AMSER Case of the Month October 2025

36-year-old female with right lower quadrant abdominal pain

Gabriel Hanson, M2

Matthew Kruse, M.D.

Creighton University School of Medicine

Patient Presentation

HPI: A 36-year-old female presents to the ED with a chief complaint of severe right sided abdominal pain that is sharp in nature, constant, and radiating to the groin and back. Patient reports associated nausea.

PMH: Tuberous sclerosis

PSH: Cholecystectomy, Hysterectomy

Physical Exam: Right lower quadrant is tender to palpation

Pertinent Labs

- CBC: WBC 17.3, HBG 11.8, ANC 12.8
- UA: Appearance – slightly cloudy, Blood – moderate, Protein – 30, RBC – 10-20, Casts Granular – 0-2, Amorphous – 2+, Squam Epithelial Cells – 5-10
- CMP: Glucose – 205, Creatinine – 1.23, Chloride – 113, CO2 – 19.0, GFR – 56
- Lactic Acid, Venous – 3.2

What Imaging Should We Order?

ACR Appropriateness Criteria

Variant 1: **Right lower quadrant pain. Initial imaging.**

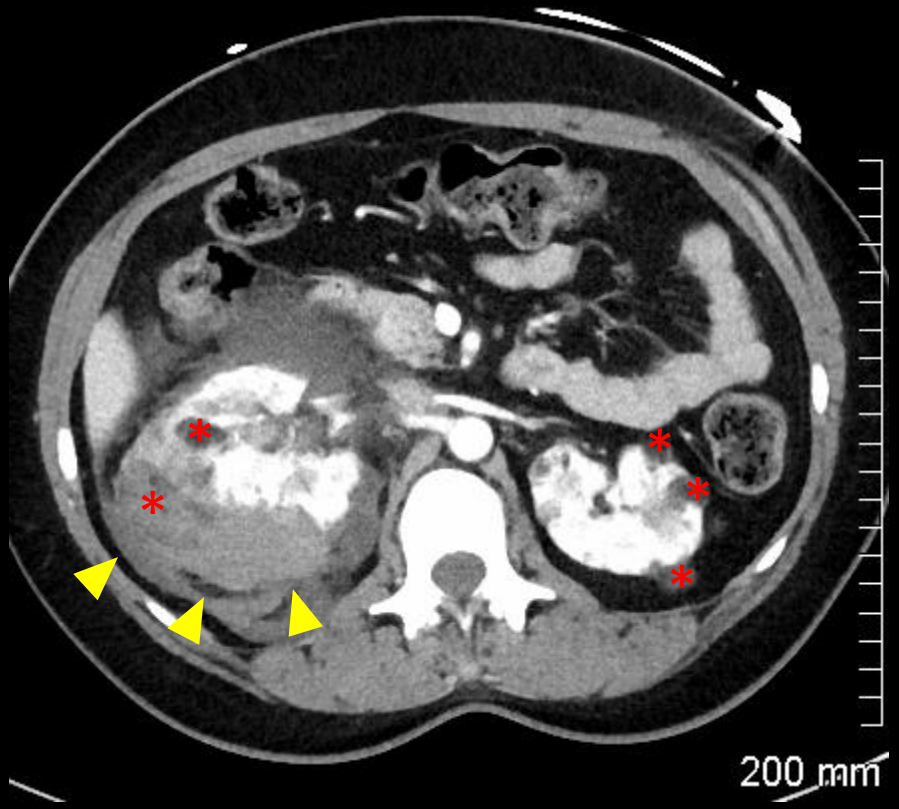
Procedure	Appropriateness Category	Relative Radiation Level
CT abdomen and pelvis with IV contrast	Usually Appropriate	☢☢☢
US abdomen	May Be Appropriate	O
US pelvis	May Be Appropriate	O
MRI abdomen and pelvis without and with IV contrast	May Be Appropriate	O
MRI abdomen and pelvis without IV contrast	May Be Appropriate	O
CT abdomen and pelvis without IV contrast	May Be Appropriate	☢☢☢
Radiography abdomen	Usually Not Appropriate	☢☢
Fluoroscopy contrast enema	Usually Not Appropriate	☢☢☢
CT abdomen and pelvis without and with IV contrast	Usually Not Appropriate	☢☢☢☢
WBC scan abdomen and pelvis	Usually Not Appropriate	☢☢☢☢

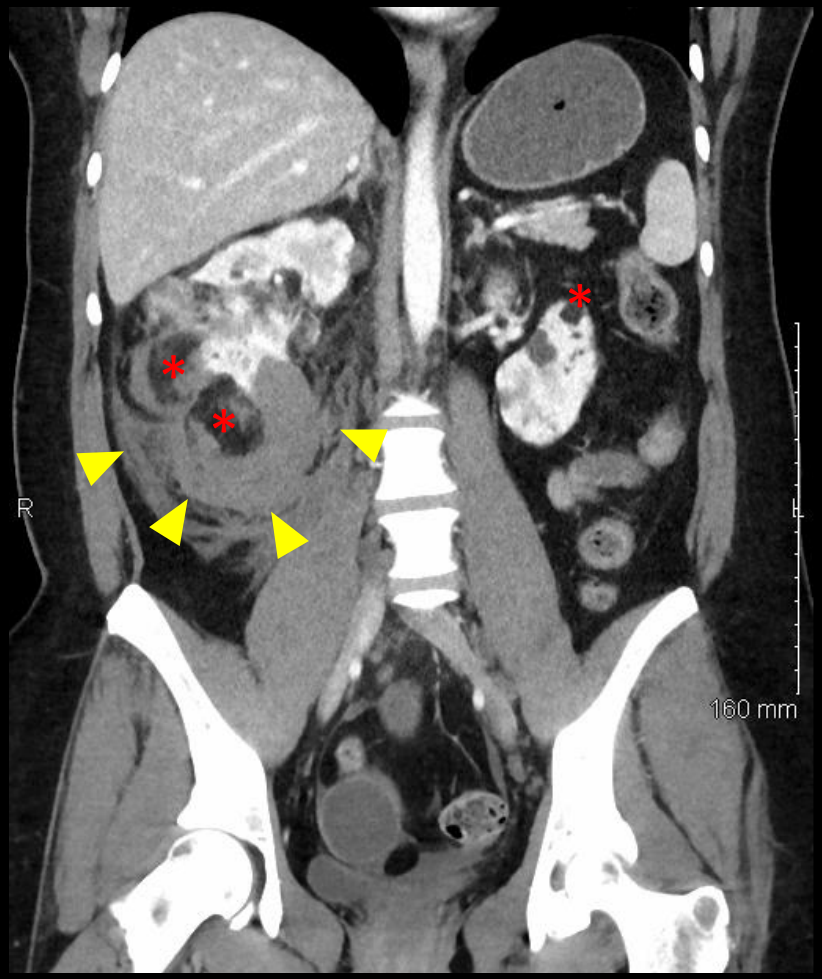
This imaging modality was ordered by the ER physician

AMSER

CT with Contrast Findings

CT with Contrast Findings (Labeled)



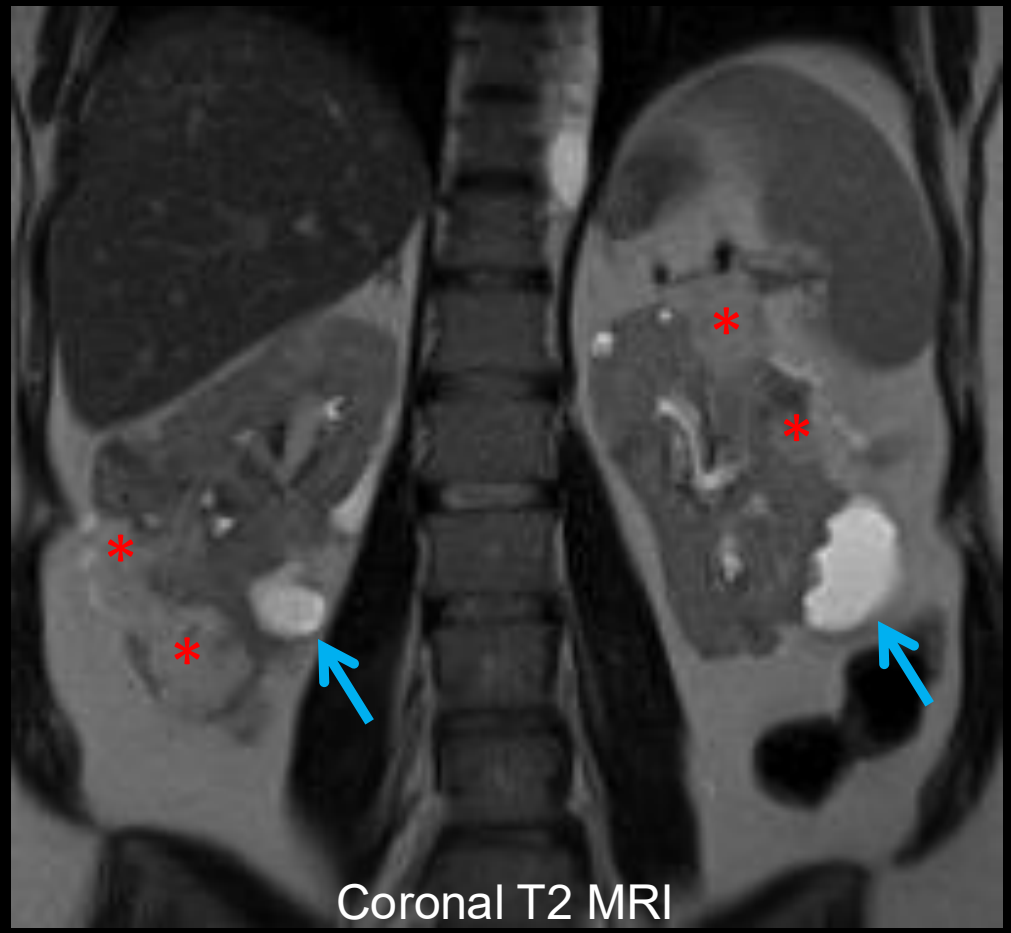


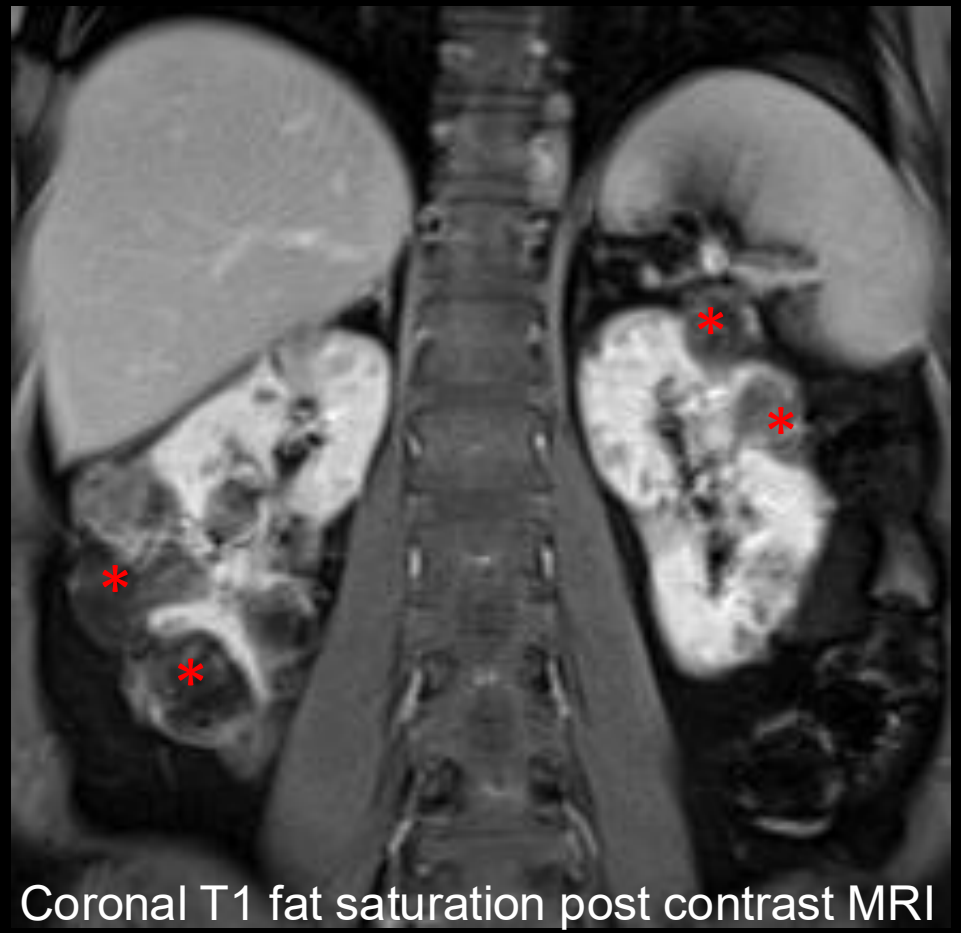
- Acute perirenal hemorrhage (>) from ruptured right angiomyolipoma

- Multiple bilateral fat-containing renal masses compatible with angiomyolipomas (*)

AMSER

Previous MRI Abdomen with and without contrast





Multiple bilateral fat-containing renal masses compatible with angiomyolipomas (*)

Renal cysts (→)

AMSER

Final Dx:

Ruptured right angiomyolipoma with acute perirenal hemorrhage in a patient with tuberous sclerosis

Case Discussion

Tuberous Sclerosis (TSC):

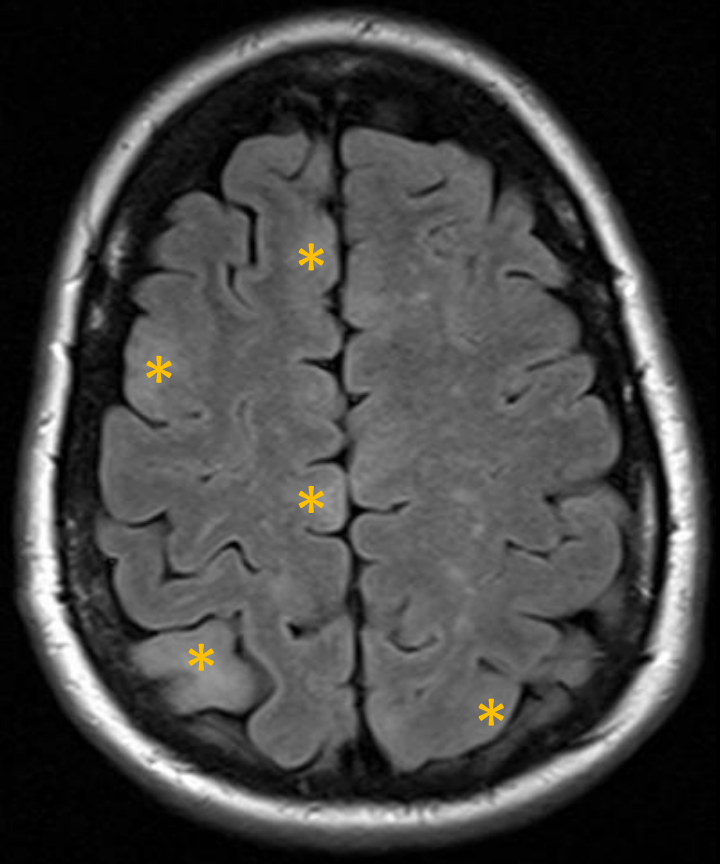
- Rare AD neurocutaneous disorder due to mutations in the TSC1 or TSC2 tumor suppressor genes [1].
- Classically diagnosed in children and presents with seizures, developmental delay, and hypomelanotic macules [2].
- Prevalence is estimated to be 1 in 6000 people [2].
- Renal failure is the leading cause of death in patients with TSC [3].

Case Discussion

TSC Imaging Manifestations [2]:

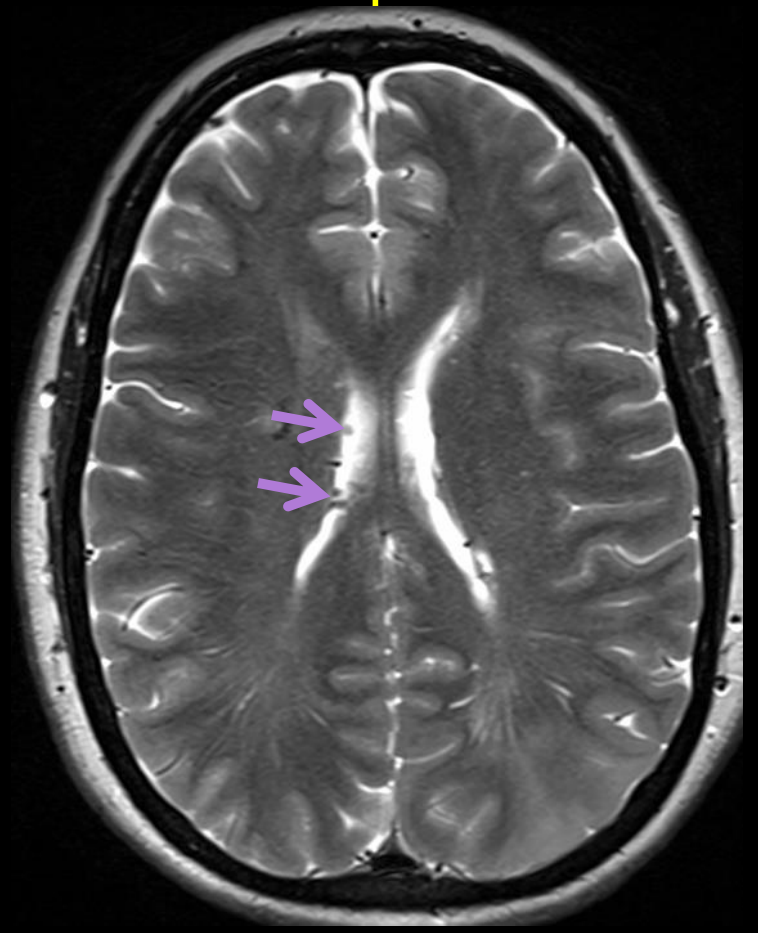
- Renal → angiomyolipomas, cysts, and renal cell carcinoma
- CNS → subependymal nodules, cortical/subcortical tubers, cerebral white matter radial migration lines, and subependymal giant cell astrocytomas
- Pulmonary → lymphangioleiomyomatosis
- Cardiac → rhabdomyomas
- Hepatic → angiomyolipomas
- Splenic → hamartomas

Previous MRI Brain for our patient



Axial T2 FLAIR MRI

Multiple T2/FLAIR hyperintense cortical and subcortical tubers / hamartomas (*)

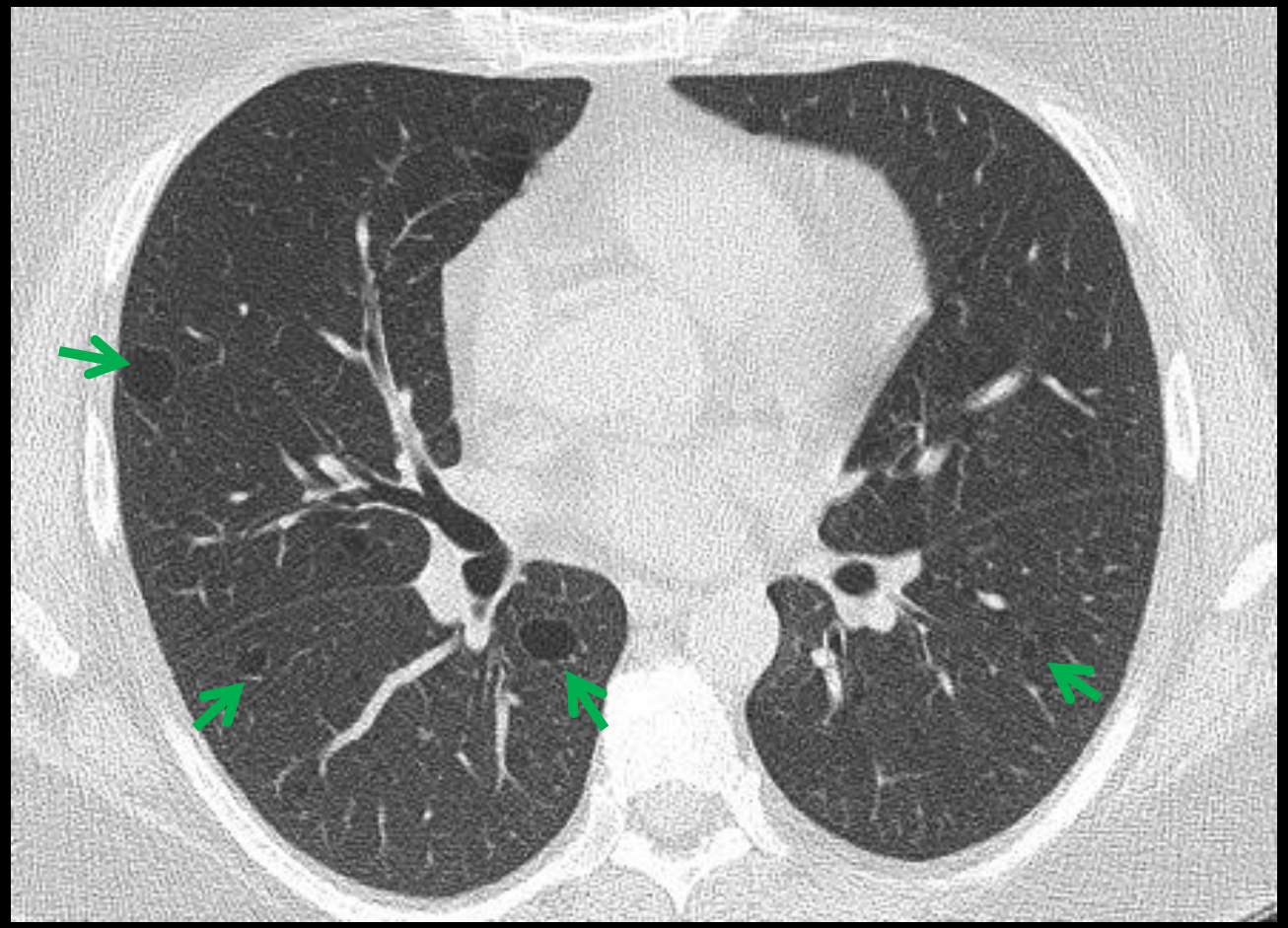


Axial T2 MRI

Multiple small subependymal nodules (→) compatible with hamartomas

AMSER

Subsequent Noncontrast CT Chest for our patient



Multiple thin-walled round pulmonary cysts (→) compatible with lymphangioleiomyomatosis

Case Discussion

Renal Manifestations of TSC:

- Angiomyolipomas (AMLs)
  - Hamartomatous lesions consisting of abnormal blood vessels, smooth muscle, and adipose tissue [3].
  - Diagnosed as a renal mass containing macroscopic fat [2].
    - Although ~5% may not contain obvious fat
  - Contain micro/macroaneurysms that may spontaneously rupture and bleed [3].
  - Lesions >4 cm are at greater risk of spontaneous hemorrhage [3].
- Cysts
  - Commonly multiple and typically asymptomatic [2].
- Renal Cell Carcinoma
  - Incidence rate is similar to general population (2-3%), but age of onset is significantly lower [2].

Case Discussion

Management of renal angiomyolipomas:

- Trending towards nephron-sparing strategies, referred to as active surveillance (AS) [4].
  - Allows for maximum preservation of renal structure and avoids risks associated with procedures [4].
  - mTOR inhibitors are becoming more frequently used as targeted therapy for AMLs that are >4cm [5].
- Active treatment (AT) options include surgical excision, angioembolization and cryoablation [4].
  - Specific situations in which AT is preferred include patients with large tumors (>4 cm), women of childbearing age, or patients who may have difficulties following up in the future [4].
  - Risk-benefit analysis should be performed prior to surgery [5].

Case Discussion

- The patient's HGB remained stable after an initial drop, permitting continued active surveillance as the chosen conservative approach.
- Care team considered starting mTOR inhibitors to help reduce risk of bleeding and cytopenias.
- After a 3 day hospital stay and adequate pain management, the patient was discharged home with instructions to follow up with PCP in 1 week and Heme/Onc in ~4 weeks.

References:

1. Wang MX, Segaran N, Bhalla S, et al. Tuberous Sclerosis: Current Update. *RadioGraphics*. 2021;41(7):1992-2010. doi:https://doi.org/10.1148/rg.2021210103
2. Manoukian SB, Kowal DJ. Comprehensive Imaging Manifestations of Tuberous Sclerosis. *American Journal of Roentgenology*. 2015;204(5):933-943. doi:https://doi.org/10.2214/ajr.13.12235
3. Casper KA, Donnelly LF, Chen B, Bissler JJ. Tuberous Sclerosis Complex: Renal Imaging Findings. *Radiology*. 2002;225(2):451-456. doi:https://doi.org/10.1148/radiol.2252011584
4. Daché A, Fatica R, Herts BR, et al. Factors predicting the active treatment of renal angiomyolipoma: 30 years of experience in two tertiary referral centers. *Frontiers in surgery*. 2023;10. doi:https://doi.org/10.3389/fsurg.2023.1094806
5. Wang H, Long Q, Wang Y, Liu L, Zhou L, Guo J. Tuberous sclerosis complex-associated renal angiomyolipomas: A single center study of 17 consecutive cases. *Oncology Letters*. 2016;12(2):1501-1506. doi:https://doi.org/10.3892/ol.2016.4766

AMSER