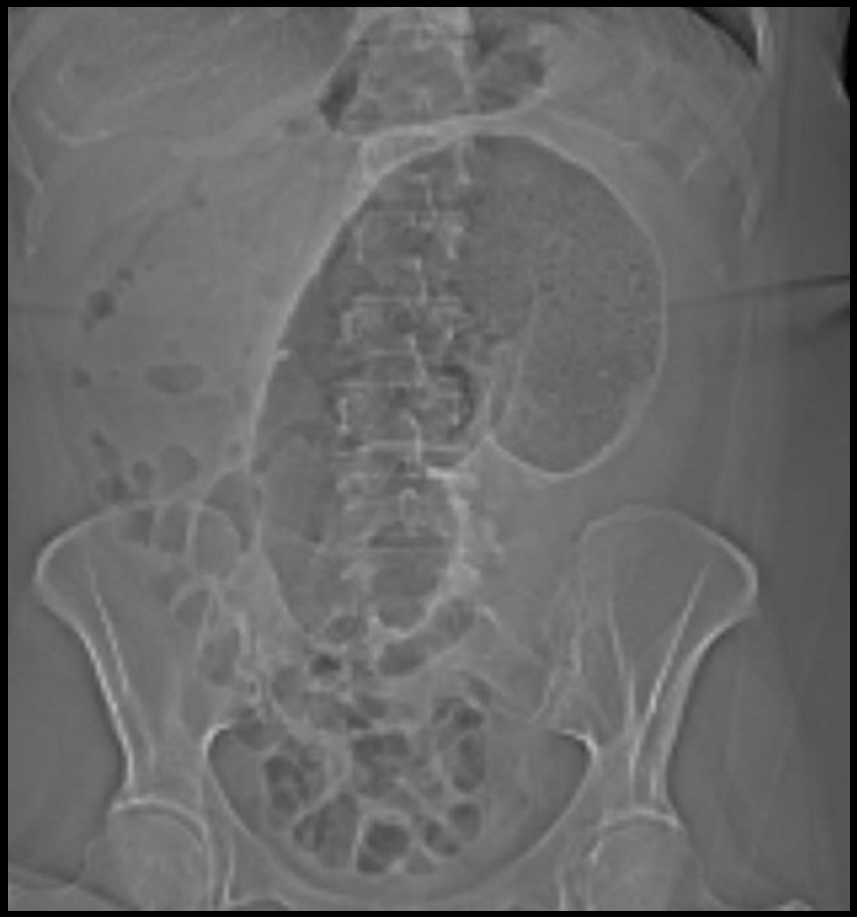
Look for the Ileocecal Valve!



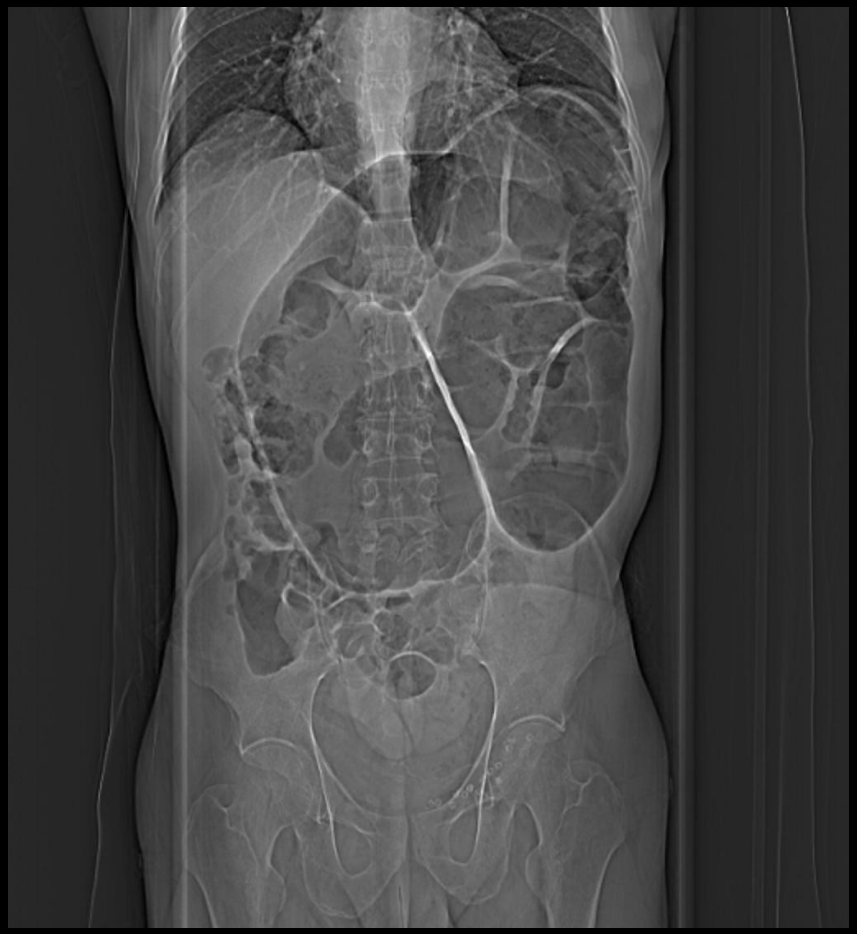




Topogram: Cecal vs. Sigmoid Volvulus



Soft Wide “V” Shape = Ileocecal Valve

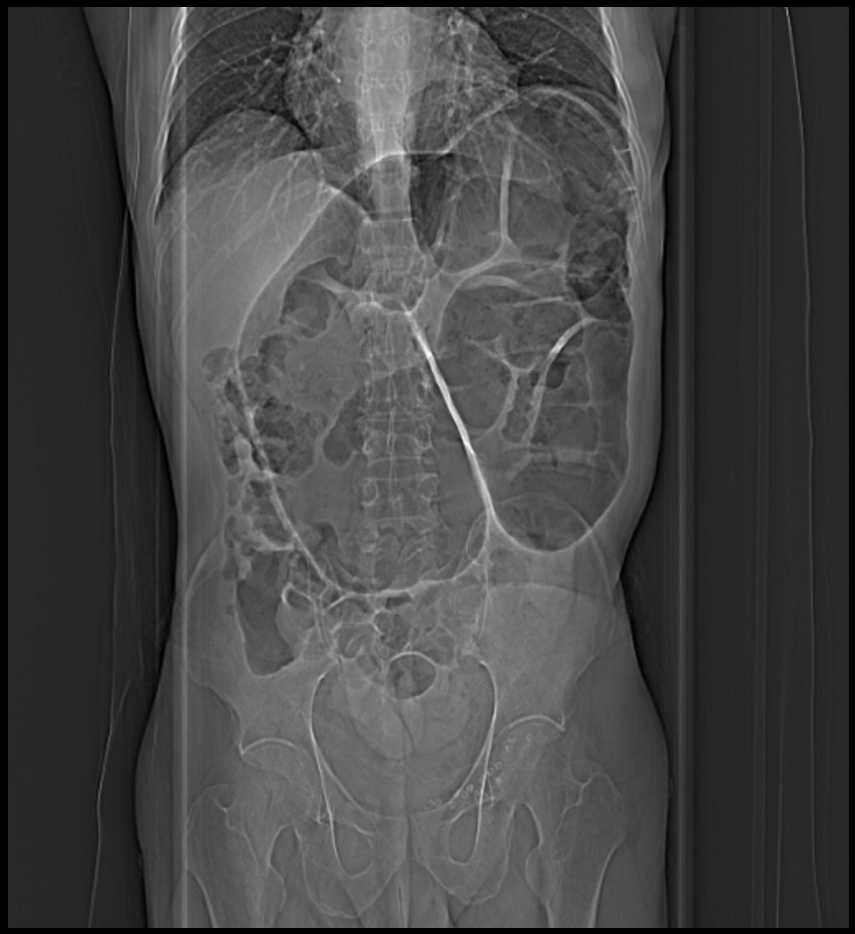


Dense White Line = Closely Apposed Bowel (Coffee Bean Sign)

Case courtesy of Dr Gagandeep Singh, Radiopaedia.org, rID: 36366

Topogram: Cecal vs. Sigmoid Volvulus

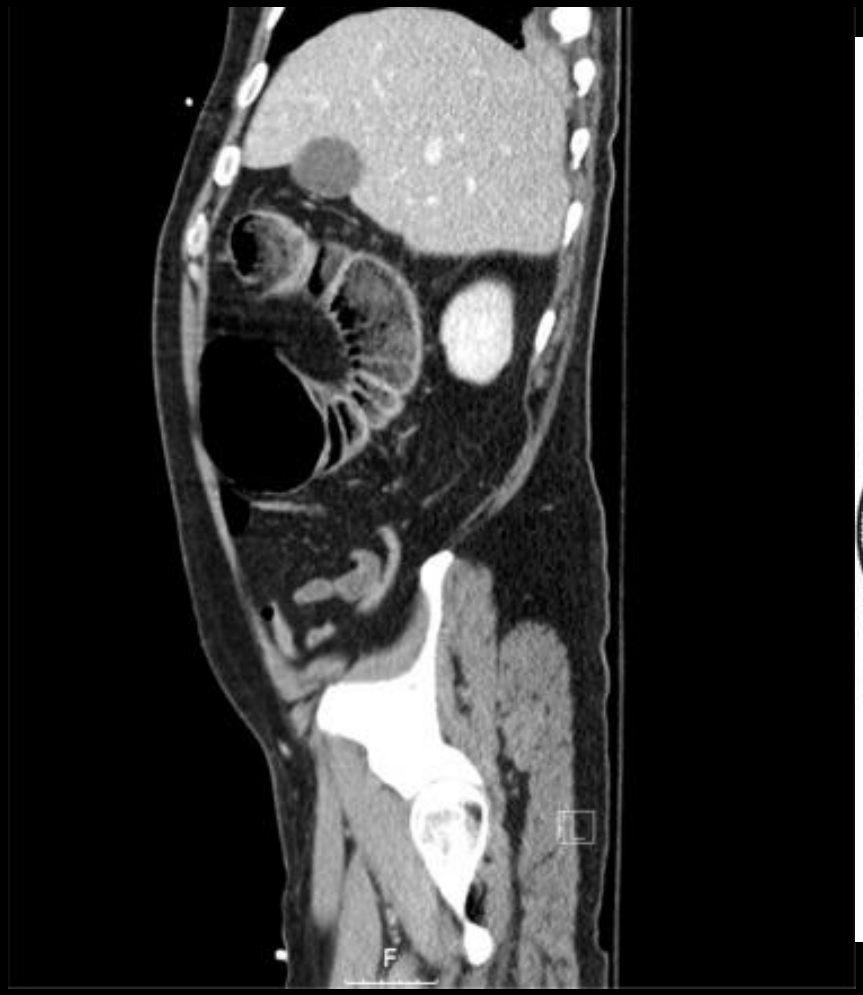
Coffee Bean Sign = Sigmoid Volvulus

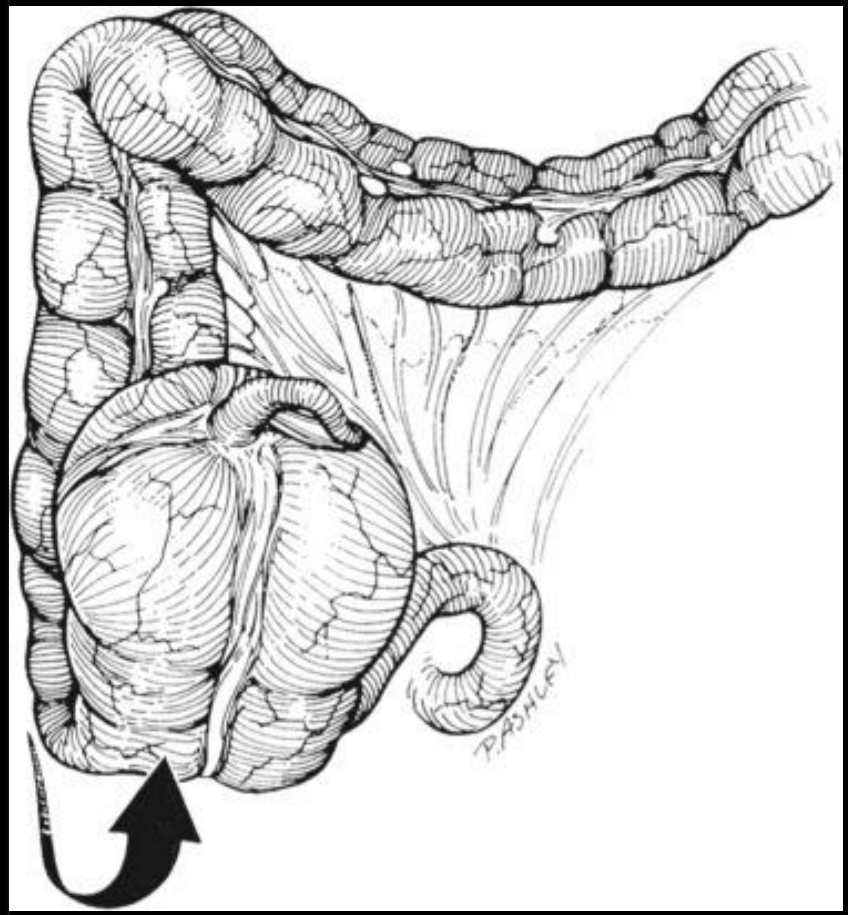


Dense White Line = Closely Apposed Bowel

Case courtesy of Dr Gagandeep Singh, Radiopaedia.org, rID: 36366

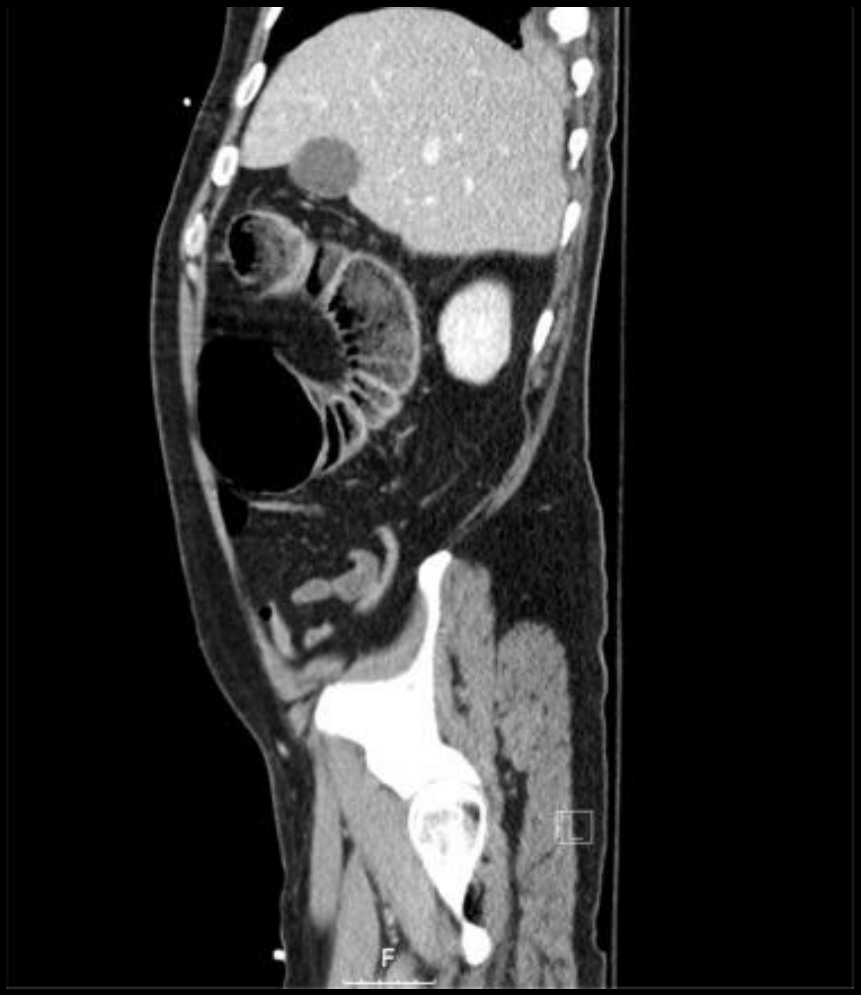
Cecal Bascule





Ishida Y, Mclean SF, Tyroch AH. Cecal bascule after spinal cord injury: A case series report. Int J Surg Case Rep. 2016;22:94-7.

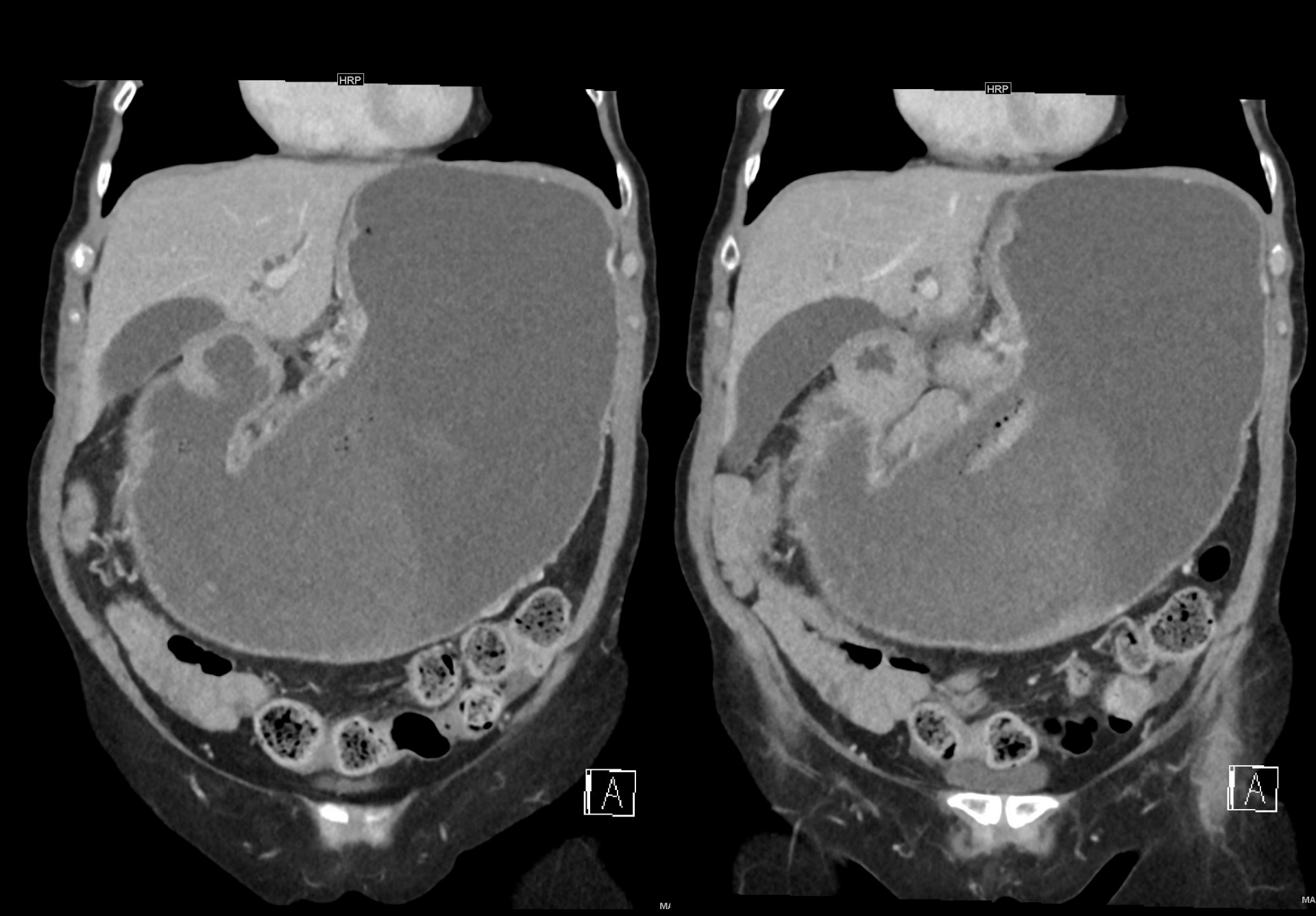
Cecal Bascule



Ishida Y, Mclean SF, Tyroch AH. Cecal bascule after spinal cord injury: A case series report. Int J Surg Case Rep. 2016;22:94-7.

Case #4

A 75 year old female patient presents with abdominal distention, nausea, and vomiting, progressed to the point where she has not been able to tolerate PO intake for three days.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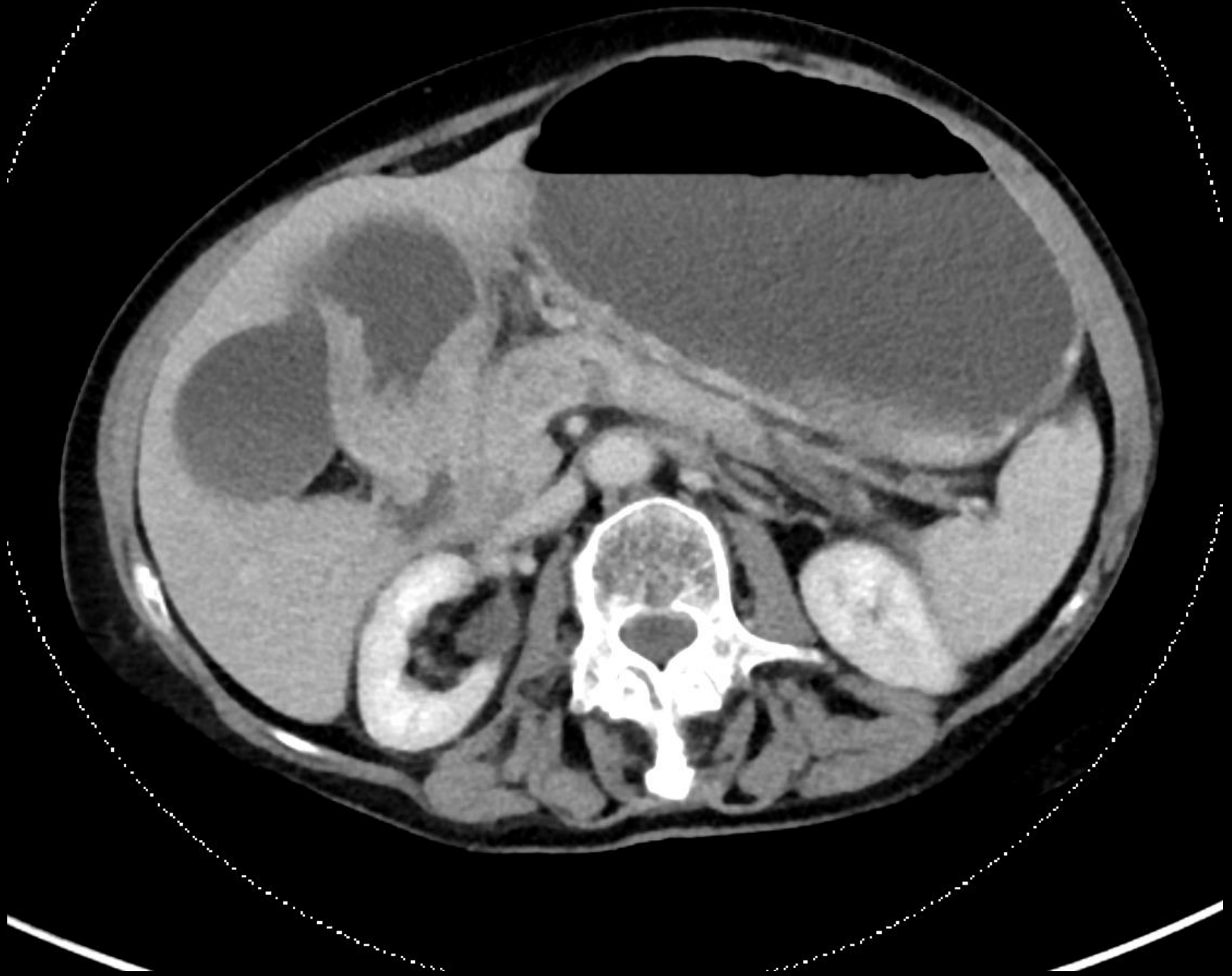
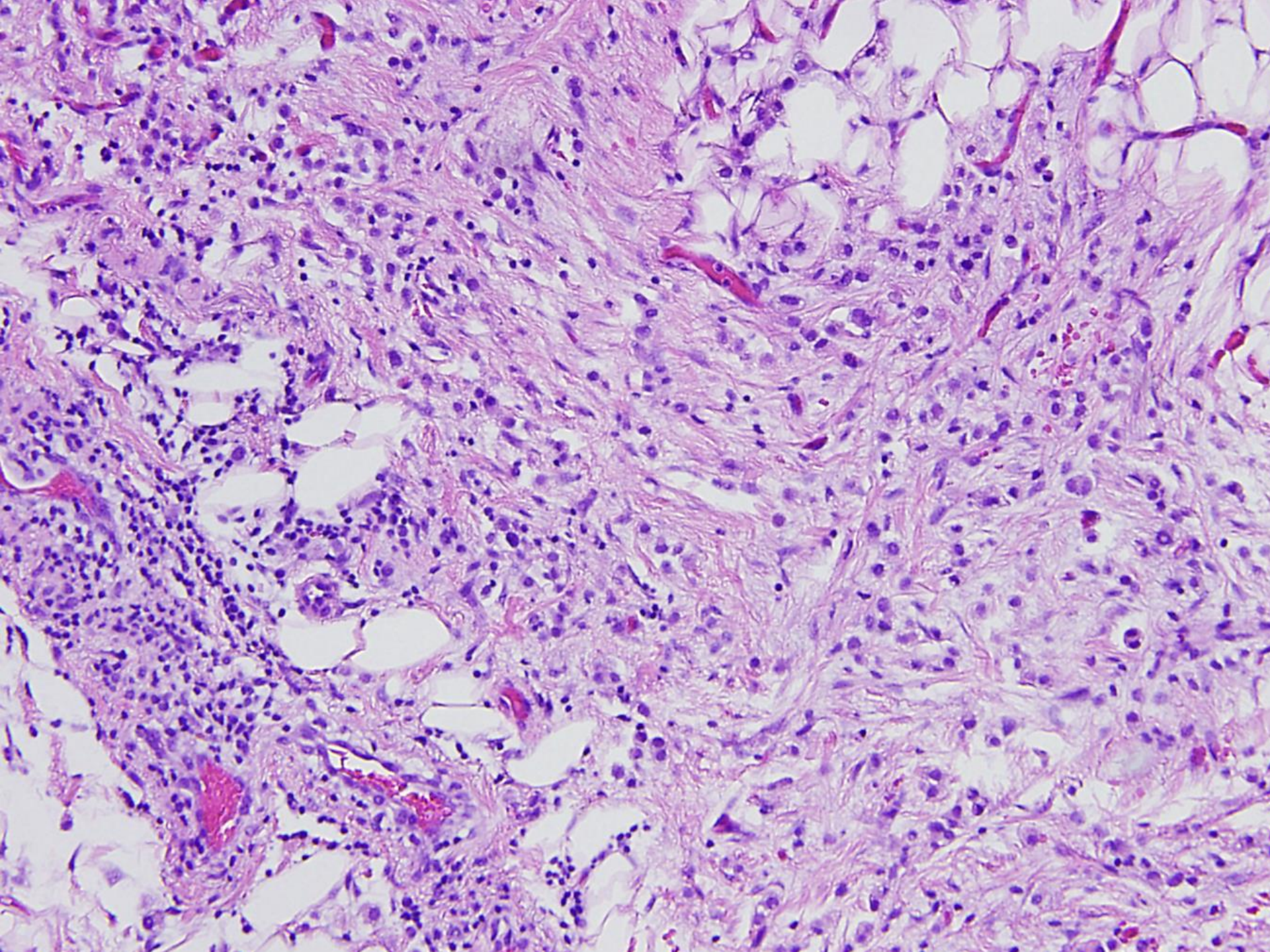
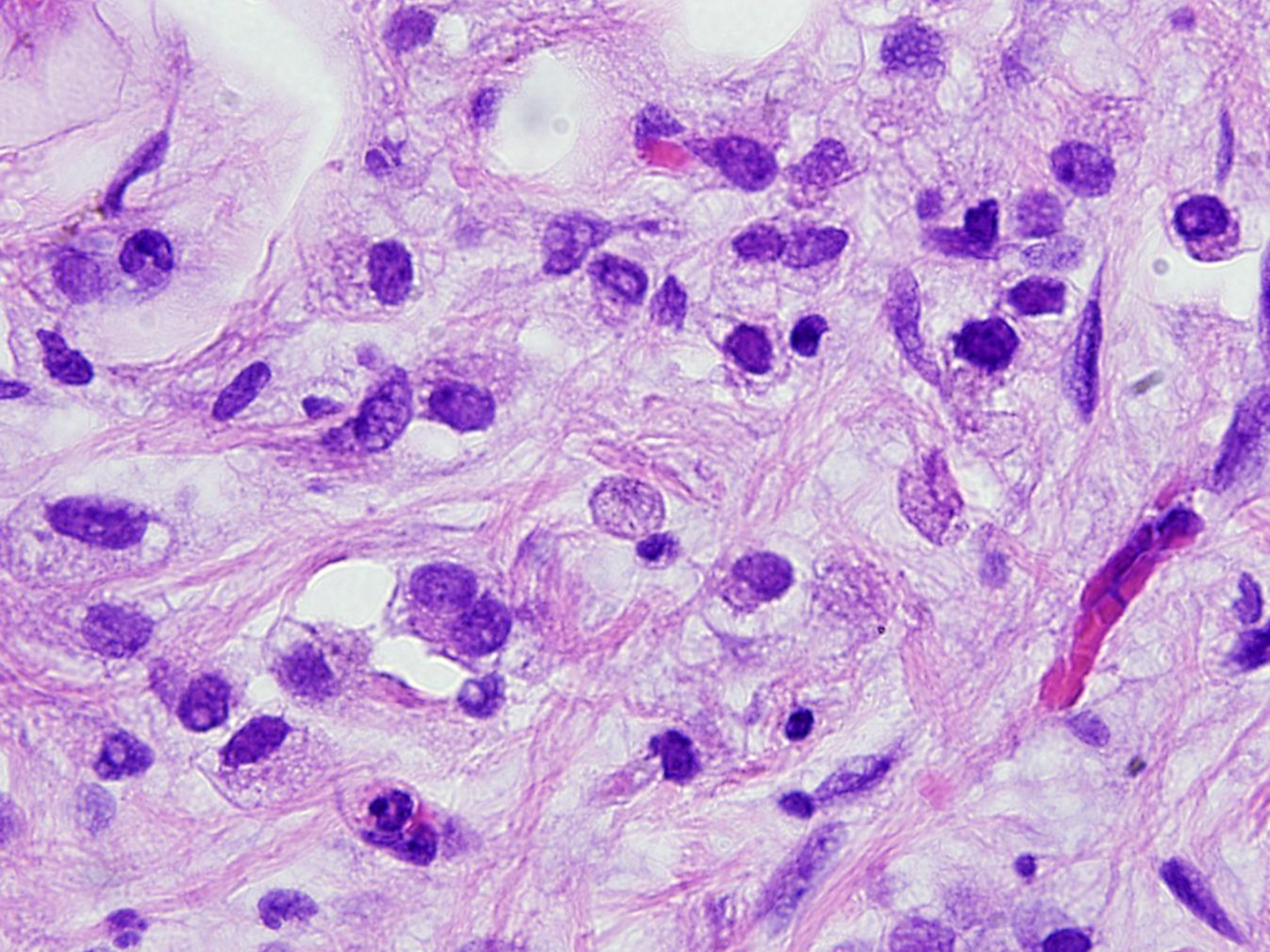
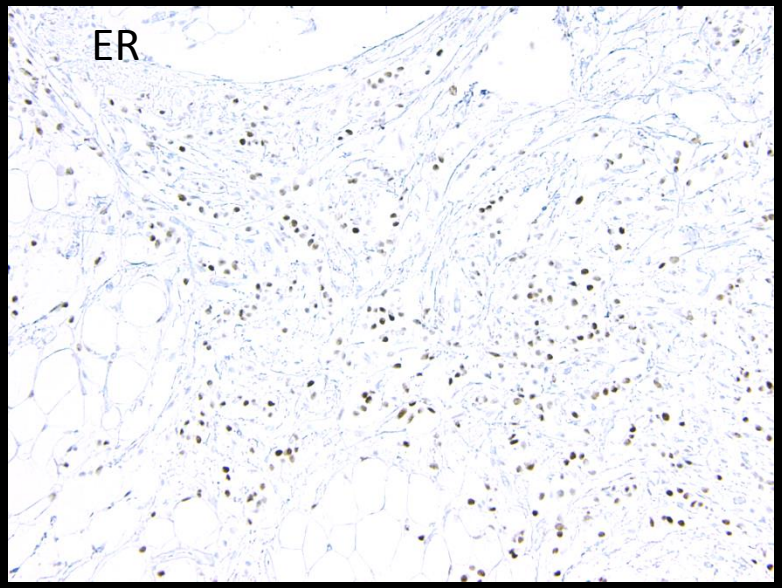


Pathology: BS-16-55400



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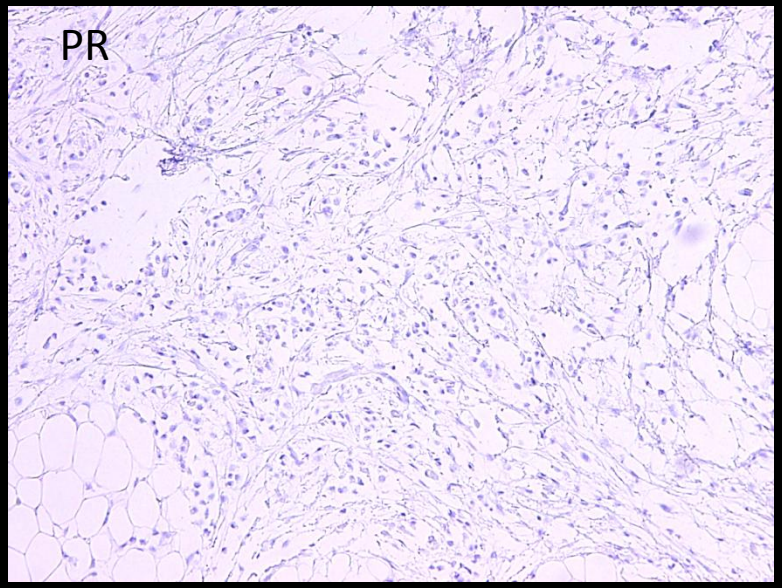
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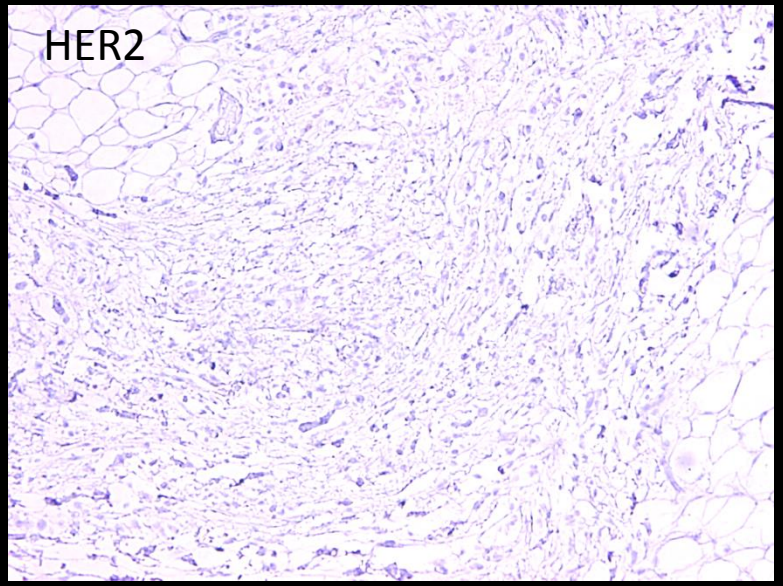
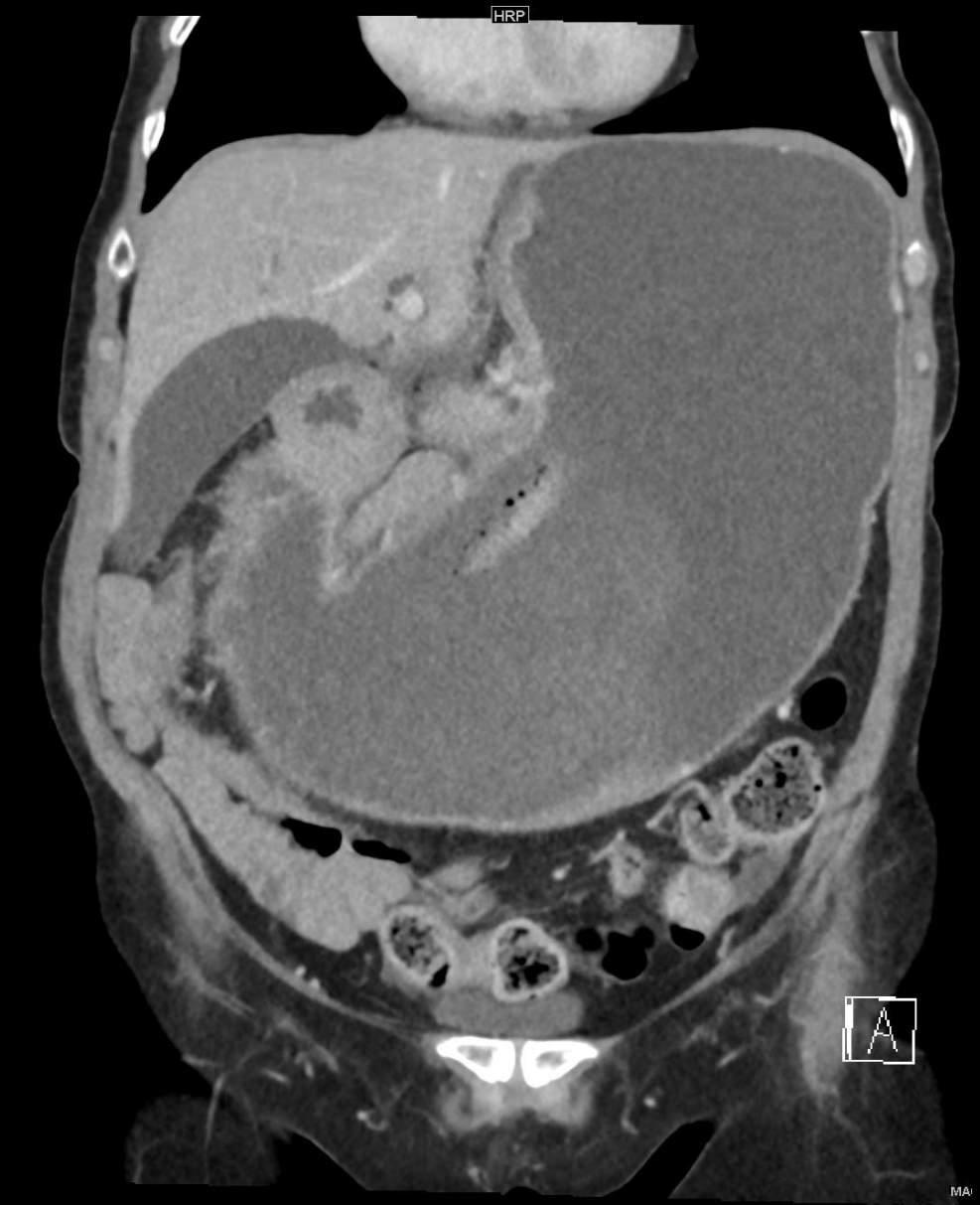
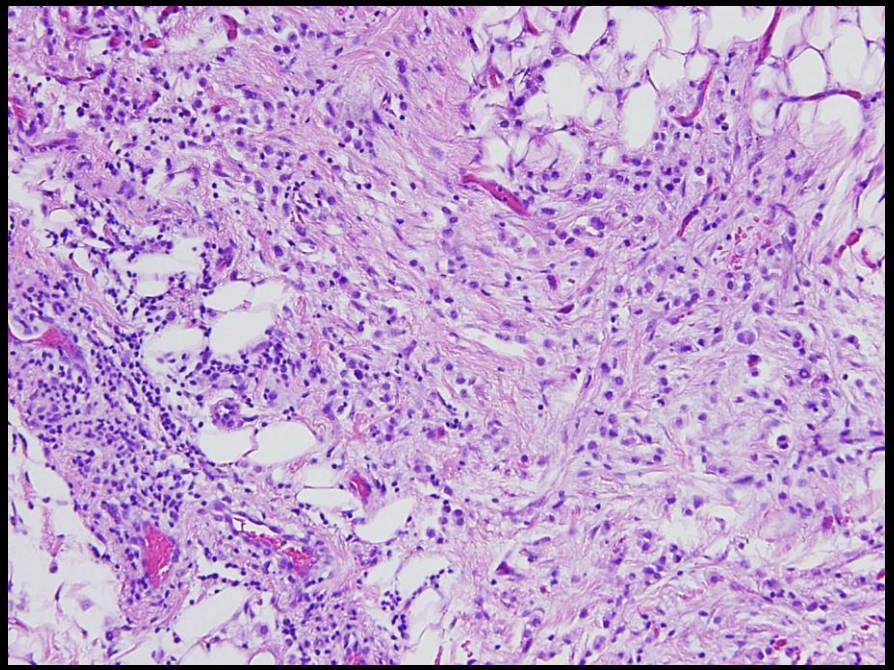

HER2

Diagnosis: Metastatic Lobular Breast Cancer





Question: Which of the following is NOT true about invasive lobular breast cancer?

A. It represents approximately 5-10% of all breast cancers
B. There is a false negative mammography rate as high as 21%
C. It metastasizes to unusual sites more frequently than invasive ductal carcinoma
D. GI metastases may be seen as late as 20-30 years after initial diagnosis
E. All of the above are true

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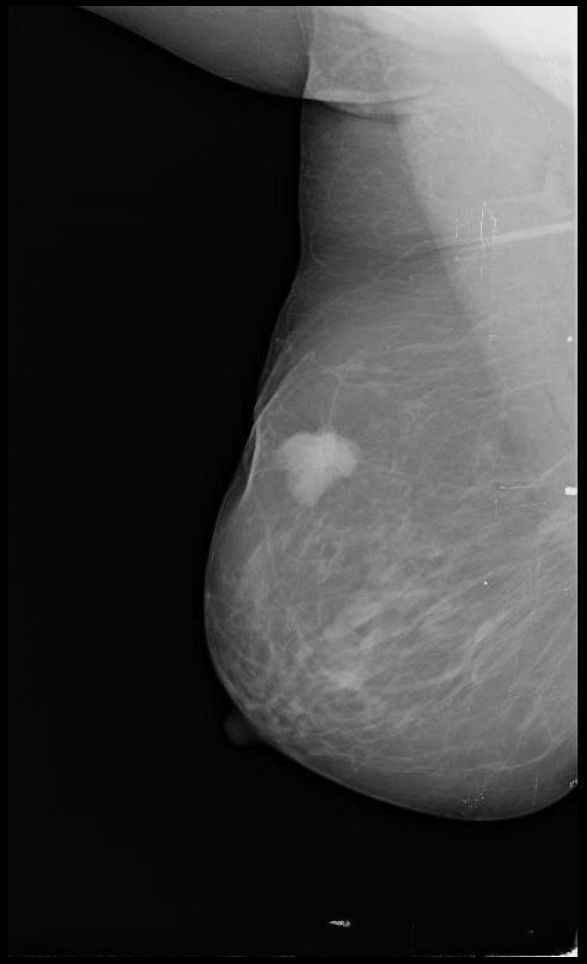
Invasive Lobular Breast Cancer: Background

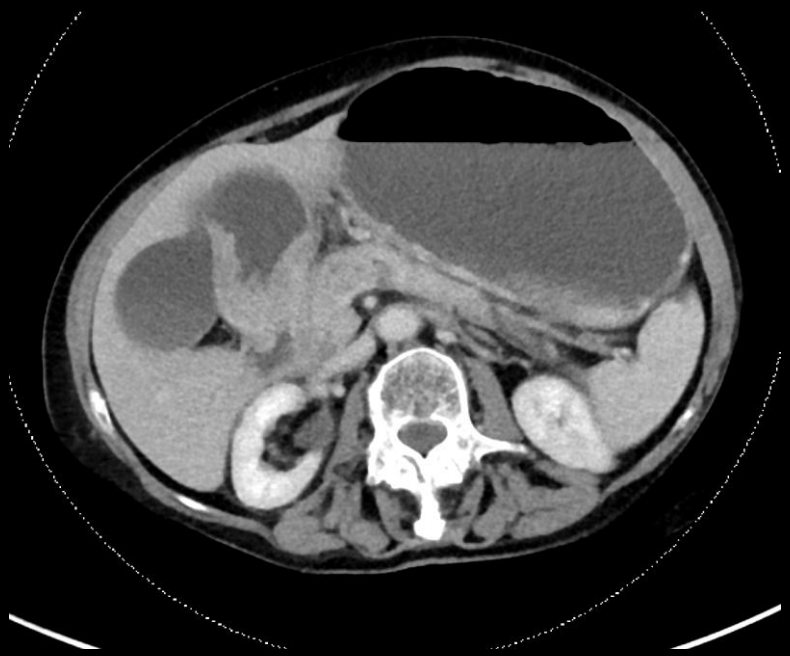


- 5-10% of breast cancer
- Usually ER+/PR+/HER2-
- Difficult to diagnose
- Can be easily missed
- Multicentric/Bilateral
- Worse prognosis than invasive ductal carcinoma

Case courtesy of Dr Varun Babu, Radiopaedia.org, rID: 19543

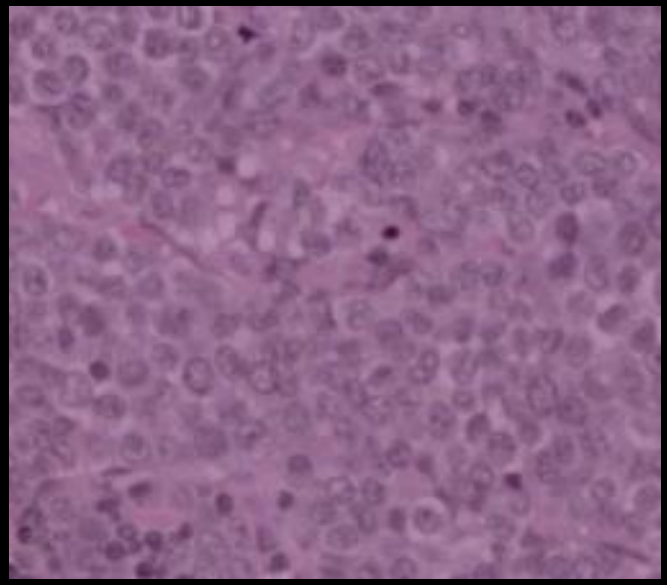
ILC Metastasizes to Unusual Places

- GI Tract
  - Second most common metastasis after melanoma
  - Can mimic primary GI neoplasm
  - Upper > Lower
- Peritoneum
- Retroperitoneum
- Leptomeninges
- Ovary
- Biliary Tree



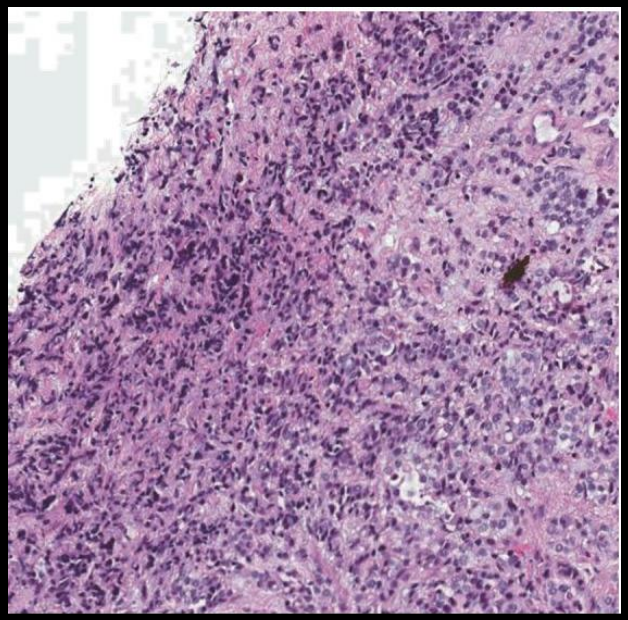
Odd Metastases Examples

A 69 year old presenting with jaundice, thought to have cholangiocarcinoma complicated by ascending cholangitis…eventually diagnosed with metastatic ILC, initially treated 30 years prior



Shakoor MT, Ayub S, Mohindra R, Ayub Z, Ahad A. Unique presentations of invasive lobular breast cancer: a case series. Int J Biomed Sci. 2014;10(4):287-93.

Odd Metastases Examples

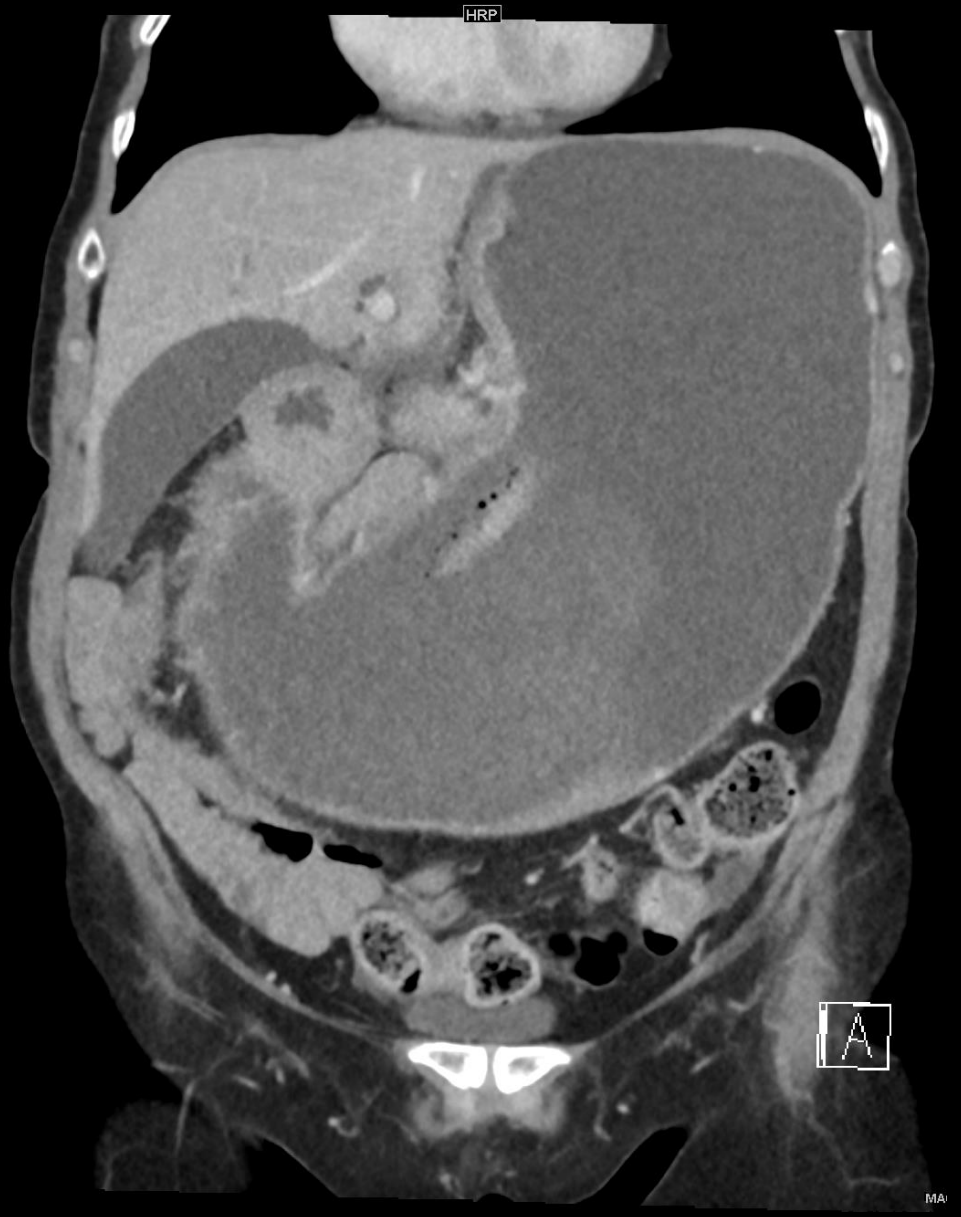


Shakoor MT, Ayub S, Mohindra R, Ayub Z, Ahad A. Unique presentations of invasive lobular breast cancer: a case series. Int J Biomed Sci. 2014;10(4):287-93.

A 77 year old treated for ILC seven years prior, found to be severely anemic…diagnosed with metastatic ILC to the stomach, bladder, and retroperitoneum, with associated severe hydronephrosis

Gastric Metastases from ILC

- Widespread gastric wall thickening > 1 cm in a well distended stomach
- Can mimic primary GI neoplasm



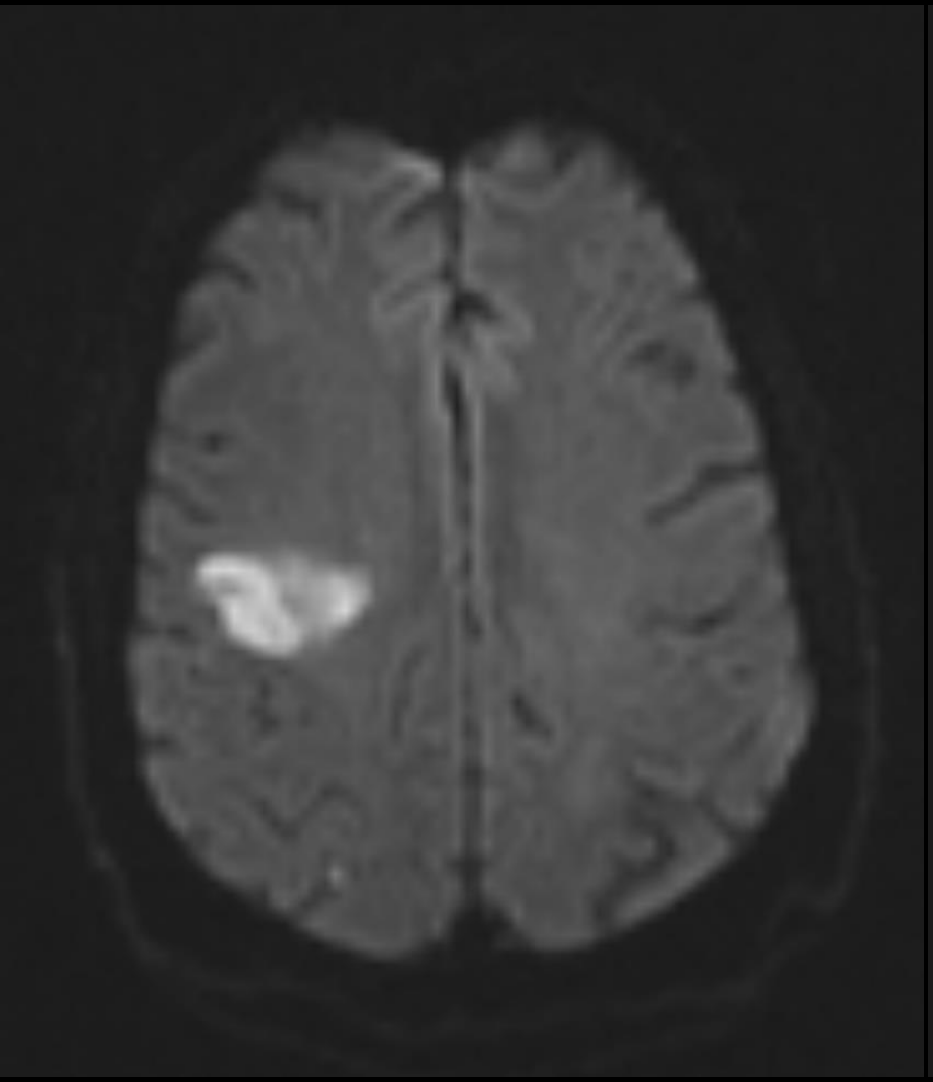
Elliott LA, Hall GD, Perren TJ, Spencer JA. Metastatic breast carcinoma involving the gastric antrum and duodenum: computed tomography appearances. Br J Radiol. 1995;68(813):970-2.

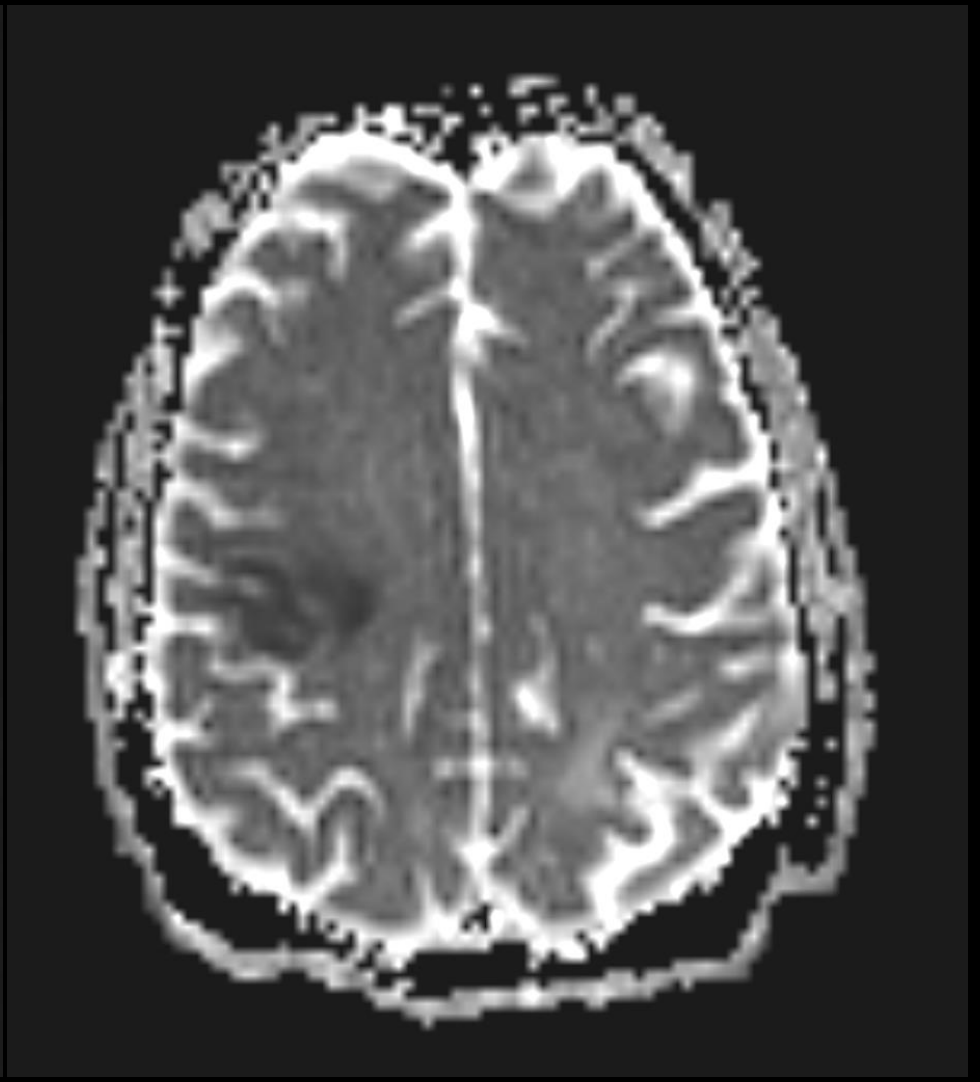
Take Home Message

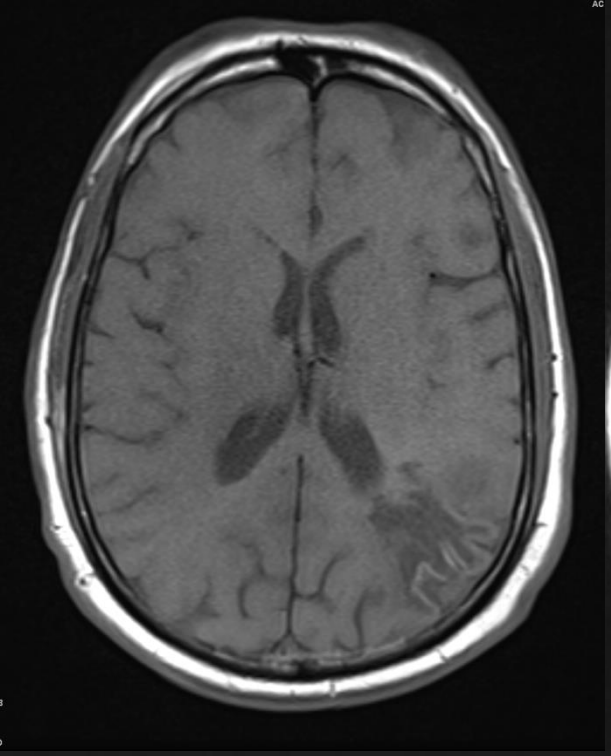
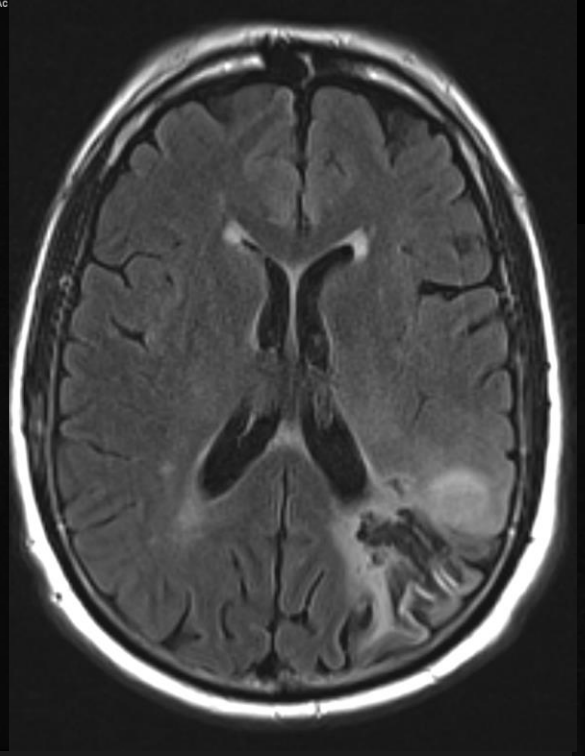
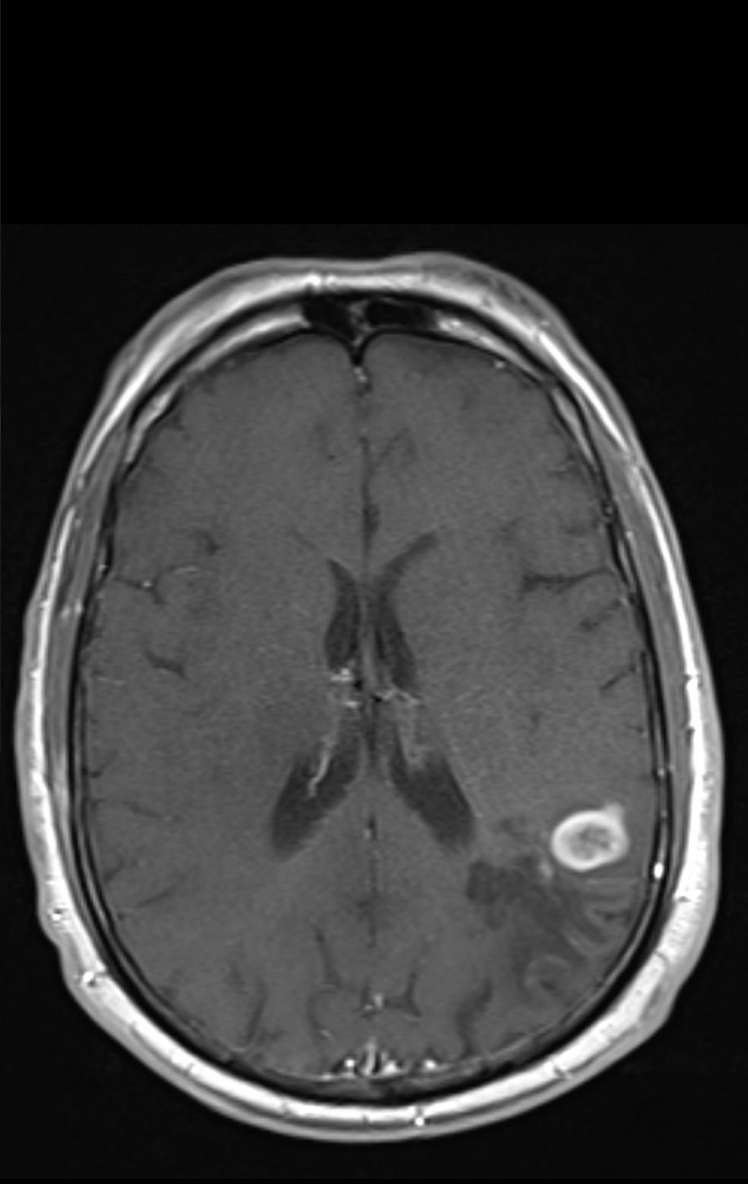
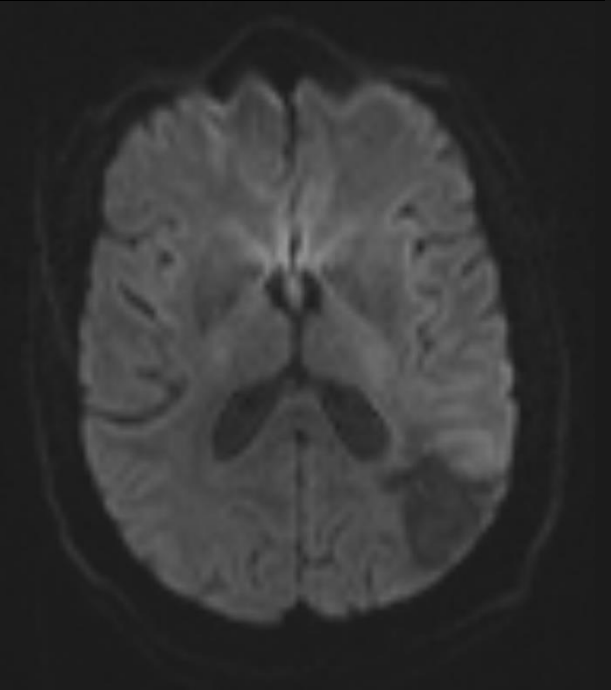
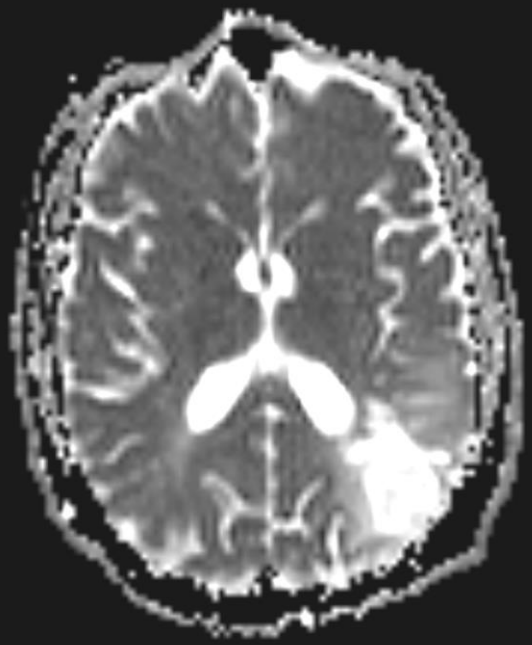
- Nonspecific symptoms can lead to a delay in diagnosis
- Keep metastatic ILC in the back of your mind in female patients presenting with abdominal complaints, even if the primary cancer was treated years ago
- Similar to the melanoma paradigm: Sneaky cancer that hides in strange places, even years later
- If an endoscopic biopsy of *mucosa* is normal, consider the *serosa*!

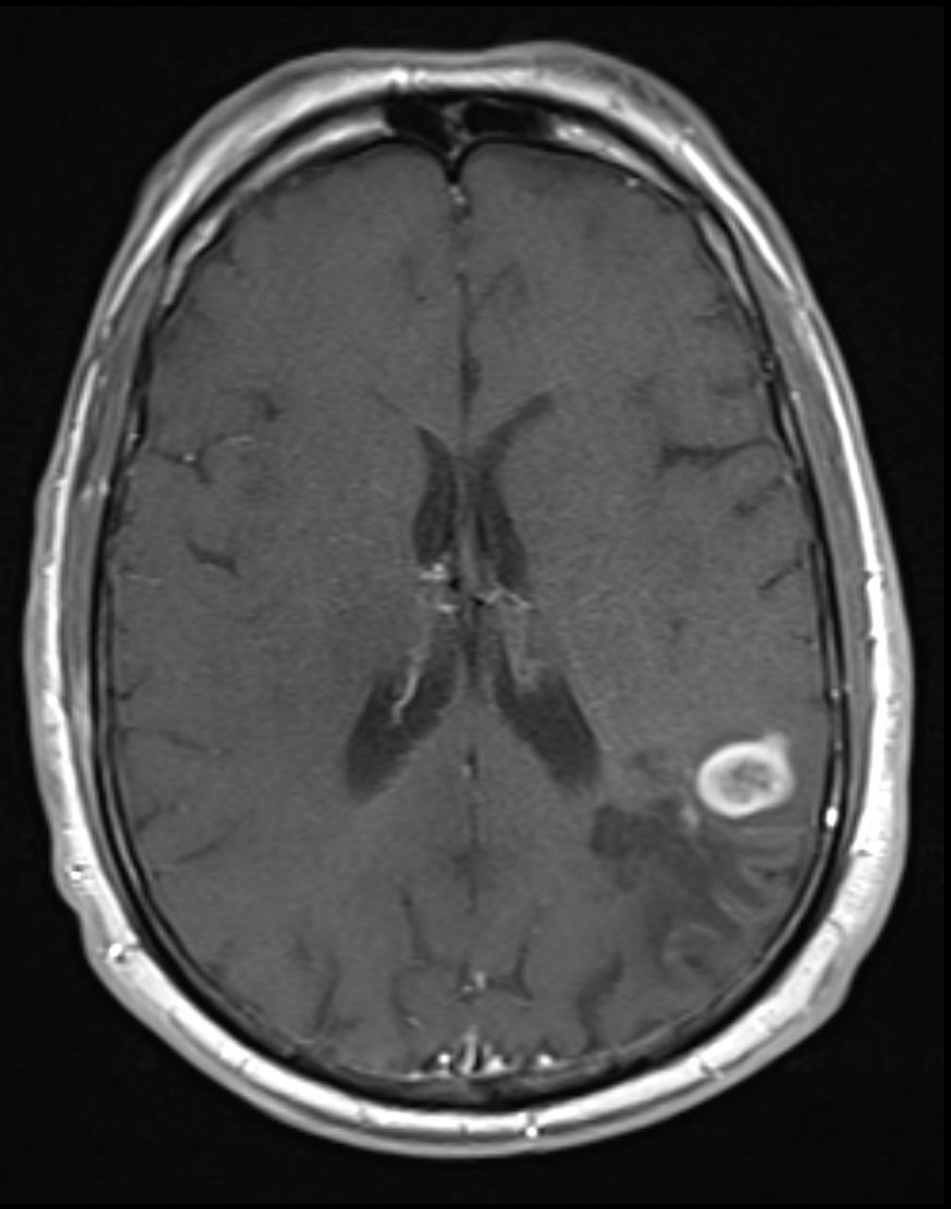
Case #5

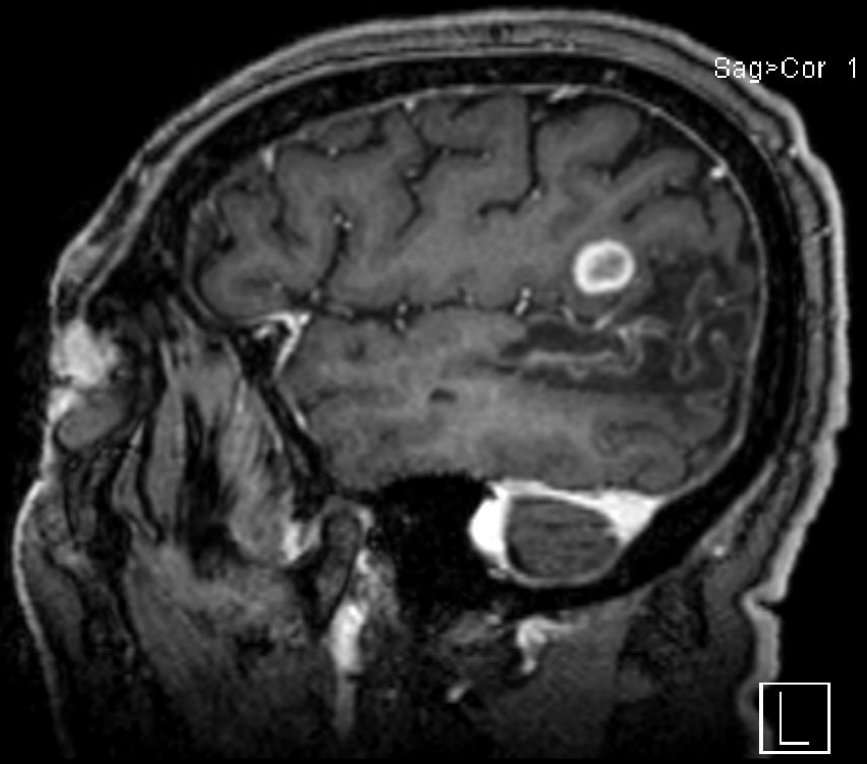
A 64 year old male patient with a history of rheumatoid arthritis on immunosuppressive medications, as well as left MCA territory infarct 7 months prior, presents with new left-sided weakness.





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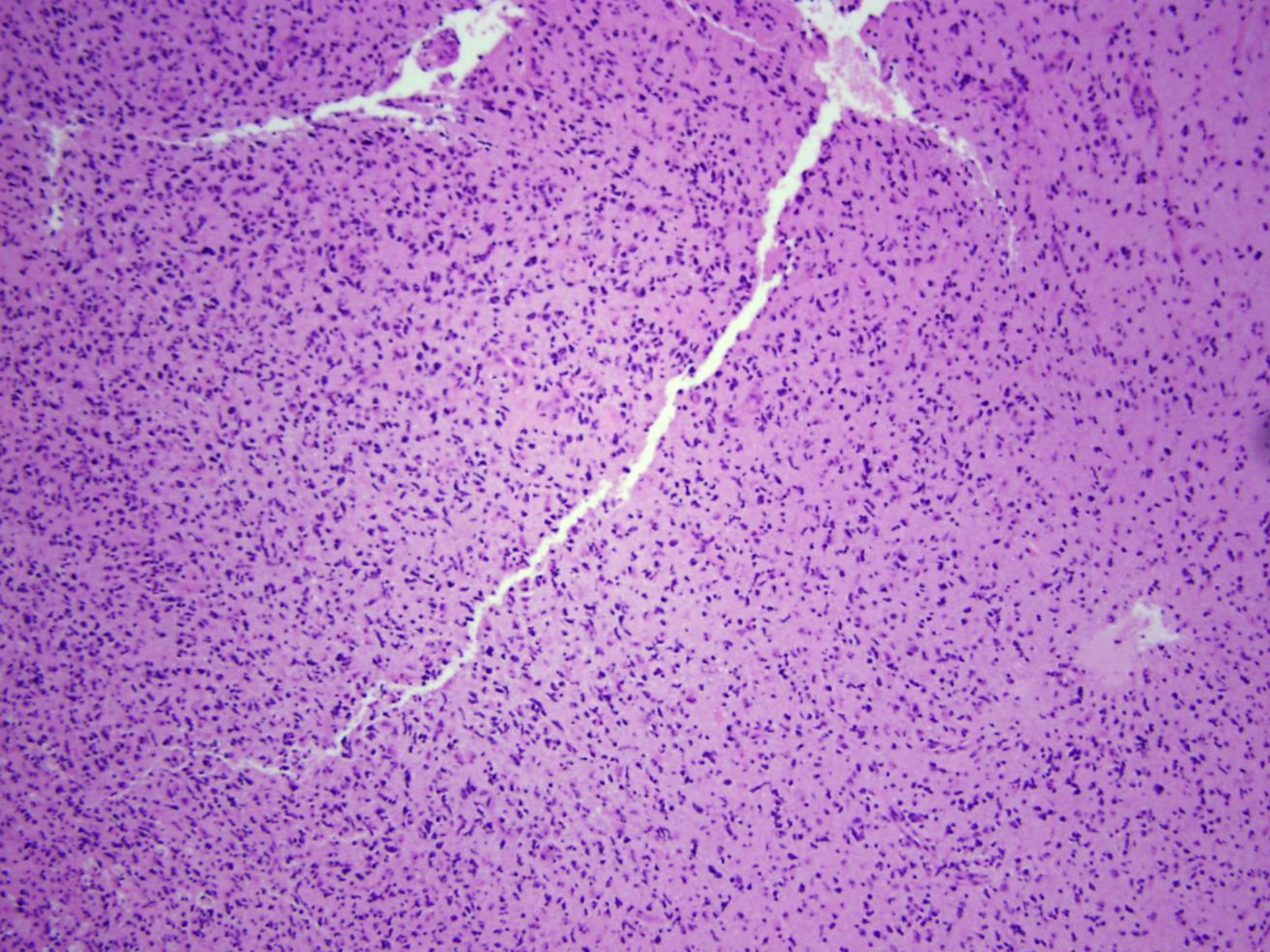
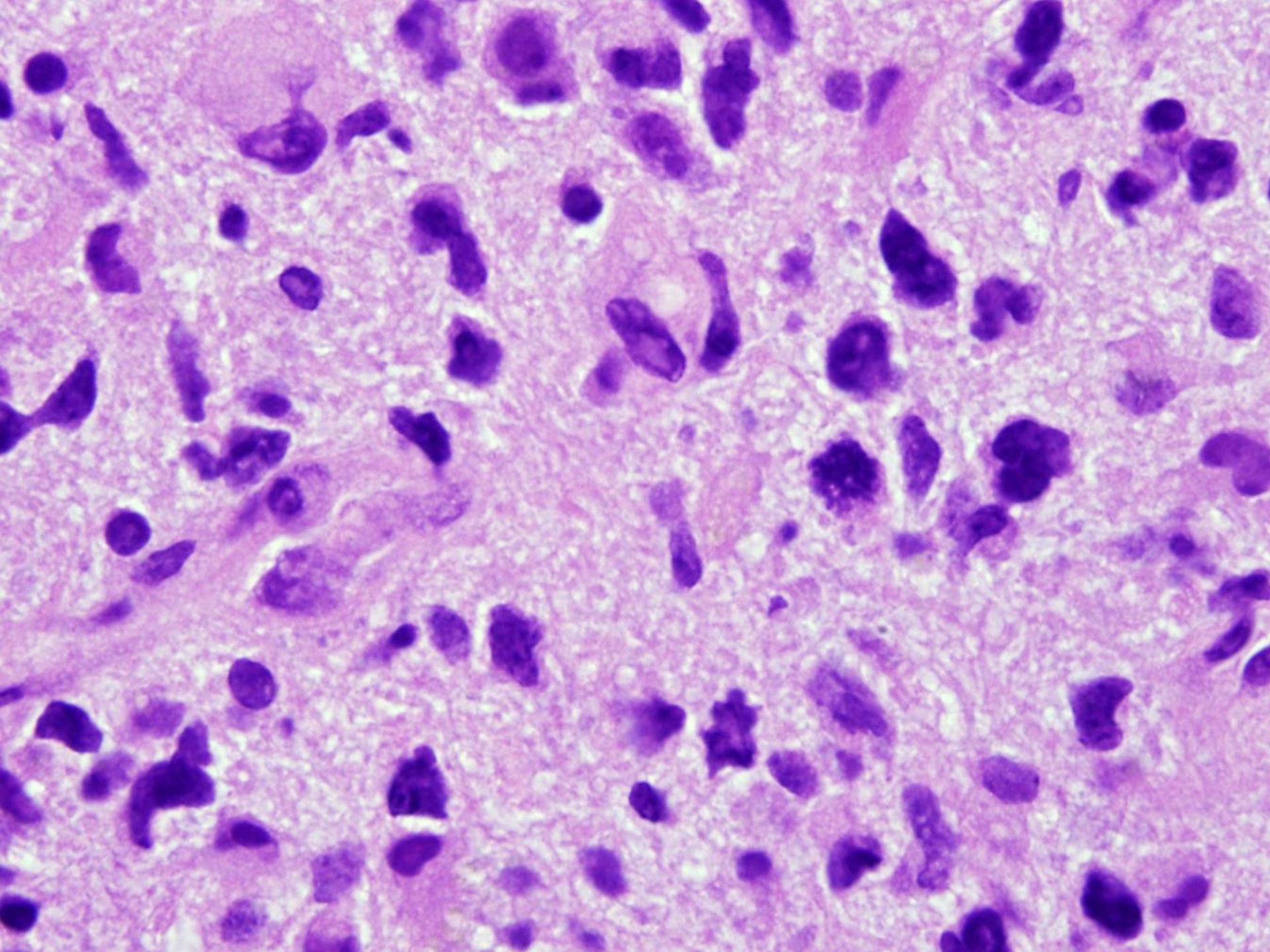
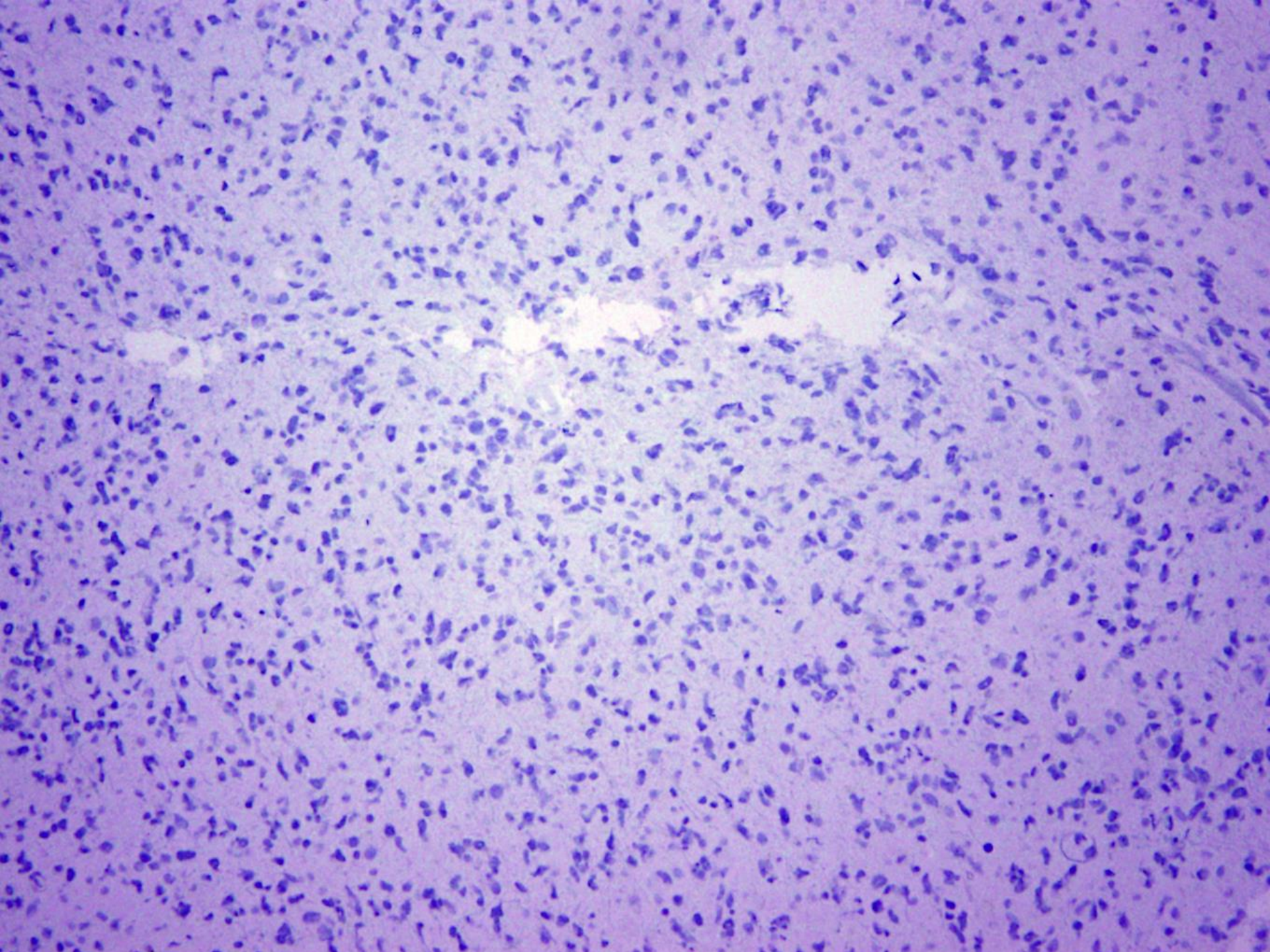
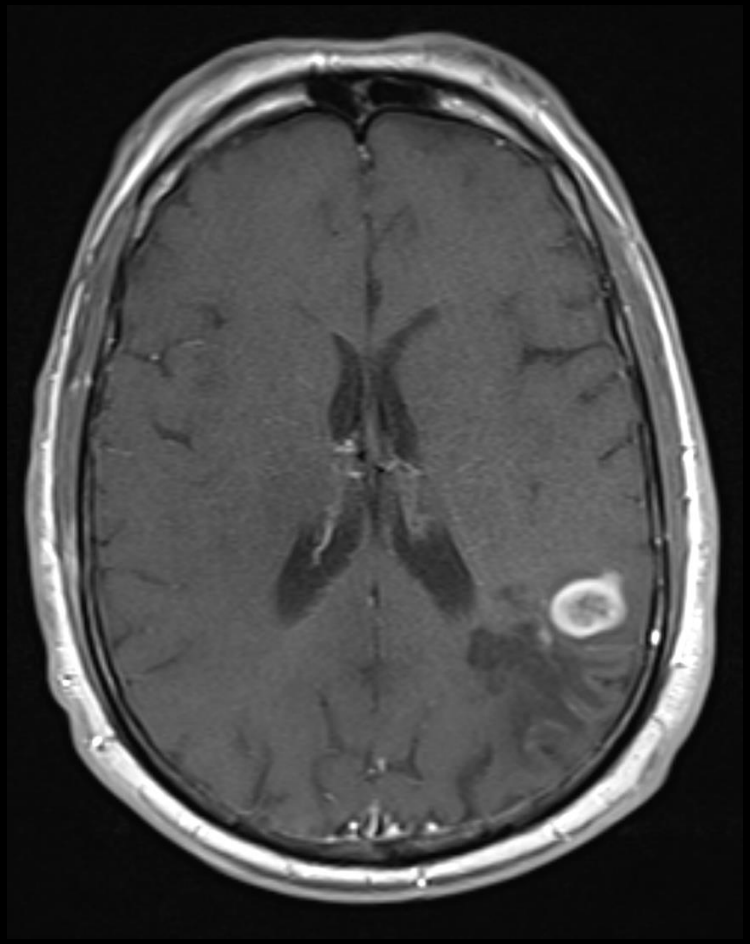
Pathology: BS-16-50621

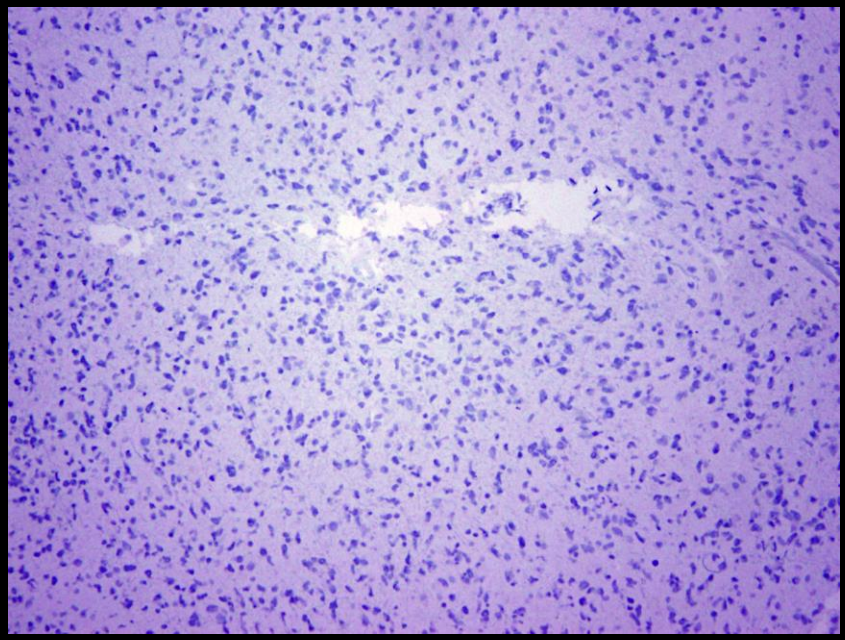






Diagnosis: Glioblastoma Multiforme





Question: After maximal surgical resection, what is the standard first line chemotherapeutic agent for GBM?

A. Temozolomide
B. Bevacizumab
C. Paclitaxel
D. Carboplatin
E. None of the Above – Radiation alone is most often used

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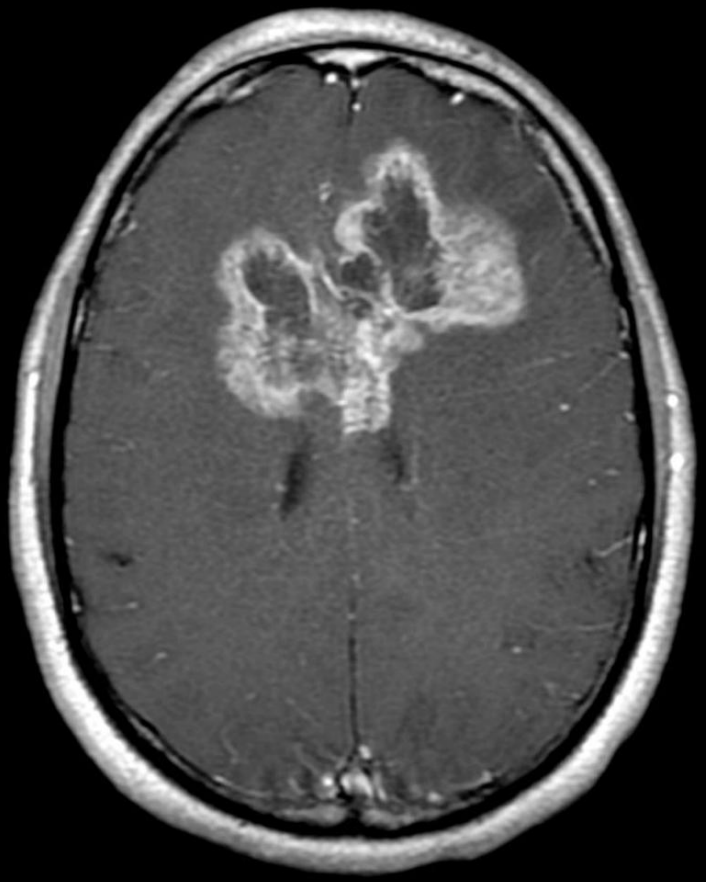
Glioblastoma Multiforme (GBM): Background

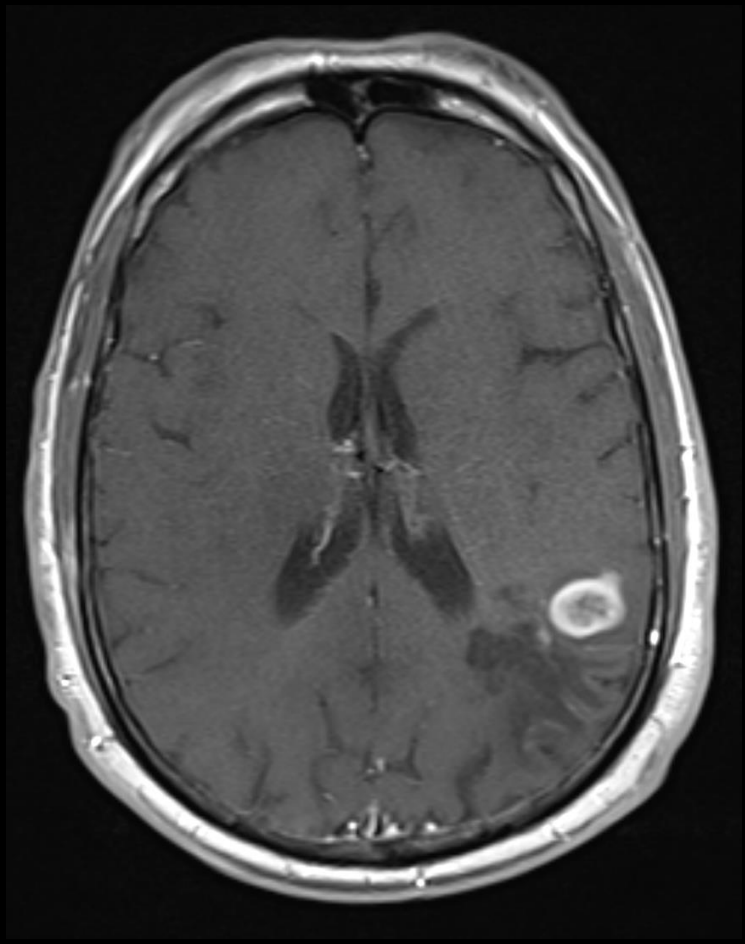


Case courtesy of A.Prof Frank Gaillard, Radiopaedia.org, rID: 2589

- Most common primary brain malignancy in adults
- Spreads along white matter tracts (including the corpus callosum)
- Association with Li-Fraumeni and Turcot Syndrome
- Terminology to know in pathology and neuro-oncology reports:
  - MGMT Methylated = Better Prognosis (TMZ will work)
  - IDH1 Wild-Type = Primary GBM = Worse Prognosis

Take Home Point: The immunosuppressed are at risk of the same pathology as immunocompetent!

- Immunocompetent Patients get Regular Pathology
- Immunocompromised patients get regular pathology PLUS opportunistic pathology



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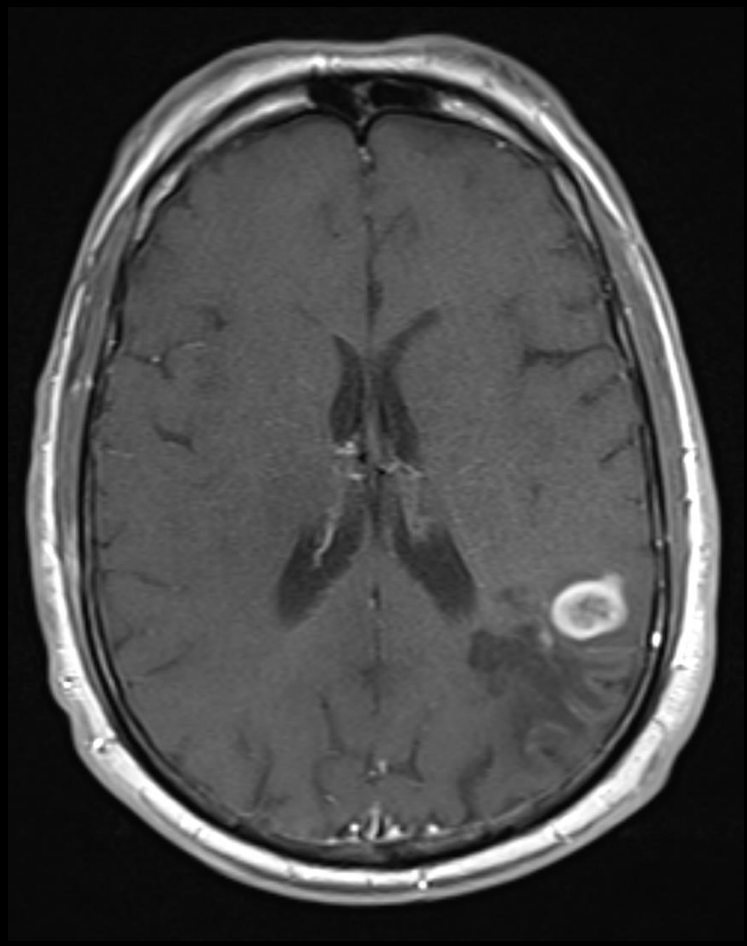

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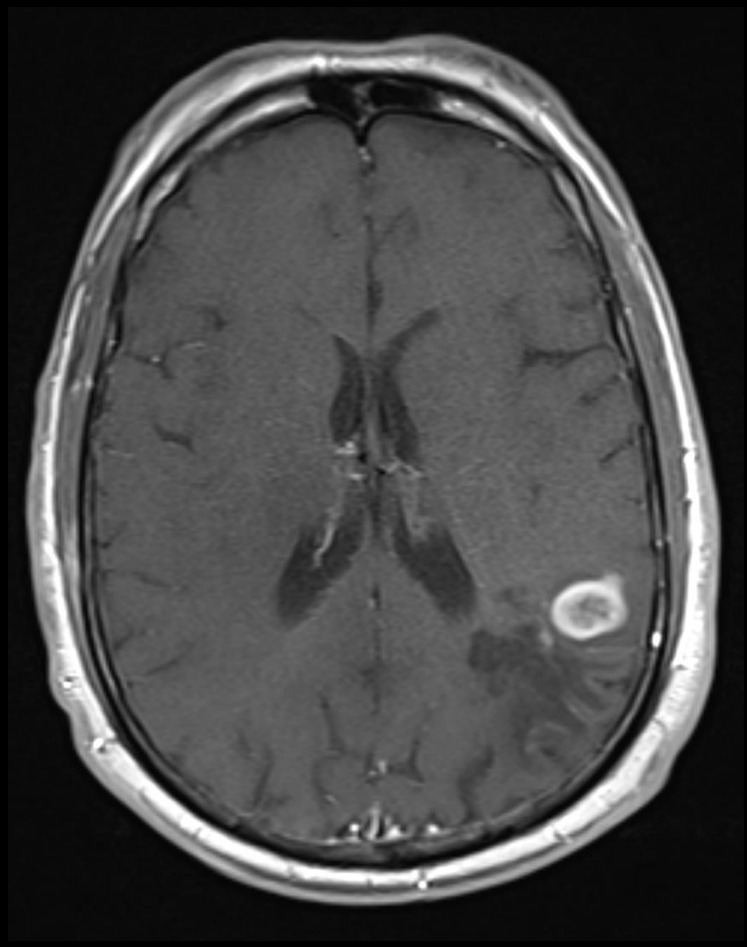

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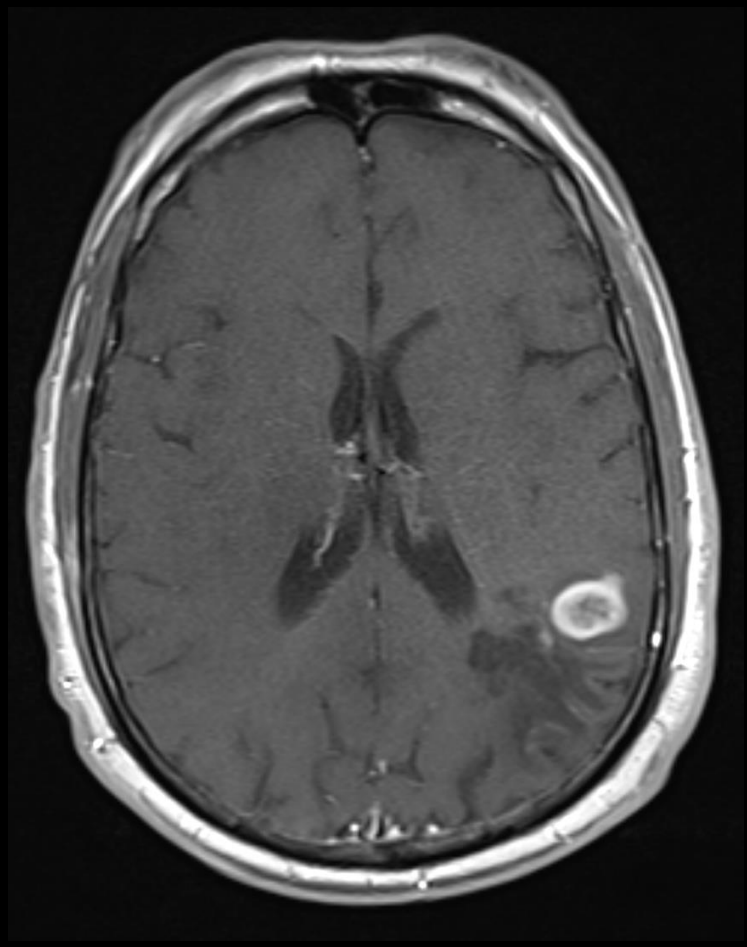

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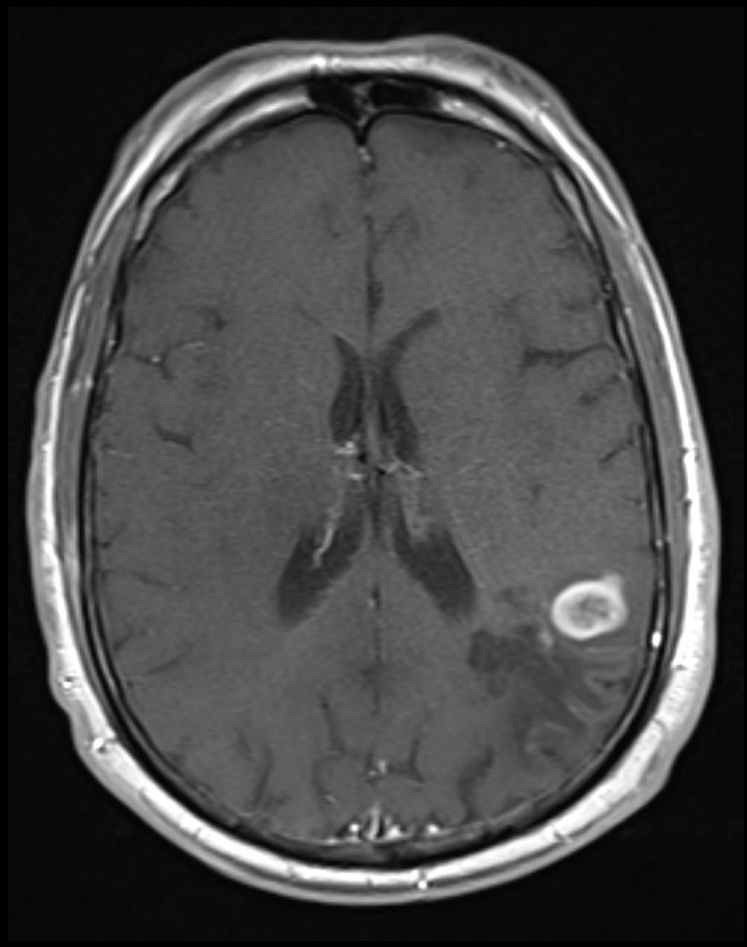

Ring Enhancing Lesion Differential

M

A

G

I

C

D

R

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Metastases *(multiple, grey/white junction)*

A

G

I

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GBM *(increased CBV on perfusion weighted)*

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GBM *(increased CBV on perfusion weighted)*

Infarct *(subacute)*

C

D

R

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Metastases *(multiple, grey/white junction)*

Abscess *(restricted diffusion, low T2 capsule)*

GBM *(increased CBV on perfusion weighted)*

Infarct *(subacute)*

Contusion *(subacute to chronic)*

D

R

Ring Enhancing Lesion Differential

Metastases *(multiple, grey/white junction)*

Abscess *(restricted diffusion, low T2 capsule)*

GBM *(increased CBV on perfusion weighted)*

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Demyelinating *(incomplete ring, no mass effect)*

R

Ring Enhancing Lesion Differential

Metastases *(multiple, grey/white junction)*

Abscess *(restricted diffusion, low T2 capsule)*

GBM *(increased CBV on perfusion weighted)*

Infarct *(subacute)*

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Demyelinating *(incomplete ring, no mass effect)*

Radiation Necrosis *(decreased CBV on perfusion)*

Take Home Messages

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- Case #5: Remember that the immunosuppressed are at risk of the same pathology as the immunocompetent!

Special Thanks

- Bharti Khurana, MD – High Grade Serous Ovarian Carcinoma
- Jen Uyeda, MD – Burkitt's Lymphoma
- Aaron Sodickson, MD – Cecal Volvulus
- Stu Silverman, MD – Metastatic Lobular Breast Cancer
- Diego Nunez, MD – Glioblastoma Multiforme

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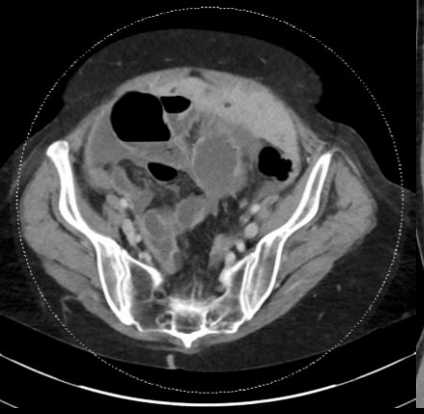
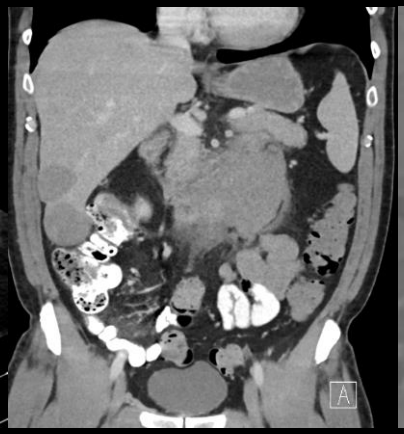
Questions?

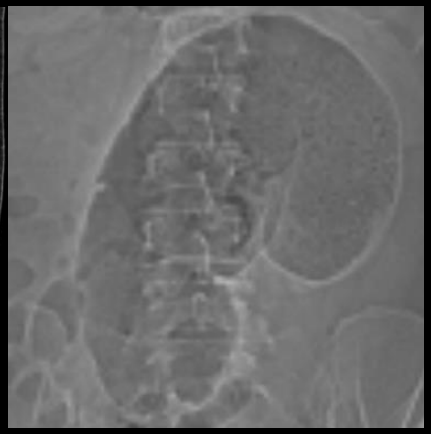
Thank You!



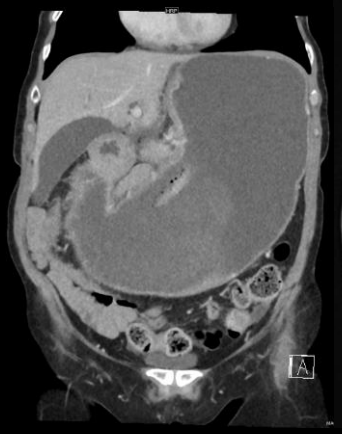
Ovarian Cancer



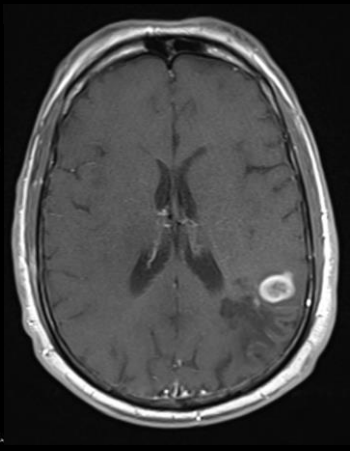
Burkitt's Lymphoma



Cecal Volvulus



Metastatic ILC



GBM