Genitourinary Radiology
In-Training Test Questions
for Diagnostic Radiology Residents

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1. Concerning congenital ureteropelvic junction (UPJ) obstruction, which one of the following is TRUE?

A. It is an uncommon cause of hydrourephrosis 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 hydrourephrosis 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:

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:

3. Which statement is TRUE concerning bladder rupture?

A. There is equal incidence between intraperitoneal and extraperitoneal rupture.
B. Extraperitoneal bladder rupture causes an elevated serum creatinine level.
C. Delayed images after a contrast-enhanced CT scan are sufficient to exclude it.
D. Intraperitoneal bladder rupture requires surgical repair.

Rationales:
A. Incorrect. Most bladder ruptures, two-thirds, are extraperitoneal, caused by trauma and pelvic fractures.
B. Incorrect. The uremia and elevated creatinine occur because of INTRAPERITONEAL ruptures, not extraperitoneal ruptures.
C. Incorrect. CT cystograms require active distention of the bladder with contrast. Passive filling of the bladder, such as seen in delayed images through the bladder after a normal contrast exam, may miss intraperitoneal ruptures which occur high in the dome, and thus may be higher than the level of the contrast-opacified urine seen during passive filling of the bladder. A CT cystogram, with active filling, overcomes this obstacle, by filling the entire bladder lumen with contrast. In addition, CT cystograms do not require post-void images.
D. Correct. Intraperitoneal bladder rupture generally require surgical closure. They do not close on their own. If uncorrected, they cause uremia and elevated creatinine as noted above.
4. Concerning prostate carcinoma, which one of the following is CORRECT?

A. 30% of prostate cancers arise from the peripheral zone of the prostate.
B. T1-weighted images provide the best contrast for detecting most prostate carcinomas.
C. Most prostate cancers demonstrate increased enhancement on immediate post- gadolinium fat-saturated T1 images.
D. Prostate cancer metastasizes early along the gonadal vein/lymphatic pathway to the periaortic and pericaval region near the level of the kidneys

Rationales:
A. Incorrect. 70% of prostate cancers arise from the peripheral zone, the remainder from the transitional and central zones.
B. Incorrect. Prostate carcinomas in the peripheral zone are generally isointense to surrounding prostate tissue on T1-weighted images. T2-weighted images demonstrate prostate cancers as low signal intensity compared to the surrounding normal high signal intensity peripheral zone.
C. Correct. Prostate cancer in the peripheral zone (where the majority of prostate cancers arise) demonstrates increased enhancement compared to the normal peripheral zone tissue.
D. Incorrect. This metastatic pathway is characteristic of testicular neoplasms, not prostatic. Lymph node metastases from prostate carcinoma are generally first to the obturator, external and internal iliac chains.

5. Concerning adrenal adenomas, which one is TRUE?

A. They are a more common cause of adrenal mass than is metastatic disease.
B. They typically have non-IV contrast density of more than 20 Hounsfield units.
C. They typically show no decrease in signal intensity on opposed phase MR imaging.
D. They typically retain 90% of their immediate contrast value on 10-minute delayed CT exam.

Rationales:
A. Correct. Adenomas are the most common adrenal mass and occur in 2 - 8 % of the population.
B. Incorrect. Adenomas most often have non contrast density of less than 10 H.U.
C. Incorrect. Adenomas typically decrease in signal intensity on the out of phase portion of opposed phase imaging.
D. Incorrect. Adenomas typically washout 50% of their initial enhancement levels on a 10 minute delayed CT exam.
6. Concerning urothelial malignancy, which statement is TRUE?

A. Adenocarcinoma is the second most common urothelial malignancy.
B. Leukoplakia is associated with transitional cell carcinoma of the bladder at the urachal remnant.
C. Transitional cell carcinoma of the upper collecting system is less common than within the bladder.
D. Fifty percent of primary renal malignancies develop from the urothelium.

Rationales:
A. Incorrect. Transitional cell carcinoma is the most common urothelial malignancy followed by squamous cell carcinoma. Adenocarcinoma is distinctly rare.
B. Incorrect. Leukoplakia is associated with squamous cell carcinoma of the bladder, not transitional cell carcinoma. The urachus is a site where transitional epithelium can undergo metaplasia to glandular epithelium and result in adenocarcinoma.
C. Correct. The entire urothelium is at risk, but transitional cell carcinomas are more common in the bladder than in the upper tracts.
D. Incorrect. 8% of renal malignancies develop from the urothelium.

7. 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.
8. Concerning testicular neoplasms, which of the following is TRUE?

A. Most testicular tumors present as painful masses.
B. Isolated testicular microlithiasis usually progresses to testicular cancer.
C. Seminoma is the most common type of testicular cancer in adults.
D. Sonography is able to detect only about 60% of testicular tumors.

RATIONALES:
A. Incorrect. Testicular neoplasms most commonly present as a painless mass.
B. Incorrect. Although about 10% of patients with microlithiasis have a testicular germ cell tumor detected sonographically at the time of their initial ultrasound examination, and there have been case reports of patients who initially present with isolated microlithiasis (i.e., testicular microlithiasis with no tumor), longitudinal data on groups of patients with isolated testicular microlithiasis have suggest that the risk, if real, is quite low.
C. Correct. Seminoma is the most common adult testicular tumors, accounting for 40-50% of adult neoplasms.
D. Incorrect. Sonography is highly sensitive (95 to 100 %) for the detection of testicular tumors.

References:

9. Concerning malacoplakia, which of the following is TRUE?

A. It is a premalignant condition.
B. It is associated with patients who are immunocompromised.
C. The renal pelvis is the most common site of urinary tract involvement.
D. It contains eosinophilic staining inclusions known as Howell-Jolly bodies.

RATIONALES:
A. Incorrect. It is not a premalignant condition.
B. Correct. Malacoplakia is an uncommon inflammatory condition of the ureter associated with chronic urinary tract infection. It is more common among immunocompromised patients.
C. Incorrect. The urinary bladder is the most common site of urinary tract involvement.
D. Incorrect. Contain basophilic staining inclusions known as Michaleis-Gutmann bodies.

10. Concerning a 3.0 cm simple ovarian cyst in an asymptomatic, post-menopausal woman, which of the following is TRUE?

A. It has a moderate to high risk of being malignant and should be removed.
B. Fibrothecoma is the most common neoplasm associated with this finding.
C. The cyst should be removed if the patient has an increased serum CA-125 level.
D. It requires no further follow-up treatment.

RATIONALES:
A. Incorrect. The risk of malignancy for a simple cyst smaller than 5.0 cm diameter in a post-menopausal woman is very low and these masses can be followed with repeat ultrasound exams every 3-6 months without operative intervention.
B. Incorrect. The most common neoplasm in those cases that had surgical removal is serous cystadenoma.
C. Correct. The CA-125 is a tumor marker that if elevated in a post-menopausal woman with an ovarian cyst indicates that removal is required.
D. Incorrect. See “A” above. The natural history of these masses is unknown and follow-up is required.

References:
Bailey CL et al. The malignant potential of small cystic ovarian tumors in women over 50 years of age. Gynecol Oncol. 1998 Apr;69(1):3-7

11. 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.

References:
12. Which of the following is TRUE concerning papillary necrosis?

A. Common etiologies are analgesics, diabetes mellitus, and sickle cell anemia.
B. Conventional radiographs usually show characteristic calcification.
C. Approximately 90% of patients with sickle cell disease develop papillary necrosis.
D. Medullary type papillary necrosis is associated with an absence of the entire papilla.

RATIONALES:
A. Correct. The common etiologies of papillary necrosis have been immortalized by the mnemonic NSAID: Non-steroidal anti-inflammatory drugs, Sickle cell anemia, Analgesic nephropathy, Infection (such as tuberculosis) and Diabetes mellitus.
B. Incorrect. Radiographs are usually normal. They can also show irregular calcifications 2-6 mm in size if part or all of the papilla is necrotic and may show a ring of calcification in a sloughed but retained papilla.
C. Incorrect. Up to 50% of sickle cell patients develop papillary necrosis.
D. Incorrect. Medullary type papillary necrosis shows only central erosion of the papilla.

References: