

**Genitourinary Radiology
In-Training Test Questions
for Diagnostic Radiology Residents**



QUALITY IS OUR IMAGE

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Sponsored by:

Commission on Education

Committee on Residency Training in Diagnostic Radiology

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1. OK Concerning congenital ureteropelvic junction (UPJ) obstruction, which one of the following is TRUE?
- A. It is an uncommon cause of hydronephrosis in children.
 - B. Urinary tract infection is the most common presentation.
 - C. Females and males are affected equally.
 - D. The presence of crossing vessels decreases the success rate of pyeloplasty.

Rationales:

A. *Incorrect.* It is the MOST common cause of hydronephrosis in children.

B. *Incorrect.* UPJ obstruction is being discovered increasingly in the prenatal period due to frequent use of obstetric ultrasound. When detected due to symptoms or signs, congenital ureteropelvic junction obstruction most often presents in infancy or childhood with an abdominal mass, flank or abdominal pain, failure to thrive, or nonspecific gastrointestinal complaints. Infection, hypertension, hematuria, and stone formation less commonly are the cause for the child to come to medical attention. In a significant number of cases, the disorder is clinically silent into adulthood, when hematuria, flank pain, fever, or rarely, hypertension, are the presenting clinical symptoms. Pain in adults is often episodic and in some cases may only present by high urine flow rates such as those produced by beer drinking.

C. *Incorrect.* Males are affected more than females by 2:1.

D. **Correct.** Crossing vessels are seen in only 15%-20% of cases but significantly reduce the success of pyeloplasty. Thus, many advocate the use of CT for preoperative planning.

Citations:

Davidson AJ, Hartman DS, eds. *Radiology of the Kidney and Urinary Tract*. Philadelphia, PA: W.B. Saunders, 1984.

Herts BR. Helical CT and CT angiography for the identification of crossing vessels at the ureteropelvic junction. *Urol Clin North Am*. 1998;25(2):259-269.

Sandler CM, Newhouse JH, Amis Jr SE, Dunnick NR. *Textbook of Uroradiology*. 3rd ed. Philadelphia, Pa: Lippincott, Williams, & Wilkins; 2001.

2. Concerning blunt trauma to the bladder, which one of the following is TRUE?
- A. Intraperitoneal rupture accounts for the majority of cases.
 - B. Less than 20% of extraperitoneal ruptures have pelvic fractures.
 - C. Intraperitoneal rupture is typically treated with surgical repair.
 - D. CT with intravenous contrast can exclude major bladder injury.

Rationales:

A. *Incorrect.* Extraperitoneal bladder ruptures account for 80%-90% of major bladder injuries.

Intraperitoneal ruptures account for 10%-20% of major bladder injuries.

B. *Incorrect.* Extraperitoneal bladder ruptures are almost always associated with pelvic fractures and are due to bladder laceration by the fracture fragments.

C. **Correct.** Intraperitoneal bladder rupture is typically treated with surgical repair of the tear and diverting vesicostomy.

D. *Incorrect.* Even delayed images of the bladder with CT and intravenous contrast are not adequate to exclude major bladder injury. This is because there is inadequate distension of the bladder. At least 300 ml of fluid is required to adequately distend the bladder and evaluate for extravasation.

Citations:

Sandler CM, Newhouse JH, Amis Jr SE, Dunnick NR. *Textbook of Uroradiology*. 3rd ed. Philadelphia, Pa: Lippincott, Williams, & Wilkins; 2001.

Vaccaro JP, Brody JM. CT cystography in the evaluation of major bladder trauma. *Radiographics*. 2000;20:1373-1381.

3. Concerning renal cystic disease, which one is TRUE?
- A. Autosomal recessive polycystic disease typically presents as multiple bilateral cysts in adulthood.
 - B. Autosomal dominant polycystic disease typically presents as enlarged hyperechoic kidneys in the neonatal period.
 - C. Acquired cystic renal disease in chronic renal failure patients on dialysis is indistinguishable from autosomal dominant polycystic disease.
 - D. Autosomal dominant polycystic disease has a higher incidence of associated hepatic cysts than does autosomal recessive polycystic disease.

Rationales:

A. *Incorrect.* Autosomal dominant polycystic disease usually presents with multiple bilateral simple renal cysts between ages 20-39 years. Autosomal recessive polycystic disease has a spectrum of presentation ages but is typically seen from the neonatal through childhood periods rather than adulthood.

B. *Incorrect.* This description is more typical of the appearance of the infantile form of ARPKD.

C. *Incorrect.* The kidneys are typically small and atrophic with multiple cysts in acquired cystic renal disease of dialysis as compared to markedly enlarged kidneys in ADPCD.

D. **Correct.** ADPCD typically has multiple hepatic cysts in over 50% of cases. Autosomal recessive polycystic disease is associated with hepatic fibrosis particularly in the juvenile onset form.

Citations:

Dunnick, Sandler, Newhouse, Amis, Textbook of Uroradiology. 3rd edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2001.

4. Which statement is TRUE concerning seminal vesicle cysts?
- A. They are associated with ipsilateral renal agenesis.
 - B. They are usually midline in location.
 - C. They are usually bilateral.
 - D. They are usually caused by prostate carcinoma.

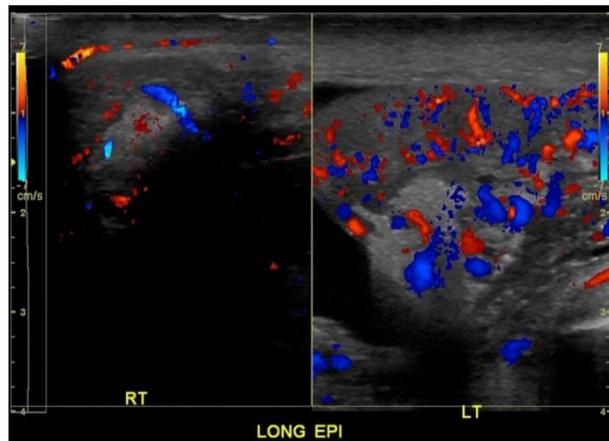
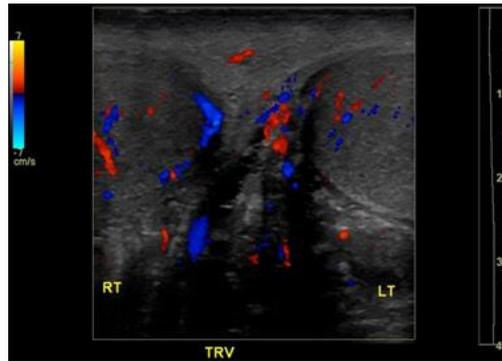
Rationales:

- A. **Correct.** Ipsilateral seminal vesicle cysts, absent ipsilateral ureter, absent ipsilateral hemitrigone and absent ipsilateral vas deferens are all associated with renal agenesis.
- B. *Incorrect.* They are usually lateral to the prostate.
- C. *Incorrect.* They are typically unilateral.
- D. *Incorrect.* They are usually due to congenital hypoplasia of the ejaculatory duct.

Citations:

Zagoria RJ, Tung GA, Genitourinary Radiology, The Requisites. First edition. St. Louis, MO: Mosby, 1997, pp 53-4, 327.

5. You are shown two images (Figure A and Figure B). What is the most likely diagnosis?

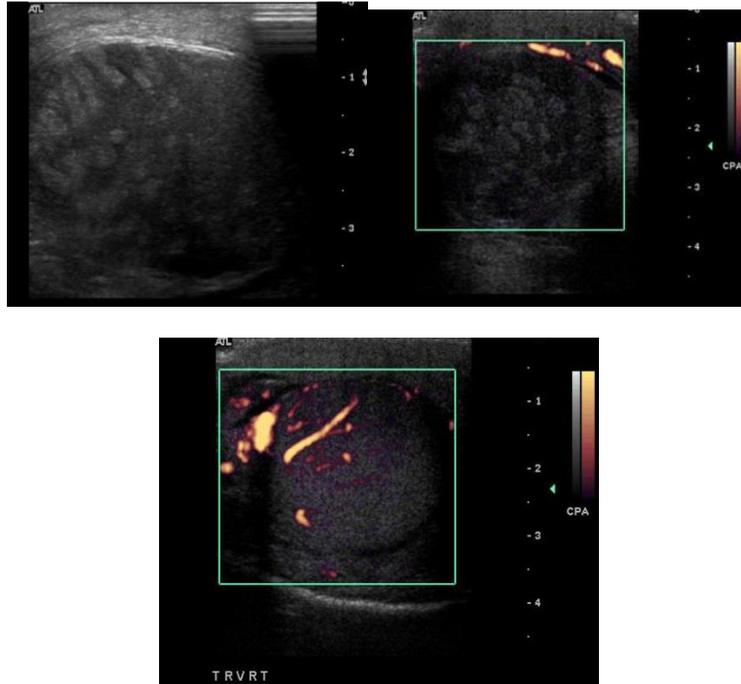


- A. Left testicular torsion.
- B. Right testicular torsion.
- C. Left epididymitis.
- D. Left epididymo-orchitis.

Rationales:

- A. *Incorrect.* The left testicle has normal vascularity, which is symmetric to the right.
- B. *Incorrect.* The right testicle has normal vascularity.
- C. **Correct.** The images demonstrate increased flow throughout the left epididymis.
- D. *Incorrect.* The images demonstrate normal flow in the left testicle, and increased flow in the left epididymis consistent with epididymitis.

6. A 21-year-old man presents with scrotal swelling and pain. What is the most likely diagnosis?

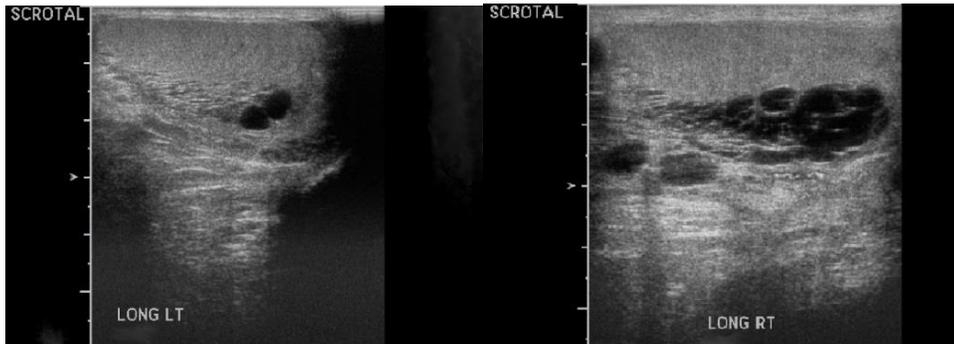


- A. Left testicular torsion with viable left testicle
- B. Left testicular torsion with infarcted left testicle
- C. Right testicle with acute orchitis
- D. Left testicular lymphoma

Rationales:

- A. *Incorrect.* The ultrasound images show lack of flow within the left testicle, indicating the diagnosis of testicular torsion in this 21 year old. However, if the left testicle was still viable, the echotexture of the left testicle on gray scale would be normal or nearly normal as compared to the asymptomatic right side.
- B. **Correct.** On power Doppler, there is no flow in the left testicle, compared to the normal right. In addition, the left testicle is very heterogeneous in echotexture with areas of increased echogenicities, indicating hemorrhage and infarction in a non viable testicle.
- C. *Incorrect.* The flow within the right testicle is normal. Acute orchitis presents as an enlarged edematous testicle with increased flow. It is generally (but not always) associated with acute epididymitis.
- D. *Incorrect.* Testicular lymphoma does present as an enlarged heterogeneous testicle. However, lymphomatous masses are generally hypoechoic. There is associated increased vascularity. The age group is also wrong as lymphoma of the testicle (as opposed to leukemic rests) is usually found in older men, above 60 to 70 years of age. There was no indication given that this patient had a history of leukemia or was immunocompromised.

7. Regarding submitted images of the scrotum, what is the most likely diagnosis?



- A. Bilateral germ cell tumors.
- B. Bilateral testicular abscesses.
- C. Tubular ectasia of the rete testis
- D. Tunica albuginea cysts.

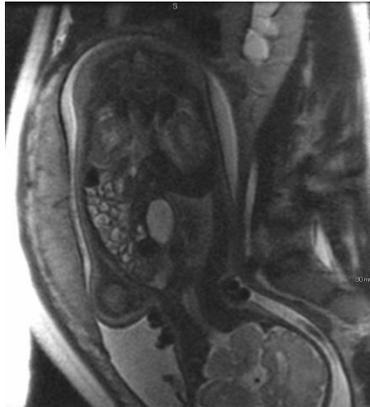
Rationales:

- A. *Incorrect:* Testicular torsion typically presents as acute testicular pain with or without testicular enlargement. Testicular echogenicity is typically homogeneous, with normal testicular echogenicity initially, becoming hypoechoic with ongoing torsion and infarct.
- B. **Correct:** The images show an intratesticular mass. Seminoma is the most common solid intratesticular neoplasm.
- C. *Incorrect:* While epididymo-orchitis can cause enlargement of the testicle as well as hypoechoic areas within the testicle, it is not typically painless.
- D. *Incorrect:* While lymphoma could present as a testicular mass, it is less common than germ cell tumors such as seminoma.

Citations:

Dunnick, Sandler, Newhouse, Amis, Textbook of Uroradiology. 3rd edition. Philadelphia, PA: Lippincott Williams & Wilkins, 2001, pp 436-449.

8. What is the salient abnormality illustrated in the image?

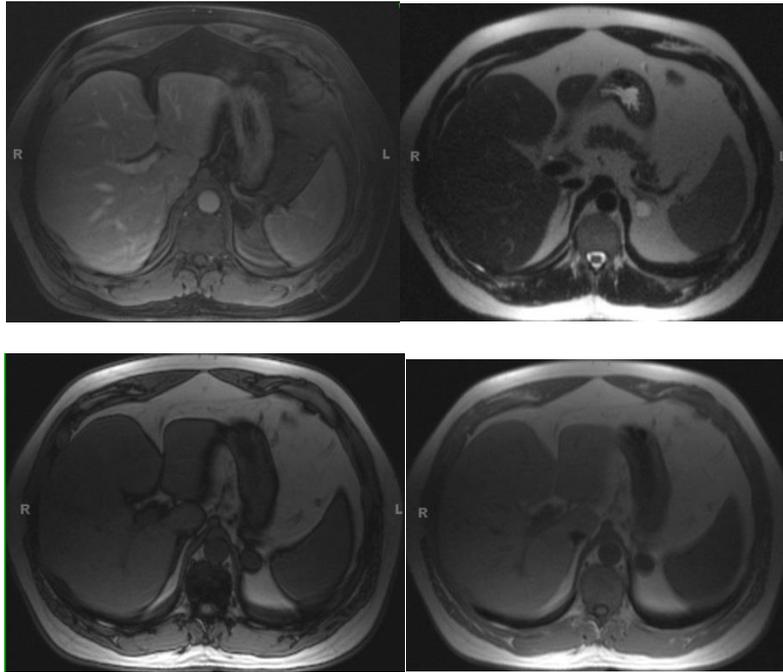


- A. Congenital diaphragmatic hernia
- B. Bronchogenic cyst
- C. Congenital cystic adenomatoid malformation
- D. Bronchopulmonary sequestration

Rationales:

- A. **Correct.** Numerous loops of small bowel and the stomach are situated within the left hemithorax consistent with a congenital diaphragmatic hernia.
- B. *Incorrect.* A bronchogenic cyst may mimic an intrathoracic stomach in that it presents as a rounded intrathoracic structure which is hyperintense on T2-weighted images. However, there are several rounded hyperintense structures in the left hemithorax.
- C. *Incorrect.* There are three pathologic varieties of congenital cystic adenomatoid malformation (CCAM). Type I lesions are uni- or multilocular lesions which are hyperintense on T2-weighted images; the cysts range in size from 3 cm to 10 cm. Type II lesions have a variable appearance as they can be composed of cysts ranging in size from 0.5 cm to 2 cm. As type III lesions are composed of tiny (usually <0.2 cm) cysts, they tend to have a solid appearance on MRI. While the intrathoracic small bowel and stomach could be confused as a large type I CCAM, it is important to note the continuity of the small bowel into the peritoneum.
- D. *Incorrect.* Bronchopulmonary sequestration generally presents as a uniform mass which is hyperintense on T2-weighted images.

9. A 50-year-old female with incidental adrenal lesions identified on a prior CT scan. What is the best diagnosis?

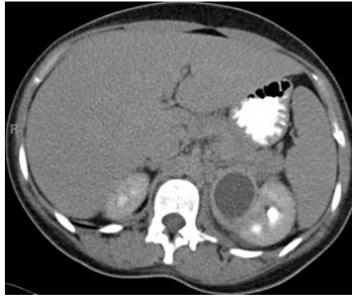


- A. Adrenal Adenoma
- B. Adrenal Hemorrhage
- C. Adrenal Pheochromocytoma
- D. Adrenal Cyst

Rationales:

- A. *Incorrect.* Images provided show a lesion with no enhancement and no signal drop off on opposed phase imaging.
- B. *Incorrect.* The lesion is not bright on T1 weighted image. The lesion has signal characteristics of simple fluid.
- C. *Incorrect.* The MRI images show a nonenhancing lesion that has signal characteristics of simple fluid. While a pheochromocytoma is often bright on T2 weighted imaging, it would be expected to enhance post contrast.
- D. **Correct.** The lesion is not enhancing and has signal characteristics of simple fluid.

11. A 25-year-old female presents with left flank pain. What is the best diagnosis?



- A. Renal Abscess
- B. Bosniak 3 Cyst
- C. Obstructed Upper Pole
- D. Renal Cell Carcinoma

Rationales:

- A. *Incorrect.* The images demonstrate a duplicated, dilated upper pole, with ectopic ureter. There is also no adjacent inflammatory change to suggest abscess.
- B. *Incorrect.* The images demonstrate a duplicated, dilated upper pole, with ectopic ureter, not a complex cystic lesion.
- C. **Correct.** The images demonstrate a duplicated, dilated upper pole collecting system, with ectopic ureter.
- D. *Incorrect.* The images demonstrate a duplicated, dilated upper pole, with ectopic ureter. There is also no solid enhancing material associated to suggest renal neoplasm.