

Topic: ULTRASONOGRAPHY/DOPPLER STUDIES

Case Based Puzzle

Case Scenario

A 35-year-old pregnant woman presents to the radiology department for a routine fetal assessment. The sonographer selects a curvilinear transducer at 3.5 MHz for transabdominal sonography (TAS). The patient has a full bladder as per preparation instructions. However, initial images show poor visualization of the pelvic structures due to suboptimal positioning. The sonographer adjusts the patient to supine with knees slightly flexed. Midway through, the patient reports discomfort, and the Doppler mode reveals normal fetal heart flow but artifact in maternal vessels. The procedure must ensure quality images while adhering to patient care protocols. Later, the same patient requires a follow-up for suspected ovarian cyst, shifting to transvaginal sonography (TVS).

Objectives

- Identify appropriate transducer selection and frequency for TAS and TVS.
- Describe patient preparations (e.g., full bladder for TAS) and positioning adjustments (e.g., supine flexed knees for TAS, lithotomy for TVS).
- Outline patient care instructions, including reassurance for discomfort and infection prevention in TVS.
- Explain how to achieve reproducible quality images using display methods like B-mode and color Doppler.

Instructions

Review the case and use the provided image to identify key elements. Answer the following questions based on the scenario, drawing from techniques, preparations, positioning, clinical applications, and quality assurance protocols.

Questions

1. What specific preparation instruction should be given to the patient for TAS to optimize acoustic window, and why is it critical?
2. For the TVS follow-up, describe the patient positioning (including leg support) and any additional hygiene protocols to minimize infection risk.
3. In the Doppler assessment, what artifact might appear if positioning is incorrect, and how can it be corrected to ensure reproducible images?
4. How does switching from TAS to TVS improve clinical application for ovarian cyst evaluation, and what transducer frequency range would you select?

Clues

- Clue 1: For abdominal approaches, hydration acts as a natural window; dehydration leads to gas interference.
- Clue 2: Endocavitary probes require protective covers and lubrication; patient consent includes explaining insertion depth.
- Clue 3: Artifacts like shadowing occur from bowel gas; knee flexion displaces it.
- Clue 4: Higher frequencies (5-9 MHz) for TVS provide better resolution for pelvic details than lower for TAS.



(Image depicts a typical TAS view of pelvic structures; use it to visualize positioning impact on image clarity.)

Rubrics	Marks Alloted (out of 10 marks)
Accuracy of Preparations & Instructions	3
Positioning & Patient Care	3
Clinical Applications & Techniques	2
Quality Assurance & Reproducibility	2
TOTAL MARKS	10 marks

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