CLINICAL MANAGEMENT

Management of vaginal bleeding presenting to the accident and emergency department

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Vaginal bleeding is a common presenting complaint in the accident and emergency (A&E) department. It can occur in all age groups from the young girl to the elderly woman. Vaginal bleeding occurs in up to 25% of all pregnancies and many of these women present to A&E rather than to their general practitioner (GP) or antenatal clinic because of 24 hour access.¹ In one teaching hospital 0.7% of patients seen in one year presented with bleeding in early pregnancy.² The main aim of management in the A&E department is to identify potentially life threatening conditions and to separate those that require urgent gynaecological referral from those that can be managed by the GP or on an outpatient basis.

This article will highlight important points to note when taking a history from a patient with vaginal bleeding, critical aspects of the examination, and the range of investigations that may be useful. It will also deal with those aspects of management pertinent to the A&E department and appropriate arrangements for the further care of these women.

It is helpful to subclassify the presenting population as detailed in the algorithm shown (fig 1).

Reproductive age group

The majority of women presenting to the A&E department with vaginal bleeding will be in this

age group. The most important diagnosis to exclude is that of ectopic pregnancy; this currently occurs at a rate of 9.6/1000 pregnancies.³ An average district general hospital will expect to deal with one ectopic pregnancy a week, although not all present via A&E. This condition still kills women and caused nine maternal deaths in the UK in 1991-93.³ Unfortunately clinical diagnosis has poor sensitivity, around 50%.⁴ There are a wide range of clinical presentations ranging from the classic collapsed patient with a haemoperitoneum, to vaginal spotting. The safest approach is to have a high degree of suspicion in each patient.

The following sections will discuss some of the most important points in both history and examination and relate these to possible diagnoses/conditions.

KEY POINTS IN HISTORY (TABLE 1)

The most important question to answer is "Could the woman be pregnant?"

● Volume and duration of bleeding

The amount does not indicate the diagnosis, a pregnancy may still be viable despite quite a heavy loss. However an ectopic pregnancy is not usually associated with excessive vaginal bleeding. Recognisable products of conception such as a jelly-like sac may have been lost which would suggest that a miscarriage has occurred. Women also occasionally describe the passage of vesicular "frog spawn"-like material which suggests a molar pregnancy. Menstrual blood does not normally clot so the passage of clots indicates a heavier than normal loss.

● Associated symptoms

Nausea, breast tenderness, urinary frequency, and fatigue may reinforce suspicions that the patient is pregnant. These symptoms may be exaggerated with a molar pregnancy, but may not be present when a pregnancy has failed to develop (missed abortion or blighted ovum).

Abdominal pain may be severe as a pregnancy is miscarrying, or in a ruptured ectopic pregnancy. Specific inquiry should be made about shoulder tip pain. A history of vaginal discharge, pelvic pain, dyspareunia, or fever may suggest pelvic inflammatory disease which can also cause irregular vaginal bleeding.

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Figure 1 Algorithm subclassifying presenting population.

Table 1 Points to cover in history taking

Bleeding	Amount, volume, duration
Associated symptoms	Abdominal pain, syncope, and shoulder tip discomfort Common symptoms of pregnancy, for example nausea and breast tenderness
Menstrual history	Date of last period Normal cycle length and regularity
Contraception	Current and recent
Past gynaecological history	Previous surgery, history of pelvic infections, or infertility Any recent treatment, for example cervical diathermy
Past obstetric history	Previous miscarriages, ectopic and viable pregnancies
Past medical history	Bleeding disorders, for example von Willebrand's disease
Drug history	Warfarin, HRT

● Menstrual history

Ask about the regularity of the cycle, the date of the last menstrual period, and whether this was normal in time, duration, and loss. Last menstrual periods are notoriously unreliable: 10% of patients in one study were found to be pregnant even when the patient stated that her last period was normal and that she could not be pregnant.⁵ Although ectopic pregnancy classically presents after 6–10 weeks of amenorrhoea, many women have had some bleeding around the time of the expected period and do not suspect that they are pregnant. Not all patients with prolonged amenorrhoea before presentation are pregnant: anovulatory cycles occur with polycystic ovary syndrome, and there may be heavy, persistent bleeding after several months of amenorrhoea.

Bleeding between the periods or after intercourse suggests the possibility of a cervical lesion causing the bleeding.

● Contraception

Always ask about the form of contraception used. Conceptions that occur with an intrauterine contraceptive device (IUCD) in situ, or when taking the progesterone only pill, are more liable to be ectopic gestations. These methods are also prone to cause erratic bleeding. No method of contraception is entirely reliable, pregnancies can occur several years after sterilisation due to recanalisation and fistula formation. The risk of an ectopic pregnancy is higher if conception occurs after sterilisation. Most failures of oral contraception are due to forgetting to take the tablets, but drug interactions or gastrointestinal upsets can affect absorption. Recent changes in contraception may also affect the menstrual cycle: periods may become heavier or more painful after cessation of the oral contraceptive pill or after insertion of an IUCD.

● Past gynaecological history

Altogether 25–50% of ectopic pregnancies occur in women with risk factors such as previous pelvic inflammatory disease, tubal surgery, previous ectopic pregnancy, and after assisted conception.⁴ Cervical malignancy may also present with vaginal bleeding so it is worth asking about the patient's smear history. Patients who have had treatment for cervical pathology at a colposcopy clinic may present to the A&E department with vaginal loss either soon after treatment or about 10 days later due to secondary haemorrhage.

● Past obstetric history

Specific inquiry should be made about the outcome of previous pregnancies, and the stages at which any miscarriages occurred. A secondary postpartum haemorrhage may present via A&E particularly if bleeding is very heavy. This commonly occurs 7–10 days after delivery.

● Previous medical history

Menstrual disturbances can be due to other medical disorders such as thyroid and renal disease. Heavy vaginal bleeding may also be secondary to a coagulation disorder, or anticoagulant medication. In adolescents coagulation disorders such as idiopathic thrombocytopenic purpura and von Willebrand's disease are the second most common cause of menorrhagia.⁶

● History of trauma

If bleeding resulted from a sexual assault and the patient's condition is stable it is advisable to discuss with the patient if she wishes to involve the police at an early stage so that a police surgeon can attend to ensure that appropriate forensic specimens are obtained. Even if the police are not involved there should be very careful documentation of the injuries. It is very rare for a woman to be seen after an illegal abortion, but this possibility should be borne in mind particularly if there is bleeding associated with a watery loss in the second trimester. In this circumstance sepsis is a major concern, and disseminated intravascular coagulation may be a consequence.

KEY POINTS IN EXAMINATION (TABLE 2)

It is recommended that a chaperone should be present during examination, regardless of the sex of the examining doctor.⁷

● Cardiovascular status—evidence of shock

The blood pressure may remain normal despite a large blood loss, tachycardia is usually the first indicator of excessive loss. Occasionally "cervical shock" due to intense vagal stimulation by products sitting in the os will lead to profound bradycardia. This is best resolved by removing the products with a sponge forceps.

● Abdominal examination

The majority of miscarriages occur before 12 weeks and the uterus will not normally be palpable abdominally. If the woman is known to be pregnant assess if the size of the uterus is appropriate for her dates, and if more than 14 weeks it may be possible to hear the fetal heart with a Doppler ultrasound. However not all swellings arising from the pelvis are due to pregnancy: fibroids and ovarian cysts are other possible causes. Look for tenderness: general-

Table 2 Key points on examination

Cardiovascular status	Tachycardia, bradycardia, blood pressure
Abdominal examination	Palpable uterus/abdominal mass Tenderness, rebound, distension Listen for fetal heartbeat
Pelvic examination	Cervical os open/closed Size of uterus, adnexal masses, or tenderness

Table 3 Key investigations

Pregnancy test	Urine on everyone, blood if unobtainable or equivocal result
Ultrasound scan	Intrauterine sac, fetal pole, and heart beat Adnexal mass or free fluid in pouch of Douglas suggestive of ectopic pregnancy
Blood group	Anti-D
Full blood count	Check for anaemia, infection, and platelets
Bacteriology swabs	Infection screen

ised or localised, rebound, guarding, and reflex bowel distension, which classically are signs of intraperitoneal bleeding.

● Pelvic examination

A speculum examination followed by a bimanual examination are necessary to differentiate between a threatened miscarriage where the os is closed, and an inevitable or incomplete where it is open, and to determine the size of the uterus and assess for any tenderness or masses in the adnexae.

Never do a vaginal examination if a woman is more than 20 weeks' pregnant—there is a risk of provoking heavy bleeding from the placenta. These patients should be referred directly to the obstetric team.

KEY INVESTIGATIONS (TABLE 3)

It may be difficult to establish the likelihood of pregnancy from the history, so a pregnancy test should almost always be performed in this age group.

● Pregnancy tests

Qualitative assays—The basis of most pregnancy tests is measurement of human chorionic gonadotrophin (hCG) in either urine or serum. These have a sensitivity of 10 to 20 mIU/ml. Urine and serum are virtually equivalent in terms of pregnancy testing. Concentrations are first detected in serum within 24 hours of fertilisation, at 5 mIU/ml. This amount doubles approximately every 48 hours. It reaches a peak of around 100 000 mIU/ml at 8–11 weeks' gestation. It can take a substantial amount of time for concentrations to fall to be undetectable, up to 60 days after a first trimester termination.⁸

A test with a sensitivity of 20 mIU/ml has a 1% false negative rate. Dilute urine rarely causes a false negative result with modern tests. Home pregnancy tests have a higher reported false negative rate, which is thought to be largely due to misunderstanding of instructions and results. There is a 1% false positive rate that can occur in women with low circulating concentrations of hCG, such as postmenopausal women and those with a hCG secreting tumour. A false positive result can also occur if there is significant proteinuria, as in patients with nephrotic syndrome.⁹

Quantitative assays—These are of little use in the A&E department, but can be helpful in differentiating between an early intrauterine pregnancy and an ectopic gestation. Abnormal pregnancies such as hydatidiform mole usually have much higher concentrations of hCG.

● Ultrasound scan (see fig 2)

The resolution of ultrasound has improved enormously and the detection of a gestational sac can occur very early on in the pregnancy. Transvaginal ultrasound should detect a normal intrauterine gestational sac at 5 weeks' gestation. Cardiac activity should be detected by a gestational age of 6.5 weeks when the sac diameter is 16 mm.¹⁰ Ultrasound is an invaluable tool to assist in the diagnosis of an ectopic pregnancy. However it is worth noting that in 15–35% of patients with an ectopic pregnancy no adnexal mass was identified and there can often be very non-specific findings.¹¹

Most gynaecology units have early pregnancy scanning clinics; if bleeding is not excessive and the os is closed it is likely that the patient can be allowed home to reattend the clinic the next day.

● ABO and rhesus blood group

Check the rhesus blood group of any pregnant woman with vaginal bleeding as *anti-D immunoglobulin must be given to those who are rhesus negative*. Current UK guidelines advise 250 IU is given when the woman is less than 20 weeks, and 500 IU for those who are over 20 weeks, ideally within 72 hours of the bleeding episode.¹² A Kleihauer test is also performed to assess the degree of fetomaternal haemorrhage, if there are large numbers of fetal cells found an increased dose of anti-D will be advised. Cross matching may be necessary if bleeding is heavy.

● Full blood count

This should be checked in every case as there are frequent surprises when women who appear haemodynamically stable are found to be profoundly anaemic. An raised white cell count may suggest an infection, although the white count is slightly higher in a normal pregnancy. Low platelets may also indicate a coagulation problem. A full coagulation screen may be necessary with severe haemorrhage, or if a septic abortion is suspected because of the risk of disseminated intravascular coagulation.

● Triple swabs if evidence or suspicion of infection

This includes swabs from the high vagina, endocervix, and chlamydial swabs from the

Figure 2 Transvaginal ultrasound scan showing a viable 9 week pregnancy (crown rump length 23 mm, the yolk sac is also seen as a clear circle above the lower limbs).

Information for women attending the early pregnancy assessment unit

The aim of this appointment is to perform an ultrasound scan and blood tests which help the doctors to assess your pregnancy.

You should attend ward* at ***** hospital on

You should have breakfast as normal but do not eat after this.

It is possible that you may have to stay on the ward all day or be admitted so you should make arrangements for childcare if this is necessary. Your partner or a friend are welcome to accompany you, and it is better not to drive yourself to the hospital in case any treatment is required.

You will have a scan which involves having some jelly and a probe put on your abdomen which gives a picture of the inside of your womb on the TV screen, your bladder needs to be full for this so please do not go to the toilet once you have arrived on the ward. If this does not give a clear picture then a special vaginal probe may be used.

Following this you will be seen by a senior doctor, who will explain the results and arrange any treatment that is necessary. Occasionally the scan is inconclusive and you may be asked to return for further blood tests 2 days later, or another scan 1–2 weeks later.

If you have any questions or have further problems with increased pain, bleeding, or fever before this appointment please contact the ward telephone number

Figure 3 Example of an information leaflet to be given to patients before attending an early pregnancy assessment unit.

endocervix. There is increasing evidence that many miscarriages are associated with infectious causes, and this group of women are obviously susceptible to sexually transmitted diseases. This is particularly important in cases with a history of assault where the police surgeon is not being involved.

TREATMENT

Vaginal bleeding requires careful assessment to avoid serious life threatening conditions and to successfully and appropriately transfer the patient out of the A&E department. As with any haemodynamically unstable patient basic resuscitation and immediate referral to the appropriate specialist (obstetrician or gynaecologist) should be the priority.

PREGNANCY TEST POSITIVE

Figure 4 illustrates how to deal with a patient who has a positive pregnancy test.

Figure 4 Management of bleeding in early pregnancy.

- **Bleeding in early pregnancy**

Vaginal examination and the use of ultrasound to determine viability significantly reduces admissions (28% to 12%), referral to gynaecologists (44% to 22%), and reattendance (15% to 4%).² Many centres now provide an early pregnancy assessment unit the next day if patients are stable and ectopic pregnancy is unlikely. There is great value in having an information leaflet available to those patients who may be having a threatened miscarriage if they have to wait until the next day for a scan. An example of an information leaflet is shown in fig 3.

Those patients who have heavy bleeding or on examination have an open os do require referral to the gynaecologist for admission. If on examination there are visible products within the os these should be removed as they can contribute to quite significant vasovagal response. Surgical management is no longer the only option for treating incomplete/inevitable miscarriages. Medical management with misoprostol enables women to have prompt attention and avoids the inevitable delay bought about from limited emergency operating lists.

- **Suspected ectopic pregnancy**

Admission is mandatory, and intravenous access should be established even if the patient is stable. The woman should be kept fasted as a laparoscopy may be required to establish the diagnosis. A ruptured ectopic pregnancy will generally require transfer direct to the operating theatre for immediate laparotomy to secure haemostasis.

- **Bleeding in later pregnancy**

Any bleeding or abdominal pain in a patient over 20 weeks' gestation is best referred directly to the labour ward, however, on occasions, the patient may be too ill or there may not be time to transfer them. The uterine blood flow in a pregnant woman can be up to 600 ml/min at term, so the condition may deteriorate rapidly. Assessment of the woman's condition may be difficult because of the normal physiological changes of pregnancy. These include reduction in serum colloid osmotic pressure due to expansion of the plasma volume, decreased vascular resistance, lower blood pressure during the second trimester, and increased cardiac output with a pulse rate 10–20 beats above normal.

General resuscitative measures must be initiated if bleeding is heavy as the situation can become life threatening if the cause is placenta praevia or placental abruption.

- Summon the obstetric team including the obstetric anaesthetist to the department urgently.
- Insert large bore intravenous cannulas (at least two). Fluids should be given with a compression cuff on the bag, blood should be warmed but filtration is not necessary.
- Cross match at least six units of blood. In an extreme emergency it may be necessary to give group compatible blood, O negative blood should be given as a last resort.

- Central venous pressure monitoring is essential to ensure that treatment is safely controlled.¹³

Vaginal examination should not be performed as this may precipitate heavier loss if the cause is a placenta praevia.

Non-pregnant patient

The women who are not pregnant can very often be sent home to be dealt with by the GP or at a gynaecology clinic. However there are some simple medical treatment options available to the A&E doctor. For simple menorrhagia tranexamic acid (1 g four times a day) will reduce the blood flow until further investigations are performed by the GP or gynaecologist.¹⁴ This medication should not be used if there is a history of thromboembolic disease. Mefenamic acid, or any non-steroidal anti-inflammatory, can be helpful in cases associated with dysmenorrhoea. Norethisterone (5–10 mg three times a day) should stop the prolonged bleeding associated with anovulatory cycles, the patient should be given several days' supply and advised to see her GP.

If there appears to be a local genital or cervical lesion causing the bleeding then early assessment at the gynaecology outpatient clinic is appropriate. However those women presenting after treatment on the cervix, for example loop diathermy, should be referred to the gynaecologist. They may require vaginal packing or surgery to the area to control the bleeding.

Any bleeding secondary to trauma should be referred to the gynaecologists for full assessment. If bleeding is not excessive and assault has been alleged then the police surgeon should attend if the woman wishes to involve the police.

Postmenopausal

In those women who are beyond the reproductive age, there are additional causes of vaginal bleeding to be considered. However, it is important to note that ovulation is thought to cease only when a woman has not had a period for one year. Hormone replacement therapy (HRT) does not prevent conception. Many women start HRT before they have reached the menopause and therefore may still be at risk of pregnancy.

The major concern with postmenopausal bleeding is the possibility of a lower genital tract malignancy. These patients can usually be referred urgently to gynaecology outpatients for investigation. They will only need admission if they are severely anaemic, bleeding heavily, or clinically unwell.

Prepubertal

Trauma will be a frequent causative factor in vaginal bleeding occurring in young girls. This may be due to accidental penetration due to falling on a sharp object, or tearing when legs are abducted suddenly, for example during gymnastics. Although straddle injuries are the commonest cause of genital trauma, accounting for 75% of accidental vulval injury these

rarely cause bleeding.¹⁵ A precise history of the type of injury sustained should be obtained, any discrepancies in the account may raise the concern of sexual abuse. Accidental injury to the hymen rarely occurs without a sharp penetrating injury. If sexual abuse is suspected referral to the paediatricians is mandatory.

Genital examination must be performed sensitively and should be limited to inspection of the external genitalia. A fuller examination should be left to the specialist paediatric and gynaecological teams involved.

Retained foreign objects may lead to a bloody discharge, but it is rare that a history will be obtained of insertion of the object! There may be an associated low grade pyrexia, pruritus, or abdominal pain. These cases will require examination under anaesthesia and should be referred to the paediatricians.

Vulvovaginitis is a common cause of bleeding but this is less likely to present to the A&E department.¹⁶

Summary

The above guidelines, in line with other recently published guidelines,¹⁷ aim to highlight to the A&E department important aspects of managing vaginal bleeding. Awareness of the possibility of ectopic pregnancy in any woman of reproductive age is essential, and every means possible must be used to exclude this diagnosis.³ The A&E team can play a useful part in the initial management and initiating appropriate follow up in a wide range of conditions which present with vaginal bleeding. Gynaecology is often an area of medicine in which many A&E senior house officers lack confidence, and we hope that this article will help to provide a structured approach to a common problem in the A&E department.

Questions relating to this article

- (1) When will be a home pregnancy test first indicate a positive result for a woman who has conceived with a previously regular 28 day menstrual cycle?
 - (A) Six weeks after her last period
 - (B) Three weeks after her last period
 - (C) At the time she would have expected to start her next period, that is four weeks after her last period
- (2) A woman presents with vaginal spotting at 16 weeks, the fetal heart is present and there are no other symptoms. She carries a blood card indicating that her blood group is A negative. What dose of anti-D should you prescribe and how soon after the bleeding occurs should this be given?
- (3) What factors in the history would lead to a high index of suspicion that a 25 year old patient presenting with vaginal bleeding had an ectopic pregnancy?

Key references

The three key references are Gilling-Smith *et al*,² Department of Health,³ and American College of Emergency Physicians.¹⁷

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