

AMSER Case of the Month

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59-year-old male with RLQ pain

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Patient Presentation

- **HPI:** 59 yo M patient with no significant PMHx presented to the ED with worsening RLQ pain that started at 7am that same morning. He had associated nausea and 1 episode of vomiting along with diarrhea earlier in the day. He denied any hematuria or radiation of his pain.
- **VS:** 198/97; Pulse: 82; Temp: 97.7F
- **Exam:** Alert and oriented; Abdomen is soft and non-tender
- PSHx, Medications, FHx, Sx

Pertinent Labs

- WBC: 9.15
- Creatinine: 1.2
- UA: 3+ blood
- Bladder scan: 291cc

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

Scenario	Scenario ID	Procedure	Adult RRL	Peds RRL	Appropriateness Category
RLQ pain, initial imaging	3195405	<input checked="" type="radio"/> CT abdomen and pelvis with IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually appropriate
		<input type="radio"/> US abdomen	0 mSv O	0 mSv [ped] O	May be appropriate
		<input type="radio"/> US pelvis	0 mSv O	0 mSv [ped] O	May be appropriate
		<input type="radio"/> MRI abdomen and pelvis without and with IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		<input type="radio"/> MRI abdomen and pelvis without IV contrast	0 mSv O	0 mSv [ped] O	May be appropriate
		<input type="radio"/> CT abdomen and pelvis without IV contrast	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	May be appropriate
		<input type="radio"/> Radiography abdomen	0.1-1mSv ☼☼	0.03-0.3 mSv [ped] ☼☼	Usually not appropriate
		<input type="radio"/> Fluoroscopy contrast enema	1-10 mSv ☼☼☼	3-10 mSv [ped] ☼☼☼☼	Usually not appropriate
		<input type="radio"/> CT abdomen and pelvis without and with IV contrast	10-30 mSv ☼☼☼☼	10-30 mSv [ped] ☼☼☼☼☼	Usually not appropriate
		<input type="radio"/> WBC scan abdomen and pelvis	10-30 mSv ☼☼☼☼		Usually not appropriate

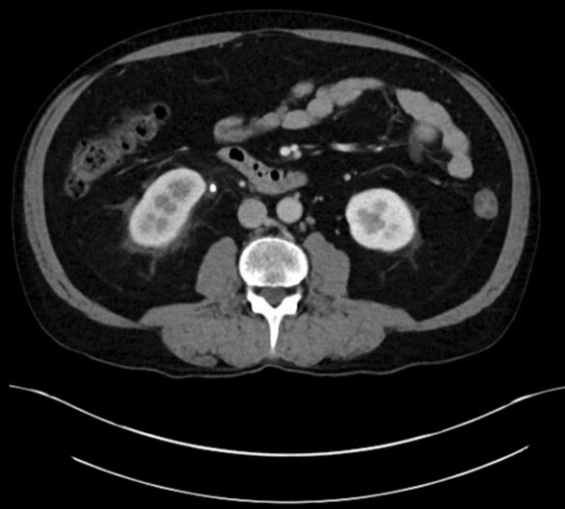


This imaging modality was ordered by the ER physician

Findings (unlabeled)



Axial



CT AP with contrast



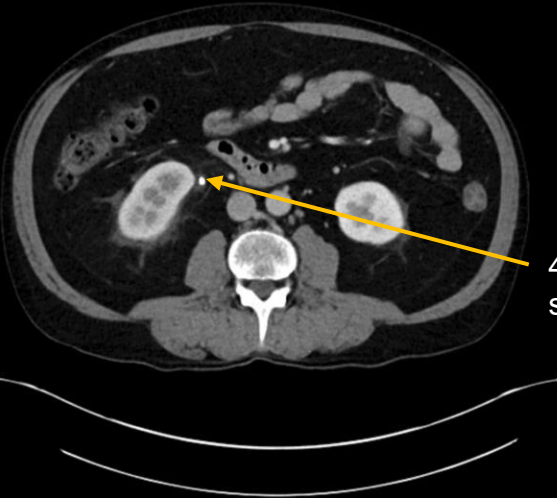
Coronal

Findings (labeled)

Moderate right sided hydronephrosis with perinephric stranding



Axial



4 mm obstructing stone at the UPJ



Coronal

Findings (unlabeled)



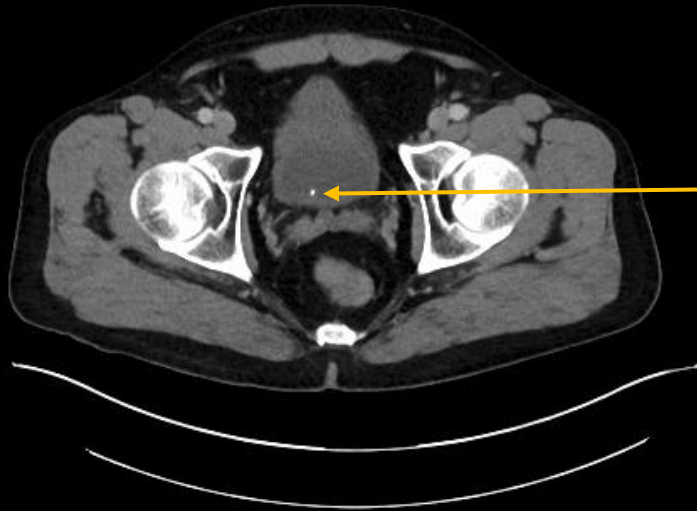
Axial



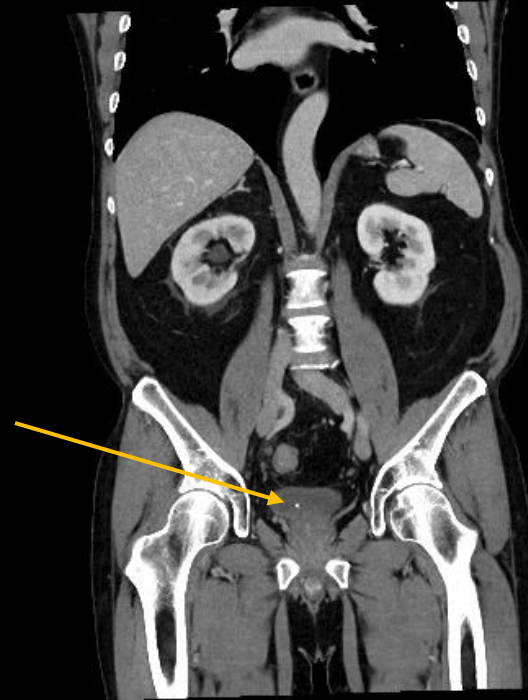
Coronal

CT AP with contrast

Findings (unlabeled)



A second 3 mm stone
to the right of midline in
the urinary bladder



Final Dx:

Hydronephrosis caused by ureteral stone

Hydronephrosis

- **Definition**

- Unilateral or bilateral dilation of the urinary collecting duct

- **Causes**

- Generally related to the obstruction of urine outflow
- Patients may present with bilateral or unilateral hydronephrosis
- Unilateral causes: Urolithiasis, malignancy, upper urinary tract infection, pregnancy
- Bilateral causes: Malignant obstruction (uterine, bladder, prostate), benign prostatic hyperplasia, congenital posterior urethral valves

- **Presentation**

- Patients are often asymptomatic. However, symptomatic patients may experience back pain that radiates to the abdomen or groin, dysuria, fever, nausea or vomiting, or hematuria

Imaging

Hydronephrosis may be identified incidentally, or in a symptomatic patient with flank or groin pain, nausea, or urinary urgency. A rising creatinine may be associated with these symptoms.

If a patient is suspected to have hydronephrosis, CT IV Urography and/or Ultrasound are the imaging of choice.

Findings

- CT: Will see a collecting duct, this is normally not seen on CT and an indication of dilation
- Ultrasound: Will see a dilated collecting duct, represented as an anechoic interconnected space with enhancement within the renal sinus. A thin renal cortex could imply chronic hydronephrosis.

Hydronephrosis

- **Complications**

- If left untreated, it can lead to several complications. The most severe being end-stage renal disease and Urosepsis

- **Management**

- Treat the underlying causes. This patient, with a 4mm stone, was medically managed with oxycodone, tamsulosin, and aggressive hydration with water

Pearl: If you are seeing a collecting system a little too easily, it's probably dilated – look for an obstructive cause

References:

Hsu S, Fan C, Liu H. Obstructive hydronephrosis with secondary urosepsis. *Clinical Case Reports*. 2022;10(4). doi:10.1002/ccr3.5689

Patel K, Batura D. An overview of hydronephrosis in adults. *British Journal of Hospital Medicine*. 2020;81(1):1-8. doi:10.12968/hmed.2019.0274

Whitworth P, Courtney KG, Oto A, et al. ACR appropriateness criteria® hydronephrosis on prior imaging-unknown cause. *Journal of the American College of Radiology*. 2024;21(6). doi:10.1016/j.jacr.2024.02.020

3. ACR AC Portal. Accessed July 27, 2025. <https://gravitas.acr.org/ACPortal/GetDataForOneScenario?senarioId=6314>.

Zambon JP, Koslov DS, Mihai B, Badlani GH. Bladder and ureteral dysfunction leading to hydronephrosis and hydroureteronephrosis in adults. *Urology*. 2018;117:1-8. doi:10.1016/j.urology.2017.11.049