Pediatric ER Board Review

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PGY-1

Question:

A 19-year-old woman in the ER complains of abdominal pain of 6 hours of duration. The pain is mostly localized in the left lower quadrant, and she denies associated symptoms, including fever, dysuria, constipation or nausea/vomits. She has been using an IUD for a year, and since she started using the device, her menstrual periods have been irregular, reason why she asked her OB to remove the device 3 months ago. At physical examination, vitals are stable and she does not appear in acute pain distress, however there is tenderness to palpation in the left lower quadrant. A vaginal ultrasound is performed and showed a mass in the right adnexa. Her last menstrual period was 8 weeks ago. The serum HCG is 4000.

Question:

Which of the following statements is correct:

a. Even after discontinuing the use, the patients with h/o IUD remain at high risk for ectopic pregnancy.
b. In order to confirm the diagnosis of ectopic pregnancy, the patient will require a CT scan of the abdomen immediately,
c. Most likely, the location of this pregnancy is heterotopic.
d. She will require a surgical procedure immediately to avoid rupture and a life threatening event hemorrhage..
e. The success rate of medical treatment with methotrexate in this patient would be nearly 90 percent.

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RISK FACTORS FOR ECTOPIC PREGNANCY

- The major cause of ectopic pregnancy is disruption of normal tubal anatomy from factors such as infection, surgery, congenital anomalies, or tumors. Anatomic distortion can be accompanied by functional impairment due to damaged ciliary activity. The highest risk is associated with a history of prior ectopic pregnancy or tubal surgery.
- The odds of ectopic pregnancy are 16.4-fold in women with current use of an IUD, and it decreases to 1.7 fold when it is discontinued.

Risk factors for ectopic pregnancy compared with pregnant controls

Degree of risk	Risk factors	Odds ratio
High	Previous ectopic pregnancy	2.7 to 8.3
	Previous tubal surgery	2.1 to 21
	Tubal pathology	3.5 to 25
	Sterilization	5.2 to 19
	IUD	
	- Past use	1.7
	- Current use	4.2 to 16.4
	- Levonorgestrel IUD	4.9
	In vitro fertilization in current pregnancy	4.0 to 9.3
Moderate	Current use of estrogen/progestin oral contraceptives	1.7 to 4.5
	Previous sexually transmitted infections (gonorrhea, chlamydia)	2.8 to 3.7
	Previous pelvic inflammatory disease	2.5 to 3.4
	In utero DES exposure	3.7
	Smoking	
	- Past smoker	1.5 to 2.5
	- Current smoker	1.7 to 3.9
	Previous pelvic/abdominal surgery	4.0
	Previous spontaneous abortion	3.0
Low	Previous medically induced abortion	2.8
	Infertility	2.1 to 2.7
	Age ≥40 years	2.9
	Vaginal douching	1.1 to 3.1
	Age at first intercourse <18 years	1.6
	Previous appendectomy	1.6

IUD: intrauterine device; DES: diethylstilbestrol.

Data from:

- *Clayton HB, Schieve LA, Peterson HB, et al. Ectopic pregnancy risk with assisted reproductive technology procedures. Obstet Gynecol 2006; 107:595.*
- *Ankum WM, Mol BWJ, Van der Veen F, Bossuyt PMM. Risk factors for ectopic pregnancy: a meta-analysis. Fertil Steril 1996; 65:1093.*

DIAGNOSTIC MODALITIES

- CT scans are modalities that are not recommended in the diagnosis of ectopic pregnancy.
- Transvaginal ultrasonography is the recommended imaging technique for patients with suspected ectopic pregnancy. It is preferred over transabdominal ultrasonography because the transvaginal view allows for direct visualization of an ectopic mass, whereas the transabdominal view does not.
- By 5.5 weeks' gestation, an intrauterine pregnancy should be identifiable by ultrasonography as a gestational sac containing a yolk sac. Visualizing these structures within the uterus effectively rules out an ectopic pregnancy, given that the incidence of heterotopic pregnancy (an ectopic and intrauterine gestation occurring simultaneously) is only about one in 4,000 spontaneous conceptions.

ECTOPIC PREGNANCY LOCATION

- The great majority of ectopic pregnancies implant in the fallopian tube (96 percent). In one series of 1800 surgically treated cases, the distribution of sites was ampullary (70 percent), isthmic (12 percent), fimbrial (11.1 percent), ovarian (3.2 percent), interstitial (2.4 percent), and abdominal (1.3 percent).

- Heterotopic pregnancy refers to the presence of simultaneous pregnancies at two different implantation sites. Most often these sites are a combination of intrauterine and ectopic pregnancies, rather than two ectopic pregnancies.

- Heterotopic pregnancy used to be rare, estimated to occur in 1 in 30,000 pregnancies. With the advent of assisted reproduction techniques (ART), including super-ovulation, intrauterine insemination, and in vitro fertilization, the overall incidence of heterotopic pregnancy has risen to approximately 1 in 3900 pregnancies.

MEDICAL, SURGICAL OR EXPECTANT MANAGEMENT?

MEDICAL TREATMENT

- Ectopic pregnancy is a potentially life-threatening condition. While surgical approaches are the gold-standard treatment, advances in early diagnosis in the 1980s facilitated the introduction of medical therapy with methotrexate. With the routine use of early ultrasound, diagnosis of ectopic pregnancy can be established early and medical treatment can be administered in many cases. The overall success rate of medical treatment in properly selected women is nearly 90 percent.

MEDICAL, SURGICAL OR EXPECTANT MANAGEMENT?

MEDICAL TREATMENT

- Candidates for MTX treatment are women with ectopic pregnancy who meet the following criteria:
  - •Hemodynamically stable
  - •Have no renal, hepatic, or hematologic disorders
  - •Able and willing to comply with post-treatment monitoring and have access to medical care in case of a ruptured fallopian tube
  - •Pretreatment serum hCG concentration ≤5000 milli-international units/mL
  - •No fetal cardiac activity on transvaginal ultrasound

MEDICAL, SURGICAL OR EXPECTANT MANAGEMENT?

SURGICAL TREATMENT

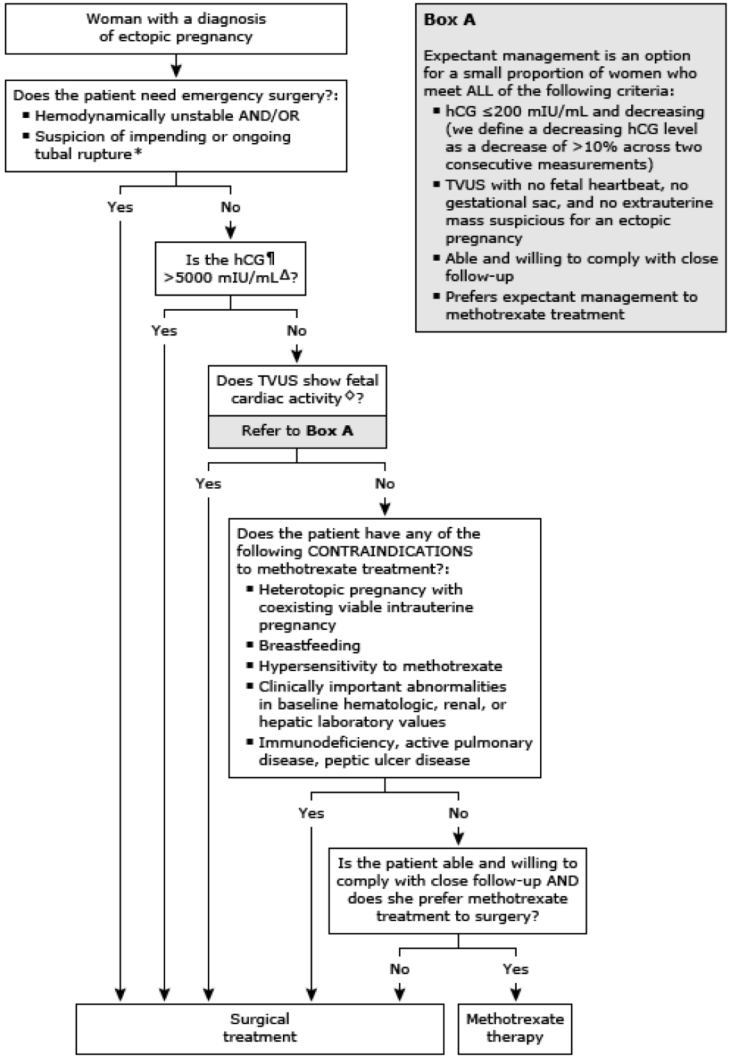
Surgery is required for women with the following characteristics:

- Need emergency surgical treatment (hemodynamically unstable, suspected tubal rupture).
- Heterotopic pregnancy with coexisting viable intrauterine pregnancy
- Contraindications to MTX therapy or failed MTX therapy

MEDICAL, SURGICAL OR EXPECTANT MANAGEMENT?

Expectant management is an option only for a small proportion of patients with ectopic pregnancy or pregnancy of unknown location and a very low risk of tubal rupture. This includes women with the following (algorithm 1):

- Transvaginal ultrasound (TVUS) does not show an extrauterine gestational sac or demonstrate an extrauterine mass suspicious for an ectopic pregnancy.
- Serum beta-human chorionic gonadotropin (hCG) concentration is low (≤200 milli-international units/mL) and declining.
- Willing and able to comply with post-treatment follow-up and with access to emergency medical services within a reasonable timeframe in case of a ruptured fallopian tube.


Woman with a diagnosis of ectopic pregnancy
Does the patient need emergency surgery?:
Hemodynamically unstable AND/OR
Suspicion of impending or ongoing tubal rupture*
Yes
No
Is the hCG¶ >5000 mIU/mL△?
Yes
No
Does TVUS show fetal cardiac activity◇?
Refer to Box A
Yes
No
Does the patient have any of the following CONTRAINDICATIONS to methotrexate treatment?:
Heterotopic pregnancy with coexisting viable intrauterine pregnancy
Breastfeeding
Hypersensitivity to methotrexate
Clinically important abnormalities in baseline hematologic, renal, or hepatic laboratory values
Immunodeficiency, active pulmonary disease, peptic ulcer disease
Yes
No
Is the patient able and willing to comply with close follow-up AND does she prefer methotrexate treatment to surgery?
No
Yes
Surgical treatment
Methotrexate therapy
Box A
Expectant management is an option for a small proportion of women who meet ALL of the following criteria:
hCG ≤200 mIU/mL and decreasing (we define a decreasing hCG level as a decrease of >10% across two consecutive measurements)
TVUS with no fetal heartbeat, no gestational sac, and no extrauterine mass suspicious for an ectopic pregnancy
Able and willing to comply with close follow-up
Prefers expectant management to methotrexate treatment

References

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