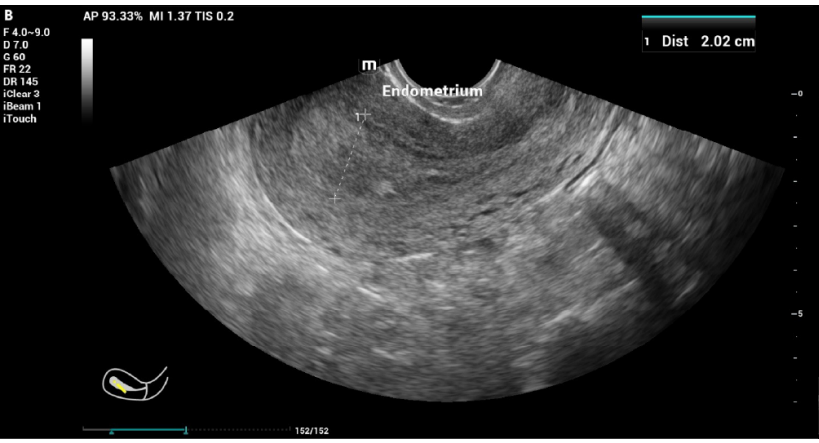
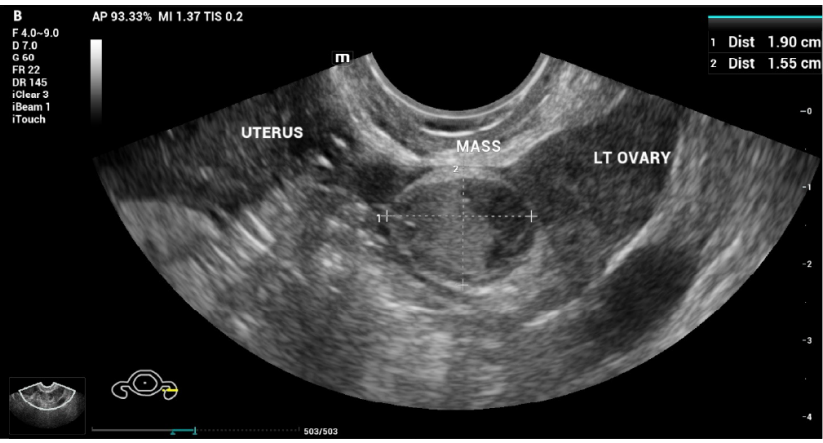
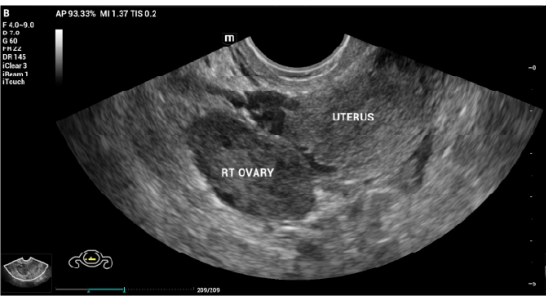
Radiographic QUIZ

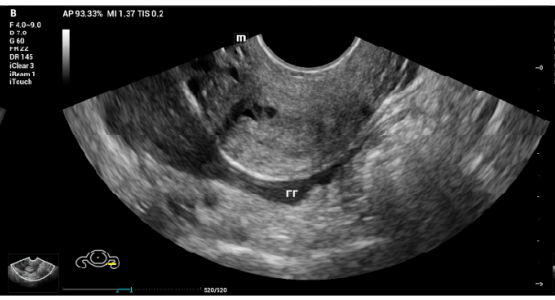
Julio Manuel Díaz Riverol[1]

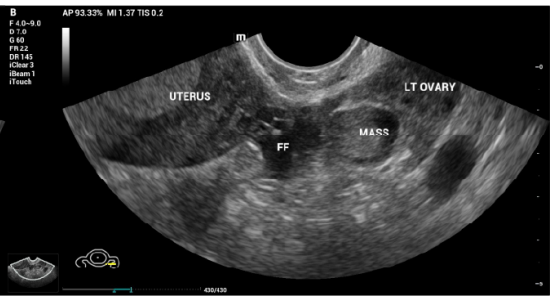
A 23-year-old woman complaining of pelvic pain, minimal vaginal bleeding, and history of 7 weeks of amenorrhea.











[1]MD, Radiologist. Belmopan Medical Imaging Center. Correspondence: diazriverol@hotmail.com

There is evidence of intrauterine gestation.

___ True

___ False

What is the salient abnormality?

___ Endometrial polyp

___ Left adnexal mass and diffusely echogenic endometrium

___ Hydrosalpinx

___ Hematosalpinx

___ Pedunculated fibroid

What is the left adnexal lesion?

___ Dermoid cyst

___ Gestational sac

___ Corpus luteum

___ Mass of heterogeneous echogenicity

___ Pedunculated fibroid

There is evidence of free peritoneal fluid.

___ True

___ False

What is the most likely diagnosis?

___ Left paraovarian cyst

___ Left tubal ectopic pregnancy

___ Left ovarian dermoid cyst

___ Heterotopic pregnancy

___ Tubo-ovarian abscess

DESCRIPTION OF THE IMAGES

Thickened echogenic endometrium measuring 2.05 cm due to diffuse decidual reaction. Mass of heterogeneous echogenicity, adjacent to the left ovary with higher echogenicity than the ovary represents the tubal ectopic pregnancy. Mild amount of free fluid in cul-de-sac and adjacent to the mass.

Diagnosis: Ruptured left tubal ectopic pregnancy, confirmed surgically.

BRIEF REVIEW OF THE PATHOLOGY

Ectopic pregnancies account for 2% of all pregnancies, and approximately 90% are in the fallopian tube. The blastocyst normally implants itself in the endometrial lining of the uterine cavity. An ectopic pregnancy results if the blastocyst implants itself elsewhere. The prevalence of ectopic pregnancy in women presenting to the emergency department with pelvic pain, bleeding, or both is near 20%. Although the clinical triad of lower abdominal pain, vaginal bleeding, and amenorrhea is considered specific for ectopic pregnancy, women may not always present with all three symptoms. Severity of symptoms range from mild cramping and spotting to shock from internal hemorrhage. Ruptured ectopic pregnancy is the leading cause of hemorrhage-related mortality in pregnancy.

The presentation of any one of the components of the triad should prompt further investigations and tests to exclude ectopic pregnancy. Abdominal pain has been found to be the most common presenting symptom of ectopic pregnancy; abdominal tenderness is the most common physical sign. In fact, considering the high potential mortality of this condition, any woman of reproductive age presenting to the emergency department with abdominal symptoms should have a beta-human chorionic gonadotropin (β-HCG) blood test or an ultrasound performed to exclude possibility of ectopic pregnancy. Few incidences of asymptomatic women who had ectopic pregnancy detected on routine sonographic screening have been reported.

Predisposing factors

Risk factors that predispose to ectopic pregnancy may not always be present, but, if present, they may be a useful adjunct in the clinical diagnosis of an ectopic pregnancy. Any factor that interferes with the normal fallopian tube function is a predisposition for an ectopic pregnancy. Gynecologic infections are a major predisposing factor in an ectopic pregnancy. Other risk factors include infertility, previous ectopic pregnancy, previous tubal surgery (causing tubal adhesions and thus altering normal tubal function), or a history of an intrauterine contraceptive device (IUCD). Although IUCD use has been linked to ectopic pregnancy, no direct relationship exists between either current or past IUCD use or the duration of its use.

After in vitro fertilization or embryo transfer, patients also are predisposed to ectopic pregnancy, particularly those who have a prior history of tubal surgery. Tubal ectopic pregnancies are predisposed by pathologic changes within the tubes, such as chronic salpingitis and follicular salpingitis. Prior cesarean section is a predisposition for scar ectopic pregnancy. Any congenital uterine or tubal anomalies, with or without diethylstilbestrol exposure, also can increase the risk of ectopic pregnancy. Cigarette smoking also predisposes a woman to ectopic pregnancy by causing ciliary dysfunction in the fallopian tubes.

Ectopic pregnancy most commonly (95%) occurs in the ampullary or isthmic portions of the fallopian tube; however, other locations could be interstitial (cornual or angular) pregnancy, cervical pregnancy, ovarian pregnancy, scar pregnancy (implantation of pregnancy within a scar of prior uterine surgery is referred to as “scar pregnancy”, it often is seen in women who have a history of prior cesarean section or myomectomy who undergo in vitro fertilization) and abdominal pregnancy.

Diagnosing ectopic pregnancy

Clinical suspicion of an ectopic pregnancy is an essential step toward diagnosis. Excluding an intrauterine pregnancy is the first step in the management of such a patient. Transvaginal ultrasonography (TVUS) is the gold standard for imaging tubal ectopic pregnancy (TEP). However, all imaging should start with transabdominal ultrasonography (full bladder not required) in order to see whether there is a large mass or fluid extending into the abdomen, both of which can be missed with TVUS-only scanning.

Imaging protocols should include adequate documentation of the uterus and its contents, ovary, adnexa, and posterior cul-de-sac. Documentation of a dynamic examination using video clips/cine loops is recommended in order to show motion of structures in relation to each other. Probe pressure can aid in showing the relationship of adnexal masses to the ovary (ie, whether the mass moves with or separate from the ovary and uterus). External pressure with the non-scanning hand can be additive for this purpose as well.

A) Intrauterine findings

The most reassuring sign that the patient does not have TEP is the presence of an intrauterine pregnancy (IUP). However, uterine findings with TEP vary and include:

- Empty uterus with variable endometrial thickness.

Thin empty endometrium. Diffusely echogenic endometrium from diffuse decidual reaction. Decidual cyst (thin wall without peripheral flow (can mimic early intrauterine pregnancy).

- Uterus with intracavitary blood.

Diffusely distributed: endometrium distended by hypoechoic material.

Focal collection: can mimic intrauterine pregnancy, so-called pseudosac (more centrally located than normal intrauterine pregnancy, no yolk sac or embryo, and might move within endometrium with probe pressure.

Rarely, intrauterine pregnancy can be seen along with TEP (Incidence of 1% in patients who have undergone in vitro fertilization, otherwise, incidence is 1 in 4000 to 30,000). Look for TEP in symptomatic in vitro fertilization patients, even if IUP is present.

B) Adnexal findings with TEP

It can be divided into those that lead to a definitive diagnosis and those suggestive of the diagnosis.

1. Adnexal findings definitive of tubal ectopic pregnancy. Gestational sac with yolk sac plus or minus embryo in adnexa, separated from the ovary.
2. Adnexal findings suspicious for tubal ectopic pregnancy (more common). Gestational sac without yolk sac/embryo in adnexa, separated from the ovary. Nonspecific adnexal mass separated from the ovary. Complex peritoneal fluid: pelvic fluid with echoes.

Differential diagnosis of adnexal findings: mimickers of TEP

- Corpus Luteous (CL): intact or ruptured.

More hypoechoic than TEP.

Hemorrhagic CL can contain echoes mimicking embryo.

Moves with the ovary, not separated from the ovary.

When ruptured, can cause symptomatic hemoperitoneum.

- Paratubal cyst or hydrosalpinx

Thin-walled, anechoic, no peripheral blood flow

- Endometrioma

Diffuse medium-level echoes, although decidualization with pregnancy causes heterogeneous appearance and internal flow

Management

TEP is a nonviable pregnancy and management decisions depend on patient clinical status, history, and imaging findings. The options for treatment and management include medical, surgical, and surveillance.

REFERENCES

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ANSWER TO THE QUIZ

There is evidence of intrauterine gestation.

- ☐ True
- ☒ False

What is the salient abnormality?

- ☐ Endometrial polyp
- ☒ Left adnexal mass and diffusely echogenic endometrium
- ☐ Hydrosalpinx
- ☐ Hematosalpinx
- ☐ Pedunculated fibroid

What is the left adnexal lesion?

- ☐ Dermoid cyst
- ☐ Gestational sac
- ☐ Corpus luteum
- ☒ Mass of heterogeneous echogenicity
- ☐ Pedunculated fibroid

There is evidence of free peritoneal fluid.

- ☒ True
- ☐ False

What is the most likely diagnosis?

- ☐ Left paraovarian cyst.
- ☒ Left tubal ectopic pregnancy
- ☐ Left ovarian dermoid cyst.
- ☐ Heterotopic pregnancy
- ☐ Tubo-ovarian abscess

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