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Exam : **AB-Abdomen**

Title : Abdomen Sonography
Examination

Version : DEMO

1. Which condition is most likely depicted in this image?



- A. Bowel obstruction
- B. Diverticulitis
- C. Appendicitis
- D. Intussusception

Answer: D

Explanation:

The ultrasound image shows a classic “target sign” or “donut sign,” characterized by concentric rings of alternating echogenicity. This sonographic finding is pathognomonic for intussusception, particularly when seen in the transverse plane.

Intussusception occurs when a segment of bowel telescopes into an adjacent segment, typically in children aged 6 months to 3 years. It commonly presents with intermittent abdominal pain, vomiting, and sometimes “red currant jelly” stools.

Key ultrasound features of intussusception:

Target sign in transverse view (concentric rings of bowel layers)

Pseudokidney or sandwich sign in longitudinal view

May show intraluminal mesenteric fat or vessels dragged in with the intussusceptum

Comparison of answer choices:

A. Bowel obstruction may show dilated loops of bowel with air-fluid levels and to-and-fro peristalsis but lacks the concentric ring sign.

- B. Diverticulitis typically shows bowel wall thickening and pericolic fat stranding; not the concentric target appearance.
- C. Appendicitis may appear as a blind-ending tubular structure (>6 mm), not with concentric ring pattern.
- D. Intussusception — Correct. The image demonstrates the classic target sign seen with this condition.

References:

Coley BD. US of gastrointestinal tract abnormalities in infants and children. *Radiographics*. 2005;25(1):27–47.
Rumack CM, Wilson SR, Charboneau JW, Levine D. *Diagnostic Ultrasound*, 5th ed. Elsevier; 2017.
AIUM Practice Parameter for the Performance of Pediatric Ultrasound (2021).

2. In which position should a patient be placed when internal echoes are seen within a fluid-filled bladder?

- A. Erect
- B. Trendelenburg
- C. Lateral decubitus
- D. Fowler

Answer: C

Explanation:

Lateral decubitus positioning allows shifting of internal echoes within the bladder, helping differentiate mobile debris (such as blood clots or sediment) from adherent masses like tumors. This technique is helpful in evaluating questionable bladder filling defects.

According to Rumack's *Diagnostic Ultrasound*:

“Changing the patient's position, such as turning to the lateral decubitus, can help distinguish mobile debris from attached bladder wall lesions.”

Reference: Rumack CM, Wilson SR, Charboneau JW, Levine D. *Diagnostic Ultrasound*. 5th ed. Elsevier, 2017.
AIUM Practice Parameter for Bladder Ultrasound, 2020.

3. Which type of hernia is located medial to the inferior epigastric artery?

- A. Direct inguinal
- B. Indirect inguinal
- C. Spigelian
- D. Femoral

Answer: A

Explanation:

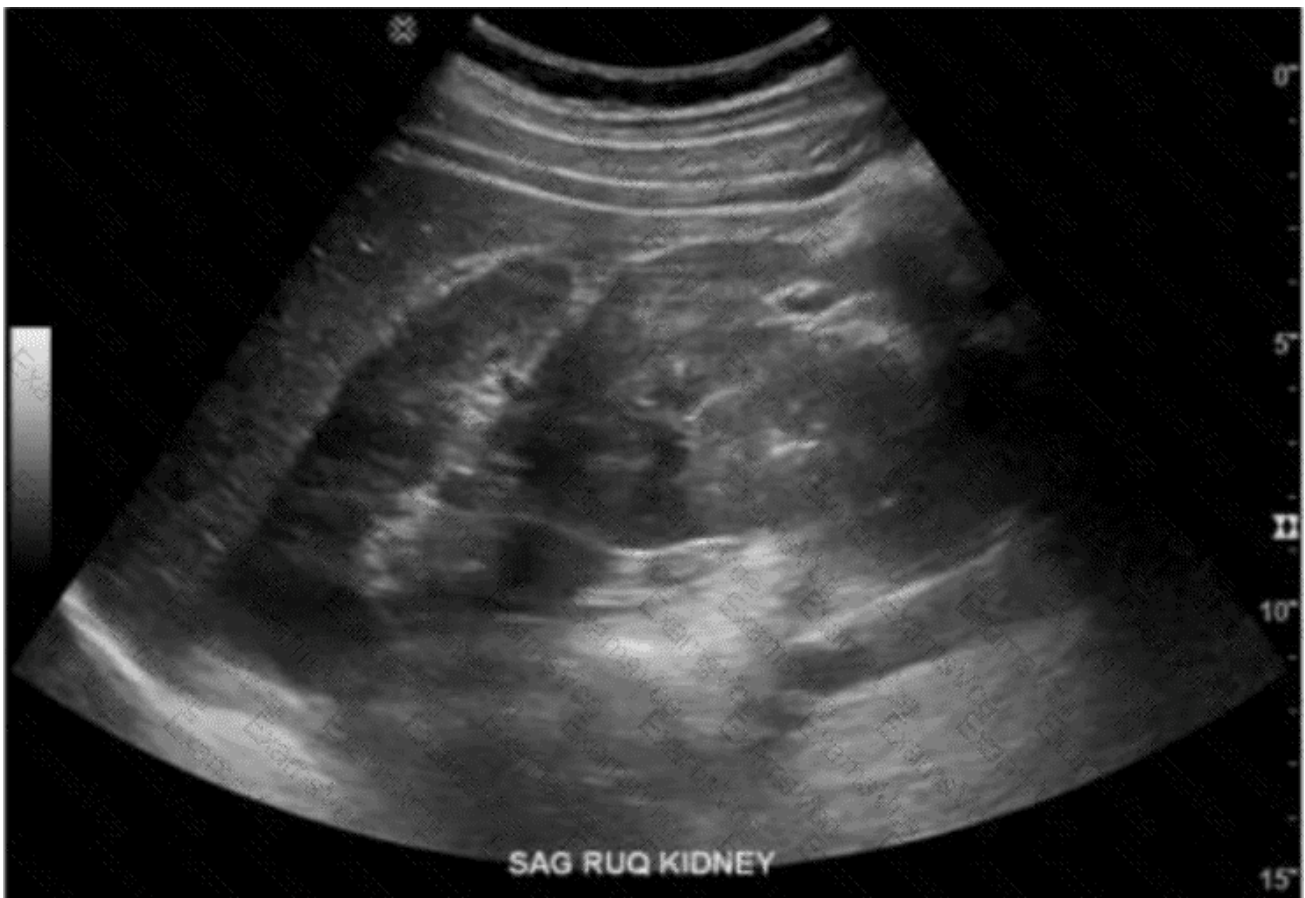
Direct inguinal hernias protrude through Hesselbach's triangle, which lies medial to the inferior epigastric artery. In contrast, indirect inguinal hernias pass lateral to the inferior epigastric artery via the deep inguinal ring.

According to Moore's *Clinically Oriented Anatomy*:

“Direct inguinal hernias occur medial to the inferior epigastric vessels, within Hesselbach's triangle.”

Reference: Moore KL, Dalley AF, Agur AMR. *Clinically Oriented Anatomy*. 8th ed. Wolters Kluwer, 2018.
Gray's *Anatomy for Students*, 4th ed., Elsevier, 2019.

4. Which renal anomaly is demonstrated on this image?



- A. Duplicated collecting system
- B. Crossed renal ectopia
- C. Horseshoe kidney
- D. Pelvic kidney

Answer: C

Explanation:

The ultrasound image labeled "SAG RUQ KIDNEY" demonstrates a midline sagittal view showing a renal parenchymal structure that extends across the midline anterior to the aorta and vertebral bodies, suggesting the presence of a horseshoe kidney.

A horseshoe kidney is a congenital renal anomaly in which the lower poles of both kidneys are fused across the midline by a parenchymal or fibrous isthmus. This isthmus typically lies anterior to the aorta and inferior vena cava and can be seen as a hypoechoic band of tissue crossing the midline on ultrasound.

Ultrasound findings characteristic of a horseshoe kidney:

Abnormally low position of the kidneys in the abdomen

Renal tissue (isthmus) bridging the lower poles anterior to the great vessels

Renal axes may be more horizontal than usual

Kidneys may appear closer together or "kissing" the spine anteriorly

Differentiation from other options:

A. Duplicated collecting system: Manifests as two separate collecting systems within one kidney, often with a central renal sinus split into two — not typically midline bridging.

B. Crossed renal ectopia: Involves one kidney crossing midline and fusing with the other on the opposite side, but they do not form a midline isthmus.

D. Pelvic kidney: A single kidney located in the pelvis due to failed ascent — it does not appear as midline fusion of two kidneys.

References:

Rumack CM, Wilson SR, Charboneau JW, Levine

D. Diagnostic Ultrasound. 5th Edition. Elsevier, 2018.

Chapter: Urinary Tract, pp. 215–218.

American Institute of Ultrasound in Medicine (AIUM). Practice Parameter for the Performance of an Ultrasound Examination of the Abdomen and/or Retroperitoneum. 2020.

Radiopaedia.org. Horseshoe kidney: <https://radiopaedia.org/articles/horseshoe-kidney>

5. During a renal artery Doppler study, which vessel should also be sampled to verify patency?

A. Inferior vena cava

B. Main renal vein

C. Portal vein

D. Iliac vein

Answer: B

Explanation:

The main renal vein should be assessed in addition to the renal arteries during renal Doppler exams.

Venous thrombosis may coexist with arterial abnormalities and can impact renal perfusion. Evaluation of both arterial inflow and venous outflow ensures a comprehensive assessment of renal vascular patency.

According to Zwiebel's Introduction to Vascular Ultrasound:

“Renal vein assessment should be performed during renal artery Doppler studies to exclude venous thrombosis or outflow obstruction.”

Reference: Zwiebel WJ, Pellerito JS. Introduction to Vascular Ultrasound. 6th ed. Elsevier, 2019.

AIUM Practice Parameter for Renal Artery Duplex Sonography, 2020.