

AMSER Case of the Month

August 2024

59-year-old patient with history of bladder cancer

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Patient Presentation

HPI: 59-year-old woman with history of transitional cell carcinoma status post cystectomy with Indiana pouch urinary diversion presents for post-treatment surveillance. Patient reports regular self catheterization every 4 hours. Denies dysuria and hematuria.

Patient Presentation (cont.)

Past Medical History: Transitional cell carcinoma, left internal carotid artery stenosis

Past Surgical History: Cystectomy with Indiana Pouch (2018), Left TCAR (2023)

Social History: Daily tobacco and vape usage

Daily Medications: Albuterol, Aspirin, Atorvastatin, Clonazepam, Clopidogrel, Trelegy Ellipta

Vitals: Stable

Pertinent Labs: Unremarkable

What Imaging Should We Order?

Select the applicable ACR Appropriateness Criteria

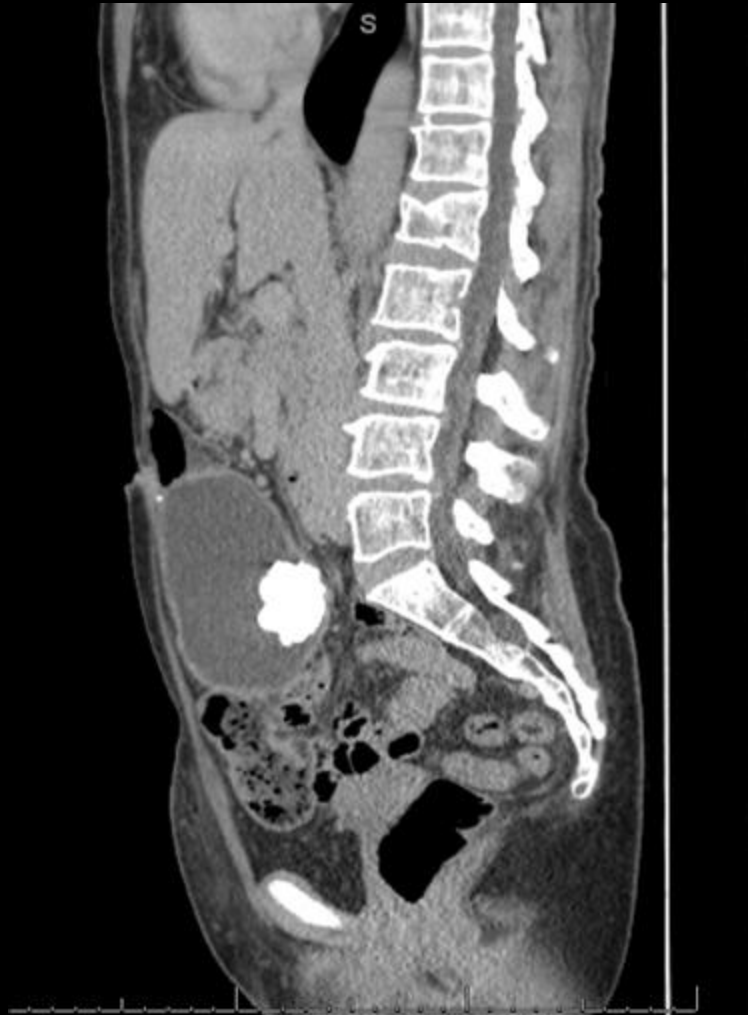
Variant 3: Muscle-invasive bladder cancer with or without cystectomy. Post-treatment surveillance.

Procedure	Appropriateness Category	Relative Radiation Level
Radiography chest	Usually Appropriate	☼
Fluoroscopy abdomen loopogram	Usually Appropriate	☼☼☼
MRI abdomen and pelvis without and with IV contrast	Usually Appropriate	○
MRU without and with IV contrast	Usually Appropriate	○
CT abdomen and pelvis with IV contrast	Usually Appropriate	☼☼☼
CTU without and with IV contrast	Usually Appropriate	☼☼☼☼
MRI abdomen and pelvis without IV contrast	May Be Appropriate (Disagreement)	○
CT chest with IV contrast	May Be Appropriate	☼☼☼
CT chest without IV contrast	May Be Appropriate	☼☼☼
CT abdomen and pelvis without and with IV contrast	May Be Appropriate (Disagreement)	☼☼☼☼
FDG-PET/CT skull base to mid-thigh	May Be Appropriate	☼☼☼☼
US pelvis (bladder)	Usually Not Appropriate	○
Radiography intravenous urography	Usually Not Appropriate	☼☼☼
CT abdomen and pelvis without IV contrast	Usually Not Appropriate	☼☼☼
CT chest without and with IV contrast	Usually Not Appropriate	☼☼☼



This imaging modality was ordered by the physician

Findings (unlabeled)

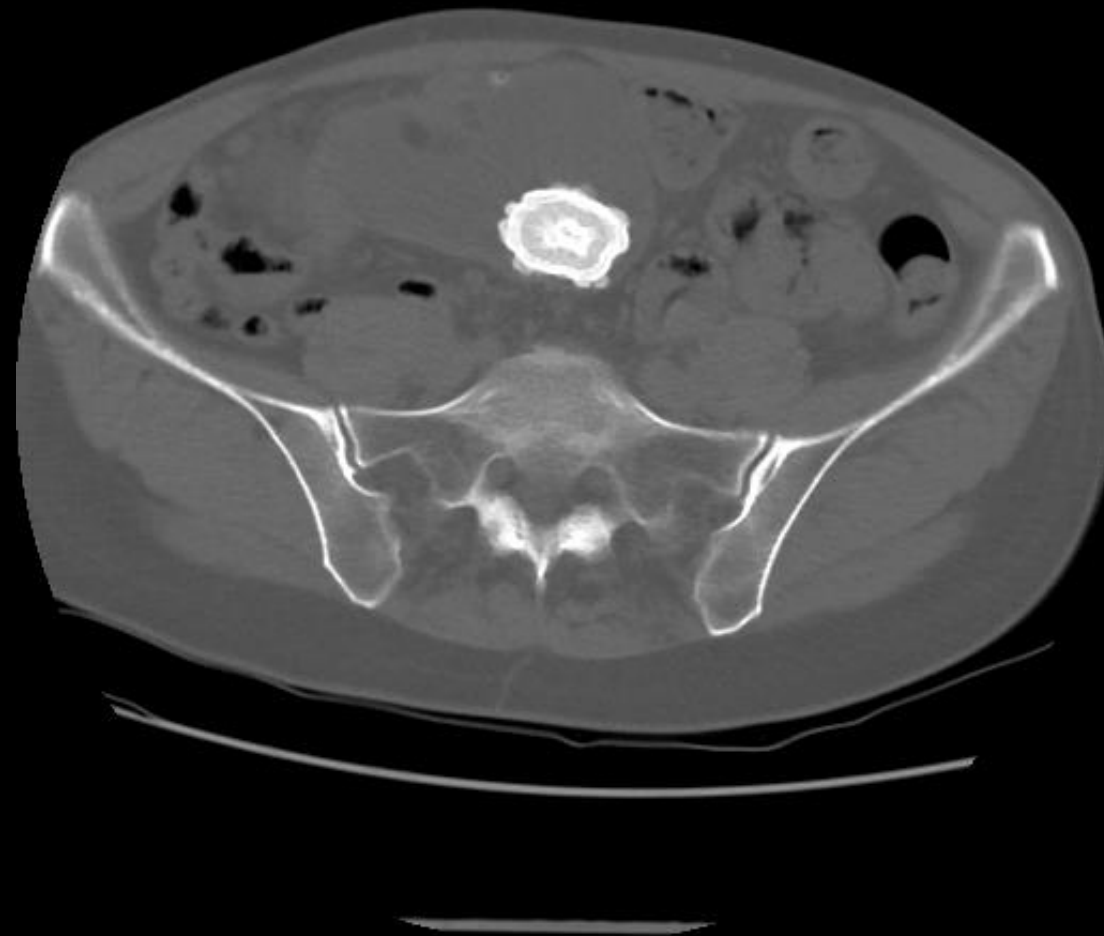


Findings: (labeled)

CT abdomen and pelvis sagittal view showing a 3.7 x 3.2 calculus within the Indiana pouch with multiple small excrescences

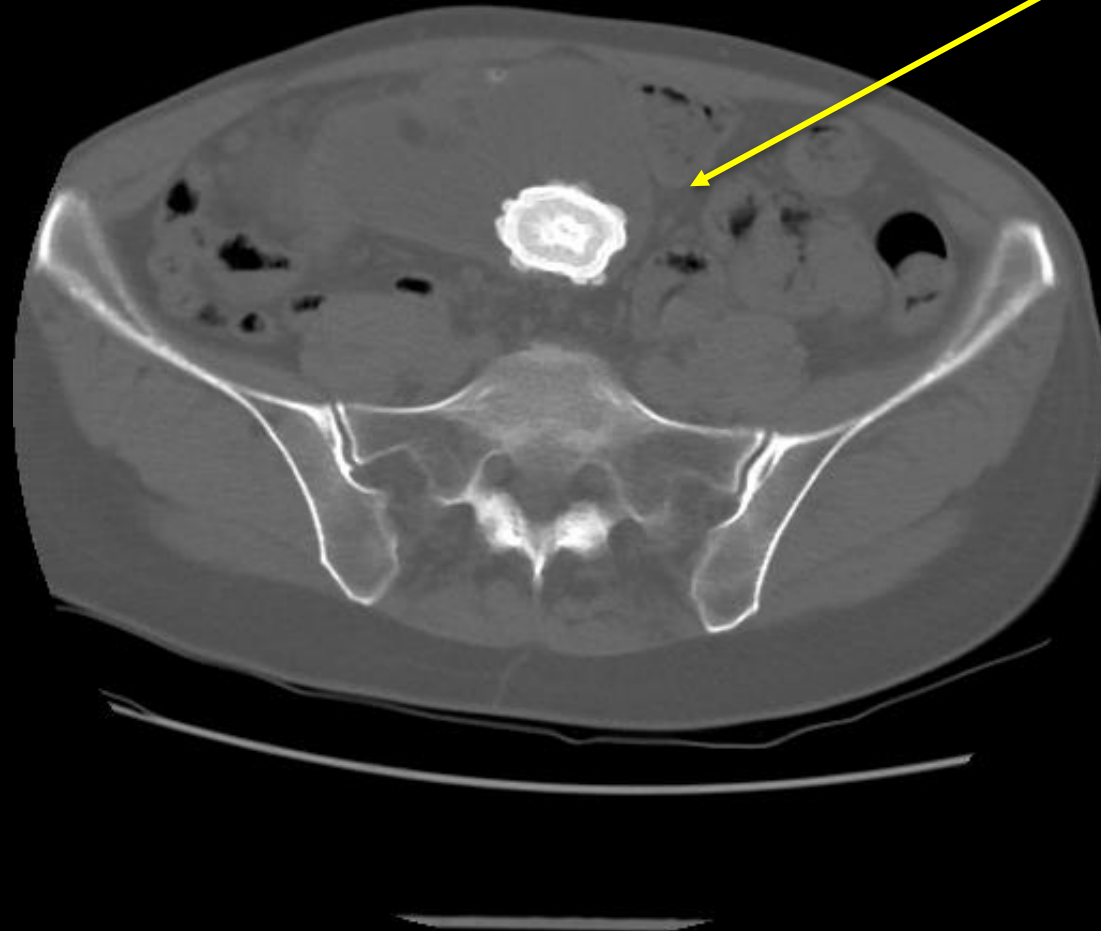


Findings (unlabeled)



Findings: (labeled)

Axial view in bone windows showing stone in the dependent portion of the Indiana pouch with internal lamellated appearance



Final Diagnosis:

Jack Stone Calculus



Case Discussion

Definition: A jack stone calculus is a subtype of urinary calculus characterized by a spiculated appearance with a dense core that resembles the six-pointed toys called jacks. The stones are typically composed of calcium oxalate dihydrate.

Pathophysiology: It is hypothesised that a jack stone forms through repeated contact with the bladder wall at the extremities of its spikes. This contact erodes the soft apatite and any associated mucoprotein, while allowing for the deposition of additional calcium oxalate. Because of this, the stone grows only at the tips, producing the characteristic “jack” shape.

Case Discussion

Risk Factors: Bladder outlet obstruction, prostatic diseases, previous lower urinary tract surgery, metabolic abnormalities, foreign bodies in the bladder, spinal cord injuries, dietary factors, dehydration, medications (tosufloxacin, triamterene, ect.)

Complications: Chronic bladder irritation, chronic urinary tract infections, fistula formation and urethral obstruction

Diagnosis: CT is the most accurate radiological tool for the evaluation of jack stone calculi. It is useful in observing the heterogeneity of a stone as well as predicting the precise size with the use of multiplanar reformation.

Treatment: Calculi made up of calcium oxalate dihydrate are particularly susceptible to fragmentation through lithotripsy.

References

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Singh KJ, Tiwari A, Goyal A. Jackstone: A rare entity of vesical calculus. Indian J Urol. 2011 Oct;27(4):543-4. doi: 10.4103/0970-1591.91449. PMID: 22279326; PMCID: PMC3263228.
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