ISSUES IN EARLY PREGNANCY

Pregnancy of Unknown Location & Early Pregnancy Loss

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ED Rounds
April 11 2017
Clinical Scenario

• 25 yo G3P1A1 with LMP Feb 27 2017 GA 6w1d by dates

• Presents with abdominal cramping & PV bleeding at 22:00

• Triage VS:
  BP: 115/70  HR: 80  T: 36.5  O2: 99%RA  RR: 16  pain: 5/10
Clinical Scenario

- Crampy pain since 13:00 across lower abdo
  - not isolated to RLQ or LLQ
- PV spotting started approx 18:00, soaked one pad so far
- Sure of LMP, periods have been regular
- No use of assisted reproductive technologies

- **PMHx:** term SVD 2013, SA at 10wk in 2015

- **Social hx:** Lives in Saint John, partner present at bedside
Clinical Scenario

- O/E No acute distress, skin pink, cap refill brisk

- Spec: small amt pooling at posterior fornix, removed with one sponge, os has fishmouth appearance

- PV: uterus palp small, no adnexal masses or tenderness

- UPT + pregnancy

- B/W drawn for CBC, Type & Screen, and bHCG

- Patient offered Tylenol for pain
Clinical Scenario

• Patient has improvement in pain while awaiting labs

• B/W results at 23:00:
  • Hb = 120
  • Type & Screen: O neg
  • bHCG = 1025

• How do you manage this patient?
Objectives

- Management of a woman presenting to the ED in early pregnancy with pregnancy of unknown location

- Definitive diagnosis of spontaneous abortion / early pregnancy loss

- Management options for confirmed early pregnancy loss
PREGNANCY OF UNKNOWN LOCATION
Ectopic Pregnancy

• Ruling out ectopic pregnancy is a critical issue in evaluation of the symptomatic patient in early pregnancy

• In women presenting to ED with abdominal pain or pv bleeding, prevalence of ectopic as high as 13%¹

• Well known sequelae of missed ectopic
  • Rupture, tubal infertility, possible death

• Sequelae of false positive diagnosis of ectopic
  • Termination of viable, desired pregnancy
Ectopic Pregnancy

- Tools for diagnosis:
  - Quantitative βHCG
  - Bedside ultrasound
  - Comprehensive ultrasound

- Clinical suspicion
Embryonic development

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<tr>
<td>5 + 0</td>
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<td>Embryo body movements visible, heart rate 175 bpm</td>
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Sonographic findings in Ectopic

- Adnexal mass
  - Simple adnexal cyst - low probability ectopic if < 3mm (5%)
  - Complex adnexal mass – high probability ectopic (90%)²,⁷
  - Most common location: ampullary or isthmic portion of fallopian tube (95% of ectopics)

- Isolated free fluid in the pelvis
  - Rarely the only sonographic finding

- Pseudogestational sac – seen in at most 10% ectopic

- Normal scan – 15 to 25%²,⁸
Role of $\beta$HCG

- $\beta$HCG levels in viable IUP, non viable IUP and ectopic pregnancy have considerable overlap

- What about the discriminatory zone?
  - 1981: Established as $\beta$HCG=6500 for trans abdominal US
  - 1989: $\beta$HCG =1000 – 2000 for transvaginal US

- Annals of Emergency Medicine 2011:
  - For patients with non-diagnostic bedside US, serum hCG level is not helpful in differentiating intrauterine from ectopic pregnancy in symptomatic ED patients.
Role of βHCG

• In the setting of a symptomatic patient with empty uterus, low βHCG < 1000 does not rule out ectopic pregnancy
  - Ectopic pregnancy can occur at any βHCG
  - Rupture documented at very low βHCG\(^1,3\)

• For indeterminate US with βHCG between 2000 – 3000
  - 19 ectopic and 38 non-viable pregnancies for 1 viable pregnancy\(^9\)
  - Other studies have found no correlation

• Ectopic 70x more likely than viable IUP if βHCG > 3000\(^10\)
  - Another possibility: completed abortion
Utility of US with low $\beta$HCG

- ACEP recommends:
  
  "Proceed to transvaginal ultrasonography in symptomatic patients with $\beta$HCG less than 1000."

- Comprehensive transvaginal ultrasonography has a moderate sensitivity to detect IUP with $\beta$HCG < 1000
  - 40 to 67% sensitive\(^1\)

- For patients whose final diagnosis is ectopic:
  - When $\beta$HCG < 1000, TVUS had 86 to 92% sensitivity to detect findings suggestive of ectopic\(^1\)
Safety of discharge

• One Australian study of 117 patients with confirmed ectopic pregnancy:¹¹
  • 37 clinically stable patients discharged for US within 18 hrs
    • Median delay of 14 hours, no adverse events, too small to prove safety

• Another study, 69 patients with a final diagnosis of ectopic had mean time to dx of 5.2 days¹,¹²
  • Safety data not provided
Safety of discharge

- Per RCOG 2008¹³

“If no intrauterine or ectopic pregnancy or retained products of conception are seen on transvaginal ultrasound and the woman is asymptomatic at initial assessment, she can be managed conservatively. This is irrespective of the hCG discriminatory zone.”
Safety of discharge

• NJEM 2013:3
  • there is limited risk in taking a few extra days to make a definitive diagnosis in a woman with a pregnancy of unknown location who has no signs or symptoms of rupture and no ultrasonographic evidence of ectopic pregnancy.

• Progression of hCG values over a period of 48 hours provides valuable information:13
  • If failure to fall by 15%
  • And failure to rise by 55%
  • …most likely diagnosis is ectopic pregnancy
A reasonable approach

In the pregnant patient with vaginal bleeding and/or abdominal pain:

- Always perform bedside US to establish ?definitive IUP

- Do not rule out ectopic pregnancy in patients with empty uterus and $\beta$HCG < 1000

- Do obtain a comprehensive TVUS when bedside US does not confirm IUP regardless of $\beta$HCG
A reasonable approach

In the pregnant patient with vaginal bleeding and/or abdominal pain:

• When TVUS is delayed or remains non-diagnostic, involve obstetrician to aid in risk stratification and management

• Reliable, hemodynamically stable patients may be discharged with follow up
  • Expedited TVUS (next day)
  • Repeat βHCG in 48h
Back to the case...

- 25 yo G3P1A1 with LMP Feb 27 2017 GA 6w1d by dates
- Abdominal cramping & PV bleeding, vitals stable

- Transabdominal US: gestational sac, NDIUP

- B/W results at 23:00:
  - Hb = 120  Rh: O neg  βHCG=1025

- Minimal pv spotting since arrival to ED, pain controlled with Tylenol

- How do you manage this patient?
Back to the case…

- You suspect threatened abortion, but recognize that ectopic not ruled out
- No US available after hours

- Obstetrics consulted to review case
  - There are 6 patients in case room and about to go to c-section, discusses case on phone

- Together, decided it is safe to discharge with instructions to return for TVUS in AM and serial βHCG at 48h
  - Specific discharge instructions to return immediately if bleeding/pain/presyncope
  - As patient is Rh(-) she is given a dose of Rhogam
DIAGNOSIS & MANAGEMENT OF EARLY PREGNANCY LOSS
Early Pregnancy Loss

- Non viable intrauterine pregnancy up to GA=12w6d

- In first trimester
  - spontaneous abortion = early pregnancy loss = miscarriage

- 10% of all pregnancies end in spontaneous abortion
  - 80% of these occur in first trimester

- Often have not seen FP or Ob-Gyn yet, and present to ED

- Symptoms overlap with ectopic and normal pregnancy
## Embryonic development

**Table 2. Typical embryonic chronological landmarks in the development of the embryo, as seen on transvaginal ultrasound examination (conception to 8 weeks development)**

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Embryo body movements visible, heart rate 175 bpm |

Ultrasound diagnosis of EPL

Old guidelines (pre-2011)
- Embryonic demise: crown rump length $\geq$ 5mm w no FHR
- Anembryonic pregnancy: gestational sac with mean gestational diameter $\geq$ 16mm with no embryo

- Recently challenged in two large prospective studies\textsuperscript{15, 16}
  - Due to inter-observer variability

- Dating by LMP is unreliable, must allow $\frac{1}{2}$ wk variation even when sure of dates\textsuperscript{14}
Findings Diagnostic of Pregnancy Failure

Crown–rump length of $\geq 7$ mm and no heartbeat
Mean sac diameter of $\geq 25$ mm and no embryo
Absence of embryo with heartbeat $\geq 2$ wk after a scan that showed a gestational sac without a yolk sac
Absence of embryo with heartbeat $\geq 11$ days after a scan that showed a gestational sac with a yolk sac

Criteria are from the Society of Radiologists in Ultrasound Multispecialty Consensus Conference on Early First Trimester Diagnosis of Miscarriage and Exclusion of a Viable Intrauterine Pregnancy, October 2012.
When findings are suspicious for but not diagnostic of EPL, a follow up US in 7–10d is recommended.

Findings Suspicious for, but Not Diagnostic of, Pregnancy Failure†

- Crown–rump length of <7 mm and no heartbeat
- Mean sac diameter of 16–24 mm and no embryo
- Absence of embryo with heartbeat 7–13 days after a scan that showed a gestational sac without a yolk sac
- Absence of embryo with heartbeat 7–10 days after a scan that showed a gestational sac with a yolk sac
- Absence of embryo ≥6 wk after last menstrual period
- Empty amnion (amnion seen adjacent to yolk sac, with no visible embryo)
- Enlarged yolk sac (>7 mm)
- Small gestational sac in relation to the size of the embryo (<5 mm difference between mean sac diameter and crown–rump length)
Time based criteria

Use of $\beta$HCG

- Serum $\beta$HCG becomes positive at implantation
  - Day 21 or 22 post LMP (Day 8 post conception)

- Early pregnancy: $\beta$HCG doubling time 1.4 – 2.1 days
  - Minimum of 55% rise over 48h in viable pregnancy$^{3,14,14}$

- $\beta$HCG plateaus at approx. 8 to 12 wks, then declines

- For early pregnancy < 7-8 wk gestation, serial $\beta$HCG can support a US diagnosis of spontaneous abortion
  - $\beta$HCG falling > 15% in 48h confirms non-viable pregnancy
Suggested approach from SOGC:

Management of Early Pregnancy Loss

• Expectant management

• Medical management with misoprostol

• Surgical management with suction curettage

• Note: Spontaneous abortion is medically common, and its emotional impact is often underestimated
Expectant management

- Limited to first trimester up to 12w6d
  - Contraindicated if: infection, hemorrhage

- Successful to compete expulsion in 80% women

- Expect moderate to heavy bleeding

- Confirmation: typically with US
  - Absence of gestational sac and endometrial thickness < 30mm
  - Serial βHCG alternative if limited US access
Medical Management

- Same criteria as expectant (<12w6d, medically stable)

- Sample protocol\textsuperscript{14}
  - Misoprosol 800 mcg pv, may repeat in 48h if no result
  - Ibuprofen for pain control
  - RhoGAM within 72h of first dose if Rh(-)

- US in 7-14d to document complete expulsion
  - Or serial βHCG
Surgical Management

- Traditional approach

- Urgent surgical evacuation if:
  - Hemodynamic instability, hemorrhage, infection

- Preferable if woman desires more immediate completion and less follow up

- All 3 methods result in complete evacuation in most patients with similar adverse event rates
  - Hemorrhage: 0.5 – 1%, Infection: 1 – 2%
Futher management issues

- Prevention of allo-immunization for Rh(-) mother:
  - RhoGAM 50mcg within 72h of dx of miscarriage

- Delayed conception $\implies$ no benefit

- May resume contraception immediately after completion of spontaneous abortion
  - IUD may be placed at time of surgical evacuation
Back to the case…

- 25 yo G3P1A1 with LMP Feb 27 2017 GA 6w1d by dates
  - Initial βHCG=1025
  - Bedside US: gestational sac only

- TVUS in AM: gestational sac measuring 10mm
  - No adnexal masses
- 48h βHCG=785
- Ongoing pv spotting

- TVUS at 10d: persistent gestational sac, βHCG=455
  - Diagnosis of early pregnancy loss is made
  - patient opts for D&C
Take home points

- Do obtain a comprehensive TVUS when bedside US does not confirm IUP regardless of βHCG

- Do not rule out ectopic pregnancy in patients with empty uterus and βHCG < 1000
  - Clinical judgment: safe discharge planning vs admission
  - Low threshold to involve Obs-Gyn for these cases

- Early pregnancy loss is diagnosed by US when:
  - CRL >/= 7mm with no FRH
  - Mean sac diameter >/= 25mm and no embryo

- Expectant, medical and surgical management are equally effective and safe in treatment of EPL
  - Patient preference may guide decision making
References


References


