

An Icy Demise

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5/25/2021

RAD 4001

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Clinical History

- Patient is a 26 year old female with no significant PMHx who presents with abrupt RLQ abdominal pain.
 - + heavier menses, constipation, sleep disruption
 - - fever, chills, dysuria, nausea or vomiting
- Surgical Hx includes excision of RLQ abdominal mass in Mexico (2017). No previous medical records available.
- Physical exam
 - Afebrile, vital signs stable
 - + abdominal tenderness to palpation, guarding and surgical scar in RLQ
 - - rebound tenderness

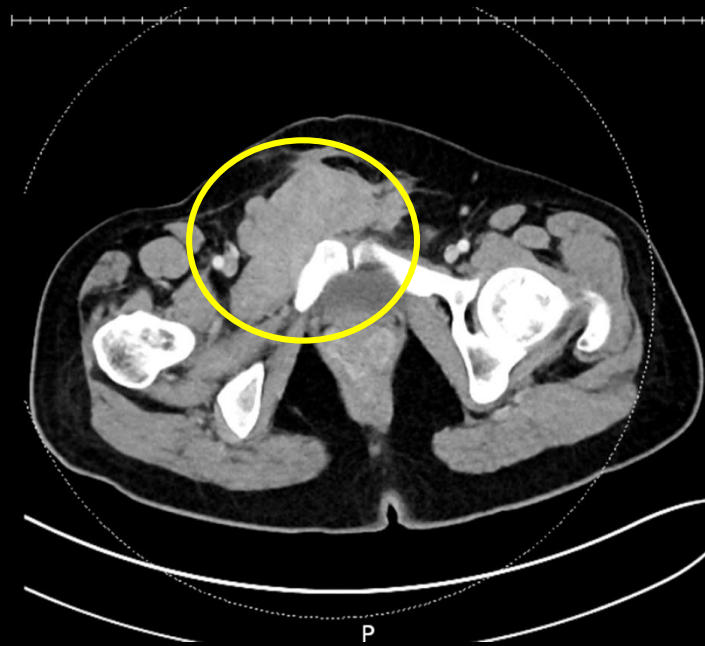
Clinical History continued

- Laboratory work-up
 - UA
 - Red, cloudy, 1+ protein, trace leukocytes, 3+ blood, >182 RBC, 9 WBC, few bacteria
 - CBC, BMP unremarkable
 - Negative pregnancy test
 - CEA negative
 - SED rate, CRP within normal limits
- No imaging performed in ED
 - Patient just had CT done a few days prior at outside hospital.
 - These images were copied into her chart.
- Discharged with tramadol 50mg; patient followed up in outpatient clinic

Outside hospital CT Abdomen/Pelvis with contrast



Sagittal View



Axial View



Coronal View

Key Imaging Findings

- Large rectus sheath, intramuscular lobulated mass within the right transversus abdominis, internal oblique, rectus abdominis, and obturator externus.
- Mass measures 4.8 x 8.9 x 17.3cm.
- Extends into the right inguinal region and into the right labia majora.

Differential Diagnosis

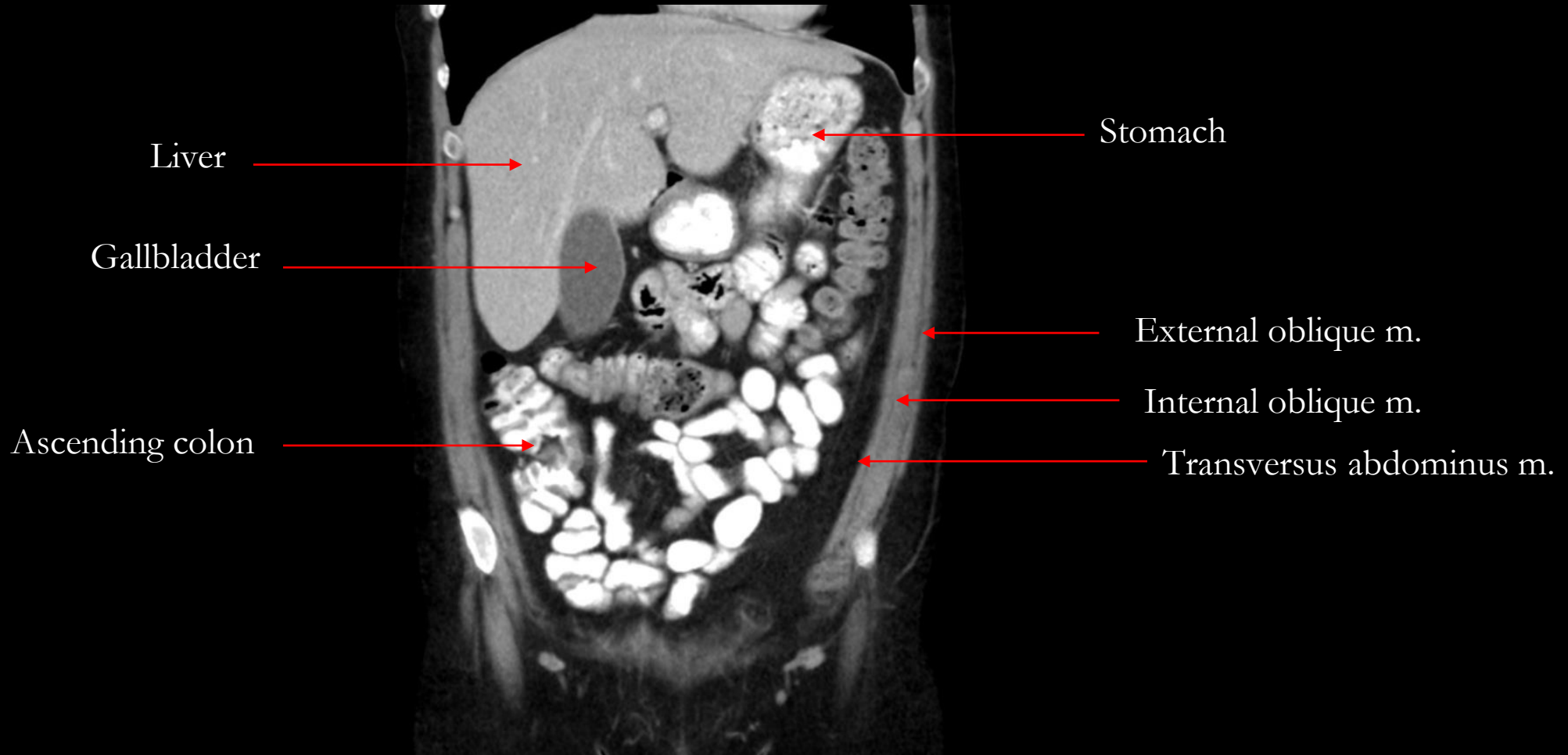
Most Likely

- Lipoma/liposarcoma
- Melanoma
- Desmoid tumor
- Dermatofibrosarcoma
- Angioma
- Abdominal abscess
- Endometriosis, fibroids
- Bowel obstruction

Other possibilities

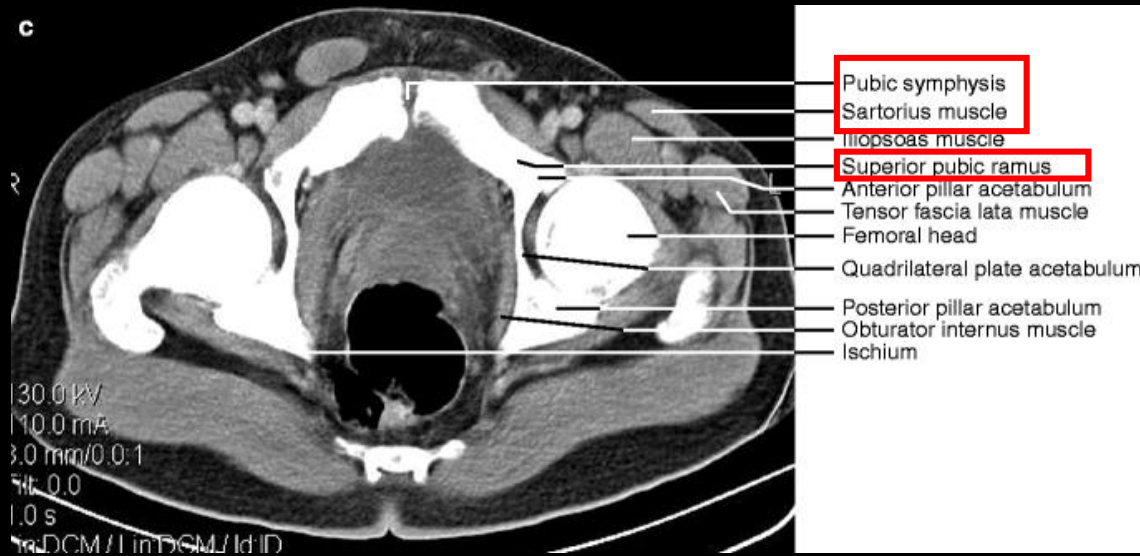
- IBD
- Ectopic pregnancy

Normal Anatomy



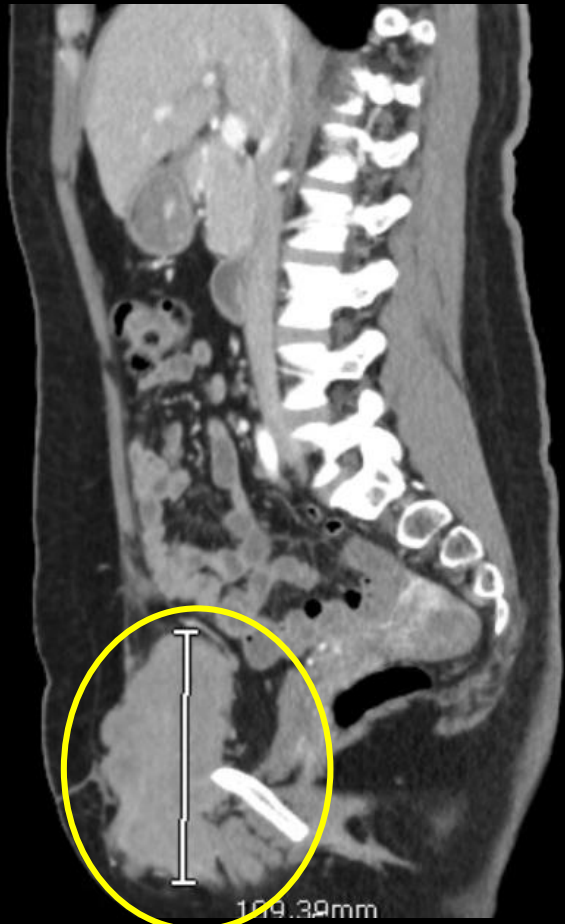
<https://radiopaedia.org/cases/normal-ct-abdomen?lang=us>

Normal Anatomy



Andronikou S. (2012) The Pelvis. In: Andronikou S. (eds) See Right Through Me. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-23893-2_26

CT Abdomen & Pelvis with contrast



Sagittal View



Axial View

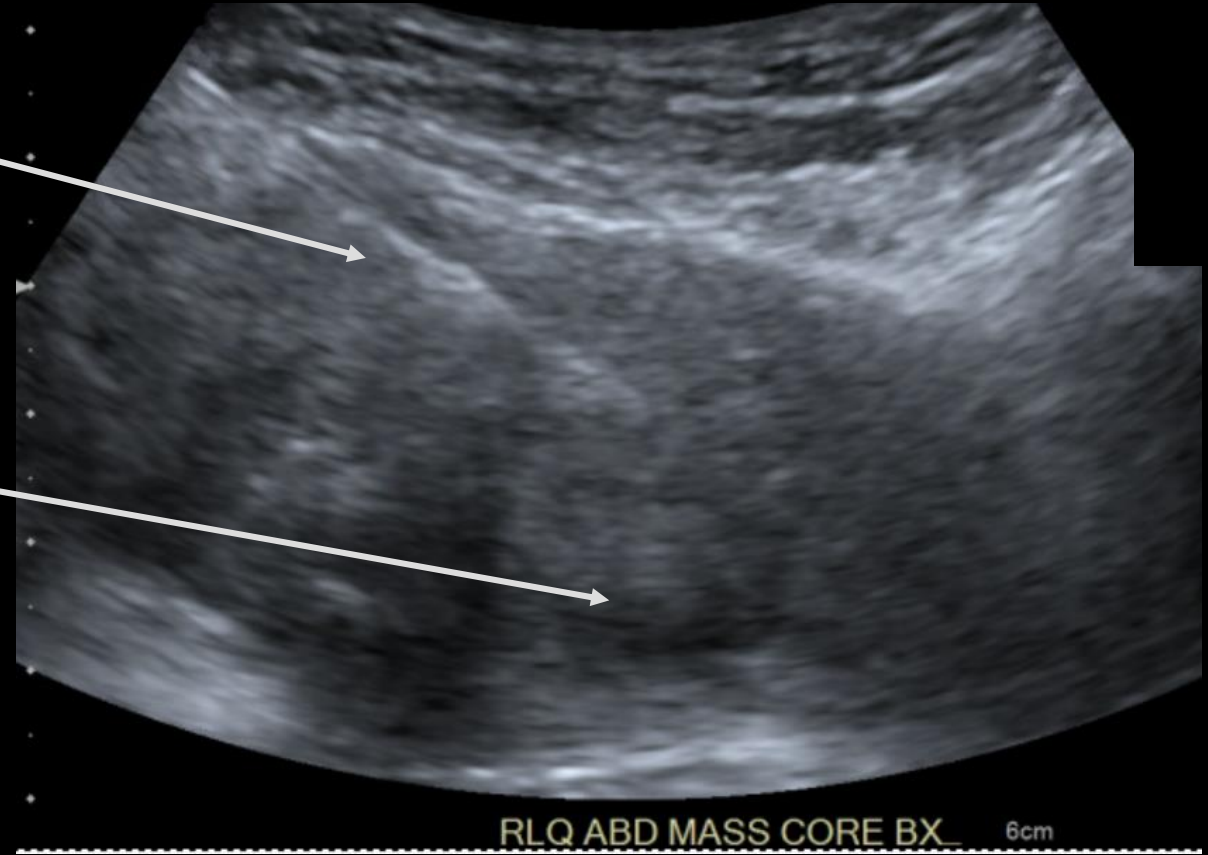


Coronal View

Ultrasound Guided Biopsy

18 gauge BioPince core needle

Abdominal mass



5 Core samples taken

Key Imaging Findings

- Large enhancing mass involves the oblique and pectineus muscles.
 - Measures 17.2 x 8.2 cm
 - Minimal size change in 4 months
- Mass abuts the pubic symphysis anteriorly, the superior pubic rami on the right
- **Pathology report:**
 - Ultrasound-guided core biopsy consistent with **desmoid-type fibromatosis**
Scattered cells are positive for SMA, rare cells are positive for desmin. S100 and CD117 are negative.

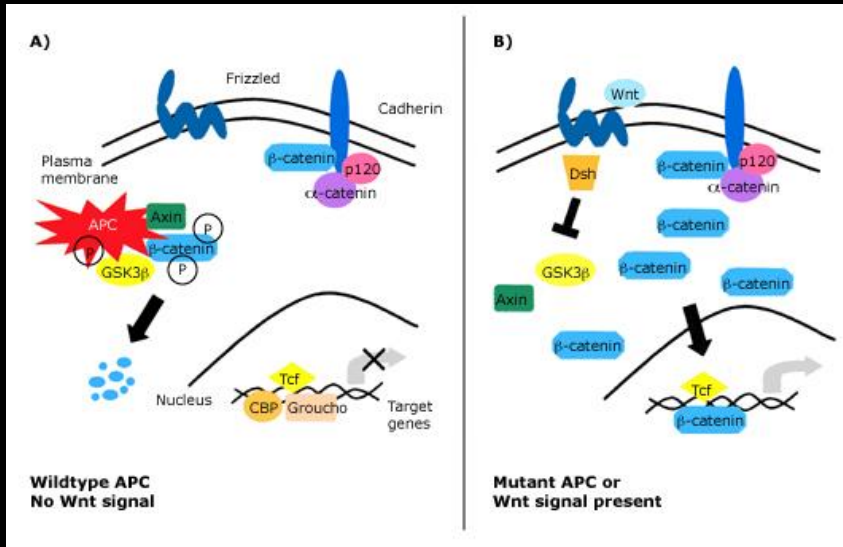
Final Diagnosis

Desmoid Tumor

Discussion

- 26 year old female with history of RLQ abdominal mass resection in 2017, presenting with mass recurrence and worsening pain.
 - Desmoid tumors tend to recur, even post-surgically with negative margins
 - Rate of recurrence is 16-39%⁽²⁾
- Commonly arise in abdominal wall, neck, extremities, and chest wall.
 - Progress slowly
 - Presenting symptoms include nausea, early satiety
 - Can potentially lead to bowel obstruction

Discussion



- Desmoid tumors are rare, representing 0.03% of all neoplasms. ⁽²⁾
- Benign lesions comprised of musculoaponeurotic stromal elements.
- Associated with FAP, Gardner syndrome.
- MRI is considered a primary imaging modality. ⁽²⁾
 - Histology required to make diagnosis
- Association with mutation of the beta-catenin gene, leading to activation of Wnt/catenin signaling.

Treatment

- Several treatment options exist:
 - Observation only if asymptomatic
 - Surgical removal
 - Radiation therapy
 - Cytotoxic chemotherapy
 - Tamoxifen
 - Imatinib
- Cryoablation
 - For extra-abdominal tumors, one study showed 39.1% of patients treated with cryoablation had no residual viable tumor and progressive disease in 4.3% ⁽⁴⁾
 - Another study found symptomatic improvement in 89% of patients and an average change in tumor volume by ~80% at 12 month follow up ⁽³⁾

Treatment

- Cryoablation – 2 of 3 sessions completed.
- Initial imaging prior to procedure again demonstrated a 17.8 cm desmoid fibromatosis mass involving the right inguinal region.
- US and CT guidance were used to place eight 14 gauge cryoprobes.
- Two freeze-thaw cycles performed (10 min x 8 min).
- Post-ablation imaging showed new hypoattenuation within the mass.
 - Evidence of cryoablation zone

Image Guided Cryoablation 1

Placement of cryoprobes in tumor to deliver freezing temperatures

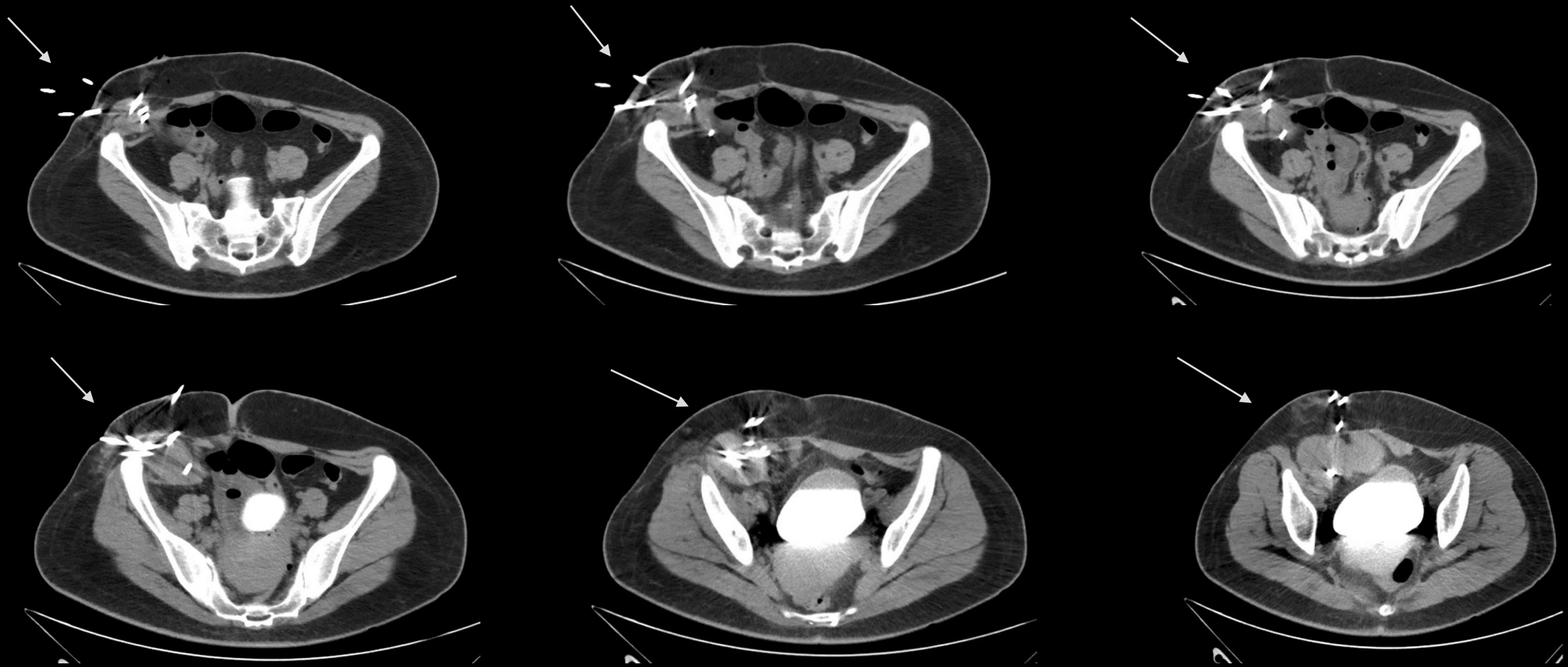
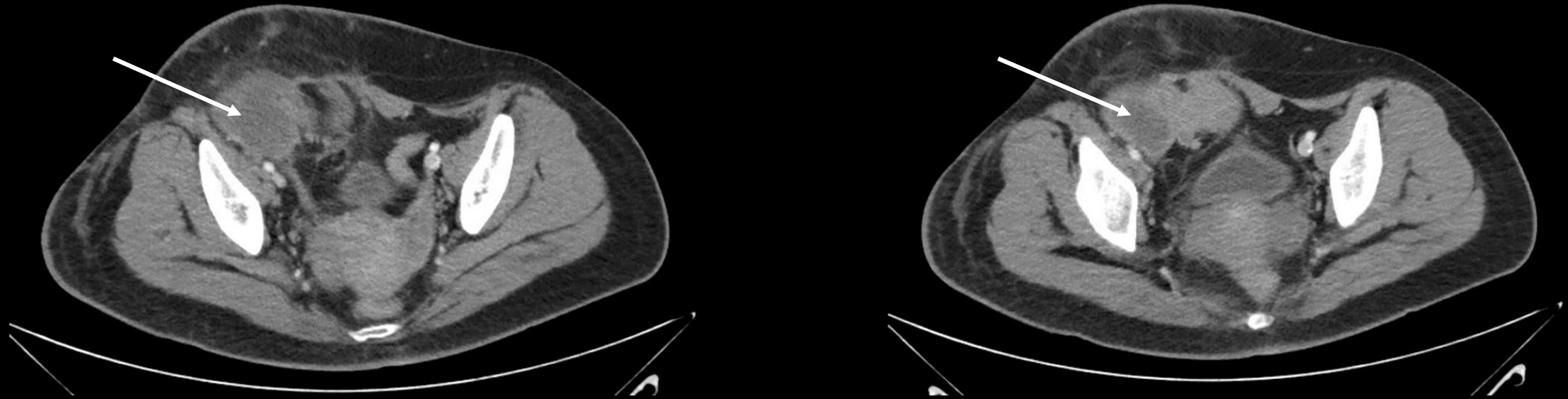


Image Guided Cryoablation 2

- Initial CT prior to second treatment



Arrows indicate hypoenhancement within the tumor, reflecting post-treatment changes from cryoablation session #1.

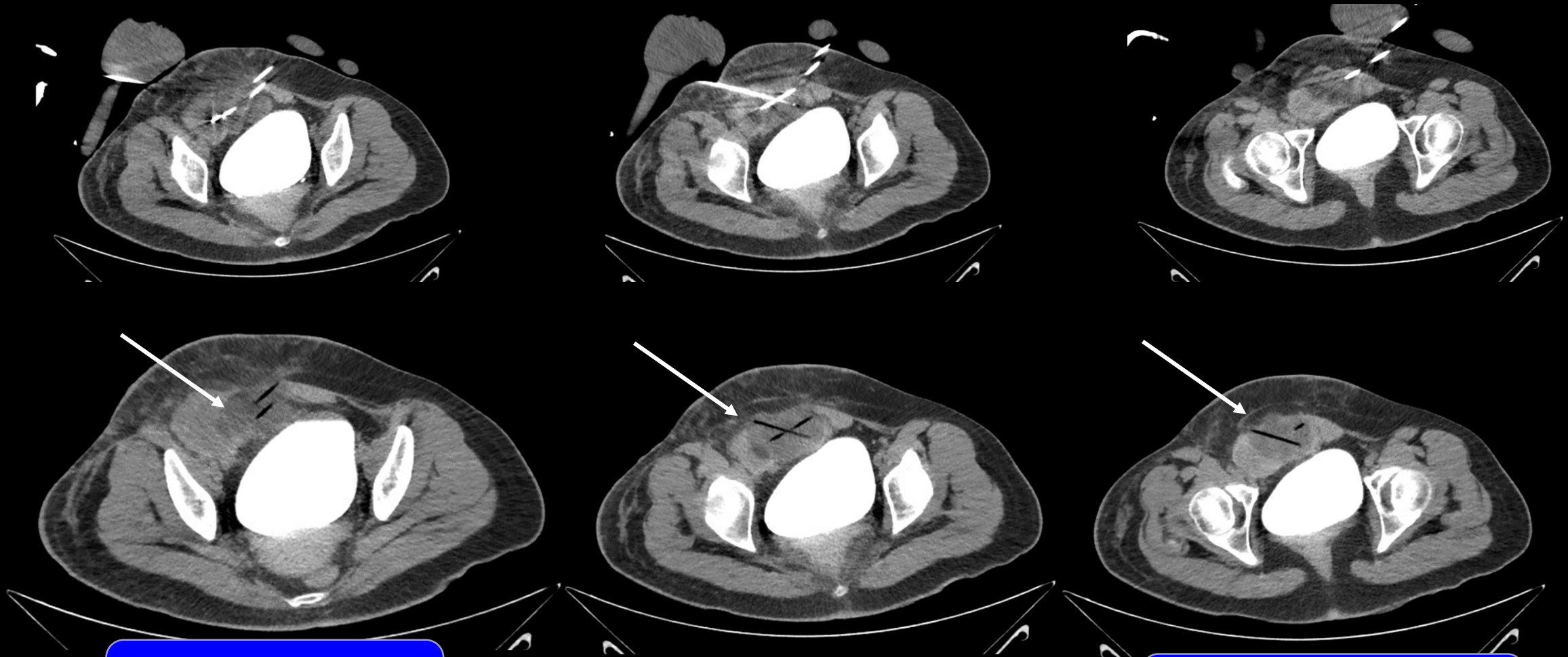
Image Guided Cryoablation 2

- Initial CT prior to second treatment

Initial imaging indicates hypoenhancement within the tumor, reflecting post-treatment changes from cryoablation session #1.



Image Guided Cryoablation 2



New hypodense region indicates ablation zone

McGovern Medical School

Notice the tract marks from cryoprobe removal

ACR Appropriateness Criteria

American College of Radiology
ACR Appropriateness Criteria®
Palpable Abdominal Mass-Suspected Neoplasm

Variant 1: **Palpable abdominal mass. Suspected intra-abdominal neoplasm. Initial imaging.**

| Procedure | Appropriateness Category | Relative Radiation Level |
|--|--------------------------|--------------------------|
| CT abdomen with IV contrast | Usually Appropriate | ⊕⊕⊕ |
| US abdomen | Usually Appropriate | ○ |
| MRI abdomen without and with IV contrast | May Be Appropriate | ○ |
| CT abdomen without IV contrast | May Be Appropriate | ⊕⊕⊕ |
| MRI abdomen without IV contrast | May Be Appropriate | ○ |
| CT abdomen without and with IV contrast | Usually Not Appropriate | ⊕⊕⊕⊕ |
| FDG-PET/CT skull base to mid-thigh | Usually Not Appropriate | ⊕⊕⊕⊕ |
| Radiography abdomen | Usually Not Appropriate | ⊕⊕ |

ACR appropriateness Criteria

- The patient's initial imaging is appropriate in accordance with the ACR appropriateness criteria.
 - Her history of prior abdominal mass resection, now presenting with recurrence, was suspicious for an abdominal neoplasm
 - CT abdomen with contrast – ionizing radiation, especially with repeated images for treatment purposes
 - Ultrasound – no risk of radiation, beneficial for probe placement during cryoablation
- CT Abdomen & Pelvis cost at Memorial Hermann TMC: \$5,380.00

<https://www.memorialhermann.org/patients-visitors/patient-services/financial-care/financial-resources/memorial-hermann-charge-master>

Take Home Points

1. Desmoid tumors are benign neoplasms, but can become locally destructive or lead to significant symptoms as they increase in size.
2. Cryoablation can safely reduce tumor burden with minimal side effects.
3. Desmoid tumors require a multi-disciplinary approach due to their rarity and varied presentation.

References

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Questions?