Do Nothing, Do Something, Aspirate: Management Of Early Pregnancy Loss

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Disclosure
- I train providers in Nexplanon insertion and removal
- I do not receive any honoraria for this

Objectives
By the end of this workshop participants will be able to:
1. Understand diagnosis of early pregnancy loss (EPL)
2. Describe EPL management options in a clinic or the ED.
3. Describe the uterine evacuation procedure using the manual uterine aspirator (MUA).
4. Demonstrate the use of MUA for uterine evacuation using papayas as simulation models.
5. Express an awareness of their own values related to pregnancy and EPL management.

Nomenclature
- Early Pregnancy Loss/Failure (EPL/EPF)
- Spontaneous Abortion (SAb)
- Miscarriage

These are all used interchangeably!
- Manual Uterine Aspiration/Aspirator (MUA)
- Manual Vacuum Aspiration/Aspirator (MVA)
- Uterine Evacuation
- Suction D&C/D&C/dilation and curettage

Background
- Early Pregnancy Loss (EPL) is the most common complication of early pregnancy
  - 8–20% clinically recognized pregnancies
  - 13–26% all pregnancies
  - ~ 800,000 EPLs each year in the US
- 80% of EPLs occur in 1st trimester
- Many women with EPL first contact medical care through the emergency room

Imperfect obstetrics: most don’t continue
Samantha

- 26 yo G2P1 presents to the emergency room with vaginal bleeding after a positive home pregnancy test. An ultrasound shows a CRL of 7mm but no cardiac activity.
- She wants to know why this happened.

Risk Factors for EPL

- Age
- Prior SAB
- Smoking
- Alcohol
- Caffeine (controversial)
- Maternal BMI <18.5 or >25
- Celiac disease (untreated)
- Cocaine
- NSAIDs
- High gravidity
- Fever
- Low folate levels

Etiology

- 33% anembryonic
- 50% due to chromosomal abnormalities
  - Autosomal trisomies 52%
  - Monosomy X 19%
  - Polyploidies 22%
  - Other 7%
- Host factors
  - Structural abnormalities
  - Maternal infection/endocrinopathy/coagulopathy
  - Unexplained

Normal Implantation & Development

- Implantation:
  - 5-7 days after fertilization
  - Takes ~72 hours
  - Invasion of trophoblast into decidua
- Embryonic disc:
  - 1 wk post-implantation
  - If no embryonic disc, trophoblast still grows, but no embryo (anembryonic pregnancy)
  - Embryonic disc embryonic/fetal pole

Milestone of embryology as assessed by TVUS

U/S Dating in Normal Pregnancy

<table>
<thead>
<tr>
<th>Landmark</th>
<th>First appearance on transvaginal ultrasound examination</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gestational sac</td>
<td>4.5 to 5 weeks</td>
</tr>
<tr>
<td>Yolk sac</td>
<td>5 weeks</td>
</tr>
<tr>
<td>Cardiac activity</td>
<td>5.5 to 6 weeks</td>
</tr>
<tr>
<td>Measurable crown-rump</td>
<td>6 weeks</td>
</tr>
</tbody>
</table>

Mean Sac Diameter (mm) + 30

OR

Crown-Rump Length (mm) + 42
Clinical Presentation of EPL

- Bleeding
- Pain/cramping
- Falling or abnormally rising βhCG
- Decreased symptoms of pregnancy
- No symptoms at all!

Samantha 26 yo G2P1, CRL of 7mm but no cardiac activity

Samantha and her partner request information on all the treatment options. You confirm the rest of her history.

Past Medical History: wisdom teeth removed
Ob History: term vaginal delivery without complication
Allergies: no known drug allergies

Management Options

**Do Nothing:** Expectant management

**Do Something:** Medical management

**Aspirate:** Uterine Aspiration

Do Nothing

_Expectant Management_

- Requirements for therapy:
  - <13 weeks gestation
  - Stable vital signs
  - No evidence of infection
- What to expect:
  - Most expel within 1-2 weeks after diagnosis
  - Prolonged follow-up may be needed
  - Acceptable and safe to wait up to 4 weeks post-diagnosis
  - If a woman comes to the ED within 2-4 weeks of a miscarriage or abortion, a pregnancy test will likely still be positive and does NOT necessarily indicate a continuing pregnancy or incompletely treated EPL.

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### Pain Management

- Miscarriage is often painful
- For patients wanting expectant or medical management, give pain medications for home use
  - NSAID
    - Ibuprofen 800 mg q 8
    - Naproxen 500 mg q 12
  - Narcotic of choice (Vicodin or Percocet, etc)
- Treat pain in the ED as needed

### Outcomes

#### Expectant Management

- Overall success rate: 81%
- Success rates vary by type of miscarriage (helpful to tailor counseling)
  - Incomplete/inevitable abortion: 91%
  - Embryonic demise: 76%
  - Anembryonic pregnancies: 66%

Luise C, Ultrasound Obstet Gynecol 2002

### What is Success?

**Definitions Used in Studies**

- ≤15 mm endometrial thickness (ET) 3 days to 6 weeks after diagnosis
- No vaginal bleeding
- Negative urine hCG

### Problems with ET Cut-off

- No clear rationale for this cut-off
- Study of 80 women with successful medical abortion
  - Mean ET at 24 hours 17.5 mm (7.6–29 mm)
  - At one week 15% with ET >16 mm
- Study of medical management after miscarriage
  - 86% success rate if use absence of gestational sac
  - 51% success rate if use ET ≤15 mm

Harwood N, Contraception 2001

### When to intervene for Expectant Management?

- Continued gestational sac
- Clinical symptoms
- Patient preference
- Time (?)
- Vaginal bleeding and positive UPT are possible for 2–4 weeks
- Poor measures of success

### Samantha

26 yo G2P1, CRL of 7mm but no cardiac activity

Samantha is continuing to bleed, though not heavily. She appears anxious about expectant management and shares with you that she really needs to do something before a follow up visit with her doctor.
Medical Management

**Medical Management Requirement for Therapy**

- <13 weeks gestation
- Stable vital signs
- No evidence of infection
- No allergies to medications used
- Adequate counseling and patient acceptance of side effects

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**Do Something**

**Medical Management**

- Misoprostol
- Misoprostol + Mifepristone
- Misoprostol + Methotrexate

No medical regimen for management of EPL is FDA approved

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**Misoprostol**

- Prostaglandin E1 analogue
- FDA approved for prevention of gastric ulcers
- Used off-label for many Ob/Gyn indications:
  - Labor induction
  - Cervical ripening
  - Medical abortion (with mifepristone)
  - Prevention/treatment of postpartum hemorrhage
- Can be administered by oral, buccal, sublingual, vaginal and rectal routes

Chen & Clin Obstet Gynecol 2007

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**Why Misoprostol?**

- Do something while still avoiding a procedure
- Cost effective
- Stable at room temperature
- Readily available

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**Misoprostol Dosing**

**Medical Management**

- 800 mcg per vagina or buccal
- Repeat x 1 at 12–24 hours, if incomplete
  - Occasionally repeat more than once
- Measure success as with expectant management
- Intervene with Uterine Aspiration management as with expectant management
- Success rate depends on type of miscarriage
  - 100% with incomplete abortion
  - 87% for all others


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**Uterine Activity Over 5 Hours**

**Misoprostol by Route of Administration**

- Vaginal DRY
- Vaginal MOIST
- Buccal
- Rectal

Side Effects and Complications
Misoprostol vs. Placebo

Nausea/Vomiting: Increased with misoprostol (SL>oral>buccal>Rectal>vaginal)
Diarrhea: Increased with misoprostol (least with vaginal placement)
Pyrexia and shivering: increased with misoprostol (if persists past 8 hours, assess for infection)
Pain: More pain and analgesics needed in one study
Hemoglobin Concentration: No difference
Infection: No statistical difference placebo vs. misoprostol
- 90% women found medical management acceptable and would elect same treatment again

Samantha
26 yo G2P1, CRL of 7mm but no cardiac activity

Samantha opts to try misoprostol but returns to the ED 7 days later after checking a home pregnancy test and finding it still positive. She is worried the misoprostol didn’t work.
Samantha says that she had a period of heavy bleeding and is now spotting. Her cramping has resolved. She has noted a marked decrease in breast tenderness and nausea.
Her ultrasound shows a uniform endometrial stripe measuring 30mm in its greatest width.
Is she complete?

Misoprostol Bottom Line
Medical management
- 800 mcg per vagina or buccal
- Repeat x 1 at 12–24 hours, if incomplete
- Occasionally repeat more than once
- Measure success as with expectant management
- Intervene with Uterine Aspiration management if
  - Continued gestational sac
  - Clinical symptoms
  - Patient preference
  - Time (?)

Mifepristone and Misoprostol
Medical Management
- Mifepristone: Progestin antagonist that binds to progestin receptor
  - Used with elective medical abortion to “destabilize” implantation site
  - Current evidence-based regimen: 200 mg mifepristone + 800 mcg misoprostol
- Success rates for mifepristone & misoprostol in EPL:
  - 52–84% (observational trials, non-standard dose)
  - 90–93% (standard dose)
- No direct comparison between misoprostol alone and mifepristone/misoprostol with standard dosing
- Mifepristone probably helps, use if you can easily

Methotrexate and Misoprostol
Medical Management
- Methotrexate
  - Folic acid antagonist
  - Cytotoxic to trophoblast
- Used in medical management for ectopic pregnancy
- Introduced in 1993 in combination with misoprostol to treat elective abortion medically
  - Success rates up to 98% (misoprostol administered 7 days after methotrexate)
  - No data for use in early pregnancy loss

Samantha
26 yo G2P1, CRL of 7mm but no cardiac activity

Samantha has completed medical management. She is now medically stable and will be discharged with instructions for follow-up as needed.
Rebecca
32 yo G3P2 at 8 weeks LMP was diagnosed with a fetal demise on her ultrasound and presents to your clinic after 2 weeks of unsuccessful expectant management stating that she “needs her baby out”. She declines medical management and requests an aspiration procedure right then, as it’s making her very anxious to carry a dead fetus.

Is there any medical history you could elicit that would make you uncomfortable doing an aspiration procedure?

Uterine Aspiration Management
Early Pregnancy Loss
- Also called suction dilation and curettage (D&C)
- Misleading term, prefer uterine aspiration or evacuation
- Who should have management with uterine aspiration?
  - Unstable
  - Significant medical morbidity
  - Infected
  - Very heavy bleeding
  - Anyone who WANTS immediate therapy

Infection Prophylaxis
Uterine Aspiration Management
- Periabortal antibiotics ↓ infection risk 42%
- No strong evidence on what to use
- Doxycycline (1–14 doses)
  - 100 mg bid x 7 days
  - 200 mg x 1 preop
  - 100 mg preop and 200 mg post op (ACOG recommendation)
- Azithromycin 1000 mg x 1
- Metronidazole:
  - Bacterial vaginosis
  - Trichomoniasis
  - Suspicious discharge
- Test for gonorrhea and chlamydia per CDC guidelines

Comparison of Outcome by Method
Management of Early Pregnancy Loss

<table>
<thead>
<tr>
<th>Factor</th>
<th>Comparison of Methods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Success rate</td>
<td>Uterine Aspiration &gt; Medical &gt; Expectant</td>
</tr>
<tr>
<td>Resolution within 48 hrs</td>
<td>Uterine Aspiration &gt; Medical &gt; Expectant</td>
</tr>
<tr>
<td>Infection risk 2–3%</td>
<td>Expectant = Medical = Uterine Aspiration</td>
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</tbody>
</table>

Patient Satisfaction

Management of Early Pregnancy Loss

- Meta-analysis: studies report high satisfaction with medical management
- Caution: Few studies looked at satisfaction
- Satisfaction depended on choice:
  - If women randomized: 55-74% satisfied
  - If women chose: 84-88% satisfied
  - Both were independent of method

Sotiriadis 2005

Cost Analysis

A study estimating the economic consequences of expanding options for EPL treatment found that the cost per case was less for women in the expanded care model as compared with the usual care model.

<table>
<thead>
<tr>
<th>Type of Care</th>
<th>Expectant Management</th>
<th>Expander care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost</td>
<td>$1274.58 per case</td>
<td>$1033.29 per case</td>
</tr>
</tbody>
</table>


Rebecca

32 yo G3P2, 8 weeks LMP, fetal demise; 2 weeks of expectant management, requesting uterine aspiration

Notify the OR and call OBGYN if needed?

Send to the emergency department for further evaluation/management?

Is this an emergency?

Cost Analysis

Medical management most cost effective
- 2 studies
  - Misoprostol vs. Expectant vs. Uterine Aspiration:
    - $1000
    - $1172
    - $2007

Expectant management most cost effective
- MIST trial
- Expectant vs. Medical vs. Uterine Aspiration:
  - £1086
  - £1410
  - £1585


Where to perform?

Uterine Aspiration Management

- Women with SAb in Canada:
  - 92.5% presenting to the ED are managed in the OR
  - 51% presenting to family physician have uterine aspiration
- Manual uterine aspiration (MUA) in outpatient setting (including the ED) can reduce hospital costs by 41%
- MUA also often called MVA (manual vacuum aspiration) — we use MUA so as not to have it confused with motor vehicle accidents

Advantages

Keeping treatment in the ED Setting

- Simplify scheduling and reduce wait time
- Average OR waiting time in UK-based study: 14 hours, with 42% of women not satisfied
- Save resources
- Avoid cumbersome OR protocols
- Prolonged NPO requirements and discharge criteria

Demetrakos 2002; Lee and Slade 1996

Moving Incomplete Abortion to Outpatient Setting

Johns Hopkins Study

Methods
- N = 35, incomplete 1st-trimester abortion
- Treatment comparison:

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Manual</th>
<th>Conventional care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uterine Aspiration</td>
<td>Electric Uterine Aspiration</td>
<td></td>
</tr>
</tbody>
</table>

Setting: L&D VS. OR

Blumenthal and Remsburg, 1994

Moving Incomplete Abortion to Outpatient or Emergency Room Setting

Johns Hopkins Study

Results
- Anesthesia requirements
- Overall hospital stay, from 19 hours to 6 hours
- Patient waiting time by 52%
- Procedure time, from 33 minutes to 19 minutes
- Costs per case: $1,404 in OR, $827 in L&D, $200 or less in ER

Blumenthal 1994

Use Outpatient/ED Management Cautiously in Women with...

- Uterine anomalies
- Coagulation problems
- Active pelvic infection
- Extreme anxiety
- Any condition causing patient to be medically unstable

*In an urgent/emergent setting, use the MUA in the office/ED as soon as possible.

What is needed for outpatient/ED management?

- Ability to diagnose EPL
- Ability to counsel appropriately about the management options
- Ability to manage pain
- Appropriate equipment for uterine evacuation
- Ability/skills to perform uterine evacuation


Counseling for MUA

Effective counseling occurs before, during, and after the procedure
- Prepare women for procedure-related effects
- Address women’s concerns about future desired pregnancies

Counseling for MUA

Quality of counseling → Patient satisfaction with care

Counseling for MUA

What is a Manual Uterine Aspirator?

- Locking valve
- Portable and reusable
- Equivalent to electric pump
- Efficacy same as electric vacuum (98%–99%)
- Semi-flexible plastic cannula

Comparison

**EUA to MUA**

<table>
<thead>
<tr>
<th></th>
<th>EUA</th>
<th>MUA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacuum</td>
<td>Electric pump</td>
<td>Manual aspirator</td>
</tr>
<tr>
<td>Noise</td>
<td>Variable</td>
<td>Quiet</td>
</tr>
<tr>
<td>Portable</td>
<td>Not easily</td>
<td>Yes</td>
</tr>
<tr>
<td>Cannula</td>
<td>4–16 mm</td>
<td>4–12 mm</td>
</tr>
<tr>
<td>Capacity</td>
<td>350–1,200 cc</td>
<td>60 cc</td>
</tr>
<tr>
<td>Suction</td>
<td>Constant</td>
<td>Decreases to 80% (50 mL) as aspirator fills</td>
</tr>
</tbody>
</table>

Clinical Indications for MUA

- Uterine evacuation in the first trimester:
  - Induced abortion
  - Spontaneous abortion/EPL
- Incomplete medication abortion
- Uterine sampling
- Post-abortion hematometra
- Hemorrhage

MUA Instruments

Steps for Performing MUA

A step-by-step poster is available from the manufacturer to guide clinicians through the procedure. Please see handout in your folder entitled “Performing Manual Vacuum Aspiration (MUA), . . .”
Complications with MUA

- Very rare
- Same as EUA
- May include:
  - Incomplete evacuation
  - Uterine or cervical injury
  - Infection
  - Hemorrhage
  - Vagal reaction


MUA vs. EUA Complication Rates

Methods
- Retrospective cohort study
- Uterine aspiration to 10wks
- Choice of method (MUA vs. EUA) up to physician
- n = 1,002 for MUA
- n = 724 for EUA

<table>
<thead>
<tr>
<th>Complications</th>
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<tbody>
<tr>
<td>2.5% for MUA</td>
</tr>
<tr>
<td>2.1% for EUA (p = 0.56)</td>
</tr>
<tr>
<td>No significant difference</td>
</tr>
</tbody>
</table>

*Elective, not spontaneous studies


Products of Conception (POC)

Procedure is complete when POC are identified.

Electric Suction Machine
Manual Uterine Aspirator


Patient Satisfaction

- Both EUA and MUA groups were highly satisfied
- No differences in:
  - Pain
  - Anxiety
  - Bleeding
  - Acceptability
  - Satisfaction
- More EUA patients were bothered by noise


MUA Safety and Efficacy: Summary

MUA is simple and easily incorporated into clinic/ED setting.


Rebecca

32 yo G1P2, 8 weeks LMP, fetal demise, 2 weeks of expectant management, requesting uterine aspiration

Rebecca is wanting to have her procedure right there in clinic, but she is concerned about the pain.

What can you tell her about pain management in an outpatient clinic?

Would it be different if she had presented directly to the emergency department for care?
Effective Pain Management

Pain is made worse by:
- Fearfulness
- Anxiety
- Depression

Improve pain management:
- Respectful, informed, and supportive staff
- Warm, friendly environment
- Gentle operative technique
- Women's involvement
- Effective pain medications

Oral Pain Medications for Uterine Aspiration

- NSAID
  - Ibuprofen 800 mg
  - Naproxen 500 mg

- Benzodiazepine
  - Ativan 1-4 mg
  - Valium 2-10 mg

- Narcotic
  - Not routinely recommended
  - Doesn’t increase pain control
  - Increases vomiting

Paracervical Block

1% Lidocaine 20 cc block
1cc at 12:00
10 cc at 4:00 and 8:00
½ deep and ½ tracking back through the cervix.

Sharp Curettage and Pain

- Requires increased dilatation
- Increases pain
- Not recommended for routine use after MUA

Pain Management Techniques

General or nitrous

Local + IV (fentanyl +/- midazolam)

Local (paracervical block with lidocaine)

Efficacy of Ancillary Anesthesia

- Importance of psychological preparation and support
- Music as analgesia for abortion patients receiving paracervical block
  - 85% who wore headphones rated pain as "0,”
  - compared with 52% of controls
- Verbicaine ("Vocal Local")/Distraction Therapy


WHO. 2003

Castleman L, Mann C. 2002.


WHO. 2003
Ultrasound and MUA

- Not required for MUA
- Used by some providers routinely
- Use contingent on provider preference and experience
- You can use to help diagnose non-viable pregnancy prior to EPL management


Rebecca

32 yr (G3P2), 8 weeks LMP, fetal demise, 2 weeks of expectant management, requesting uterine aspiration

Rebecca has her uterine aspiration with MUA procedure right then in the clinic.

The procedure is uncomplicated and her questions after include:

“Can I get pregnant right away?”
“Am I at risk for another miscarriage?”

Future Miscarriage Risk

- Rhogam at time of diagnosis or surgery
- Pelvic rest for 2 weeks
- No evidence for delaying conception
- Initiate contraception upon completion of procedure (even IUDs!)
- Expect light‐moderate bleeding for 2 weeks
- Menses return after 6 weeks
- Negative ßhCG values after 2–4 weeks
- Appropriate grief counseling


When Women Should Contact Clinician

- Heavy bleeding with dizziness, lightheadedness
- Flu-like symptoms lasting >24 hours
- Fever or chills
- Syncope
- Any questions

For More Information on EPL

- TEAMM website: www.miscarriagemanagement.org
- UCSF website: www.earlypregnancylossresources.org
- Ipas WomanCare Kit for Miscarriage Management www.ipaswomancare.com
- Papaya Workshop Videos: www.papayaworkshop.org
Thanks!

Questions
teammm@uw.edu