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MISCARRIAGE and RELATED PROBLEMS

Spontaneous miscarriage affects 10 – 20% of clinical pregnancies. For more than 100 years the traditional approach to this problem has been to first confirm failure of the pregnancy, establish its intrauterine location and to then proceed with surgical evacuation of the uterus. However, in recent decades medical and expectant management has been tested as alternatives to the surgical approach. These nonsurgical alternatives meet patient preferences for care, are cost effective and have fewer complications than the traditional dilatation and curettage of the uterus. In particular, randomised trials have demonstrated that the risk of infection is less with nonsurgical treatments and rare complications such as uterine perforation and Asherman's syndrome are also avoided.

A nonsurgical approach to the management of miscarriage requires a systematic approach the assessment of patients who present with bleeding and or pain in the first trimester of pregnancy. Close follow up and timely intervention when indicated are also required. These services are best provided by an Early Pregnancy Assessment Service (EPAS). Integral to such a service is the provision of an environment and facilities that are optimal for the psychological care of women whose pregnancies are threatened by the spectre of miscarriage.

The management of ectopic pregnancy, recurrent miscarriage, molar pregnancy (gestational trophoblastic disease) and patients seeking termination of pregnancy are not covered by these guidelines although reference to all four is required.

Guidelines

It is recommended that the traditional terms of inevitable, incomplete, missed, complete and threatened abortion (and related terms such as "blighted ovum") be abandoned in favour of the following:

<i>Complete miscarriage</i>	Pregnancy loss before 20 weeks gestation with macroscopically or microscopically identified products of conception and an empty uterus to ultrasound evaluation*.
<i>Early Pregnancy Failure</i>	Ultrasound-confirmed evidence of a nonviable pregnancy in an asymptomatic woman i.e. without pain or vaginal bleeding
<i>Incomplete Miscarriage</i>	Pregnancy with passage of macroscopically or microscopically identified products of conception but ultrasound evidence of significant intrauterine material*.
<i>Threatened Miscarriage</i>	Uterine bleeding with or without pain in a pregnancy prior to 20 weeks gestation but with ultrasound evidence of continuing embryonic or fetal viability.

*See the Appendix 1



It is important to note that these definitions make no reference to the state of the cervix but relies instead primarily on ultrasound evaluation of the intrauterine contents. Ultrasound evaluation by transabdominal and or transvaginal scanning by an experienced, clinically competent operator is therefore central to an early pregnancy assessment. There are occasions in which ultrasound is either not readily available or not diagnostic. So, in practice, a further diagnostic category is required:

Undiagnosed Early Pregnancy Problem= Bleeding and or pain in pregnancy when ultrasound has not yet been performed OR

- Is unlikely to be helpful because the period gestation is too early OR
- Has been performed and does not confirm an intrauterine gestation.

This diagnosis incorporates such previously used terms as “biochemical pregnancy” and “?ectopic”

When is Hospitalisation Required?

A hospital Emergency Department (ED) is the best site for acute problems in the first 20 weeks of pregnancy that includes significant vaginal bleeding or severe pain.

For this purpose the following terms apply:

Significant bleeding Vaginal bleeding that is heavier than a normal period or bleeding that is accompanied by severe pain

Severe Pain Pelvic pain that is sufficient to interfere with a patient’s normal functioning or is not responding to simple measures

All other problems in the first 20 weeks of pregnancy that may require hospitalisation are best dealt with by an EPAS.

Patients who present to the ED with possible miscarriage but *without significant bleeding or severe pain* require the following:

- Basic History
- Confirmation of pregnancy by urine HCG testing
- Vital signs (BP, PR and Temp), abdominal examination and inspection of vaginal loss (including any material passed)
- Venipuncture for HB, Blood group (if not readily available) and quantified beta HCG
- Referral to the next available EPAS (and asked to take along other relevant data e.g. date of LMP, date confirmation of pregnancy, prior ultrasound reports, antenatal record etc.)

Patients who present to the ED with an early pregnancy problem that involves significant bleeding or severe pain or a question of ectopic pregnancy are assessed in the ED according to guidelines provides in Appendix 2. The EPAS becomes a part of their ongoing care if a medical or conservative approach to the management of their miscarriage is elected.



Appendix 1

Early Pregnancy Assessment Service (EPAS) Guidelines

- Patients are referred to the EPAS by their GP, gynaecologist or the hospital ED staff.
- An EPAS typically runs Monday - Friday with appointments available each morning through a midwife coordinator.
- Basic documentation, demographics, history and vital signs are undertaken by the midwife or ED Nurse.
- For patients with reliable dates and a gestation >13 weeks an abdominal Doppler for fetal heart sounds is conducted by the midwife.
- Abdominal and/or vaginal ultrasound is conducted by the registrar or any appropriately trained person. (A transvaginal scan is required in approx. 40% of patients referred to an EPAS).

Management of Threatened and Complete Miscarriage

A diagnosis of *threatened miscarriage* is made if an ultrasound examination shows an embryonic or fetal echo with evidence of fetal heart motion.

A diagnosis of *complete miscarriage* is made if there are identified products of conception that have been passed and the ultrasound examination of the uterine cavity shows heterogenous shadows of 15 mm or less in maximum AP diameter. Such patients usually have no pain and a history of PV bleeding that is settling.

If no products of conception have been identified and there was never ultrasound evidence of an intrauterine pregnancy then a diagnosis of complete miscarriage cannot be made. In such instances the diagnosis is *Undiagnosed Early Pregnancy Problem* (see management below). Follow up with serial measures of beta HCG may be required to exclude ectopic pregnancy or molar disease.

Anti-D is administered to Rh Negative patients according to the guidelines given below.

Patients with an ongoing viable pregnancy who wish to continue their pregnancy are invited to undergo routine antenatal tests. They are also provided with basic information about early pregnancy care as well as their options for the prenatal testing for aneuploidy. They are then referred to the antenatal carer of their choice.

Patients with an ongoing viable pregnancy who wish to consider termination of pregnancy are counselled about their options and referred appropriately.



Management of Incomplete Miscarriage and Early Pregnancy Failure

A diagnosis of *early pregnancy failure* is made in patients with an intact intrauterine gestational sac whose mean diameter is >25 mm and there is no evidence of embryonic echo or an embryonic echo >7 mm CRL and no evidence of heart motion.

A diagnosis of *incomplete miscarriage* is made in when there is ongoing vaginal bleeding and/or pain and ultrasound examination of the uterine cavity shows heterogenous shadows of 16 mm or more in maximum AP diameter. Both clinical and ultrasound assessments are required for the diagnosis of incomplete abortion.

All patients in these diagnostic categories are offered surgical evacuation of the uterus, medical or conservative management of their miscarriage. Patients:

- Who are febrile (temperature >37.5)
- Have a closed cervix and an intact sac diameter of >5 cm
- Have miscarried on two previous occasions
- Are unlikely to cope well with the uncertainty and length of follow up required with nonsurgical management

are encouraged to undergo uterine suction curettage.

This is scheduled for the next available time according to clinical priority. Consideration may need to be given to cervical ripening if dilatation of the cervix >10 mm is likely to be required.

Medical management consists of 800 mcg of Misoprostol into the posterior fornix. Oral administration is acceptable to those women who prefer this. 600 mcg of Misoprostol is sufficient for women with incomplete miscarriage. Outpatient care is an option but such patients require 24-hour access to a hospital for telephone advice or admission as required. Review every 2 – 3 days is desirable.

Conservative management consists of repeat evaluation by the EPAS after 3 and 7 days and weekly as required. *Patients are offered telephone consultation or review in the EPAS or ED at any time (24 hours, all days) should pain or bleeding become of concern to them.*

Follow up continues until the miscarriage is confirmed to be complete. The diagnosis of complete miscarriage is a clinical one best made by an experienced clinician aided by ultrasound evaluation. *Not all “products of conception” seen on ultrasound, with or without colour Doppler imaging require uterine curettage.*

Follow up with serial serum beta HCG estimations has a limited role because it takes some time for this hormone to be cleared from the blood stream. For example serum beta HCG can be positive for 2 – 3 weeks after complete evacuation of a uterus for termination of a normal pregnancy. Serial serum beta HCG estimations can be very useful however in the management of suspected ectopic pregnancy (undiagnosed early pregnancy problem) when ultrasound evaluation is non informative. *In such instances the only safe option is to follow the beta HCG levels back to zero (or less than 5 IU/L)*

Patients undergoing medical or conservative management of miscarriage need to informed that the success rate is 25-100% depending on the amount of material within the uterus and their tolerance of the time and discomfort required. Several weeks of follow up may be required and a number of patients (20 – 50%) will request surgical evacuation during this time. Expectant management may involve resorption



of retained tissue with little associated bleeding. A few patients have menstrual-like bleeding for weeks.

Other Aspects of Management

1. Non-sensitised rhesus (Rh) negative women should receive anti-D immunoglobulin (250 IU before 12 weeks, 600 or 625 IU after 12 weeks) in the following circumstances:

- Ectopic pregnancy
- All bleeding after 12 weeks gestation
- If surgical evacuation of the uterus is performed
- For miscarriage <12 weeks gestation when bleeding is heavy or associated with pain (if there is clinical doubt then anti-D should be given)

This may need to be repeated after 6 weeks if bleeding continues with a viable pregnancy.

Surgical evacuation of the uterus should be performed using suction curettage.

At risk women e.g. those <30 years age undergoing surgical evacuation of the uterus should be screened by urine PCR for Chlamydia trachomatis.

Tissue removed surgically or passed spontaneously should be submitted to histology to exclude ectopic pregnancy and gestational trophoblastic disease.

All professionals should be aware of the psychological sequelae associated with miscarriage. Support and counselling and or referral to other resources is performed when required. This may be the patient's GP, a miscarriage support group or the hospital's Social Work Department.

Management of Undiagnosed Early Pregnancy Problem

A diagnosis of "*presumed ectopic pregnancy*" is made if the quantified beta HCG is >3000 IU/L and no gestational sac or products of conception are identified in the uterine cavity.

All other patients are categorised as an "*undiagnosed early pregnancy problem*". Their further management is undertaken according to the clinical circumstances and in consultation with the gynaecologist on call. It will usually involve follow up, after patient counselling, by serial measures of quantified beta HCG and/or further ultrasound examinations.

References

1. RCOG Clinical (Green Top) Guidelines: *The management of early pregnancy loss* October 2000.
2. NICE Guideline "*Ectopic Pregnancy and Miscarriage*" December 2012
3. Shelley JM Healey D and Grover S: *A randomised trial of surgical, medical and expectant management of first trimester spontaneous miscarriage*. ANZ J Obstet and Gynaec 45:122-127, 2005
4. Brownlea S Holdgate A Thou STP and Davis GK: *Impact of an early pregnancy problem service on patient care and Emergency Department presentations*. ANZ J Obstet and Gynec 45:108-111, 2005
5. Luise C Jermy K May C Costello G Collins WP and Bourne TH: *Outcome of expectant management of spontaneous first trimester miscarriage: observational study*. Brit Med J 324:873-875, 2002

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Appendix 2

BLEEDING, PAIN AND POSSIBLY PREGNANT

Guidelines for the Emergency Care of Patients who present with Vaginal Bleeding.

Patients may present to the Emergency Department or an After Hours Medical Service because of vaginal bleeding in early pregnancy. They are frequently in a state of high emotion since this represents the ultimate threat to their unborn child. Management therefore needs to be carried out in a calm, competent and systematic fashion.

STEP 1 - DIAGNOSIS OF PREGNANCY

The availability of very sensitive and specific pregnancy tests has made this step easy. However, if a patient gives a clear history of a positive pregnancy test *then there is little point in repeating this*. If however there is no such history, then a rapidly and competently performed URINE test can be most useful.

If the test is negative then:

1. The patient can be told that she is NOT pregnant (this immediately removes much of the emotion from the situation).
2. Ectopic pregnancy (a life threatening condition) can be reasonably (but not absolutely) excluded.

If the pregnancy test is positive then assessment can move rapidly or simultaneously to the following steps.

STEP 2 - VITAL SIGNS AND RESUSCITATION

A rapid assessment of vital signs especially:

- pulse rate
- colour; and
- blood pressure
- together with some history about the amount of vaginal bleeding.

If there is evidence of *substantial* blood loss i.e. >500 ml total and/or maternal hypotension with tachycardia then an intravenous line may be inserted and fluids infused e.g. 1 litre N saline. Take blood for crossmatch.

Such steps involve fewer than 5% of miscarriages and, *for most others, a drip is rarely necessary*.

STEP 3 - IS THIS PREGNANCY CONTINUING?

- First *an estimate of the likely duration of the pregnancy* is required. This may involve history about any prior ultrasound scans
- prior consultation with a doctor with confirmation of pregnancy and estimated date of delivery (EDD)
- menstrual history - last menstrual period AND cycle length
- date of conception with assisted conception e.g. IVF

An ultrasound scan is the best method of assessing a pregnancy between 6 and 14 weeks of pregnancy. However, it is not appropriate when:



- the pregnancy is <6 weeks amenorrhoea (5.5 weeks with a vaginal probe and an experienced operator) or >14 weeks (use a Doppler for fetal heart sounds)
- the woman is shocked or in a lot of pain
- ultrasound is not readily available

Vaginal Examination (VE)

This step is by no means mandatory for all occasions. In general it is desirable when ultrasound is not readily available, there is a history of passage of tissue or the patient is bleeding heavily or with signs of shock out of proportion to the amount of blood loss. The last suggests products of conception in the cervical os and their removal is both diagnostic and therapeutic.

First explain to the patient why a VE is necessary and reassure her that it will not cause a miscarriage. If you have insufficient experience to perform the VE and collect all the necessary information PLEASE DO NOT PROCEED. If your findings cannot be relied upon then someone else will have to repeat this examination.

A speculum examination should generally be performed first. Ensure that you have adequate assistance and equipment i.e.

- patient in a dorsal or lithotomy position on a firm couch
- good light and assistance to redirect it
- speculum
- sponge holding forceps and plenty of swabs for clearing blood from the vagina (if bleeding heavily)
- kidney dish

It is sometimes necessary to visualise the cervix by repeated swabbing. Remove any blood clots or products of conception from the cervix by grasping them with sponge holders twisting and gently withdrawing. If there is substantial bleeding or products of conception in the cervix, then the patient may be hypotensive and expedient removal of products may restore cardiovascular support rapidly.

If there are no products of conception visible it is desirable to perform a gentle digital examination to assess whether the cervix is open. One finger can be introduced as far as possible into the cervix (bearing in mind the difference between a nulliparous and multiparous cervix). Identification of the open cervix at the level of the internal os requires some experience.

Ultrasound Examination

A full bladder is desirable for an adequate abdominal scan in early pregnancy. Sometimes it is desirable to keep the patient "Nil by mouth" in which case IV fluids or bladder catheterization can be used. If threatened abortion seems to be the likely diagnosis then oral water only is acceptable.

Transvaginal ultrasound does not require a full bladder and is the route of choice in most instances. However, most ultrasonographers will prefer to begin with a full bladder and the abdominal scan in order to rule out advanced pregnancy and large ovarian masses.



If the patient is >7 weeks amenorrhoea by certain dates and a fetal heart cannot be detected by ultrasound then the usual diagnosis is failed pregnancy. *This diagnosis is confirmed if the ultrasound dimensions of the sac exceed 25 mm and a fetal heart motion cannot be demonstrated.*

If however all of the above criteria cannot be met it is better to refer the patient on for a second opinion. It is important to tell the patient something. Truthfulness is the best option eg. "it doesn't look very good but I am not in a position to make the final diagnosis. I would like a second opinion."

If dates are uncertain and there is no question of ectopic pregnancy then a repeat ultrasound after 7 – 14 days is appropriate. Such patients can be invited to return for further clinical review if significant pain or bleeding occurs.

STEP 4 - INVESTIGATIONS REQUIRED

All patients with bleeding in early pregnancy require a blood group and antibody screen (BG & BGA). If the group is Rhesus negative the patient requires I/M Anti D (1 amp) administered within 72 hours. If the pregnancy continues then this should be sufficient to cover further episodes of possible maternal iso-immunisation for up to six weeks.

Other investigations should only be ordered if clinical indicated e.g.

FBE Full blood examination if clinically anaemic or substantial blood loss has occurred.

RUBP Rubella immunity if the patient is in doubt about her immune status and planning further pregnancy.

STS, HIV & Hep Syphilis, HIV and Hepatitis B/C serology for at risk patients.

HVS High vaginal (or endocervical) swab for gram stain and culture when septic abortion is suspected

CHLAMYDIA For at risk patients especially if D&C is planned

Steps are taken to ensure that *the results of all the above tests are forwarded to the site of ultimate responsibility* e.g. obstetrician, family doctor or hospital if admitted.

HISTOLOGY Any products of conception passed should be placed in a sterile container and kept with the patient. It is better not to cover them with formalin since a few patients with recurrent abortion may benefit from a chromosome analysis of the abortus and this requires cell culture.

STEP 5 - DIAGNOSIS OF ECTOPIC PREGNANCY

Ectopic pregnancy (EP) occurs in almost 1:50 pregnancies and should be considered in the differential diagnosis of pelvic pain or bleeding in any woman of reproductive age. It occurs more frequently in women with a past history of ectopic pregnancy or pelvic inflammatory disease, infertility and assisted conception. Pregnancy, including clinically significant ectopic pregnancies, can be readily excluded by a bedside test for beta HCG in urine. If EP cannot be excluded then the first and most important step is a quantified measurement of beta HCG in serum.



Observation is reasonable management for a well-informed patient who can be reliably followed and if the HCG is <250 IU/ml. In some circumstances observation in hospital with serial measurements of quantified beta HCG may be necessary in order to avoid disturbing a viable intrauterine pregnancy.

1. **For beta HCG<250 IU/ml.** Significant haemoperitoneum is unlikely but surgical intervention for EP can be required for any concentration of beta HCG down to <20 IU/ml. Observe (with admission if the patients circumstances require this) and repeat the quantified beta HCG in 24 - 48 hours. A successful intrauterine pregnancy (IUP) will exhibit a doubling of the beta HCG every 48-72 hours.
2. **For beta HCG 500-1000 IU/ml.** As for 1. above but laparoscopy should be considered sooner rather than later if there are clinical signs of EP.
3. **For beta HCG 1000-3000 IU/ml.** Arrange a vaginal scan. If an intrauterine gestational sac is demonstrated then EP can be reasonably excluded (except in the very rare instance of simultaneous IUP and EP). Beware of an intrauterine pseudo sac. Remember that up to 50% of IUP's which present with vaginal bleeding and/or pain will be unsuccessful. However, if a fetal echo with normal heart motion is demonstrable, then 94-98% of such pregnancies will continue successfully (depending on the age of the patient).
4. If an intrauterine sac cannot be demonstrated and there are clinical signs of EP then laparoscopy with or without uterine suction curettage is indicated. All material obtained should be submitted for histology.
5. **For beta HCG>3000 IU/ml.** Arrange a vaginal scan. If an intrauterine gestational sac is not demonstrated then laparoscopy is indicated.

6 WHERE NEXT?

If the patient has an ongoing viable pregnancy then appropriate referral to the carer of choice is required. Patients considering termination of a pregnancy may require alternative referral. In either case all relevant information and the results of tests should be included in the referral.

SUMMARY

- Not every patient with vaginal bleeding requires a vaginal examination - ultrasound examination may be more appropriate - see Step 3 above. Vaginal ultrasound is the best option.
- Quantitative HCG can be useful in the diagnosis of ectopic pregnancy - see Step 5
- Few patients require resuscitation or IV therapy
- Vaginal examination of an aborting patient requires experience. If in doubt, please ask for help
- Very few investigations are required when a pregnancy has aborted - see Step 4.

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