



Allegheny
Health Network



DREXEL UNIVERSITY
College of
Medicine

RAD-PATH Final Presentation

31 year-old female with Ectopic Pregnancy

Heather Conway, MS4
Drexel University College of Medicine

Matthew S. Hartman, MD, Department of Radiology
Allegheny Health Network

Sharon Liang, MD, PhD, Department of Pathology
Allegheny Health Network



Patient Presentation

- 31 year old female who presents from clinic with imaging concerning for left sided ectopic pregnancy. Patient is symptomatic with some spotting and mild LLQ pain. S/p IVF treatment. Approximately 6 weeks pregnant.
- Past Medical History: Polycystic ovarian syndrome (PCOS), CVA while on OCP, Graves disease, HPV, female infertility (secondary)
- Gynecological History: G3P1001

Physical Exam and Pertinent Labs

- Physical exam: vitals stable 157/81 98 16 97% RA
 GYN exam: Small amount (< 2 cc) bright red blood from external os.
 B/l adnexal tenderness to deep palpation. Otherwise normal.

- CBC: WNL
- beta-Hcg



1/2/2020	2/1/2020	2/3/2020	2/17/2020	2/19/2020
< 1	36	125	6343	9776

What Imaging Should We Order?

ACR Appropriateness Criteria

Clinical Condition: Acute Pelvic Pain in the Reproductive Age Group

Variant 1: Gynecological etiology suspected, serum β -hCG positive.

Radiologic Procedure	Rating	Comments	RRL*
US pelvis transvaginal	9	Both transvaginal and transabdominal US should be performed if possible.	0
US pelvis transabdominal	9	Both transvaginal and transabdominal US should be performed if possible.	0
US duplex Doppler adnexa	8		0
MRI pelvis without IV contrast	6	This procedure can be performed if US is inconclusive or nondiagnostic. See the Summary of Literature Review and <i>ACR Manual on Contrast Media</i> for the use of contrast media.	0
MRI abdomen and pelvis without IV contrast	6	This procedure can be performed if US is inconclusive or nondiagnostic. See the Summary of Literature Review and <i>ACR Manual on Contrast Media</i> for the use of contrast media.	0
MRI pelvis without and with IV contrast	1		0
MRI abdomen and pelvis without and with IV contrast	1		0
CT pelvis without IV contrast	1		☻☻☻
CT pelvis with IV contrast	1		☻☻☻
CT pelvis without and with IV contrast	1		☻☻☻☻
CT abdomen and pelvis without IV contrast	1		☻☻☻
CT abdomen and pelvis with IV contrast	1		☻☻☻
CT abdomen and pelvis without and with IV contrast	1		☻☻☻☻

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level

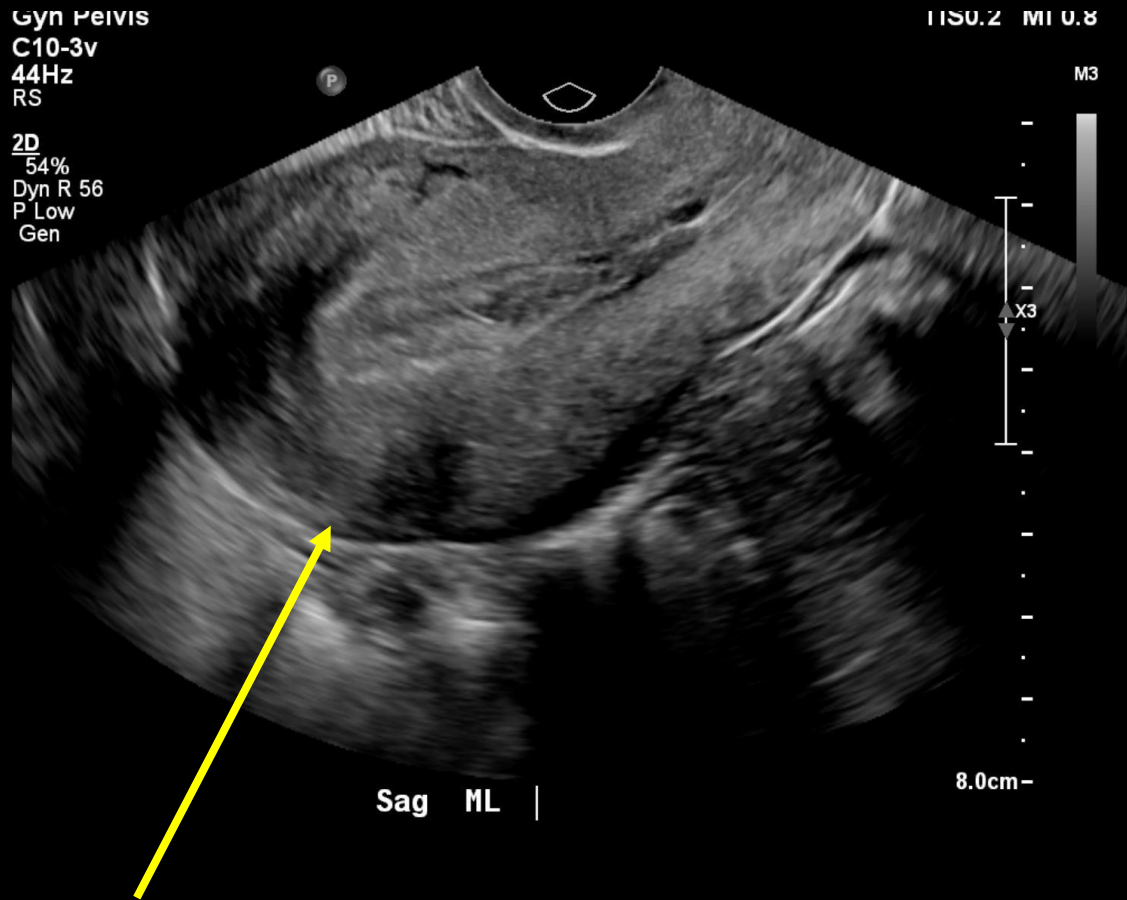
Variant 1: First trimester vaginal bleeding. Positive urine or serum pregnancy test.

Procedure	Appropriateness Category	Relative Radiation Level
US pelvis transvaginal	Usually Appropriate	0
US pelvis transabdominal	Usually Appropriate	0
US duplex Doppler uterus	May Be Appropriate	0
MRI pelvis without IV contrast	May Be Appropriate	0
MRI pelvis without and with IV contrast	Usually Not Appropriate	0
CT pelvis without IV contrast	Usually Not Appropriate	☻☻☻
CT pelvis with IV contrast	Usually Not Appropriate	☻☻☻
CT pelvis without and with IV contrast	Usually Not Appropriate	☻☻☻☻

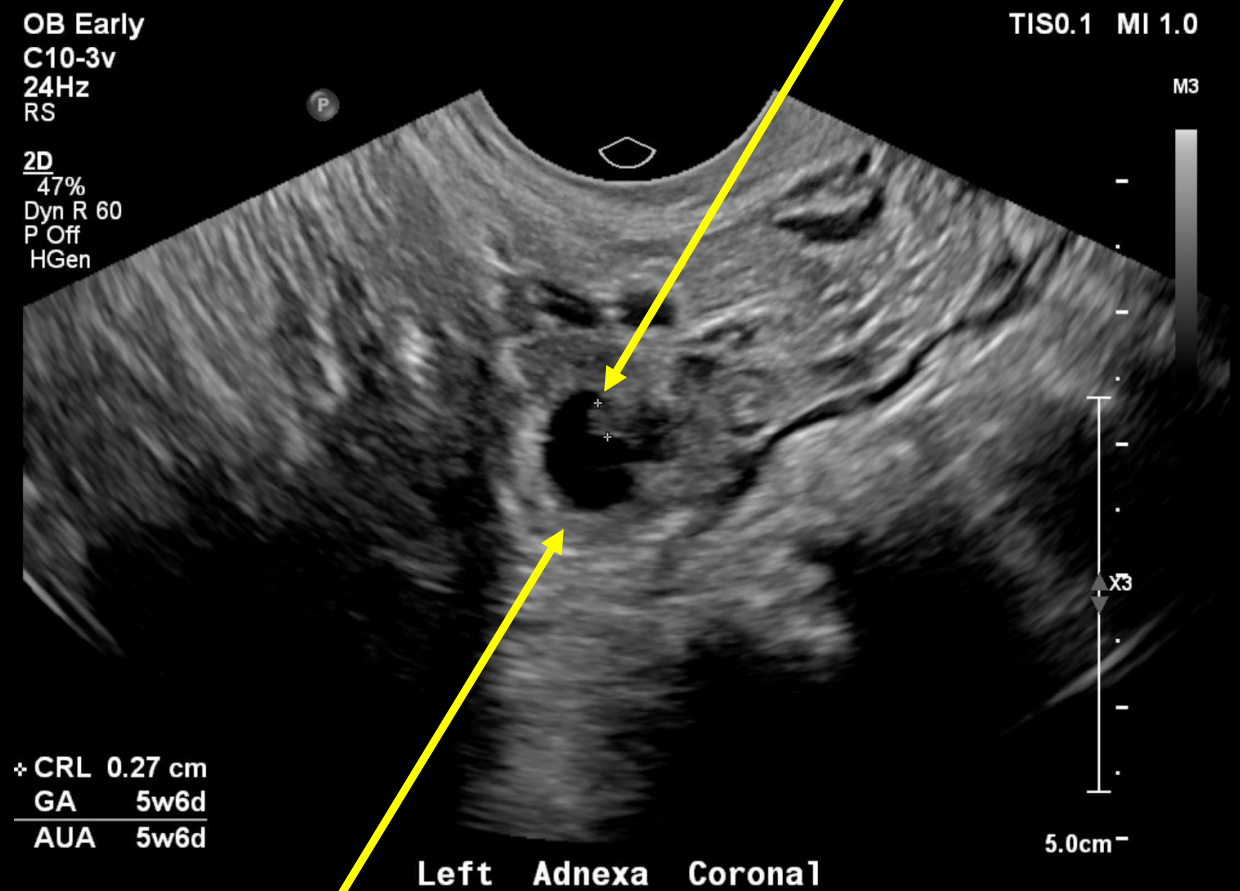
Transvaginal Ultrasound (unlabeled)



Transvaginal Ultrasound (labeled)



Uterus showing no intrauterine pregnancy (IUP)



Gestational sac

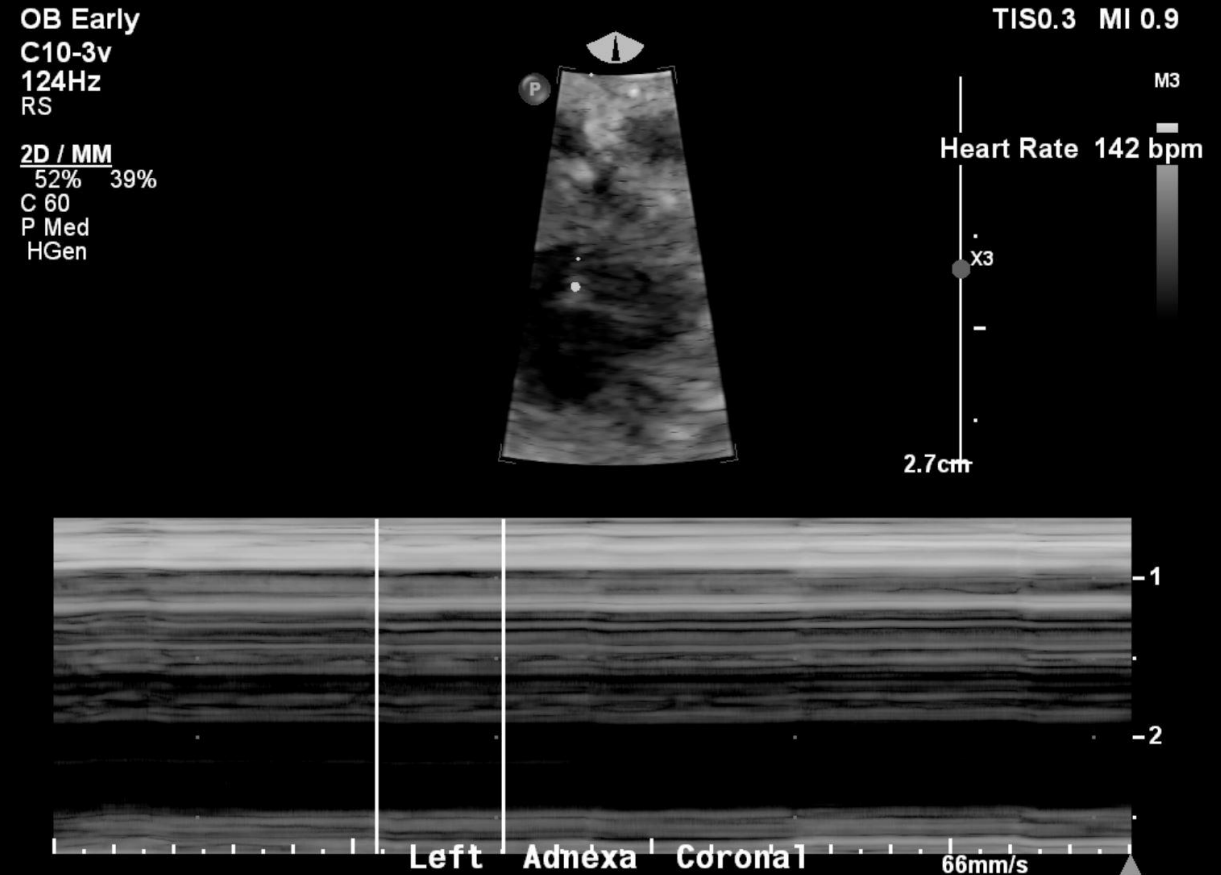
CRL measurement of ectopic indicating GA of 5w6d

✦ CRL 0.27 cm
GA 5w6d
AUA 5w6d

Transvaginal Ultrasound (labeled)



Gestational sac adjacent to left ovary



M mode: Embryonic heart rate measured 142 bpm

Differential Diagnosis Based on Imaging

- Ectopic pregnancy (ruptured)
- Ectopic pregnancy (unruptured)

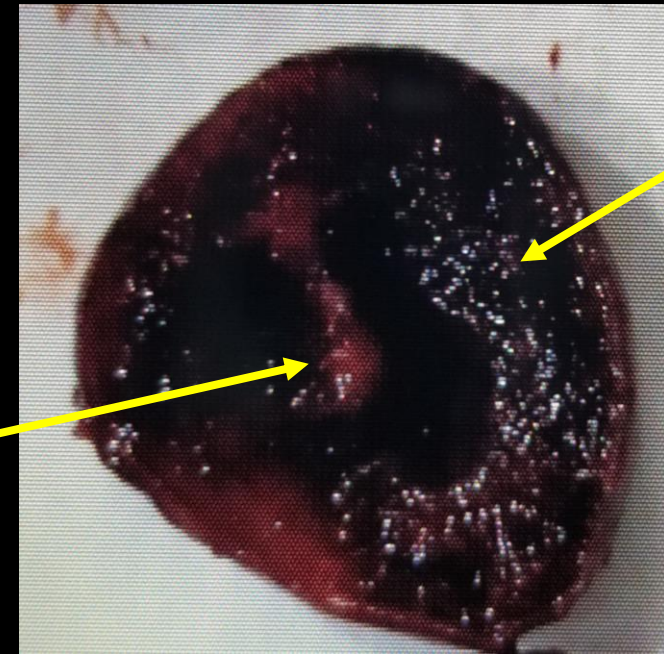
Case Continued...

- Patient taken for emergent laparotomy

Gross Surgical Specimen: Left salpingectomy



Dilated portion of left fallopian tube
containing ectopic pregnancy



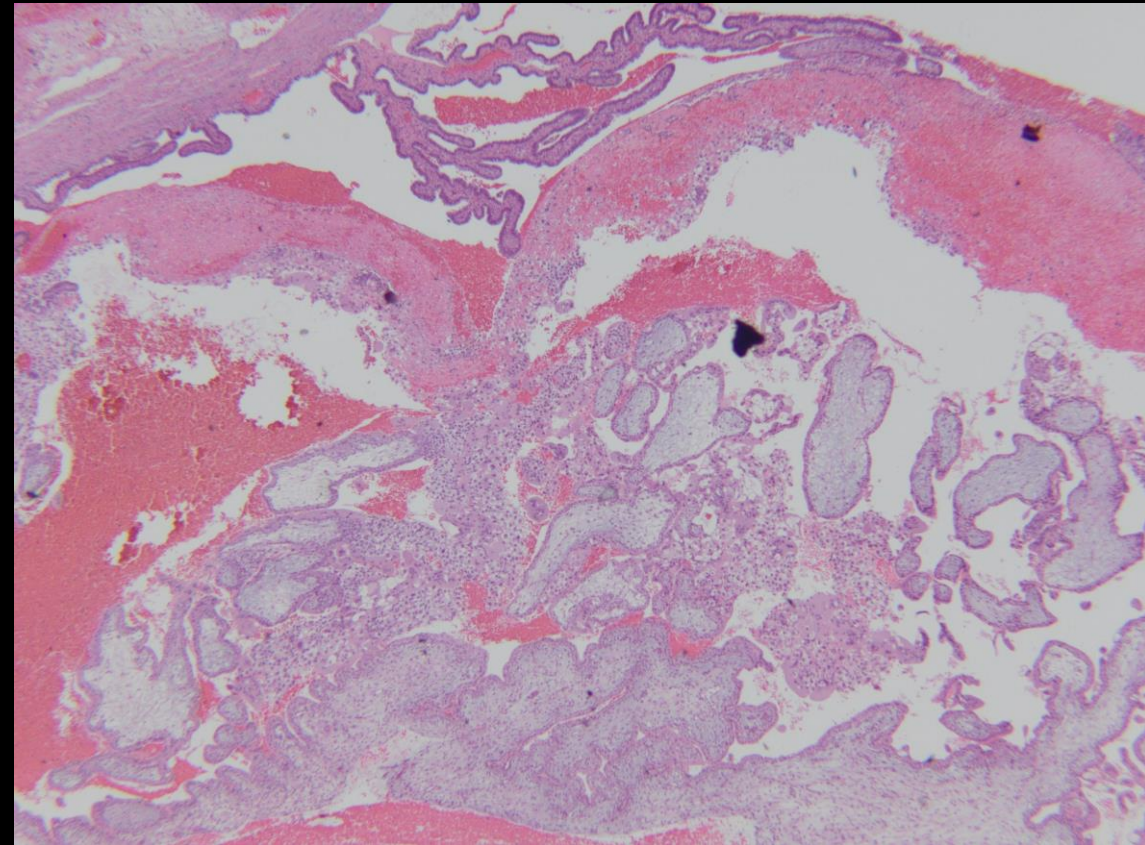
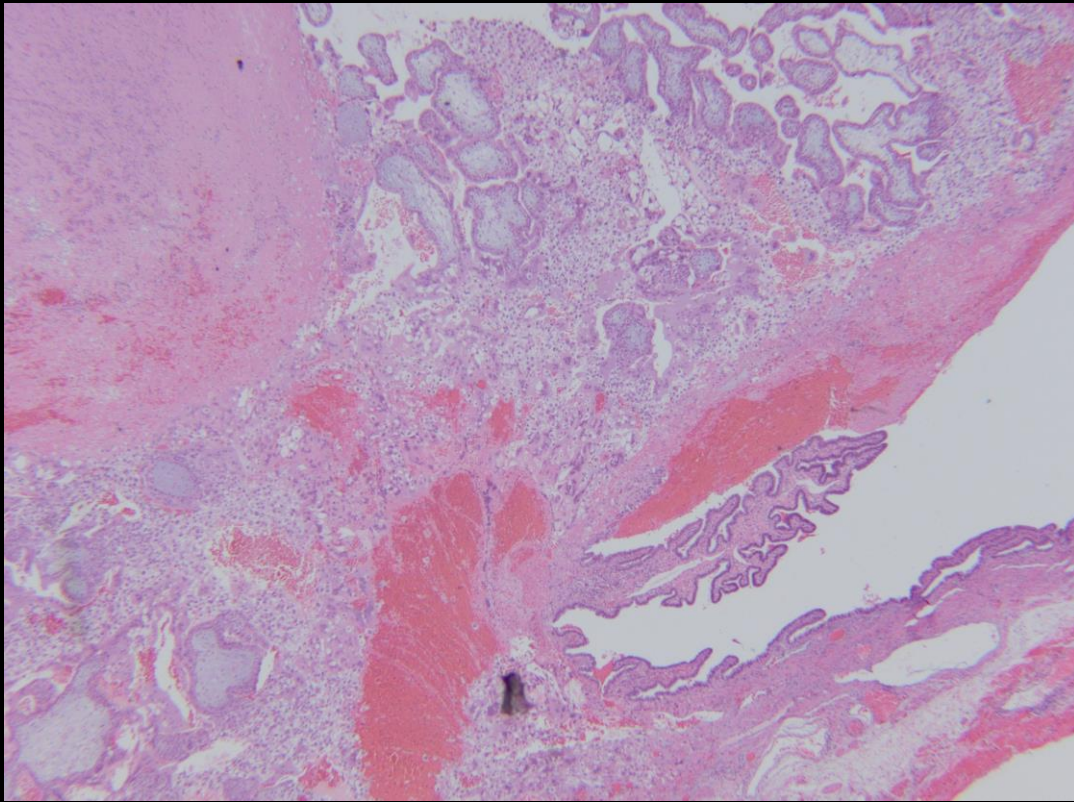
Embryo

Gestational
sac

Cross section through dilated segment
of left fallopian tube

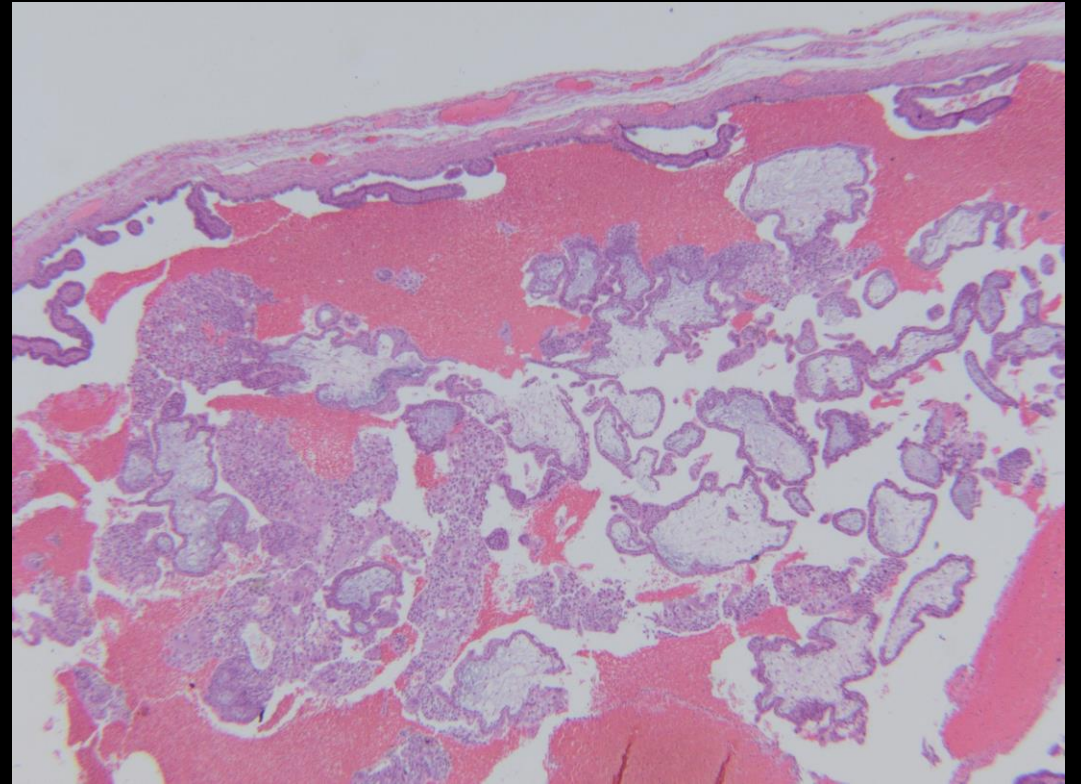
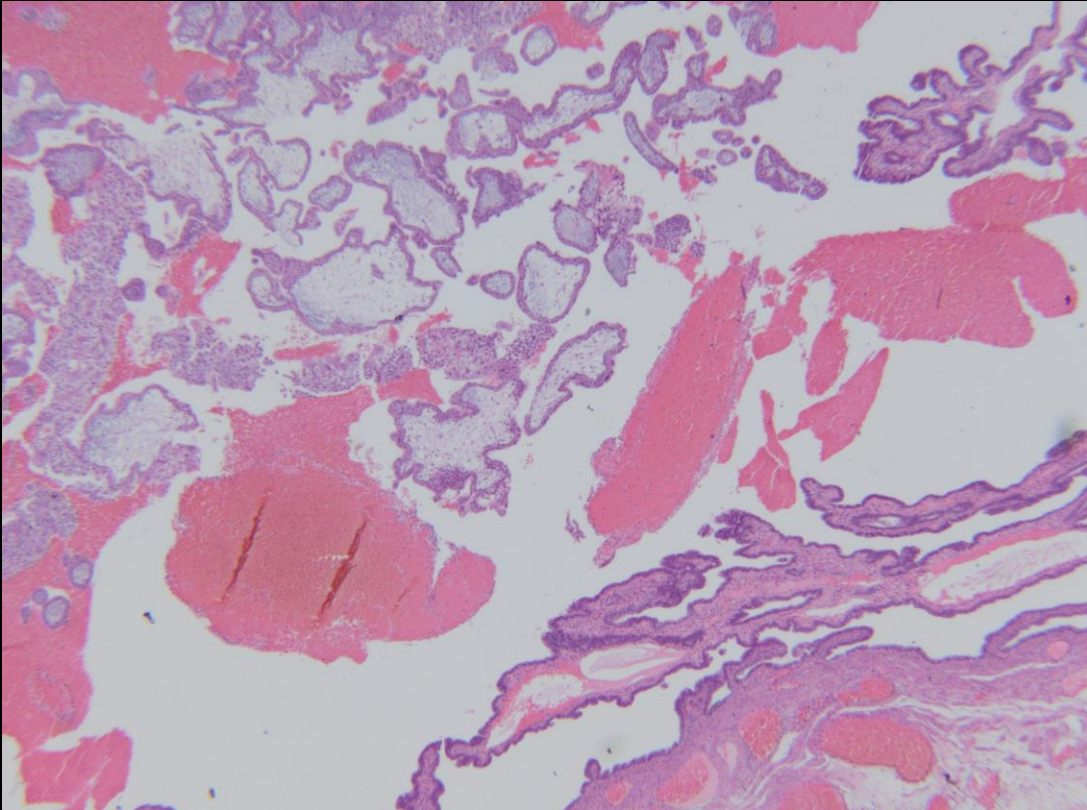
Histology

- Final report: Immature Chorionic Villi



Histology

- Final report: Immature Chorionic Villi



Final Diagnosis:

Ectopic Pregnancy in Left Fallopian Tube

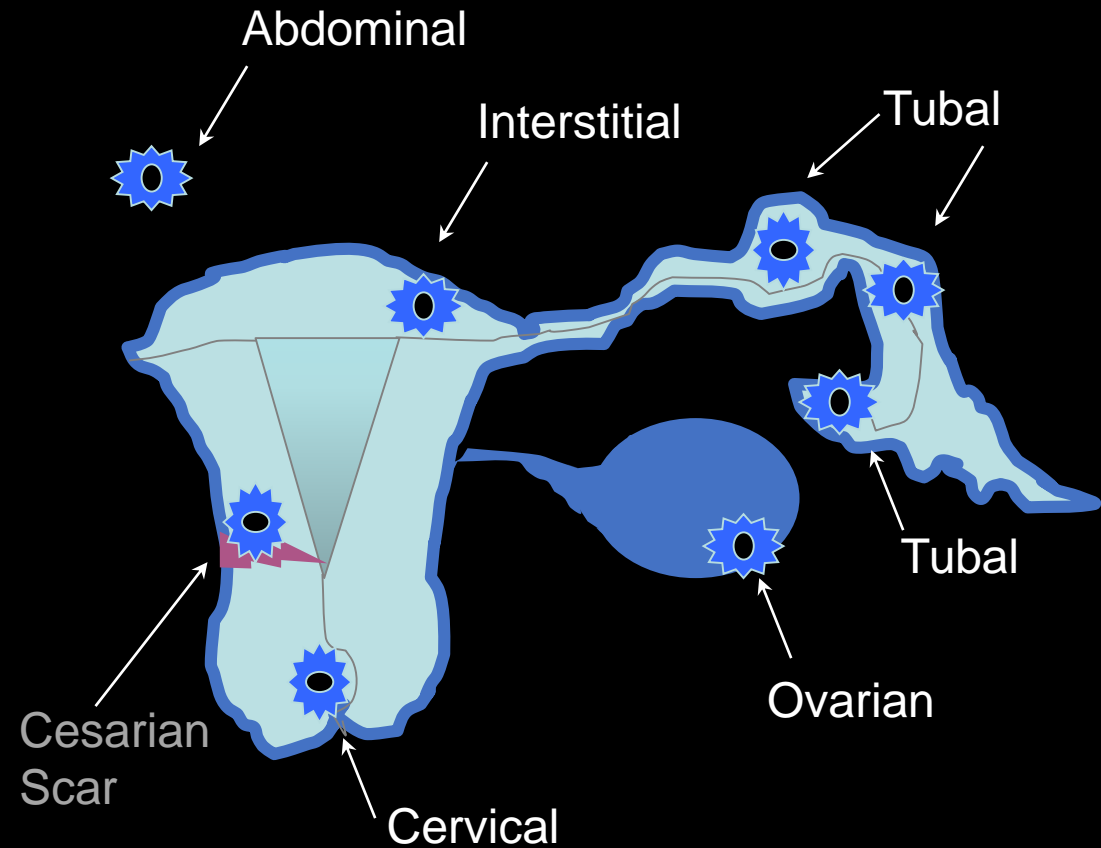
Immature Chorionic Villi and Implantation Site Within Fallopian Tube Lumen

Case Discussion

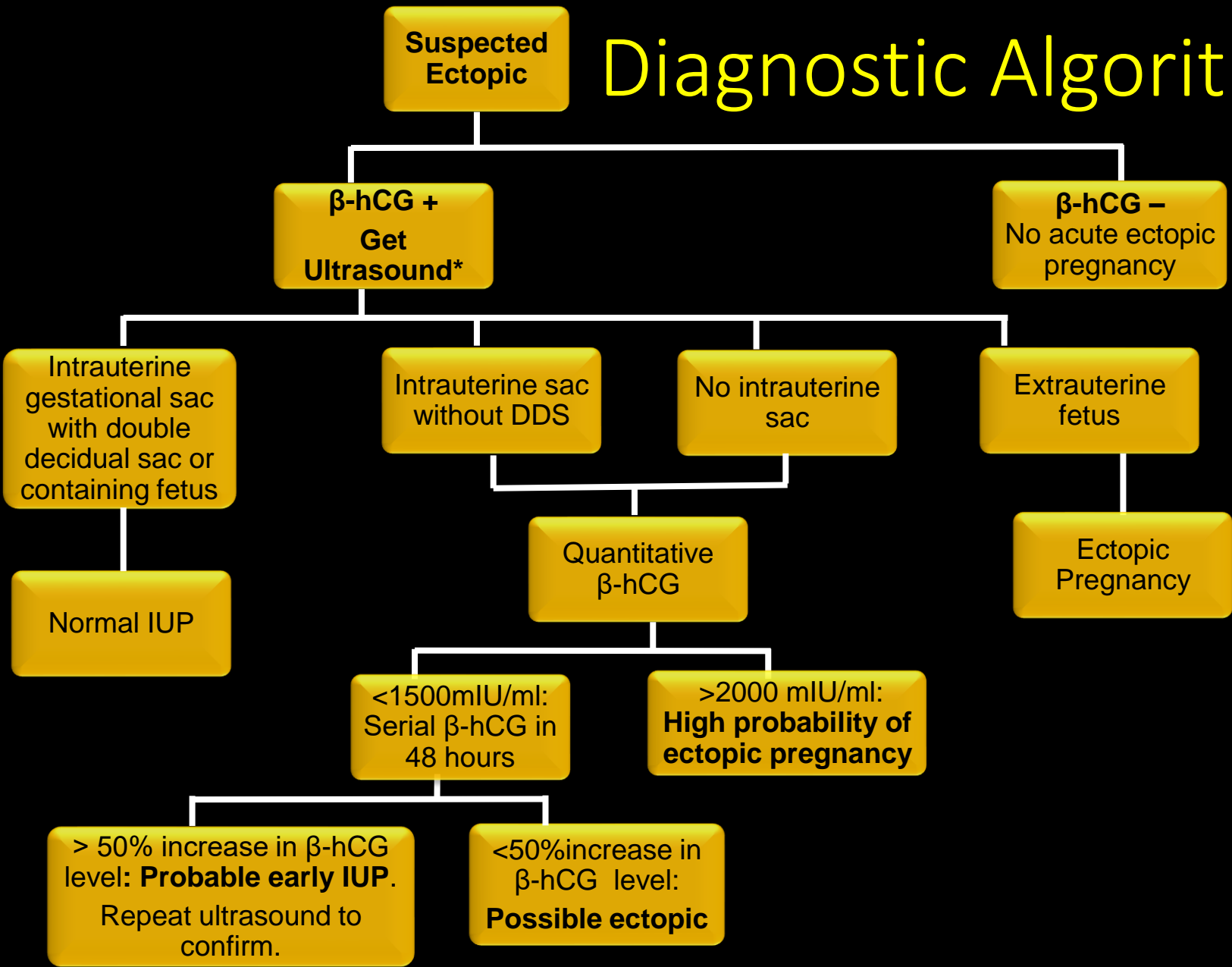
- Ectopic pregnancy occurs when the developing blastocyst implants at a site other than the endometrium of the uterine cavity
- Ectopic pregnancies account for ~2% of all confirmed pregnancies in the United States
- Ruptured ectopic pregnancy is the leading cause maternal mortality in the first trimester
- Risk Factors
 - Previous ectopic pregnancy
 - Pelvic inflammatory disease
 - Prior tubal/pelvic surgery
 - In vitro fertilization**
 - Smoking
 - Endometriosis
 - Diethylstilbestrol (DES) exposure in utero

Anatomic Sites and Incidence

- > 95% of ectopic pregnancies occur in the fallopian tubes
- ~ 2.5% are ovarian
- All other anatomic sites are rare (<1%)



Diagnostic Algorithm



Sonographic Signs

Ruptured vs. Nonruptured

- Nonruptured

- Tubal Ring Sign: hyperechoic ring surrounding fluid collection in adnexa
- “Ring of Fire” sign: ring of high-velocity, low-impedance vascular flow around ectopic gestational sac (nonspecific)

- Ruptured

- Pelvic free fluid within the rectouterine space is nonspecific
- Pelvic hemorrhage has 86-93% PPV of ectopic pregnancy in setting of positive β -hCG
- Fluid in Morrison’s pouch raises suspicion for ruptured ectopic

Findings on sonography	Positive Predictive Value (PPV) for Ectopic Pregnancy
Ectopic embryo with heart motion	100%
Adnexal mass containing nonliving embryo or yolk sac	100%
Hyperechoic ring surrounding fluid collection in adnexa, β -hCG positive	95%
Complex or solid adnexal mass, β -hCG positive	92%

Management

- Medical: Methotrexate
 - Predictors of treatment success:
 - Gestational sac < 3.5 cm
 - Absence of embryonic cardiac activity
 - Low β -hCG level (< 4,000 IU/L)
 - No hemoperitoneum
- Surgical: Laparotomy/Salpingectomy
 - Indicated for hemodynamically unstable patients and in cases with embryonic cardiac activity**
 - Salpingostomy preferred for preserving future fertility, however increased risk of inadequate removal of products of conception and recurrence of symptoms
- Expectant management may be suitable for hemodynamically stable patients with falling β -hCG levels

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