Bedside Ultrasonography for Obstetric and Gynecologic Emergencies

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KEYWORDS

• Ultrasonography • Obstetric • Gynecologic • Emergency imaging
• Ectopic pregnancy • Yolk sac • Gestational sac

KEY POINTS

- This article reviews the basic technique of performing transabdominal and transvaginal (endocavitary) ultrasonography.
- The sonographic appearance of a normal intrauterine pregnancy, as well as abnormal findings that may be encountered, are reviewed.
- A range of common ovarian and uterine diseases are reviewed.

INTRODUCTION

Ultrasonography is the ideal diagnostic modality for evaluation of a female patient with a pelvic complaint.[1] This article of *Critical Care Clinics* provides a guide for using bedside ultrasonography for the diagnosis of emergent obstetric and gynecologic disease. First, how to perform the scans is reviewed. This review is followed by a detailed discussion of the appearance of a normal intrauterine pregnancy (IUP) versus an abnormal one, including reviews of fetal bradycardia, ectopic pregnancies, and molar pregnancy. Subsequently, common gynecologic complaints, including ovarian cysts, uterine fibroids, and intrauterine device (IUD) localization, are reviewed. Emergent gynecologic diseases, including ovarian torsion, tubo-ovarian abscess (TOA), hydrosalpinx, and pyosalpinx, are discussed. Readers should gain from this article an understanding of how to perform these scans and should be able to apply this knowledge to the clinical scenarios they encounter.

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TECHNICAL CONSIDERATIONS OF OBSTETRIC AND GYNECOLOGIC SONOGRAPHY

Transducer Selection

Ultrasonographic images of the female pelvis can be obtained using either a curvilinear or an endocavitary transducer (Fig. 1).

The decision of which transducer to use should be based on the clinical scenario and the diagnostic question the provider seeks to answer, along with the comfort of the provider with performing either scan. For example, in a pregnant patient in the first trimester for whom the provider seeks to document the presence or absence of an IUP, an endocavitary approach provides the most information as well as the most detailed view of the structures of interest. In a 50-year-old woman with vaginal bleeding, a transabdominal view using the curvilinear transducer is likely sufficient to evaluate for the presence of obvious causes of her dysfunctional uterine bleeding. In general, the endocavitary transducer should be used for performing ultrasonography in the first trimester of pregnancy and for evaluation of ovarian or fallopian tube disease.[2–4] The low-frequency, curvilinear transducer can be used for evaluation of second-trimester or third-trimester fetuses, and larger uterine and ovarian diseases, such as fibroids, large ovarian cysts, and so forth.[5] However, these are generalizations, and physician comfort with the scan is an obvious key factor in determining which scan to perform in which clinical context.[6] The next section reviews the steps of performing each scan.

TECHNIQUE FOR PERFORMING TRANSABDOMINAL PELVIC ULTRASONOGRAPHY

Transabdominal pelvic ultrasonography should be performed with the patient in the supine position. The curvilinear 3-MHz to 5-MHz transducer should be placed in a transverse orientation just proximal to the symphysis pubis, with the transducer indicator toward the patient's right side. Begin by identifying the full bladder, and then note the outline of the uterine wall and the endometrial stripe immediately posterior to the bladder (Fig. 2).

Note that the absence of a full bladder significantly limits the examination, because the anechoic urine filling the bladder is serving as the acoustic window to allow better visualization of the deeper-lying uterus. Fan the transducer superiorly to inferiorly, and evaluate, or interrogate, the uterus for any pertinent findings. Repeat the examination with the transducer indicator pointing toward the patient's head, in the sagittal

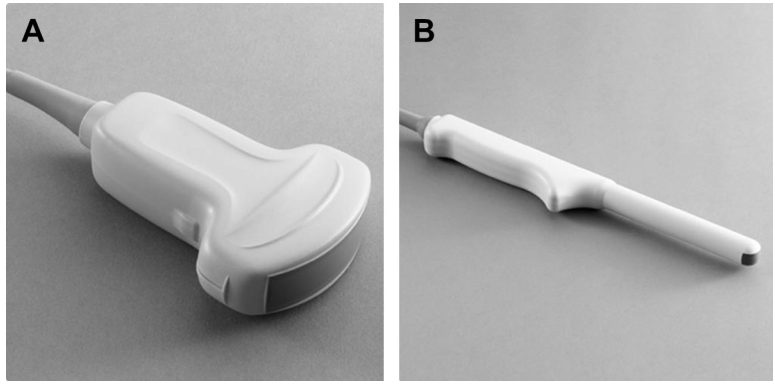

Fig. 1. (*A*) Curvilinear (2–5 MHz) and (*B*) endocavitary (5–8 MHz) transducers. (*Courtesy of* FUJIFILM Sonosite, San Francisco, CA; with permission.)