

## Facilitator's Guide

This presentation is designed to be interactive. You will start by passing out a short pre-test which seeks to activate learners and help them focus on the key points of the presentation. Give learners approximately 5 minutes to complete the test. Next, review the cases with the group, attempting to elicit the answers to the questions from the audience. If the audience is large, you can break them down into small groups and provide copies of the power point pictures, and have each small group discuss a case, and then bring them back together to review the learning points from each case. The answers are in italics for each section. PowerPoint can be used to display images. **Be sure to refer to the First Trimester Bleeding Algorithm and Guidelines for Diagnosis of Early Pregnancy Failure for the cases.** You should pass copies out for each participant to use. Once you have finished discussing the cases, review the answers to the pre-test for which an answer guide is provided.

### Case # 1: Threatened Abortion

You are the on-call resident at night for your practice. You receive a call early in the morning from Maria, who is a 26-year-old woman who reports vaginal bleeding for the past 2 hours. She tells you that she has an appointment for her initial prenatal visit next week, but is concerned that she may need to be seen sooner. What additional information do you need?

- *When was her LMP? When was her first positive pregnancy test?*
- *Has she had an Ultrasound (U/S) which established an intrauterine pregnancy?*
- *How much bleeding is she having? How many pads has she gone through? Any clots? Is she having any symptoms of acute blood loss such as lightheadedness, palpitations, or syncope?*
- *Is she having any pain? Is she having any cramping?*
- *Does she know her blood type?*

Maria tells you that her LMP was 5½ weeks ago and she first had a positive pregnancy test 2 days ago, which is when she made her prenatal appointment. She describes a small amount of brown blood in her underwear and when wiping and she has not needed to use a pad. She is having some mild lower abdominal cramping and denies symptoms of acute blood loss. She does not know her blood type, but does not remember having a shot when her daughter was born. Based on this information, what is your plan?

- *Maria should be seen in the office that day as we have not established that this is an intrauterine pregnancy and we are unsure of her Rh type. She should be given ectopic and bleeding precautions (listed below) over the phone.*
- *"Call back before your visit if:"*

- 1) *You are bleeding through more than 2 thick maxi-pads per hour for 2 hours in a row*
- 2) *You feel light-headed or like you are going to pass out*
- 3) *You have severe abdominal or pelvic pain, especially on one side*

Maria meets you at the office the following morning. She is still experiencing some spotting, but otherwise has no other symptoms. You assess her feelings about this pregnancy and she tells you she is very worried about the bleeding as she has been trying to get pregnant for months and she is very excited about the possibility of a sibling for her daughter. What do you do next?

- *Follow Algorithm for each step*
- *Vital signs and physical exam, including speculum and bimanual exam.*
- *In office hemoglobin or hematocrit, urine pregnancy test*

Maria's exam:

BP: 113/75, P: 80, RR: 14, Pox: 100%

Speculum: closed cervix, some brown blood in vaginal vault

Bimanual exam: uterus 5-6 weeks size, no uterine or adnexal masses or tenderness

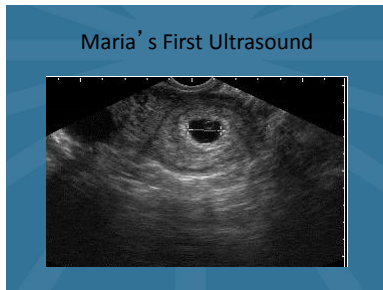
Is it safe to reassure Maria and have her follow up for initial prenatal visit next week?

- *No, all women with first trimester bleeding need a history and exam including speculum/bimanual examination, Rh status, and evaluation with an U/S or if U/S not available serial  $\beta$ -hCGs.*
- *This information allows us to:*
  - 1) *assess hemodynamic stability*
  - 2) *determine if Rhogam is needed and*
  - 3) *evaluate for ectopic pregnancy. Most women will also want to know if the pregnancy is viable.*
- *Definitive diagnosis of early pregnancy loss (EPL) can only be made if (see guidelines):*
  - a. *POC are seen by clinician on a speculum exam*
  - b. *CRL  $\geq$  7mm and no FH*
  - c. *MSD of  $\geq$  25 mm and no embryo*
  - d. *Absence of embryo with FH  $\geq$  2 weeks after a scan that showed a GS without a YS*
  - e. *Absence of embryo with FH  $\geq$  11 days after a scan that showed a GS with a YS.*
  - f. *IUP on US with no growth over one week*
  - g. *IUP previously seen on US now no longer visible (Chen, Clin Obstet Gynecol, 2007; Doubilet, NEJM 2013)*
- *Presumptive diagnosis of EPL can be made if  $\beta$ -hCG falls  $>$ 50%, but if an IUP was **never** seen on U/S ectopic pregnancy cannot be fully excluded from*

*differential. Patient should be given ectopic precautions and quants should be followed to zero. (Barnhart, Obstet Gynecol., 2004).*

Ultrasound shows a gestational sac measuring 7mm and a yolk sac without a fetal pole.

[Show Image – Maria’s First Ultrasound]

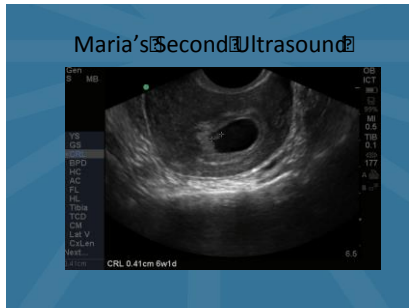


What is your diagnosis? What is your plan? How do you counsel Maria? If her exam had shown an open cervix with visible POC how would your diagnosis and plan change?

- *Diagnosis: Threatened abortion. The presence of intrauterine gestational sac with a yolk sac rules out ectopic pregnancy. Viability of the pregnancy is still uncertain so a follow up ultrasound and/or serial  $\beta$ -hCGs are indicated.*
- *Plan: Repeat ultrasound in one week or follow serial  $\beta$ -hCGs (now and in 48 hours) – U/S is preferred if available. Serial  $\beta$ -hCGs can also be used, but they will not give as much information. Both are often done because the normal rise of the hCG can be reassuring to a very anxious patient, but the ultrasound is more definitive. Give patient bleeding precautions. Make sure you have her correct contact information and give her your emergency contact information.*
- *Women presenting with first trimester bleeding should be counseled that:*
  - a. First trimester bleeding is common*
  - b. They did not cause the bleeding*
  - c. There is nothing they can do at this point that will “save” the pregnancy, there is no evidence for bedrest in the first trimester.*
- *If open os with POC (more than just endometrial cast: villi or gestational sac should be seen for definitive diagnosis) the diagnosis of incomplete abortion can be made in one visit and an ultrasound and serial quants are not necessary.*

Maria’s blood work comes back as O+. You call her and let her know that she does not need Rhogam. Her initial quant is 3090 and 48 hours later rises to 6,070. Maria returns one week later. She has had no further bleeding and her only complaint is of nausea. Repeat U/S shows a gestational sac, yolk sac and fetal pole measuring 4mm with fetal heart tones seen on U/S.

## [Show Image – Maria’s Second Ultrasound]



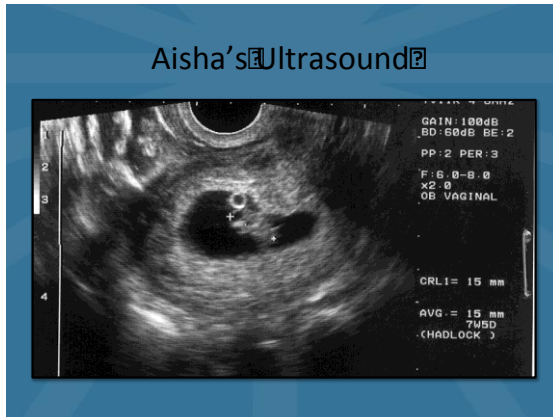
How do you counsel Maria?

- *Ultrasound has shown normal progression and her pregnancy is currently viable, though there is still a small risk of future miscarriage*
- *The risk of pregnancy loss drops once fetal cardiac activity has been documented on U/S.*
- *In pregnant women presenting with first trimester bleeding, the presence of fetal cardiac activity decreased the likelihood of early pregnancy loss to approximately 10%. (Poulose, J Obstet Gynecol, 2006)*
- *First-trimester bleeding is common and occurs in approximately 25% of pregnancies. There is nothing she did to cause the bleeding.*

### **Case # 2: Early Pregnancy Loss – Missed Abortion**

You are seeing Aisha for her initial prenatal visit. She is a 20 year old G2P0010 with no medical problems. Her LMP was 8 weeks ago. Aisha tells you that although this pregnancy was unplanned she is excited to have a baby, her mother is very supportive, and she has decided to continue the pregnancy. She states that she experienced several episodes of vaginal bleeding over the past week, but her sister told her that that was normal. She quantifies the bleeding as light, “like the end of a period”. She has had some mild cramping as well. Initially she had experienced some nausea, but that has subsided over the past week or so. Her physical exam shows a closed cervix and she has an approximately 6-week sized uterus on bimanual exam. Ultrasound reveals a gestational sac, yolk sac and 15mm CRL with no fetal cardiac activity seen.

[Show Image – Aisha’s Ultrasound]

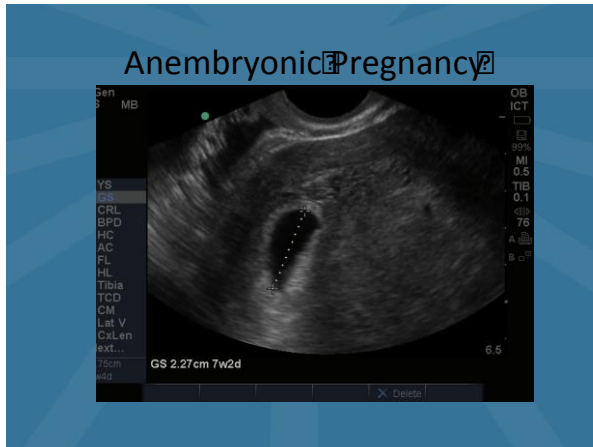


What is your diagnosis? What is your plan? How do you counsel the patient?

- *Early Pregnancy Loss*
- *Definitive diagnosis of EPL can only be made if (see guidelines):*
  - POC are seen by clinician on a speculum exam*
  - CRL  $\geq$  7mm and no FH*
  - MSD of  $\geq$  25 mm and no embryo*
  - Absence of embryo with FH  $\geq$  2 weeks after a scan that showed a GS without a YS*
  - Absence of embryo with FH  $\geq$  11 days after a scan that showed a GS with a YS.*
  - IUP on US with no growth over one week*
  - IUP previously seen on US now no longer visible**(Chen, Clin Obstet Gynecol, 2007; Doubilet, NEJM 201)*
- *Treatment options are expectant management, misoprostol, or manual vacuum aspiration. Send a baseline hemoglobin and Rh type and administer Rhogam if patient is Rh negative.*
- *Counseling: Early pregnancy loss is common. Nothing she did caused this. The most likely cause is a chromosomal abnormality that would not have allowed the pregnancy to develop normally. There is not anything they can do to stop the process once it has begun: there is no evidence for bedrest. Future fertility following a single early pregnancy loss is unchanged.*

What if Aisha’s ultrasound had showed a gestational sac measuring 22mm with no yolk sac and no fetal pole?

[Show Image – Anembryonic Pregnancy]



- *This most likely an anembryonic pregnancy, however in a highly desired pregnancy ultrasound should be repeated in one week to assess for interval growth or development of a yolk sac or fetal pole. Yolk sac and fetal pole should be visible by 20mm gestational sac. (Jeve, Ultrasound Obstet Gynecol. 2011) A mean sac diameter of  $\geq 25$ mm and no embryo is diagnostic for early pregnancy loss (Doubilet, NEJM 2013)*

### Case # 3: Ectopic Pregnancy

Colleen is 36 years old and comes to you with a complaint of intermittent vaginal spotting, nausea, and breast tenderness for the past week. She tells you that she couldn't possibly be pregnant as she has a copper IUD in place. She thinks her last menstrual period was about 6 weeks ago. To be sure you check a pregnancy test and are surprised when it comes back positive. What is your biggest concern? What do you do next?

- *Concern for ectopic pregnancy (IUD still in place) vs early pregnancy loss in the setting of IUD vs expelled IUD with subsequent intrauterine pregnancy*
- *Pregnancies with IUDs are rare, but when they happen 1 out of three will be ectopic (MacIsaac, Obstet Gynecol Clin N Am, 2007)*
- *Plan: Exam to ensure hemodynamic stability, look for IUD strings and assess adnexa on bimanual*

On exam Colleen's vitals are stable, her IUD strings are visible 2cm from os, the os is closed with no blood in vault and she has no appreciable adnexal mass or tenderness.

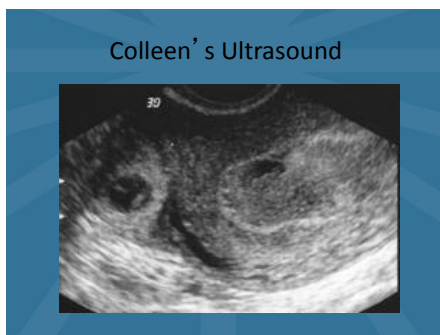
What is your plan from here?

- *Check stat quantitative  $\beta$ -hCG, Rh typing, urgent ultrasound to locate pregnancy*

- *If ultrasound is not available at the point of care, give ectopic precautions and emergency contact information while arranging for an urgent ultrasound to be done*

You discuss the positive pregnancy test with Colleen and your concern for a pregnancy outside of the uterus. Colleen tells you that she does not want to be pregnant right now and will not continue the pregnancy. You draw a quant and Rh typing and send Colleen for an urgent ultrasound. The ultrasound shows no IUP, thickened endometrial stripe, fundal IUD, a 2cm complex adnexal mass and a small amount of fluid in the cul-de-sac.

[Show Image – Colleen’s Ultrasound - Note IUD not visible on this image]



The quantitative HCG comes back as 4100. What is your diagnosis? What is your plan?

- *Ectopic pregnancy: the quantitative HCG is above the discriminatory zone (1500-3000) at which you would expect to see an intrauterine pregnancy on ultrasound and there are other signs on the ultrasound that are highly suggestive of ectopic pregnancy, including a complex ovarian mass and fluid in the cul-de-sac making ectopic pregnancy very likely.*
- *Plan: Treat or refer for treatment with methotrexate. There is no need to remove the IUD.*
- *Notes on the discriminatory zone:*
  - *The discriminatory zone can vary between institutions since it is dependent on the resolution of the ultrasound machine, the skill of the sonographer and the number of gestations.*
  - *$\beta$ -hCG values also differ depending on lab used. Comparing  $\beta$ -hCG values from different labs is not reliable.*
  - *In a desired pregnancy, the diagnosis of ectopic needs to be made with caution so as not to mistakenly disrupt a viable intrauterine pregnancy. A single  $\beta$ -hCG above the discriminatory zone with no IUP on ultrasound should not be used alone to make the diagnosis. In a desired pregnancy, other signs of ectopic pregnancy on ultrasound (adnexal mass, fluid in cul-de-sac) and serial ultrasounds and  $\beta$ -hCGs can be used to*

*differentiate between ectopic pregnancy, early pregnancy loss and early viable pregnancy.*

- *If the patient has decided not to continue the pregnancy, however, and the  $\beta$ -hCG is above the discriminatory zone with no IUP or ectopic on ultrasound you can treat or refer for treatment with methotrexate without delay.*

#### **Case # 4 Pregnancy of Unknown Location**

Tania is a 28 year old woman who had a positive pregnancy test over the weekend. Last night she developed some mild midline cramping and spotting. She is worried that she is having a miscarriage. Her menses are regular and she has been trying to get pregnant for the past several months. LMP was 4½ weeks ago. What do you do next?

- *All women with first trimester bleeding need a history and exam including speculum/bimanual examination, Rh status, and evaluation with an U/S or if U/S not available serial  $\beta$ -hCGs.*
- *This information allows us to:*
  - 1) *assess hemodynamic stability*
  - 2) *determine if Rhogam is needed and*
  - 3) *evaluate for ectopic pregnancy. Cervical motion tenderness can be an important finding suggestive of ectopic pregnancy. Most women will also want to know if the pregnancy is viable.*
- *In this case, because she is so early it is helpful to have a  $\beta$ -hCG result to help interpret the U/S results. If  $\beta$ -hCG is below the discriminatory zone you may not see an IUP.*

Ultrasound shows thickened endometrial stripe but no IUP, no fluid in the cul-de-sac and normal adnexa. The  $\beta$ -hCG is 300 and the patient is RH positive with a hemoglobin of 12.5.

[Show Image – Tania’s Ultrasound]



Does this US result surprise you? What is your differential? What is your plan?



- *No. The  $\beta$ -hCG is well below the discriminatory zone so it is unlikely that you would see an IUP on U/S.*
- *Early intrauterine pregnancy not yet visible on U/S vs. early pregnancy loss vs. ectopic pregnancy*
- *Repeat  $\beta$ -hCG in 48 hours.*
- *Give bleeding and ectopic precautions. Make sure you have an accurate phone number to call patient back with results!*

Repeat  $\beta$ -hCG is 400. How do you counsel the patient?

- *99% of women with a symptomatic viable pregnancy will exhibit at least an increase in  $\beta$ -hCG of 53% (ratio, 1.53) over 48 hours (Barnhart, Obstet Gynecol, 2004). This patient's  $\beta$ -hCG increased only 33% so there is only a 1% chance that this is a viable pregnancy.*
- *This is likely a non-viable, intra-uterine pregnancy, though it could also be an ectopic pregnancy. Because it is a desired pregnancy, we need to be very sure that it is not a viable pregnancy. We would probably proceed with "watchful waiting" and continue serial  $\beta$ -hCG until the discriminatory zone is reached or definitive diagnosis of EPL or ectopic pregnancy can be made.*

Tania continues to have some cramping and spotting. Repeat  $\beta$ -hCG is 150. What is your differential diagnosis now? What is your plan?

- *Most likely she has had a miscarriage and should not require any further treatment, but since an IUP was never seen on U/S, technically this is a pregnancy of unknown location and ectopic pregnancy cannot be 100% excluded.*
- *Her  $\beta$ -hCG should be followed until zero but this can be done weekly unless she develops symptoms concerning for ectopic. (Silva, Obstet Gynecol, 2006)*

### **Case # 5 Early Pregnancy Loss**

Jessica is a G2P1 at 7 weeks by sure LMP who presents to your office with 4 days of cramping and vaginal bleeding as heavy as a period with some blood clots. She hasn't taken a urine pregnancy test yet but thinks she has had a miscarriage and would like to confirm this. You check a urine pregnancy test and it is positive. On exam she is hemodynamically stable, with blood trickling from closed os, no POC visible, no adnexal mass or tenderness. What is your differential diagnosis at this point and why?

- *DDx: Threatened abortion, early pregnancy loss, ectopic pregnancy*
- *Though heavy bleeding is associated with miscarriage it is not diagnostic and heavy bleeding can occur with a viable pregnancy as well as ectopic pregnancy.*

What do you do next?

- *[Refer to algorithm] Get an ultrasound and a  $\beta$ -hCG, hemoglobin and Rh type.*

The ultrasound shows no IUP, a small amount of fluid in the cul-de-sac.

[Show Image – Jessica’s Ultrasound]



The  $\beta$ -hCG is 2370. Rh negative, hemoglobin 11.2. How does this change your differential diagnosis and what do you do now?

- *In light of her sure dates and heavy bleeding, these ultrasound results make viable IUP very unlikely. Early pregnancy loss is most likely but ectopic pregnancy remains on the differential.*
- *Give ectopic precautions and repeat  $\beta$ -hCG in 48 hours.*
- *Give Rhogam 50mg. Full dose Rhogam (300mg) is needed with bleeding after 12 weeks gestation.*
- *Start iron supplementation.*

Two days later the repeat  $\beta$ -hCG has fallen to 710. Her bleeding has tapered to less than a period with intermittent cramps. The patient is planning to go out of town for a week vacation. How do you counsel her? Is it safe for her to go on vacation? Does she need any further testing?

- *Most likely she has had a miscarriage and should not require any further treatment, but since the pregnancy was never seen on ultrasound and no POC were seen, technically this is a pregnancy of unknown location and ectopic pregnancy cannot be 100% excluded.*
- *Her  $\beta$ -hCG should be followed until zero but this can be done weekly unless she develops symptoms concerning for ectopic.*

- *It is safe for her to go on vacation as long as she has access emergency contact information in the rare event that she were to develop heavy bleeding, signs of infection or symptoms of ectopic pregnancy.*

## **References**

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7. Silva, Celso, Mary D. Sammel, Lan Zhou, Clarisa Gracia, Amy C. Hummel, and Kurt Barnhart. "Human chorionic gonadotropin profile for women with ectopic pregnancy." *Obstetrics & Gynecology* 107, no. 3 (2006): 605-610