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Cases of obstetrics. Part I

Tutorial for practical lessons of obstetrics and gynecology for students of the 4th and 5th course of medical faculty

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ABBREVIATIONS

BV bacterial vaginosis

CIN cervical intraepithelial neoplasia

CTG cardiotocograph

CTPA computerized tomography pulmonary angiogram

DCDA dichorionic diamniotic

DIC disseminated intravascular coagulopathy

EAS external anal sphincter

ECG electrocardiogram

FBS fetal blood sampling

GBS group B streptococcus

GDM gestational diabetes mellitus

Hb haemoglobin

hCG human chorionic gonadotrophin

HIV human immunodeficiency virus

MCH mean cell haemoglobin

NT nuchal translucency

OC obstetric cholestasis

PCOS polycystic ovarian syndrome

PE pulmonary embolism

PIH pregnancy-induced hypertension

RDS respiratory distress syndrome

TEDS thromboembolic stocking

TIBC total iron-binding capacity

TPN total parenteral nutrition

TSH thyroid-stimulating hormone

T3 tri-iodothyronine

T4 thyroxine

UTI urinary tract infection

VBAC vaginal birth after caesarean

VDRL venereal disease research laboratory (test)

VTE venous thromboembolism

WHO World Health Organization

CASE 1: ECTOPIC PREGNANCY MANAGEMENT

History

A 33-year-old woman presented to the early pregnancy unit of the hospital reporting brown vaginal discharge and some mild lower abdominal pain for 2 days. Her last period started 6 weeks 3 days ago and this is her first pregnancy.

Examination

The heart rate is 78/min and blood pressure 115/68 mmHg. The patient appears comfortable. The abdomen is not distended and no masses are palpable. There is no tenderness on palpation. Speculum examination is normal with no active bleeding seen and the cervix appears normal and closed. No cervical motion tenderness or adnexal tenderness is apparent on bimanual examination.

INVESTIGATIONS
Urinary pregnancy test: positive Transvaginal ultrasound: an empty uterus is noted and a 25 mm mass is seen adjacent to the left ovary which has the appearance of an ectopic pregnancy. A small gestation sac is seen within the mass but no embryo or heartbeat is visible. There is no significant free fluid in the pouch of Douglas. Serum hCG: 4322 IU/L

In view of the high hCG level, medical and expectant management of this ectopic pregnancy are contraindicated. Laparoscopic surgical management is therefore advised.

Questions

• Assuming you are the doctor obtaining informed consent for the surgical procedure, how would you counsel the woman regarding whether a salpingectomy or salpingotomy is performed?

• Following surgery what advice should be given to this woman before discharge home?

ANSWER 1

Salpingectomy or salpingotomy?

Salpingectomy (removal of the fallopian tube with ectopic pregnancy within it) and salpingotomy (linear incision along the antimesenteric border of the tube to remove the ectopic pregnancy) are both reasonable options for this woman, depending on her wishes after full counselling. Although it may seem intuitive to the woman that the tube should not be removed, the following issues should be explained:

1. The risk of persistent trophoblast (due to incomplete removal of all ectopic pregnancy tissue) is 4–8 per cent after salpingotomy but extremely rare after salpingectomy. Therefore there is a small chance of needing methotrexate for a non-declining hCG after salpingotomy.

2. An ectopic pregnancy may suggest a previously poorly functioning tube, prone to recurrent ectopic pregnancy. In addition, the current ectopic pregnancy will have distended the tube and the salpingotomy would damage it further. Thus leaving a damaged tube increases further the risk of subsequent ectopic pregnancy.

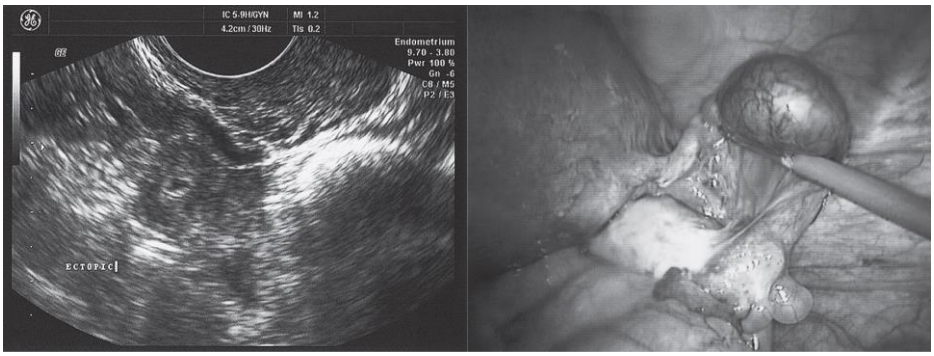
3. The risk of repeat ectopic pregnancy after salpingectomy and salpingotomy is approximately 15 and 10 per cent respectively.

4. The intrauterine pregnancy rate after salpingotomy or salpingectomy is approximately 60 per cent with a nonsignificant trend toward an improved likelihood of subsequent normal intrauterine pregnancy with salpingectomy.

5. At laparoscopy the contralateral tube would be assessed and if it seemed abnormal (blocked or surrounded with adhesions) then all attempts would be made to perform salpingotomy rather than salpingectomy on the tube containing the ectopic pregnancy.

6. It may not be technically possible to perform a salpingotomy and excessive bleeding may necessitate salpingectomy even if salpingectomy is the preferred option preoperatively.

Figures 1.1 and 1.2 show the ultrasound appearance of the ectopic pregnancy and the laparoscopic findings, respectively.



Advice before discharge

The box below summarizes the important counselling and advice for a woman following diagnosis of ectopic pregnancy. In addition, if the woman has undergone salpingotomy or there was a suggestion of possible spillage of trophoblast at salpingectomy, then she should have hCG monitoring until the hCG returns to the non-pregnant level (<5 IU/L).

! Postoperative counselling points after ectopic pregnancy
• Explanation of diagnosis and operation. • Appropriate counselling that the woman may grieve (this is the loss of a pregnancy) with advice about further support. • Avoid the progesterone only contraceptive pill (POP) and intrauterine contraceptive device (IUCD) (both are associated with a slightly higher risk of ectopic pregnancy). • Approximately 60 per cent of women who have had an ectopic pregnancy go on to have a live birth in the next three years, but there is a 10–15 per cent chance of a further ectopic pregnancy. • Early transvaginal scan is indicated at around 5 weeks' gestation to confirm the location of any future pregnancy. • Effective contraception should be used if the woman does not wish to become pregnant again at the moment.

KEY POINTS

• The indications for surgical management of ectopic pregnancy (rather than expectant or medical) are: • haemodynamic instability • live ectopic pregnancy (cardiac activity seen) • hCG greater than 3000 IU/L • significant pain • presence of significant haemoperitoneum on ultrasound • patient choice/poor compliance with conservative treatment. • The decision to perform a salpingectomy, rather than salpingotomy, depends on patient choice and operative findings. • hCG follow-up after salpingotomy is essential.

CASE 2: PAIN IN EARLY PREGNANCY

History

A 22-year-old woman attends the emergency department complaining of abdominal pain. She is 7 weeks 4 days pregnant by certain menstrual dates. She had a normal vaginal delivery at term 18 months ago. Her periods are usually regular every 27 days, with bleeding for 3–5 days. She has no previous gynaecological history. Her medical history involves mild asthma and two episodes of cystitis.

The pain started suddenly two nights ago and is localized to the right iliac fossa with some radiation down the right thigh. It is constant though worse on movement, so she has tended to lie still. She has not taken any analgesia as she is uncertain whether this is safe for the baby. She is always constipated and this is worse since she became pregnant. She has urinary frequency but no dysuria or haematuria. She has a slightly reduced appetite but does not feel feverish or sweaty.

Examination

Her temperature is 36.4°C, heart rate 90/min and blood pressure 96/58 mmHg. There are no signs of anaemia and she feels warm and well perfused. She is slim and the abdomen is not distended. There is focal tenderness on palpation of the right iliac fossa, with slight rebound tenderness but no guarding. Rovsing's sign is not present. Speculum examination is unremarkable. The uterus is bulky and retroverted with no cervical excitation. The right adnexa is tender with a suggestion of 'fullness'.

INVESTIGATIONS		
		Normal range for pregnancy
Haemoglobin	12.1 g/dL	11–14 g/dL
Mean cell volume	89 fL	74.4–95.6 fL
White cell count	5.1×10^9/L	$6–16 \times 10^9$/L
Platelets	223×10^9/L	$150–400 \times 10^9$/L
C-reactive protein	5 mg/L	<10 mg/L
Urinary pregnancy test: positive Urinalysis: protein trace; blood negative; nitrites negative; leucocytes negative Transvaginal ultrasound findings are shown in Figs. 2.1 and 2.2.		

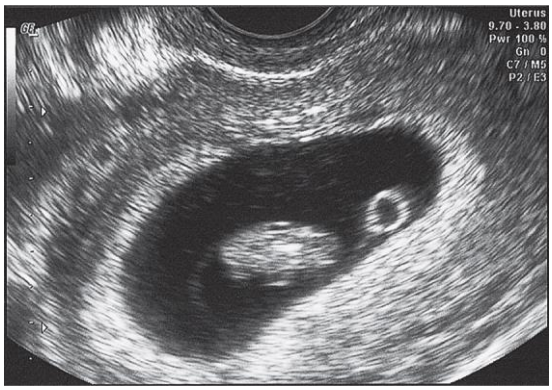


Figure 2.1 Transvaginal ultrasound scan showing a midsagittal view of the uterus.

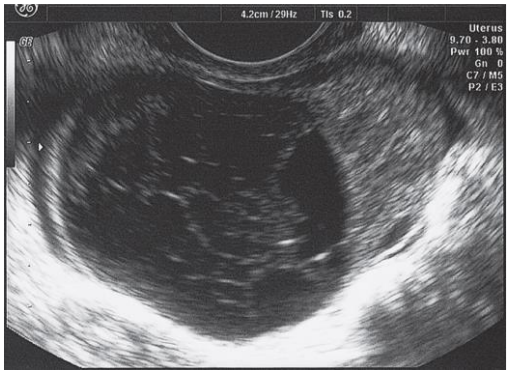


Figure 2.2 Transvaginal ultrasound scan showing a transverse view of the right adnexa, demonstrating a haemorrhagic lesion measuring 73 × 64 mm.

Questions

• What is the likely diagnosis and what are the differential diagnoses for the pain?

• How would you further investigate and manage this woman?

ANSWER 2

The ultrasound images show a single viable intrauterine pregnancy and haemorrhage into a corpus luteal cyst.

! Differential diagnosis for pain in early pregnancy
• Corpus luteum • Ectopic pregnancy • Miscarriage • Ovarian cyst • Urinary tract infection • Renal tract calculus • Constipation • Appendicitis • Unexplained pain

Urinary tract infection or calculi are excluded by the urinalysis result. Constipation is more likely to cause left-sided pain and the sudden onset of pain would perhaps be unusual. Appendicitis should be considered but the lack of systemic features, the normal temperature, white count and C-reactive protein are suggestive of this not being the diagnosis.

The corpus luteum is the cystic area that develops on the ovary at the ovulation site. It may be solid, cystic or haemorrhagic and may vary in size. On colour Doppler ultrasound it has a typical 'ring of fire' appearance, distinguishing it from other types of ovarian cyst. In this case the 'spider web' or reticulated pattern of echoes within the cyst suggests that it is haemorrhagic.

Management

Management is supportive with analgesia (paracetamol in the first instance followed by codeine derivatives if necessary) and reassurance. There is no evidence that bleeding into the corpus luteum adversely affects the pregnancy outcome. As the cyst is so large, it may be sensible to repeat an ultrasound scan in 2–4 weeks to confirm resolution.

KEY POINTS
• A large or haemorrhagic corpus luteum is a common cause of early pregnancy pain. • Most women have no cause found for early pregnancy pain. • Ectopic pregnancy must be excluded and non-gynaecological aetiology considered (constipation or urinary tract infection) in women with pain in early pregnancy.

CASE 3: EARLY PREGNANCY ULTRASOUND

History

A 25-year-old woman is referred by the general practitioner (GP) for early pregnancy dating ultrasound scan. She is gravida 4 para 2. Her first positive pregnancy test was 4 days ago and she went to her GP to arrange a termination of pregnancy as she feels that she cannot cope with another child. She has been taking the combined oral contraceptive pill (COCP), so pregnancy could not be dated clinically. She has no significant gynaecological history of note except for an episode of chlamydia at age 18 years, for which she and her partner were fully treated. As a child she had a ruptured appendix and needed a midline laparotomy. She has no other relevant past medical history.

She has had no pain though did note some moderate vaginal bleeding 2 weeks before for 3 days, which settled spontaneously.

Examination

She looks well with normal heart rate and blood pressure and a soft non-tender abdomen. Speculum examination shows a closed cervix with a normal discharge and no blood. The uterus feels normal size and is anteverted and mobile. There is no cervical excitation. There is slight tenderness in the left adnexa but no masses are palpable.

INVESTIGATIONS
Transvaginal ultrasound findings are shown in Fig. 3.1.

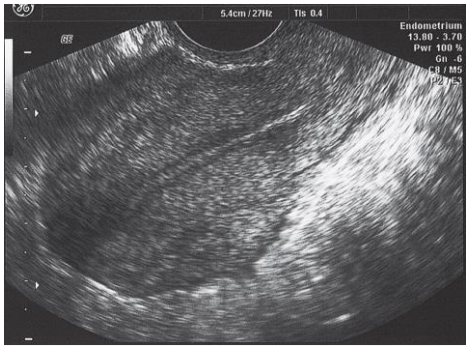


Figure 3.1 Transvaginal ultrasound scan showing a midsagittal view of the uterus.

Questions

• How would you interpret this ultrasound scan result?

• Serial serum human chorionic gonadotrophin (hCG) and progesterone are requested and the results are as follows:

Day 1: serum hCG 703 IU/L, progesterone 30 nmol/L

Day 3: serum hCG 905 IU/L, progesterone 24 nmol/L

• What is the likely diagnosis and the differential diagnosis, and how would you further investigate and manage this woman?

ANSWER 3

The transvaginal ultrasound scan shows an empty uterus and no adnexal masses. This is therefore termed a pregnancy of unknown location (PUL).

! Definition of a pregnancy of unknown location
No ultrasound signs of either intra- or extrauterine pregnancy or retained products of conception in a woman with a positive pregnancy test

PUL occurs in up to 20 per cent of women in early pregnancy units and the possible underlying diagnoses are:

• early intrauterine pregnancy: too early to be visualized on ultrasound

• failed pregnancy: a complete miscarriage where the pregnancy has been completely expelled but where no previous scan is available to confirm that an intrauterine pregnancy had been present

• ectopic pregnancy: the pregnancy is located outside the uterine cavity but has not been visualized at initial ultrasound examination.

Only 10 per cent of PULs are subsequently diagnosed as ectopic pregnancies, but all must be investigated with serial serum hCG to determine which of the above three diagnoses is likely.

Serum hCG results and management

The hCG at which an intrauterine pregnancy would normally be visualized is 1000–1500 IU/L (in most but not all cases). A normal early pregnancy would generally show an increase in hCG of over 66 per cent in each 48 h. The progesterone level is usually high (40–60 nmol/L) in an ongoing pregnancy and low (<20 nmol/L) in a failing pregnancy.

In this case the suboptimal hCG rise and midrange progesterone are typical (but not diagnostic) of an ectopic pregnancy, and the woman should have a repeat ultrasound within a few days. If an ectopic pregnancy is visualized then medical or surgical management should depend on signs and symptoms. If a pregnancy is still not visualized and she becomes symptomatic then laparoscopy is indicated to establish the diagnosis. If hCG continues to rise with no apparent pregnancy visible, then methotrexate for persistent PUL may be considered.

KEY POINTS
• Pregnancy of unknown location may represent an early intrauterine pregnancy, complete miscarriage or an ectopic pregnancy. • Follow-up hCG and ultrasound must be arranged for these women.

• If pain develops before a diagnosis is confirmed, laparoscopy should be carried out to exclude an ectopic pregnancy.

CASE 4: MIDTRIMESTER COMPLICATIONS

History

A 19-year-old woman has attended the emergency department with vaginal discharge. She is 17 weeks' gestation in her third pregnancy. The previous two pregnancies were terminated medically in the first trimester using prostaglandins. This pregnancy was unplanned but she is now looking forward to being a mother.

She had a small amount of bleeding at around 7 weeks, which persisted until 9 weeks. Ultrasound scan at 7 weeks showed a single viable embryo.

She booked for antenatal care late at 13 weeks. The combined test for Down's syndrome showed low risk (1:5100). She has not yet felt any fetal movements in the pregnancy.

She is a non-smoker and has drunk no alcohol since finding out she was pregnant at 7 weeks. She has no other significant medical history.

On direct questioning the vaginal loss started a few hours ago. Initially she thought it was possibly urine that was leaking but it has no smell and she is sure it is now coming from the vagina. There has been a minimal amount of blood on the pad but it is mainly clear fluid. Initially the fluid soaked through all of her clothes, but it is now less. There has been no abdominal pain.

Examination

She appears distressed. Her temperature is 37.1 degrees, blood pressure is 115/68 mmHg and pulse is 84/min.

Abdominally the uterus is palpable about one-third of the way between pubic symphysis and umbilicus and feels soft. The abdomen is non-tender.

Speculum examination shows the cervix to appear normal and closed. There is a moderate amount of clear watery shiny fluid pooling in the speculum, which is also seen coming from the cervix when the woman is asked to cough.

INVESTIGATIONS		
		Normal range for pregnancy
Urinalysis: trace protein; no leucocytes; no nitrites		
Haemoglobin	10.8 g/dL	11–14 g/dL
Mean cell volume	92 fL	74.4–95.6 fL
White cell count	6.9×10^9/L	$6–16 \times 10^9$/L
Platelets	321×10^9/L	$150–400 \times 10^9$/L
C-reactive protein	11.3 mg/L	<10 mg/L

Questions

• What is the diagnosis?

• What is the prognosis and what should you say to the woman?

• What, if any, further investigations should be requested and what would be your management plan?

ANSWER 4

Diagnosis

The history and speculum findings are very highly suggestive of rupture of membranes at 17 weeks' gestation. This is relatively rare but the presence of persistent first-trimester bleeding is a risk factor, probably because the blood and haemosiderin cause irritation and ultimately necrotic breakdown of the membranes. The other likely cause is subclinical infection. Bacterial vaginosis in particular is associated with increased risk of midtrimester fetal loss.

! Prognosis and communication to the woman
The prognosis in such premature rupture of membranes is extremely poor. This is because of the various factors that may ensue following membrane rupture: 1. Spontaneous miscarriage is common after rupture of membranes. 2. Chorioamnionitis is likely to develop once the integrity of the gestation sac has been breached. 3. If miscarriage or infection does not occur, then the fetus is likely to have profound pulmonary hypoplasia due to lack of amniotic fluid, as well as limb contractures. Exact figures are not available but an estimate of the possibility of the woman taking home a live baby is probably around 10–20 per cent. Therefore she must be offered a grave prognosis for the pregnancy, with respect to not only the chance of fetal survival but also the chance of her developing chorioamnionitis, which can be very sudden and catastrophic.

Further investigation and management

To confirm the diagnosis and to check whether the fetal heartbeat is still present an ultrasound scan should be performed. If the fetus has died then medical evacuation of the pregnancy should be carried out without delay.

If the fetus is alive and the scan confirms anhydramnios or oligohydramnios then the woman should be given the option of termination of the pregnancy. This would be in her best interests in terms of preventing serious maternal infection. In view of the poor prognosis for the fetus, many women would choose this option.

If she declines termination then she should be closely monitored for symptoms and signs of infection such as fever, shivering, 'flu type symptoms, abdominal pain, offensive vaginal discharge or bleeding. Pyrexia >37.5°, tachycardia, hypotension or increased respiratory rate should be looked for. Alternate-day serum C-reactive protein and white cell count should be checked. There should be a very low threshold for recommending termination of the pregnancy if any combination of these features develops, as sepsis is a leading cause of maternal death in the UK, with one-third of such deaths occurring before 24 weeks' gestation.

During expectant management the fetal heartbeat should be auscultated daily to allow for evacuation of the pregnancy if the fetus dies in utero. Whether the pregnancy is terminated due to fetal death, maternal choice or maternal infection, the first-line method would be the use of prostaglandin, preceded by mifepristone (a progesterone antagonist) 48 hours earlier if time allows.

KEY POINTS
• The prognosis for a baby after rupture of membranes in the second trimester is extremely poor. • The risks of sepsis and its consequences for the mother should be considered as very important in counseling the woman regarding continuation of the pregnancy after second trimester rupture of membranes. • The woman should be advised to report any symptoms or signs of possible sepsis and these should be acted on as soon as possible.

CASE 5: PAIN AND BLEEDING IN EARLY PREGNANCY

History

A 30-year-old woman is referred from her GP. She is 11 weeks and 2 days' gestation and has noticed dark spotting and mild period-like pains for the last 4 days. Her last period was 4 months ago but she has a history of polycystic ovarian syndrome and has an irregular cycle bleeding for 4–7 days every 5–6 weeks. She had a positive home pregnancy test after she noticed breast tenderness, and came for a dating ultrasound scan 4 weeks ago that confirmed a viable single intrauterine pregnancy. Since then she has had a booking visit with the midwife and all routine blood tests are normal. She is gravida 2 para 0. Her last pregnancy 9 months ago ended in a complete miscarriage at 7 weeks. There is no other medical or gynaecological history of significance.

Examination

She is apyrexial with normal heart rate and blood pressure. The abdomen is soft and nontender. Speculum examination shows a small cervical ectropion but this is not bleeding. The cervix is closed and no blood or abnormal discharge is seen. Bimanual examination reveals an 8–10-week-sized anteverted mobile uterus with no cervical motion tenderness, adnexal masses or tenderness.

INVESTIGATIONS
Transvaginal ultrasound scan report **(Fig. 5.1):** the uterus contains a gestational sac measuring 49 × 48 × 36 mm. A single fetus of crown–rump length 47 mm is visible. Fetal heartbeat is absent. The uterus is anteverted. Both ovaries appear normal with no adnexal masses visible.

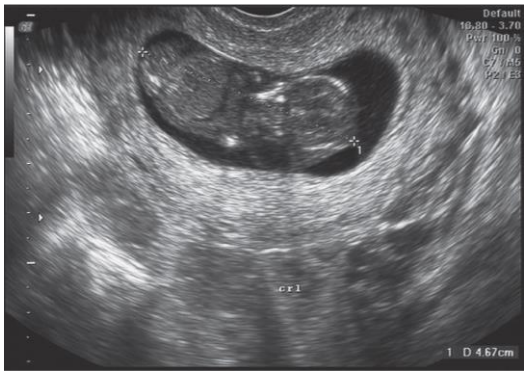


Figure 5.1 Transvaginal ultrasound scan showing the midsagittal view through the uterus.

Questions

• What is the diagnosis?

• How would you investigate and manage this patient?

ANSWER 5

The diagnosis is of a missed miscarriage. The alternative terminology for this condition is delayed miscarriage, silent miscarriage or early fetal demise.

The diagnosis can be made for two reasons. First, the fetal heartbeat has been seen previously and is no longer visible. Second, where the crown–rump length exceeds 7 mm, a fetal heartbeat should be visible on transvaginal ultrasound in all cases of a viable pregnancy. Thus the diagnosis could have been made even if the previous scan result was not known.

The term 'empty sac' (blighted ovum or anembyonic pregnancy) is used where the pregnancy has failed at a much earlier stage, such that the embryo did not become large enough to be visualized, but a sac is still seen. The diagnosis of an empty gestational sac can be made when the mean sac diameter exceeds 25 mm with no visible fetal pole (fetus). This is illustrated in Fig. 5.2. The management of missed miscarriage and empty sac is the same.

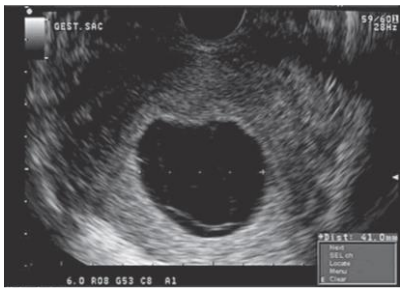


Figure 5.2 Transvaginal ultrasound image demonstrating an empty gestational sac with mean sac diameter greater than 25 mm, confirming the diagnosis of miscarriage.

Management

The woman needs to discuss how to proceed now and also what has happened and what she might expect for future pregnancies. The management of miscarriage is expectant, medical or surgical. The choice should be given with the potential advantages and disadvantages of each:

• *Expectant ('wait and see') approach:*

• avoids medical intervention and can be managed completely at home

• may involve significant pain and bleeding

• unpredictable time frame – miscarriage may even take several weeks

• more successful for incomplete miscarriage than for missed miscarriage

• *Medical (intravaginal or oral misoprostol tablets):*

• avoids surgical intervention and general anaesthetic

• the woman may retain some feeling of being in control

• equivalent infection and bleeding rate as for surgical management (2–3 per cent)

• surgical evacuation may be indicated if medical management fails

• Surgical (evacuation of retained products of conception):

• can be arranged within a few days and avoids prolonged follow-up

• very low rate of failure (retained products of conception)

• small risk of uterine perforation or anaesthetic complication.

Success rates for missed miscarriage are generally greater for medical or surgical management, whereas expectant management is very successful for incomplete miscarriage.

! Important counselling points after miscarriage
• Express sympathy – this is a very significant event for the couple and they may perceive the pregnancy loss as strongly as they would the loss of a full-term baby. • Offer further counselling if needed and give written advice sheets/leaflets. • Reassure that the miscarriage would not have been a result of anything she has done, such as lifting heavy objects, having a glass of alcohol or having sexual intercourse (all common reasons for women to feel they are responsible for the loss). • Explain that over 60 per cent of fetal losses are due to sporadic chromosomal abnormalities such as trisomies. • Explain that although she has had two consecutive fetal losses there is still a high chance (>70 per cent) that she will have a normal pregnancy in the future.

Further investigation into recurrent miscarriage is usually reserved for those with three or more consecutive losses, because miscarriage is extremely common and those couples with two miscarriages are extremely unlikely to have any underlying cause of miscarriage.

KEY POINTS
• Most miscarriages are due to sporadic fetal chromosomal abnormalities. • A 'missed' miscarriage may be managed expectantly, medically or surgically. • Never forget that a miscarriage may be a significant life event for a woman/couple, regardless of whether or not the pregnancy was planned.

CASE 6: BLEEDING IN EARLY PREGNANCY

History

A 36-year-old woman presents with vaginal bleeding at 8 weeks 3 days' gestation. She has never been pregnant before. Bright red 'spotting' commenced 7 days ago, which she thought was normal in early pregnancy. However since then the bleeding is now almost as heavy as a period. There are no clots. She has no abdominal pain. Systemically she has felt nausea for 3 weeks and has vomited occasionally. She had large-loop excision of the transformation zone (LLETZ) treatment after an abnormal smear 6 years ago. Since then all smears have been normal. There is no other significant gynaecological history. She has regular periods, bleeding for 5 days every 28 days, and has never had any known sexually transmitted infections. In the past she used condoms for contraception.

Examination

The heart rate is 68/min and blood pressure is 108/70 mmHg. The abdomen is soft and nontender. Speculum reveals a normal closed cervix with a small amount of fresh blood coming from the cervical canal. Bimanually the uterus feels bulky and soft, approximately 10 weeks in size. There is no cervical excitation or adnexal tenderness.

INVESTIGATIONS
Urinary pregnancy test: positive Figure 6.1 shows the transvaginal ultrasound findings.

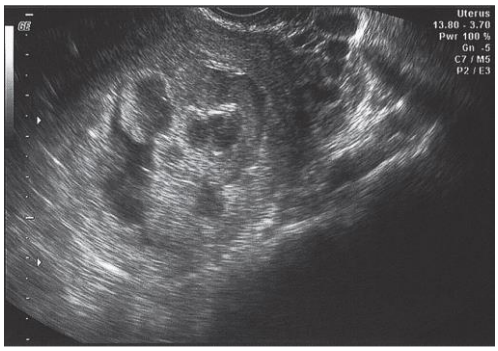


Figure 6.1 Transvaginal ultrasound scan showing a midsagittal view through the uterus.

Questions

• What is the likely diagnosis and differential diagnosis?

• What would one expect to see at scan in this woman if the pregnancy was normal?

• How would you manage the patient?

ANSWER 6

The ultrasound scan shows a mixed echogenicity appearance in the uterus, typical of a complete hydatidiform mole (molar pregnancy, part of the spectrum of gestational trophoblastic disease). There is no recognizable gestational sac or fetus.

This appearance may also be seen occasionally in pregnancies where early fetal demise has occurred but the sac has not been expelled (delayed miscarriage) resulting in cystic degeneration of the placenta.

The incidence of hydatidiform mole (also known as gestational trophoblastic disease) is approximately 1 in 714. It generally presents with painless vaginal bleeding though it may be diagnosed as an incidental finding when ultrasound is performed for another indication. The classical associations with hyperemesis, thyrotoxicosis or pre-eclampsia are rarely seen in the developed world where diagnosis is generally made in the first trimester.

Normal findings at 8 weeks

The normal findings at 8 weeks would be a fetus of approximately 18 mm, with a positive fetal heartbeat. The yolk sac would still be visible and the amniotic sac would also be seen. The fetus would be beginning to develop visible arm and limb buds and fetal movement may be seen.

Figure 6.2 shows a transvaginal image of a normal 8-week gestation sac and fetus.

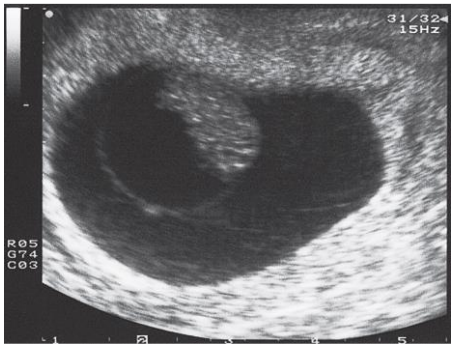


Figure 6.2 Transvaginal image of a normal 8-week gestation sac and fetus (amniotic sac is seen but yolk sac is not visible in this view).

Further management

The management for suspected molar pregnancy is always surgical evacuation of the uterus, with urgent histological examination of the tissue.

Once diagnosis is confirmed by histology, any woman with a confirmed partial or complete mole should be referred to a specialist gestational trophoblastic disease centre (in the UK in Sheffield, Dundee and Charing Cross Hospital) for follow-up of human chorionic gonadotrophin (hCG) levels. Women with persistently raised hCG levels are offered chemotherapy to destroy the persistent trophoblastic tissue and minimize the chance of development of choriocarcinoma. Only 0.5 per cent of women diagnosed with a partial molar pregnancy will require chemotherapy, compared with 10–15 per cent of women with a complete molar pregnancy.

Most women however do not require chemotherapy as the hCG becomes negative within a short period of time. These women should be advised:

• not to become pregnant again until the hCG is normal

• there is a 1 in 84 chance of a further molar pregnancy

• they should have hCG monitoring after any subsequent pregnancy (whether live birth, fetal loss or termination)

• the combined oral contraceptive pill may safely be used once hCG has returned to normal.

KEY POINTS
• Molar pregnancy may be suspected on ultrasound examination but the diagnosis must be confirmed with histological examination of products of conception after surgical uterine evacuation. • Molar pregnancies must be followed up at a specialist gestational trophoblastic disease centre. • Development of choriocarcinoma after molar pregnancy is rare, but persistent trophoblastic disease requiring chemotherapy is more common.

CASE 7: BLEEDING IN EARLY PREGNANCY

History

A 31-year-old woman presents with vaginal bleeding at 5 weeks 6 days' gestation. She has had a previous left uterine tubal ectopic pregnancy managed with laparoscopic salpingectomy. She is certain of her last menstrual period date and has regular cycles. Her last smear test was normal and she has not used contraception since her last pregnancy 3 years ago.

When she was 21 years she had an episode of pelvic inflammatory disease treated with intravenous antibiotics. She is otherwise not aware of having had any sexually transmitted infections. She has been with her partner for 7 years. She smokes 10 cigarettes per day and does not drink alcohol. The bleeding is described as very light and she has not been aware of any pain. She has not felt dizzy or lightheaded and has no shoulder-tip pain.

Examination

She is warm and well perfused. The blood pressure is 136/78 mmHg and heart rate 75/min. The abdomen is not distended and no tenderness is elicited on palpation. The cervix is closed. The

uterus feels normal size, anteverted and mobile, and there is no cervical motion tenderness. Gentle adnexal examination shows no significant tenderness.

INVESTIGATIONS
Human chorionic gonadotrophin (b-hCG): 691 IU/L Transvaginal ultrasound scan findings are shown in Figs. 7.1 and 7.2.

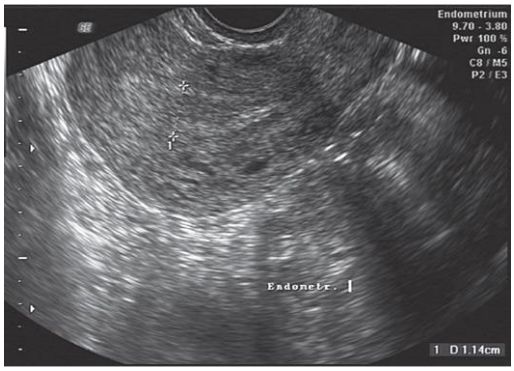


Figure 7.1 Transvaginal ultrasound scan showing a midsagittal view through the uterus.

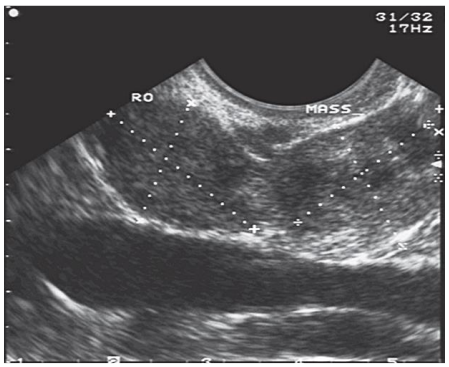


Figure 7.2 Transvaginal ultrasound scan showing a transverse view through the right adnexa.

Questions

• What is the diagnosis?

• What management options are available and which management would be preferred in this particular case?

ANSWER 7

The ultrasound scan images show an empty uterus and an adnexal mass adjacent to the right ovary. The mass represents an ectopic pregnancy. No gestation sac or fetal pole is visible and the pregnancy is therefore not considered 'viable'. However there is still a possibility of rupture if not treated.

! Risk factors for ectopic pregnancy
• Smoking • Previous pelvic inflammatory disease or chlamydial infection • History of infertility • In vitro fertilization • Previous tubal surgery • Previous ectopic pregnancy • Intrauterine contraceptive device (IUCD) or progesterone only pill

Management

Three options might be appropriate to this woman:

• *Surgical:* laparoscopic excision of the tube (salpingectomy) or salpingotomy to incise the tube and flush out the ectopic pregnancy.

• *Medical:* intramuscular methotrexate to destroy the rapidly dividing trophoblast tissue, with regular hCG follow-up to confirm resolution. As methotrexate is teratogenic, it should be given only once a possible intrauterine pregnancy has been completely ruled out. In this case, this may be by repeat hCG in 48 h to be certain that the change is not consistent with a potentially viable pregnancy.

• *Expectant:* 'wait and see' approach, suitable if the hCG at 48 h is decreasing spontaneously and the woman remains asymptomatic.

In this case the woman has previously had a uterine tube removed and surgery might compromise the remaining tube, so methotrexate treatment is preferred. However if the tube is damaged but preserved, she may be at high risk of further ectopic pregnancy. Prerequisites for methotrexate are normal full blood count, renal and liver function before treatment, compliance with the intense follow-up, and understanding the need not to become pregnant again for at least 3 months due to the potential teratogenic effects. Potential side effects are abdominal pain (sometimes difficult to distinguish from pain suggestive of tubal rupture), nausea, diarrhoea and, rarely, conjunctivitis and stomatitis.

KEY POINTS
• Ectopic pregnancies are commonly asymptomatic or associated with atypical symptoms. • Surgical, medical or expectant management of ectopic pregnancy depends on the symptoms, signs and hCG result. • Methotrexate is effective but follow-up is intensive and sometimes prolonged. • Methotrexate should never be administered if there is a possibility of a potentially viable intrauterine pregnancy.

CASE 8: BLEEDING IN EARLY PREGNANCY

History

A 41-year-old woman is seen in the early pregnancy unit because of vaginal bleeding. She is gravida 4 para 2 having had two previous normal vaginal deliveries followed by a miscarriage. She has a regular 28-day menstrual cycle and her last period started 9 weeks ago. She had slight vaginal bleeding 2 weeks ago and on ultrasound scan an early intrauterine pregnancy had been visualized with gestational sac of 18 × 12 × 22 mm diameter and a yolk sac visualized of 4 × 5 × 5 mm. No fetus was visualized. She was given an appointment for a repeat ultrasound.

Four days ago her bleeding became very heavy and she passed large clots which she described as 'like liver'. She developed severe abdominal pain which lasted for about 4 h, and since then the bleeding has become very light and she is now pain-free.

She has normal appetite and no nausea or vomiting. She has no urinary or bowel symptoms.

Examination

She appears well and is apyrexial. There are no signs of anaemia. The heart rate is 82/min and blood pressure is 132/78 mmHg. The abdomen is soft and mildly tender suprapubically. Speculum shows the cervix is closed with a small amount of old blood in the vagina. There is slight uterine

tenderness on bimanual palpation and the uterus feels normal size, anteverted and mobile, with no adnexal tenderness or cervical motion tenderness.

INVESTIGATIONS
A transvaginal ultrasound scan is shown in Fig. 8.1.

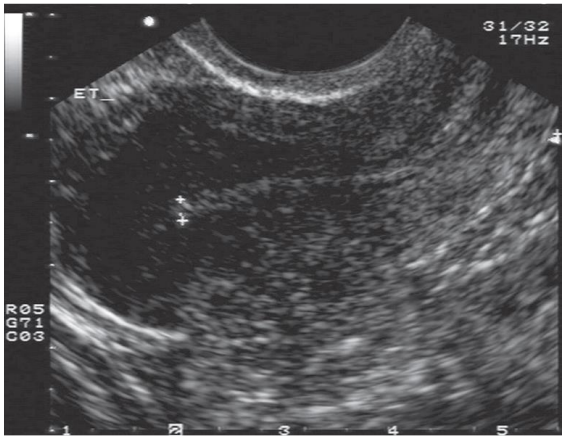


Figure 8.1 Transvaginal ultrasound scan showing a midsagittal view through the uterus.

Questions

• What is the diagnosis?

• What further management is indicated?

ANSWER 8

The ultrasound image shows a longitudinal view of the uterus with a thin homogenous endometrium and no evidence of a gestation sac or retained products of conception. As we know from the previous report that there was previously an intrauterine pregnancy, we can conclude that this is a complete miscarriage. If a previous ultrasound had not been available we would need to treat the case as a pregnancy of unknown location and monitor serial serum hCG.

No further management is needed as the miscarriage is complete and there are no signs of retained products of conception, or any suggestion of sepsis. Anti-D is not needed even if the woman is rhesus negative as the pregnancy is less than 12 weeks' gestation.

Counselling is the most important part of this consultation, as explained in case 45.

There is no clear evidence that a longer interpregnancy interval improves the outcome in future pregnancies, and the couple should be informed that they may try and conceive whenever they choose. However it may be advisable to wait until after the next menstrual period (usually 4–6 weeks after a miscarriage) in order to date the pregnancy.

Reassurance scans are helpful in future pregnancies and may improve outcome. In view of the two consecutive losses, reassurance ultrasound at 7 weeks and then at intervals until the 11–14-week scan would be ideal.

KEY POINTS
• Clinical suspicion alone is not sufficient to make a diagnosis of miscarriage. • If the uterus is empty and an intrauterine gestation has not been previously confirmed then a case should be treated as a pregnancy of unknown location, with serial hCG follow-up. • Appropriate counselling is vital in the management of couples with early pregnancy loss.

CASE 9: PAIN IN EARLY PREGNANCY

History

A 39-year-old woman presents with left iliac fossa pain in pregnancy. The pain is intermittent and cramping. She has had difficulty sleeping because of the pain, but has not taken any analgesia, as she is afraid that this may affect the baby. There is no vaginal bleeding. The woman has a long history of secondary infertility. She had a spontaneous vaginal delivery at term 9 years ago, and started trying to conceive again soon after. She was investigated a year ago and found to have polycystic ovarian syndrome and was therefore commenced on clomifene citrate. This was her third cycle, her last menstrual period started 45 days ago and she had a positive pregnancy test 4 days ago.

Examination

The woman is apyrexial with normal blood pressure and heart rate. She is overweight (body mass index 32 kg/m2) and therefore examination is limited but there is some tenderness on deep palpation in the left adnexa. On bimanual examination the uterus is normal size and anteverted. There is some left adnexal tenderness but no obvious masses are palpable.

INVESTIGATIONS
Transvaginal ultrasound findings are shown in Fig. 9.1.

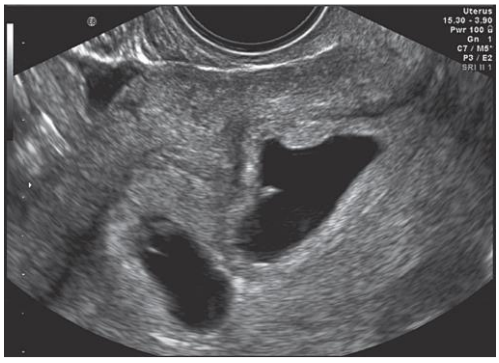


Figure 9.1 Transvaginal ultrasound scan showing a midsagittal view through the uterus.

Questions

• What can you infer about the pregnancy from this ultrasound?

• What are the differential diagnoses for the pain?

• How would you further investigate and manage this patient?

ANSWER 9

Two distinct echolucent areas are visible within the endometrium. Each has a bright trophoblastic ring around confirming that these are gestation sacs. Neither sac demonstrates a definite yolk sac or fetal pole. The findings suggest a twin pregnancy with gestational age of 4–5 weeks, and this is consistent with the woman's last menstrual period date. The sacs are distinct and therefore the pregnancy will definitely be dichorionic diamniotic. Zygosity cannot be determined by this ultrasound as both dizygotic pregnancy and a monozygotic embryo that split prior to implantation would give this appearance.

! Differential diagnosis of pain in this woman
• Gynaecological: • corpus luteal cyst • other non-pregnancy-related incidental ovarian cyst • ovarian hyperstimulation (a rare complication of clomifene treatment) • Non-gynaecological: • constipation • gastroenteritis • urinary tract infection • renal tract calculus

Ectopic pregnancy is effectively ruled out by the presence of an (twin) intrauterine pregnancy (heterotopic pregnancies occur in around 1 in 1000 women pregnant after ovulation induction). Pelvic inflammatory disease is extremely uncommon in pregnancy as is irritable bowel syndrome.

Further investigation

The woman should be asked about constipation or loose stools, urinary frequency, dysuria or loin pain. Urinalysis for blood (suggestive of calculus) or nitrates/leucocytes (suggestive of infection) should be performed with midstream urine sent for microscopy, culture and sensitivity if positive.

The adnexae should normally be examined during the ultrasound examination. A corpus luteum is a very common cause of pain in early pregnancy and shows a typical peripheral blood flow pattern resembling a 'ring of fire' on colour Doppler examination. Corpora lutea resolve spontaneously by 12 weeks' gestation. Other ovarian cysts would also be easily seen on ultrasound – most can be safely managed expectantly in pregnancy unless there is a suspicion of malignancy, torsion or symptoms are severe. Ovarian hyperstimulation is also easily recognized on ultrasound scan. In this case the urinalysis is negative, there is no suggestive history of a bowel problem and the adnexae appear normal; therefore reassurance should be given and the patient discharged.

KEY POINTS
• Gynaecological and non-gynaecological problems are common causes of pain in early pregnancy and should be investigated once an ectopic pregnancy has been ruled out. • Corpus luteal cyst is probably the commonest gynaecological cause of early pregnancy pain and is managed conservatively with analgesia and reassurance.

CASE 10: VOMITING IN PREGNANCY

History

A 28-year-old Asian woman is referred by her GP with persistent vomiting at 7 weeks' gestation. She is in her second pregnancy having had a normal vaginal delivery 3 years ago. She is now vomiting up to 10 times in 24 h, and has not managed to tolerate any food for 3 days. She can only drink small amounts of water.

She saw her GP a week ago who prescribed oral prochlorperazine but these only helped for a few days. She feels very weak in herself and is unable to care for her son now.

On direct questioning she has upper abdominal pain that is constant, sharp and burning. She has not opened her bowels for 5 days. She is passing small amounts of dark urine infrequently but there is no dysuria or haematuria. There has been no vaginal bleeding.

There is no other medical or gynaecological history of note except that she suffered persistent vomiting in her first pregnancy requiring two overnight admissions.

Examination

She is apyrexial. Lying blood pressure is 115/68 mmHg and standing blood pressure 98/55 mmHg. Heart rate is 96/min. The mucus membranes appear dry. Abdominal examination reveals tenderness in the epigastrium but no lower abdominal tenderness. The uterus is not palpable abdominally.

INVESTIGATIONS		
Normal range for pregnancy		
Haemoglobin	11.1 g/dL	11–14 g/dL
Mean cell volume	90 fL	74.4–95 fL
White cell count	8.9×10^9/L	$6–16 \times 10^9$/L
Platelets	298×10^9/L	$150–400 \times 10^9$/L
Sodium	131 mmol/L	130–140 mmol/L
Potassium	3.0 mmol/L	3.3–4.1 mmol/L
Urea	8.2 mmol/L	2.4–4.3 mmol/L
Creatinine	65 mmol/L	34–82 mmol/L
Alanine transaminase	30 IU/L	6–32 IU/L
Alkaline phosphatase	276 IU/L	30–300 IU/L
Gamma glutamyl transaminase	17 IU/L	5–43 IU/L
Bilirubin	12 mmol/L	3–14 mmol/L
Albumin	34 g/L	28–37 g/L
Pregnancy test: positive Urinalysis: protein negative; blood negative; nitrites negative; leucocytes negative; ketones ++++; glucose negative		

Questions

• What is the diagnosis?

• What are the potential complications of this disorder?

• How would you further investigate and manage this patient?

ANSWER 10

The woman is suffering from hyperemesis gravidarum. This affects only less than 2 per cent of pregnancies, although more than 50 per cent of women report some nausea or vomiting when pregnant.

! Definition of hyperemesis gravidarum
Severe or protracted vomiting appearing for the first time before the 20th week of pregnancy that is not associated with other coincidental conditions and is of such severity as to require the patient's admission to hospital.

! Differential diagnosis of vomiting in early pregnancy
• Urinary tract infection • Gastroenteritis • Thyrotoxicosis • Hepatitis

The diagnosis in this case can be made because the urinalysis is negative apart from the ketones, so urinary tract infection is very unlikely. She has not opened her bowels but this is likely to be secondary to poor dietary intake and dehydration. Liver function is normal, so liver disease causing vomiting is unlikely (though abnormal liver function may occur as a result of hyperemesis itself). Thyroid function is normal, so an alternative diagnosis of hyperthyroidism causing the vomiting is unlikely.

! Complications of hyperemesis gravidarum
• Wernicke's encephalopathy (from vitamin B deficiency) • Korsakoff's syndrome (from vitamin B deficiency) • Haematemesis (from Mallory-Weiss tear) • Psychological – resentment toward the pregnancy and expression of desire to terminate the pregnancy

The fetus is not at risk from hyperemesis and the nutritional deficiency in the mother does not seem to affect development. The risk of miscarriage is lower in women with hyperemesis. The risk of twins and molar pregnancy has traditionally been thought to be greater in women with hyperemesis, but this is refuted in more recent research.

Further investigation and management

Hyperemesis is a self-limiting disease and the aim of treatments is supportive, with discharge of the woman once she is tolerating food and drink and is no longer ketotic on urinalysis.

Fluids: 3–4 L of normal saline should be infused per day. Dextrose solutions are contraindicated as they may precipitate Wernicke's encephaolopathy and also because the woman is hyponatraemic and needs normal saline.

Potassium: excessive vomiting generally leads to hypokalaemia, and potassium chloride should be administered with the normal saline according to the serum electrolyte results.

Antiemetics: first-line antiemetics include cyclizine (antihistamine), metoclopramide (dopamine anatagonist) or prochlorperazine (phenothiazine). In severe cases, ondansetron may be effective. There is no evidence of teratogenicity in humans from any of these regimes.

Thiamine and folic acid: vitamin B1 (thiamine) can prevent Wernicke's encephalopathy or the irreversible Korsakoff's syndrome (amnesia, confabulation, impaired learning ability).

Antacids: for epigastric pain.

Total parenteral nutrition (TPN): TPN is rarely indicated but may be life saving where all other management strategies have failed.

Thromboembolic stockings (TEDS) and heparin: women with hyperemesis are at risk of thrombosis from pregnancy, immobility and dehydration, and should be considered for low-molecular-weight heparin regime as well as TEDS.

Monitoring

Daily monitoring should be carried out, with weight measurement and urinalysis for ketones and renal and liver function.

KEY POINTS
• Hyperemesis gravidarum is a diagnosis of exclusion. • There is generally no adverse effect on the fetus.

• Treatment is supportive. • Thiamine replacement prevents Wernicke's encephalopathy and Korsakoff's syndrome.

CASE 11: BLEEDING IN EARLY PREGNANCY

History

A 23-year-old woman is referred by her GP with vaginal bleeding. She noticed that there was blood on the toilet paper 2 days ago, and following this she has had bright red spotting intermittently. She has no pain and there are no urinary or bowel symptoms.

Her last menstrual period started 9 weeks and 6 days ago and she has a regular 31-day cycle. She had a positive home urine pregnancy test 3 weeks ago after she realized she had missed a period and was feeling very tired. This is her first pregnancy. She had been using condoms but with poor compliance, so the pregnancy was unplanned but she is now happy about it.

She is generally well, only having been admitted to hospital once in the past for an appendectomy at the age of 17 years. She takes no medication, does not smoke and drinks minimal alcohol. She denies any use of recreational drugs.

Examination

The woman is apyrexial. The blood pressure is 120/65 mmHg and heart rate 78/min. The abdomen is soft and non-tender with no palpable uterus or other masses.

Examination
The woman is apyrexial. The blood pressure is 120/65 mmHg and heart rate 78/min. The abdomen is soft and non-tender with no palpable uterus or other masses.

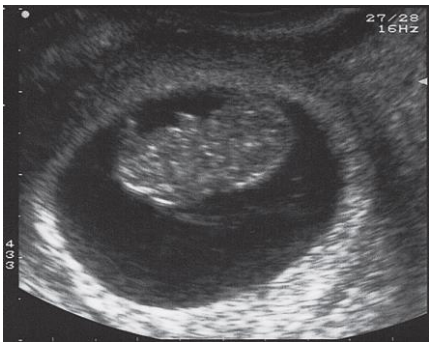


Figure 11.1 Transvaginal ultrasound scan.

Questions

• How would you interpret the ultrasound result?

• What further examination, investigations or management would you like to perform or request?

ANSWER 11

The ultrasound scan shows a viable single intrauterine pregnancy. The crown–rump length is compatible with the gestational age by menstrual dates, especially as the woman reports a long menstrual cycle (3 days longer than normal, therefore gestational age would be 3 days less than the 'normal'). Where there is a significant discrepancy with menstrual and ultrasound gestational age estimation (e.g. more than 7 days), one should consider the possibility of inaccurate reporting of the

last menstrual period date, irregular cycles leading to inaccurate estimated ovulation date, or of a possible growth-retarded fetus which may be destined to miscarry.

In this case, as the ultrasound is reassuring the diagnosis would be of a 'threatened miscarriage'.

Figure 11.2 shows a three-dimensional image of the fetus, demonstrating the developing limbs and the physiological midgut herniation which occur at this developmental stage.

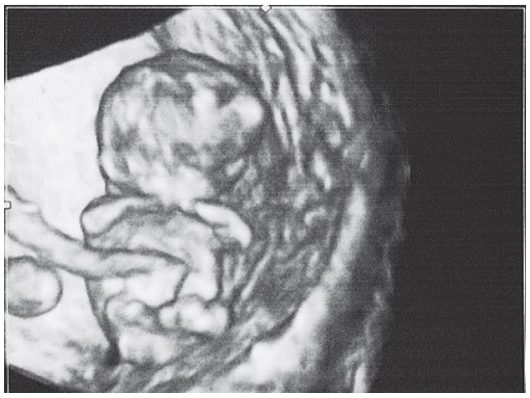


Figure 11.2 Three-dimensional transvaginal ultrasound scan.

Further management

A speculum examination should be performed. The possible findings may be:

• normal appearance
• cervical ectropion (often associated with postcoital bleeding)
• cervicitis (common with chlamydia)
• cervical polyp
• cervical malignancy (rare but should not be missed).

No further investigations are necessary at this stage – the amount of bleeding is unlikely to have caused anaemia. Rhesus status is irrelevant as anti-D immunoglobulin is only indicated in a rhesus negative woman where the bleeding occurs after 12 weeks' gestation or where a miscarriage has occurred.

Management in this case is simple reassurance. Available evidence suggests that the pregnancy is at less than 5 per cent risk of miscarriage if the fetal heartbeat is normal and the bleeding resolves. There is no clear evidence for progesterone, bedrest or avoidance of sexual intercourse with threatened miscarriage. Further assessment should be offered if the bleeding becomes heavier or recurs. Otherwise the woman's next appointments are likely to be the antenatal midwife booking visit and the 11–14-week ultrasound scan.

KEY POINTS
• Vaginal bleeding in pregnancy is associated with miscarriage in up to 50 per cent of cases, but the risk is lower if the bleeding is light. • After a fetal heartbeat has been visualized, the chance of subsequent first-trimester miscarriage is around 5 per cent. • Threatened miscarriage is managed supportively with reassurance – administration of progesterone and other measures have not yet been proven beneficial.

CASE 52: PAIN IN PREGNANCY

History

A 33-year-old Asian woman complains of worsening abdominal pain for 4 days. She is 16 weeks pregnant in her third pregnancy. She has a 10-year-old son, by normal delivery, and had a miscarriage 8 years ago. Her pregnancy has been uneventful until now with an unremarkable first-trimester scan.

The pain is in the left lower abdomen and is constant and sharp. She has taken paracetamol with little effect and she is unable to sleep due to the pain.

She has had no vaginal bleeding and reports urinary frequency since the beginning of the pregnancy. She is mildly constipated and has no nausea and vomiting. There is no history of trauma. She has not felt the baby moving yet.

Examination

The woman is apyrexial and pulse rate is 125/min, with blood pressure 110/68 mmHg. The uterus is palpable just above the umbilicus. There is significant tenderness over the left uterine fundal region, where it also feels firm. The abdomen is otherwise soft and non-tender. There is voluntary guarding but no rebound tenderness. Bowel sounds are normal. Speculum examination shows a normal, closed cervix and no blood. The fetal heartbeat is heard with hand-held fetal Doppler.

INVESTIGATIONS		
		Normal range for pregnancy
Haemoglobin	10.6 g/dL	11–14 g/dL
Mean cell volume	79 fL	74.4–95.6 fL
White cell count	7.2×10^9/L	$6–16 \times 10^9$/L
Platelets	378×10^9/L	$150–400 \times 10^9$/L
C-reactive protein	5 mg/L	<10 mg/L

Questions

• What is the likely diagnosis and how should it be confirmed?

• How would you manage this woman?

• What effect will this condition have on the pregnancy?

ANSWER 12

The diagnosis is of fibroid degeneration. The uterine size larger than dates and the localized uterine tenderness are the important features in making this diagnosis. Fibroids affect 20–30 per cent of the female population, commonly developing between 30 and 50 years. They are particularly common in African-Caribbean women.

Fibroids are oestrogen sensitive and therefore grow in pregnancy in response to the hyperoestrogenic state. When they outgrow their blood supply they undergo ‘red degeneration’, with necrosis within the fibroid causing the intense localized pain. The diagnosis of fibroids is confirmed by ultrasound visualization of an encapsulated mass in the uterus. The degeneration is confirmed by the ultrasound appearance of cystic spaces within the fibroid mass.

Degeneration pain usually starts gradually, and some women manage at home with simple paracetamol and rest until the pain subsides. However it is common for the pain to be severe enough for admission to hospital for opiate analgesia. Opiates are safe in pregnancy provided use is not

prolonged. Intravenous fluids may be required if the woman is not drinking, or is vomiting due to the pain.

Most women remain well systemically, although a full blood count and C-reactive protein should be taken to check haemoglobin and to assess the white blood count and inflammatory markers. In this case the woman has a mild microcytic anaemia of pregnancy and should be given ferrous sulphate.

The pregnancy itself is not usually compromised by degenerating fibroids except in the rare cases where sepsis develops, in which case miscarriage may occur.

Fibroids are managed expectantly in pregnancy but may cause malpresentation at term, or obstructed labour if there is a pelvic fibroid. In either of these circumstances, caesarean section should be performed. Most fibroids shrink spontaneously during the puerperium, so consideration of surgery should be deferred for at least 3 months after delivery.

KEY POINTS
• Fibroids are common and may cause pain as they outgrow their blood supply and undergo 'red degeneration'. 5• The pain is self-limiting and treatment is pain management.

CASE 13: ILLEGAL DRUG USE IN PREGNANCY

History

A 19-year-old woman is referred to the antenatal clinic by her general practitioner. She is currently 22 weeks' gestation in her second pregnancy. She had a son by normal vaginal delivery 18 months ago, who was taken into social services care initially and now lives with his grandparents (the father's parents). Since then, the woman has been having very infrequent periods and only discovered she was pregnant when she attended the emergency department with a presumed urinary tract infection 2 weeks ago. At that stage abdominal palpation revealed a mass, and ultrasound scan confirmed the singleton gestation.

The GP letter informs that the woman has been a user of crack cocaine and heroin in the past but that she has been on a methadone replacement programme for the last 8 weeks. The current prescribed regime is 60 mL methadone, which she collects daily from the pharmacist.

The woman reports that she still injects street heroin several times per week but has not used crack cocaine for several months. She says that she drinks minimal alcohol but she smokes 20–25 cigarettes per day.

There is no other medical history of note.

She lives in a council flat with her partner who is also taking prescribed methadone. She denies any domestic violence within the relationship.

Examination

The woman appears thin and anxious. The blood pressure is 107/65 mmHg and pulse 90/min. The abdomen is distended with the fundus palpable at the umbilicus. The fetal heartbeat is heard with a hand-held Doppler device.

INVESTIGATIONS
Rubella: immune Syphilis: negative Hepatitis B surface antigen: positive HIV1/2: negative Haemoglobin: 11.4 g/dL Blood group: A positive

Questions

• What other investigations should be arranged?

• What are the risks associated with drug use in pregnancy?

• How would you manage this woman during the pregnancy?

ANSWER 13

The woman has been found to be hepatitis B surface antigen positive. This needs further investigation with e antigenicity to determine risk of transmission, and liver function tests. Assuming the hepatitis B is related to needle sharing, she is also at significant risk of hepatitis C and this should also be tested for at this stage. A urine toxicology screen should be performed with the woman's consent, to confirm the drug history she has given and what the risks to the fetus may be.

! Illegal Drug Use Risks
Crack cocaine: crack cocaine use is associated with placental abruption and hence increased risk of perinatal death or prematurity. It is also known to cause intrauterine growth restriction by way of arterial vasoconstriction. Heroin: opiates are not teratogenic but are associated with intrauterine growth restriction and premature delivery. Cannabis: cannabis is not known to have specific risks in pregnancy, but the tobacco use associated and the possibility of other associated drug use makes it an important risk factor. Tobacco: tobacco use is associated with fetal growth restriction and low birth weight. There is also the risk of respiratory disease in the infant from passive smoking.

Management of the pregnancy

Multidisciplinary team

Most units have a specialist team for management of drug-using women in pregnancy. This should include specialists in substance misuse, a social worker, a specialist midwife and an interested obstetrician.

Opiate replacement

The woman needs to be encouraged to engage more fully with the methadone replacement programme. This may well mean increasing the methadone regime to allow her to stop the street heroin. Once this has been achieved then she can gradually reduce the dose needed, with appropriate support. It is better to be still taking a maintenance dose of methadone through the pregnancy than to try and stop too quickly, resulting in unquantifiable amounts of illegal drugs being taken during the pregnancy.

Fetal monitoring

The fetus should be assessed for growth during the pregnancy in view of the increased risk of intrauterine growth restriction.

Delivery

Labour should be managed as for any non-drug-using woman. The difference may be that the usual doses of opiates needed for analgesia (epidural or systemic) may be insufficient and need to be titrated up to ensure adequate pain control.

Fetal blood sampling should be avoided in labour due to the risk of vertical transmission of hepatitis B antigen.

Postpartum

The baby should be administered hepatitis B immunoglobulin at delivery and be given the accelerated hepatitis B immunization course.

Babies of opiate-using mothers may have initial respiratory depression as a result of the opiates but then develop withdrawal symptoms. They need immediate transfer to the neonatal unit for management of the symptoms, with reducing doses of opiates.

Issues of care for the baby should be established between the social services, medical team and the parents, prior to delivery.

KEY POINTS
• Women who use illegal drugs have high-risk pregnancies. • A team approach that encourages trust and engagement from the woman is likely to be most effective. • Fetal growth should be monitored and the fetus transferred to the neonatal unit at delivery for management of respiratory depression and withdrawal.

CASE 14: ANTENATAL SCREENING

History

A woman aged 23 years is referred by her general practitioner to the antenatal clinic at 12 weeks in her first pregnancy. She has booked late having only just discovered she is pregnant. She separated from her partner of 2 years a few weeks ago but is supported by her family and friends. She has no significant medical history and is one of four siblings. On direct questioning her mother apparently had a stillbirth attributed to some form of congenital abnormality 28 years ago. Otherwise the pregnancy is assessed to be low risk.

She is offered a screening test for Down's syndrome, which she agrees to. This is performed at 12 weeks 2 days' gestation.

INVESTIGATIONS
Combined test for Down's syndrome: • Pregnancy-associated plasma protein-A (PAPP-A): 0.4 multiples of the mean (MoM) • Free beta human chorionic gonadotropin (hCG): 1.7 multiples of the mean (MoM)

• Nuchal translucency: 2.9 mm Overall Down's syndrome risk calculated as 1 in 118

Questions

• What tests are available for screening for Down's syndrome and how accurate are they?

• How would you counsel this woman about her options now?

ANSWER 14

Screening for Down's syndrome

PAPP-A, free beta hCG and nuchal translucency (by ultrasound) are used in combination in the 'combined' test, one of the screening tests available to detect Down's syndrome. Down's syndrome is associated with a decreased level of PAPP-A and increased level of NT and free beta hCG.

Serum marker levels are however affected by other variables. For example PAPP-A is decreased in heavier women, about 60 per cent higher in Afro-Caribbean and about 20 per cent lower in women who smoke, though these factors are taken account of in the risk assessment.

Other screening tests include the 'triple test', 'quadruple test' and 'integrated test'. All such tests aim for a detection rate of at least 90 per cent of affected fetuses and a screen positive rate of less than 2 per cent of the unaffected fetuses.

The assessment of 'high' or 'low' risk is dependent on the viewpoint of the individual, but risk higher than 1 in 150–250 is generally considered 'high risk'. Such women should be offered a diagnostic test.

Counselling

The woman should be counselled through the following options.

Expectant management

• The woman may choose not to have any further testing and accept the chance of a baby with Down's syndrome.

• Detailed ultrasound scan: at 20 weeks, features of Down's syndrome (skull abnormalities, ventriculomegaly, atrial septal defect, duodenal atresia, echogenic bowel, hydronephrosis and short limbs) may be apparent on detailed anomaly scan. If none of these 'soft markers' are found then the woman might choose still to avoid further diagnostic tests.

Diagnostic tests

• Chorionic villous sampling (CVS):

• performed 11 to 14 weeks' gestation

• ultrasound guidance

• sample of placental tissue collected generally using needle inserted through the abdominal wall

• small risk of miscarriage (about 1 per cent) associated with the procedure

• inconclusive result in 1 per cent of cases (so amniocentesis then required).

• Amniocentesis:

• performed any time from 15 to 16 weeks' gestation

• ultrasound guidance

• sample of amniotic fluid collected using needle inserted through the abdominal wall

• small risk of miscarriage (about 1 per cent).

• Cell-free fetal DNA: This recently developed non-invasive diagnostic test detects cell-free fetal DNA in a sample of maternal blood from 10 weeks' gestation. It is used to identify the common trisomies (21, 18, 13) and fetal gender.

Women's decisions depend on many factors. Some will want to know the diagnosis in order to consider termination of pregnancy, whereas other couples may not opt for termination but wish to be prepared for a baby with Down's syndrome (and any medical needs it may have, such as cardiac abnormalities) without the ongoing uncertainty throughout the duration of the pregnancy. Time for discussion and sensitivity to the woman's own situation are imperative in counselling.

KEY POINTS
• The possibility of screening for Down's syndrome should be considered with all women regardless of age. • Women who choose not to undergo screening or diagnostic tests should have this choice respected. • Screening tests produce a risk for an individual pregnancy being affected by a chromosomal abnormality, following which a woman may choose to undergo a diagnostic test. • Diagnostic tests are chorionic villus sampling, amniocentesis and testing for cellfree fetal DNA in maternal blood.

CASE 15: EPILEPSY IN PREGNANCY

History

A 24-year-old woman attends for prepregnancy counselling. Her general practitioner referral letter is shown.

Dear Doctor

Please could you see and advise this young woman who wishes to start a family in the near future? She was diagnosed with grand mal epilepsy when she was 12 and has been on medication since then. She was initially under a paediatric neurologist but for the last 6 years has been under my care at the practice. Her current treatment regime includes sodium valproate, phenytoin and lamotrigine. She last had a fit around 1 month ago. She recently married and is keen to start a family as soon as possible. I would be grateful if you could see her to discuss the management of any pregnancy. She has never been pregnant before.

Yours sincerely,

Questions

• What specific risks are there in pregnancy for this woman?

• How should she be managed?

ANSWER 15

The incidence of epilepsy in women of child-bearing age is approximately 1 in 150. The risks of epilepsy in pregnancy can be divided into risks to the mother and to the fetus.

Risks to the mother

Increased plasma volume causes reduced drug levels and a possible increase in fits. Other causes of increased fit frequency include excessive tiredness and hyperemesis. Some women also decide to stop their medication because of fears of adverse effects on the baby, although this may actually increase the risk to the baby as a result of a higher likelihood of prolonged fits.

Risks to the fetus

There is an increased risk of congenital abnormality due to antiepileptic drugs (7 per cent risk for one drug, with risk increasing with multiple drugs). The risk probably applies similarly to all antiepileptic medications used. There is also an intrinsic increased risk of epilepsy in the offspring of an epileptic mother, and during the pregnancy the fetus is also at risk of fetal hypoxia from uncontrolled maternal epilepsy.

Management principles

Prepregnancy

• Refer for neurology opinion and minimize the number of drugs, aiming for a single drug regime.

• Advise the woman to continue her medication during pregnancy, as having an increased number of fits is likely to increase the risk of fetal hypoxia.

• If no fits have occurred for at least 2 years consider stopping all medication.

• Prescribe preconceptual folic acid (5 mg daily rather than 400 mg) to minimize the risk of neural tube defects and prevent folate deficiency seen with antiepileptic regimes.

Antenatal

• Plan for joint medical and obstetric care.

• Monitor plasma levels of anticonvulsant regime (levels are likely to diminish due to increased plasma volume).

• Advise the woman to take showers instead of baths to minimize the risk of drowning if a fit occurs in the bath.

• Arrange detailed anomaly scan and a fetal echocardiography at around 18–20 weeks for cardiac abnormalities.

• Start vitamin K from 36 weeks' gestation, to correct any potential clotting deficiency from the inhibition of clotting factor production by anticonvulsants and thus reduce the chance of fetal bleeding (e.g. intraventricular haemorrhage). The baby should also receive intramuscular (rather than oral) vitamin K at birth.

• There are no specific differences in labour management from non-epileptic women.

Postnatal

• Anticonvulsant therapy is not a contraindication to breast-feeding.

• Decrease medication doses as maternal physiology returns to normal.

• Adequate social support is vital and plans need to be made for safe care of the infant (due to the risk of fits in the mother).

KEY POINTS
• Prepregnancy fits should be well controlled, aiming for a single drug regime. • Epileptic medication is associated with an increased risk of congenital abnormality but the risk to the mother and baby of stopping medication usually takes priority over the risk of fetal abnormality. • Drug compliance during pregnancy must be emphasized.

CASE 16: OBESITY IN PREGNANCY

History

A woman has been referred for a hospital antenatal appointment at 16 weeks' gestation. This is her first pregnancy. She is 38 years old.

She booked for antenatal care with the midwife at 7 weeks and the only significant risk factor identified was that her body mass index was 36 kg/m2. She has always been overweight and considers her weight as normal for her. There is no significant past medical or gynaecological history.

Examination

Weight is 95 kg. Blood pressure is 145/88 mmHg. The uterus is not palpable on abdominal palpation but hand-held Doppler ultrasound reveals a fetal heartbeat of 155/min.

INVESTIGATIONS
Urinalysis: negative Booking bloods: Syphilis: negative HIV: negative Hepatitis B: negative Rubella: immune Random blood glucose: 4.7 mmol/L Blood group A: positive Haemoglobin 13.1 g/dL

Questions

• How will you advise this woman about the possible effects of obesity on her pregnancy?

• What specific management plans should be put in place for her in view of her body mass index?

ANSWER 16

Obesity in pregnancy is defined as body mass index (BMI) of greater than 30 kg/m2 at first antenatal appointment and occurs in up to 20 per cent of women. Twenty-seven per cent of maternal deaths occur in obese women, and most adverse maternal and fetal outcomes are overrepresented in obese women.

Advice on effects of obesity on pregnancy

Obese women should be sensitively advised of the increased risk of the following disorders in pregnancy: gestational diabetes (two- to threefold), hypertensive disorders (two- to threefold), venous thromboembolism (ninefold), slow labour and caesarean section (twofold), postpartum haemorrhage (twofold) and wound infection (twofold).

Fetal risks of maternal obesity include increased congenital abnormality (60 per cent increased risk), prematurity (20 per cent increased risk), macrosomia (two- to threefold), shoulder dystocia (threefold), stillbirth (twofold) and neonatal death (twofold).

Specific pregnancy management for this woman

Preconception advice

Ideally this woman should have had preconceptual information and advice regarding the pregnancy risks, with weight loss support offered prior to conception. She should have been prescribed folic acid at the higher dose of 5 mg daily due to the higher incidence of neural tube defects in babies of obese mothers. Similarly as an obese woman she is more likely to be vitamin D deficient and should have vitamin D supplementation during pregnancy and breast-feeding.

Management in pregnancy

• Anaesthetic consultation should be arranged to discuss the possible increased difficulty with venous access, regional anaesthesia or general anaesthetic.

• Antenatal thromboprophylaxis should be considered if there are two or more other risk factors such as smoking, immobility or parity greater than 3. The dose of lowmolecular-weight heparin is calculated according to the woman's weight.

• Increased frequency of antenatal blood pressure measurements should be arranged and a large cuff is necessary for accurate assessment.

• Gestational diabetes screen (glucose tolerance test) should be performed by 28 weeks.

• With regard to planning for delivery, this woman should be advised to have a hospital birth (not home birth) due to increased maternal and fetal risks.

• Although a caesarean is more likely than in a non-obese woman, in view of the increased risks associated with operative delivery, a vaginal birth should be encouraged.

• Early intravenous access should be established in labour and there should be active management of the third stage, due to postpartum haemorrhage risk.

• Throughout the pregnancy and postnatally she should be encouraged to lose weight through moderate exercise and dietary control.

CASE 17: GLUCOSE TOLERANCE TEST

History

A woman attends the antenatal day assessment unit to discuss the result of her glucose tolerance test. She is 42 years old and this is her sixth pregnancy. She has previously had three caesarean sections, one early miscarriage and a termination of pregnancy. All booking tests were normal as were her 11–14-week and anomaly ultrasound scans.

The woman is of Indian ethnic origin but was born and has always lived in the UK. She is now 26 weeks' gestation and her midwife arranged a glucose tolerance test because of a family history of type 2 diabetes (her father and paternal aunt).

Examination

The body mass index (BMI) is 31 kg/m2. Blood pressure is 146/87 mmHg. The symphysiofundal height is 29 cm and the fetal heart rate is normal on auscultation.

INVESTIGATIONS
Urinalysis: glycosuria ++ Glucose tolerance test (75 g glucose drink): Pretest fasting blood glucose: 6.4 mmol/L 2 h blood glucose following glucose load: 11.3 mmol/L

Questions

• What is the diagnosis and on what criteria can this be made?

• What are the principles of management for this patient?

ANSWER 17

The diagnosis is of gestational diabetes mellitus (GDM) and is based on the 2 h glucose concentration exceeding 11.1 mmol/L (World Health Organization (WHO) criteria). The diagnosis may also be made if the fasting blood glucose exceeds 7.8 mmol/L, in which case a formal glucose tolerance test would not have been necessary. Transient glycosuria is common in pregnancy and may occur after a glucose-rich drink or snack. Therefore the urinalysis alone is unhelpful in the assessment of this woman.

GDM occurs in up to 3 per cent of the pregnant population depending on the ethnic diversity of the specific population. In some cases it may be the first presentation of previously undiagnosed diabetes.

! Risk factors for GDM
• Pre-existing: • obesity • previous GDM • family history of diabetes • women with previously large babies or stillbirth • increasing maternal age • Occurring in this pregnancy: • glycosuria • large for dates baby • polyhydramnios

The importance of the diagnosis relates to the effect on the mother and fetus.

• Effects on the fetus:

• fetal macrosomia

• polyhydramnios

• neonatal hypoglycaemia

• neonatal respiratory distress syndrome

• increased stillbirth rate

• Effects on the mother:

• increased risk of traumatic delivery (e.g. shoulder dystocia)

• increased caesarean section risk

• increased risk of developing GDM in subsequent pregnancies

• 50 per cent increased risk of developing type 2 diabetes within 15 years

Management principles

• Optimal control of maternal blood glucose minimizes the chance of fetal complications. This needs the multidisciplinary input of a diabetologist, specialist diabetes nurse, dietitian, specialist midwife and obstetrician.

• Dietary advice and counselling are the initial interventions (reduced fat and carbohydrate intake with weight control).

• Blood glucose monitoring at home should be initiated with pre- and postprandial levels at each meal.

• Oral hypoglycaemics (metformin) may be used prior to commencing insulin in women where diet control is not effective.

• If blood glucose measurements are repeatedly high, insulin should be commenced.

• The fetus should be monitored with regular ultrasound scans for growth and liquor volume (polyhydramnios being a sign of fetal polyuria secondary to excessive glucose level).

• Delivery should be planned by 40 weeks, but caesarean section should be performed for obstetric indications only.

• Sliding-scale insulin should be initiated in labour for women on insulin.

• The insulin can be stopped immediately postpartum as normal glucose homeostasis returns rapidly after delivery.

• The fetus should be carefully monitored for neonatal hypoglycaemia.

• The mother should have a repeat glucose tolerance test 6 weeks postpartum to rule out pre-existing diabetes.

KEY POINTS
• Gestational diabetes should initially be treated with dietary and weight advice. Insulin may be needed if blood glucose levels remain high. • One-third of women with impaired glucose tolerance in pregnancy will go on to develop diabetes mellitus in the next 25 years.

CASE 18: ANTENATAL SCREENING

History

A woman aged 34 years is 9 weeks' gestation in her third pregnancy. Her first pregnancy ended in a first-trimester suction termination at 18 years of age and she had a miscarriage 8 months ago requiring surgical management. She is generally well except for mild asthma.

She has no family history of congenital abnormalities. She is a non-smoker and currently drinks approximately 3 units of alcohol per week. Her only medication is folic acid 400 mcg daily.

Her partner is 31 years old and was adopted. He has no known medical problems. The routine booking blood and urine tests are normal.

The couple opt for Down's syndrome screening and a first-trimester ultrasound appointment is booked for 12 weeks.

INVESTIGATIONS
The first-trimester ultrasound findings are shown in Fig. 18.1. Ultrasound report: Single fetus. Fetal heart action normal Crown–rump length: 62.4 mm (corresponds to 12 weeks 3 days' gestation) Nuchal translucency (NT): 3.2 mm Risk of trisomy by maternal age (34 years): 1:276 Adjusted risk of trisomy after NT: 1:30

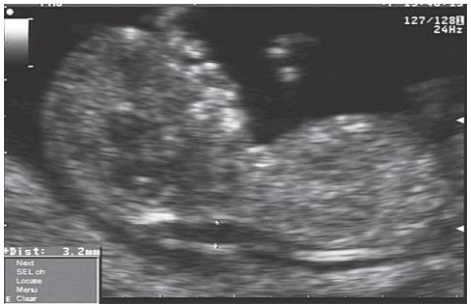


Figure 18.1 First-trimester transabdominal ultrasound scan.

Questions

• How would you explain the report to the couple?

• The couple chose to have a further test and the results are normal (46 XY normal karyotype). What further diagnoses should be considered?

ANSWER 18

Explanation of the report

Down's syndrome screening can be difficult to explain, and any discussion should start with checking that the couple understands what Down's syndrome is:

• a chromosomal 'genetic' problem that usually occurs sporadically ('by chance')

• associated with physical abnormalities which may be relatively minor, such as short stature, abnormal facial appearance, or major, such as severe cardiac abnormality

• always associated with learning disability, though the extent is variable

• generally associated with life expectancy up to 40 or 50 years.

The 'nuchal translucency' test is a screening test and does not give a definite answer as to whether the pregnancy is affected or not. The risk in this case based on the mother's age alone is 1 in 276, but the high NT measurement combined with the maternal age suggests that the risk for this particular baby is 1 in 30. Most women even with a high risk result actually have a normal fetus (a false-positive result).

Further investigation

Fetuses with a high-risk NT but normal karyotype have an increased likelihood of other structural defects such as congenital heart disease, exomphalos, diaphragmatic hernia and skeletal defects. This couple should therefore have a detailed anomaly scan and fetal cardiac echo at around 20 weeks' gestation.

KEY POINTS
• Nuchal translucency (NT) is a screening test not a diagnostic test. • The NT result may increase their risk but most women with increased NT have a normal fetus (false positive). However women who have a high-risk NT and normal karyotype are at risk of other structural defects, so a detailed anomaly scan should be performed at around 20 weeks.

CASE 19: ANTENATAL CARE

History

A woman attends a routine antenatal appointment at 31 weeks' gestation. She is 26 years old and this is her fourth pregnancy. She has three children, all spontaneous vaginal deliveries at term. Her third child is 18 months old and the delivery was complicated by a postpartum haemorrhage (PPH) requiring a 4-unit blood transfusion. This pregnancy has been uncomplicated to date, with normal booking blood tests, normal 11–14-week ultrasound and normal anomaly ultrasound scan.

She feels generally tired and attributes this to caring for her three young children. She reports good fetal movements (more than 10 per day).

Examination

Blood pressure is 126/73 mmHg.

INVESTIGATIONS (BLOOD TESTS TAKEN AT 28 WEEKS)		
		Normal range for pregnancy
Haemoglobin	7.8 g/dL	11–14 g/dL
Mean cell volume	68 fL	74.4–95.6 fL
White cell count	11.2×10^9/L	$6–16 \times 10^9$/L
Platelets	237×10^9/L	$150–400 \times 10^9$/L
Urinalysis: negative Blood group: A negative No atypical antibodies detected		

Questions

• What is the likely diagnosis and what are the implications for the pregnancy?

• What further investigations would you wish to arrange?

• How will you manage this woman for the last trimester of pregnancy?

ANSWER 19

The haemoglobin is significantly low even for pregnancy, and is associated with a low mean cell volume. This is usually due to iron-deficiency anaemia. Iron-deficiency anaemia usually occurs when the woman enters pregnancy with depleted iron stores, although she may not at that stage have low haemoglobin or any signs or symptoms suggestive of anaemia.

! Implications of anaemia in pregnancy
• Baby (possible): • low birth weight • neonatal anaemia • cognitive impairment • Mother: • antenatal − fatigue − fainting − dizziness • peripartum − increased risk of haemodynamic compromise • increased likelihood of transfusion

At delivery, blood loss is inevitable. This woman has additional risk factors of having her fourth delivery and having a history of PPH. As she is already very anaemic, she may decompensate easily if blood loss occurs, increasing her likelihood of hypovolaemic shock and need for emergency blood transfusion.

Further investigation

Although the likely cause of these indices is iron deficiency, differential diagnoses include a mixed folate and iron deficiency, thalassaemia, chronic bleeding or anaemia of chronic disease (e.g. renal disease). A full history should therefore be taken to exclude chronic diseases and to elicit any family history of thalassaemia.

Iron deficiency should be demonstrated with findings of low mean cell haemoglobin (MCH) and low serum ferritin. Ferritin below 12 mg/L confirms the diagnosis. Serum and red cell folate should also be checked and the woman should be screened for haemoglobinopathies.

If chronic disease is suspected, then further investigations may be indicated such as renal and liver function tests for chronic disease, or gastrointestinal tract endoscopy for causes of chronic bleeding.

Further management

Correction of anaemia

• The woman should be prescribed ferrous sulphate 200 mg twice daily, increasing to three times if tolerated. If iron tablets are not tolerated then alternatives include iron suspension or parenteral (intramuscular) iron injections. These are painful and do not increase the serum haemoglobin more than the maximum expected from oral iron (1 g/dL per week).

• In extreme cases, where it is not possible to increase the haemoglobin level by iron supplementation, blood transfusion should be considered.

• An iron-rich diet should be encouraged.

Delivery

• At delivery, she should be considered at high risk of PPH and have an intravenous cannula inserted in labour, with full blood count and group and save.

• Active management of the third stage is essential (syntometrine, controlled cord traction) and an oxytocin infusion considered if bleeding is excessive or the uterus is suspected to be atonic.

• Following delivery, the woman should continue iron supplementation until iron stores (ferritin) are restored, even if haemoglobin is normal.

KEY POINTS
• Anaemia (not physiological) must be investigated in pregnancy. • If untreated, anaemia will worsen during pregnancy and blood loss at delivery may be catastrophic. • Women with previous PPH must have active management of the third stage.

CASE 20: PREVIOUS CAESAREAN SECTION

History

A woman is referred to the obstetric antenatal clinic by the community midwife after the booking appointment revealed that she had had a previous emergency caesarean. You are the foundation year 2 doctor seeing her and you elicit the history and examine her.

She is 25 years old and pregnant with her second child. Her daughter was born 3 years ago by emergency caesarean section for failure to progress in labour due to an occipitoposterior position. The pregnancy had been uncomplicated and she had gone into spontaneous labour at 40 weeks 5 days. She had contractions for 24 h, and during this time she underwent artificial rupture of membranes and was given a syntocinon infusion for 8 h. The cervix dilated to 8 cm but she did not progress further despite regular strong contractions.

Following the emergency caesarean the baby was well, but the woman was readmitted to hospital after 7 days because of an infected wound haematoma for which she required intravenous antibiotics. The antibiotics altered the taste of the breast milk and the baby subsequently had to have formula milk.

She now feels anxious that she might have to go through the same experiences again and is wondering whether she can request an elective caesarean section to avoid having another long labour and emergency procedure, with its associated complications.

She has had no other pregnancies and is generally fit and healthy. She is currently 16 weeks' gestation and has had a normal nuchal scan. Booking blood tests are normal.

Examination

The abdomen is distended, compatible with pregnancy. The low transverse scar is visible and is non-tender. The uterus is palpable to midway between the symphysis pubis and the umbilicus. The fetal heartbeat is heard with a hand-held Doppler machine.

Question • How should you advise and manage her?

ANSWER 20

The current average caesarean section rate in the UK is approximately 24 per cent. This means that many women are returning in subsequent pregnancies having had a previous caesarean section. In

this case the woman has an otherwise low-risk pregnancy and the only factor to be considered at this stage is the planned mode of delivery.

She should be able to make an informed choice after appropriate information regarding vaginal birth after caesarean section versus planned caesarean section.

The important points for this woman to be informed about and to consider are summarized:

• Vaginal birth after caesarean (VBAC):

• successful in up to 70 per cent of cases

• emergency caesarean section rate is approximately 30 per cent

• 1 in 200 risk of uterine rupture (scar dehiscence)

• close cardiotocograph monitoring is needed, with intravenous access, fasting and full blood count and group and save serum available

• normal progress is expected and augmentation of labour is not usually recommended in women with a uterine scar

• induction of labour may be appropriate in selected women with previous caesarean section

• Planned caesarean section:

• operative delivery is associated with higher risks of haemorrhage, infection, v isceral damage and thrombosis

• mobility and ability to care for child and baby are more impaired by caesarean section than vaginal delivery

• planned caesarean does avoid the possibility of an emergency procedure

• after two caesarean sections a further caesarean would be the recommended option in any subsequent pregnancy

The woman should be offered a further appointment toward the end of the third trimester to confirm her decision regarding mode of delivery and to check for any complications that might contraindicate vaginal delivery such as breech presentation, a large baby, scar tenderness or pre-eclampsia. One of the most important points in the consultation is to listen to her concerns about the previous delivery and what her fears might be. An empathetic approach will help her to feel confident about any decision she makes this time.

KEY POINTS
• Although low, the maternal morbidity and mortality are higher for caesarean section than for vaginal delivery. • The chances of a successful vaginal delivery after a previous caesarean section are up to 70 per cent. • A woman's experiences of previous deliveries are very important in counselling for any subsequent pregnancy and delivery.

CASE 21: GROUP B STREPTOCOCCUS

History

You are asked to see a woman in the antenatal assessment unit. She is gravida 4 para 1, having had a normal vaginal delivery 3 years ago, a first-trimester miscarriage and two first-trimester terminations.

She is currently 26 weeks' gestation. One week ago she was seen because she experienced vaginal bleeding. At the time a small cervical ectropion had been noticed and as the bleed had occurred postcoitally, it was assumed likely to be secondary to the ectropion.

However, as per protocol, she had vaginal and endocervical swabs sent and a full blood count and group and save sample requested.

INVESTIGATIONS		
		Normal range for pregnancy
Haemoglobin	10.1 g/dL	11–14 g/dL
Mean cell volume	76 fL	74.4–95.6 fL
White cell count	8.0×10^9/L	$6–16 \times 10^9$/L
Platelets	183×10^9/L	$150–400 \times 10^9$/L
Blood group: A positive No atypical antibodies detected Endocervical swab: chlamydia negative; gonorrhoea negative High vaginal swab: candida – small numbers identified Group B streptococcus: positive culture.		

Questions

• How would you interpret these results?

• How would you manage the pregnancy and delivery in light of these results?

ANSWER 21

The key results are:

• mild anaemia

• group B streptococcus carrier

• candida.

The anaemia is mild for pregnancy and as the mean cell volume is low, suggesting iron deficiency, it may be treated with ferrous sulphate 200 mg twice daily, with repeat haemoglobin after 4 weeks. She should also be advised about an appropriate iron-rich diet (e.g. meat, lentils, spinach).

Candida organisms are present very commonly in the vagina, particularly in pregnancy. This should be treated (with vaginal clotimazole) only if the woman is symptomatic (itching or lumpy discharge).

Group B streptococcus (GBS)

GBS (*Streptococcus agalactiae*) colonization occurs in 25 per cent of women at some stage during their pregnancy. In this case the finding of GBS may relate to the presenting symptom of bleeding, but is most likely to be an incidental finding. This is the most important result as there is a risk of GBS to the baby with an incidence of 1 in 2000 neonates being infected, with 6 per cent mortality.

! Babies at Particular Risk of GBS Infection
• Previous baby affected by GBS • GBS in the vagina or urine at any stage during the current pregnancy • Preterm delivery • Prolonged rupture of membranes • Pyrexia in labour

In the UK, universal screening for GBS has not been shown to be effective in reducing neonatal death.

Management

Antenatal treatment does not seem to reduce the neonatal risk (perhaps because of recolonization). However measures are taken to reduce transmission to the baby at the time of delivery:

• intravenous penicillin (or clindamycin or erythromycin if allergic) should always be given to the mother in labour

• neonatal care depends on the clinical scenario but may include:

• observation of the baby for up to 5 days postpartum for signs of sepsis

• consideration of culture of the baby for evidence of infection (ear, nose, axilla)

• intravenous antibiotics until culture results confirm no evidence of infection.

KEY POINTS
• GBS is the most common cause of serious bacterial infection in UK infants, with a mortality of 10 per cent. • Antenatal treatment is not effective but treatment at the time of delivery reduces perinatal morbidity and mortality.

CASE 22: TWIN PREGNANCY

History

A 37-year-old woman attends the antenatal clinic at 18 weeks' gestation. She is gravida 2 para 1, having had a spontaneous vaginal delivery at term 8 years ago. This current pregnancy was achieved through in vitro fertilization after four attempts (cycles). Two embryos were implanted. The first-trimester scan confirmed a twin gestation and noted a lambda sign between the gestations sacs. The anomaly scan is due in 2 weeks.

So far the woman has been feeling nauseated and tired but well.

Examination

The blood pressure is 120/78 mmHg. The fundus is palpable 2 cm above the umbilicus. Two separate fetal hearts are heard on hand-held fetal Doppler, one 143/min, the other 130/min.

INVESTIGATIONS		
		Normal range for pregnancy
Haemoglobin	9.8 g/dL	11–14 g/dL
Mean cell volume	71 fL	74.4–95.6 fL

White cell count	5.3×10^9/L	6–16 × 10^9/L
Platelets	204×10^9/L	100–400 × 10^9/L
Urinalysis: negative Haemoglobin electrophoresis: sickle trait (AS) Blood group: A positive Rubella antibody: immune HIV1/2: negative Hepatitis B: negative Syphilis: negative Twelve-week transabdominal ultrasound scan report: two viable fetuses present, measuring 82 and 80 mm.		

Questions

• How would you interpret the results?

• What can the parents be told about the zygosity of the pregnancy?

• How would you monitor and manage this pregnancy?

ANSWER 22

The ultrasound confirms a twin pregnancy with a lambda sign (projection of placental tissue between the dividing membranes). This is suggestive of a dichorionic pregnancy. The woman is anaemic with a low mean cell volume suggestive of iron-deficiency anaemia. The only other investigation of note is that the woman has sickle trait.

Zygosity

Although the pregnancy appears dichorionic diamniotic (DCDA), this does not inform us about zygosity. A monozygotic pregnancy may be DCDA if the embryo has split at an early stage. One third of monozygotic pregnancies are DCDA, two-thirds monochorionic diamniotic and around 1 per cent are monochorionic monoamniotic. A single implanted embryo may even split in an IVF pregnancy. Confirmation of zygosity is by genetic analysis, or by observing that the fetuses are of different genders.

Monitoring

Twin pregnancies are associated with increased maternal risks of hyperemesis, anaemia, preterm labour, antepartum haemorrhage, pre-eclampsia, gestational diabetes, thrombosis and caesarean delivery. The fetuses are at risk of intrauterine growth restriction, prematurity, stillbirth or neonatal death, congenital anomalies and operative delivery.

! Monitoring in Twin Pregnancies
• Regular full blood count • Close blood pressure and urinalysis monitoring • Fetal growth surveillance from 28 weeks • Screening for gestational diabetes

Management

In addition to routine antenatal care this woman needs:

• information regarding the increased maternal and fetal risks with twin pregnancy

• regular hospital antenatal assessment from the late second trimester

• ferrous sulphate and folic acid supplementation

• discussion of mode of delivery (depending on growth and presentation of twins at around 36 weeks)

• hospital delivery by 40 weeks

• introduction to multiple pregnancy support groups.

The woman has sickle trait and her partner should also be tested. If he is also sickle trait positive then prenatal testing of the babies should be offered to determine whether they are homozygous and therefore going to be affected by sickle cell disease.

KEY POINTS
• Chorionicity and amnionicity can be determined with high accuracy by ultrasound in the first trimester but unless the fetuses are seen to be of different sexes, the zygosity of dichorionic diamniotic twins can only be confirmed with genetic testing. • Multiple pregnancies are high risk for both mother and babies, and close monitoring is essential for the early detection of problems. • A woman with sickle cell trait whose partner is also sickle cell trait positive should be offered prenatal diagnosis by chorionic villus sampling, amniocentesis or cordocentesis.

CASE 23: CHICKEN POX EXPOSURE IN PREGNANCY

A woman has telephoned the antenatal clinic for advice. She is 16 weeks' gestation in her second pregnancy. She took her son to a birthday party yesterday and has been telephoned now by the party host to say that one of the other children at the party has just developed a typical chicken pox rash.

She is worried about the effect of chicken pox on her pregnancy.

Questions

• What, if any, further questions do you need to ask her?

• What investigations should be performed?

• How will you advise and manage the case depending on the investigation results?

ANSWER 23

Chicken pox (caused by varicella zoster virus) is a very common, highly contagious and generally self-limiting mild childhood illness, mostly spread by respiratory droplets. Ninety per cent of antenatal women will have been previously infected with chicken pox and immunity can be demonstrated by the presence of varicella zoster virus (VZV) IgG antibodies in the serum.

Questions to be asked

• Does the woman know whether she has had chicken pox before?

• What was the nature of her contact with the affected child?

• What was the duration of her contact with the affected child?

When asked she can't remember whether or not she had chicken pox as a child. It was an indoor party and she herself had stayed at the party with her son for about 30 minutes.

Investigations to be performed

In many cases, a blood sample will have been retained from the antenatal booking blood tests that can be tested for VZV immunoglobulin (IgG). Otherwise the woman should be asked to have blood taken urgently for VZV IgG (ideally taken at the general practitioner's practice so that she does not attend the antenatal clinic and potentially infect other non-immune pregnant women).

Advice and management

If the serum varicella IgG is positive then immunity is confirmed and the woman can be reassured that neither she nor her fetus is at risk of infection.

Maternal risks

If the IgG is negative then she is not immune and more than 15 minutes in the same room as the infected individual is sufficient to place her at risk of infection. She should be given varicella immunoglobulin VZIG as soon as possible (effective if given up to 10 days after contact). She should then be advised that she is still potentially infectious and to avoid any other pregnant women during the infectious period of 8–28 days after exposure.

The risk of maternal varicella to the mother is greater than in the mild childhood form of the illness. Pneumonia, encephalitis and hepatitis are the potential complications. Maternal death is reported in 1 per cent of affected pregnant women (five times higher than in nonpregnant women). If she is infected then the rash would be expected to appear within 1–3 weeks. She must be advised to seek medical attention at the outset of a rash developing and should be prescribed acyclovir orally at the start of symptoms. She must be referred to hospital for supportive care and intravenous acyclovir if chest symptoms, neurological symptoms or a haemorrhagic rash occurs.

Fetal risks

The risk of miscarriage is not increased in women who develop chicken pox in the first trimester. However fetal varicella syndrome (skin scarring, limb hypoplasia and neurological abnormalities) may occur in 1 per cent of fetuses of women infected up to 28 weeks, as a result of herpes zoster reactivation after the initial infection. Specialist fetal medicine ultrasound 5 weeks after initial infection may detect the anatomical abnormalities. If infection occurs before 12 weeks' gestation the chance of varicella syndrome is much lower.

Maternal infection at term carries the risk of varicella of the newborn which is a severe infection with up to 30 per cent mortality if untreated. The risk is approximately 30 per cent in infants of mothers infected 1–4 weeks before delivery, with highest risk conferred if infection is within 7 days of delivery. If possible delivery should therefore be delayed until after recovery from maternal infection to allow transplacental transfer of maternal antibodies to the fetus. VZIG should be given to the susceptible neonate.

If the woman is non-immune but does not develop the infection then vaccination should be recommended after delivery.

KEY POINTS
• Chicken pox in pregnancy is potentially much more severe than in nonpregnant adults, with maternal death reported in up to 1 per cent of affected women. • VZV is spread by respiratory droplets with same room contact for more than 15 minutes considered to place a nonimmune woman at high risk. • VZIgG should be given as soon as possible after exposure. • Fetal risks of maternal chicken pox infection are fetal varicella syndrome (if mother infected before 28 weeks) or varicella of the newborn (if mother infected 1–4 weeks before delivery).

CASE 24: BLEEDING IN PREGNANCY

History

You are asked to review a nulliparous woman who has presented with vaginal bleeding at 39 weeks 5 days' gestation. Booking blood pressure was 123/72 mmHg. Her last midwife visit was 10 days ago when blood pressure was 130/76 mmHg.

This evening she noticed a small 'gush' of blood and discovered a bright red stain in her underclothes. She denies actual abdominal pain but reports some intermittent lower abdominal discomfort. The baby has been moving normally during the day.

Examination

She is warm and well perfused. Her blood pressure is 158/87 mmHg and heart rate 84/min. The symphysiofundal height is 36 cm and the fetus is cephalic with 3/5 palpable abdominally. Moderate uterine tenderness is noted. The uterus is soft but during the palpation two moderate uterine tightenings are noted. On speculum examination the cervical os is closed and there is a moderate amount of vaginal blood.

INVESTIGATIONS
Urinalysis: protein +; blood ++; leucocytes negative; nitrites negative The cardiotocograph (CTG) is shown in Fig. 24.1.

Figure 24.1 Cardiotocograph.

Questions

• What is the diagnosis?

• How should this woman be managed?

ANSWER 24

The diagnosis is of placental abruption in view of the bleeding, uterine tenderness and irritability. CTG is reassuring at present with baseline 130/min, normal variability, several accelerations and no decelerations. Regular uterine activity is demonstrated on the tocograph.

! Common causes of antepartum haemorrhage (APH) at term
• Maternal blood: • blood-stained show • bleeding placenta praevia • placental abruption • cervical ectropion • infection (e.g. candida) • Fetal blood: • vasa praevia

A 'show' can be ruled out, as the blood is fresh rather than mucus-like and dark. Placenta praevia would have been detected at the anomaly scan, and bleeding placenta praevia is typically painless. She has no features suggesting infection, and vasa praevia bleeding would normally occur with rupture of membranes. Placental abruption is supported by the history of fresh bleeding and uterine irritability with the associated high blood pressure and proteinuria (pre-eclampsia is a cause of abruption).

Placental abruption may be major with catastrophic haemorrhage or, as in this case, be less dramatic. However caution should be maintained for two reasons: first, a small bleed may herald a larger bleed. Second, although some bleeding is revealed, there may be a more significant concealed bleed. Pregnant women may not show any signs of hypovolaemic shock until a large amount of blood has been lost.

Management

Women with APH should always be admitted for observation. Initial management for this woman includes intravenous access, group and save, full blood count and clotting profile. Urea, electrolytes and urate should be sent, looking for abnormalities associated with preeclampsia. Urine collection for over 24-h for proteinuria is not indicated in this case as induction of labour is already indicated on clinical grounds. Blood pressure should be repeated at regular intervals and antihypertensives commenced if indicated.

Induction of labour may increase the chance of operative intervention, but the risk of expectant management is that sudden and catastrophic further haemorrhage may occur. As the woman is over 37 weeks, there is little risk to the fetus of prematurity from induction.

KEY POINTS
• Placental abruption is a clinical diagnosis based on symptoms and examination. • Blood loss caused by placental abruption may be concealed or revealed. • A woman may not show signs of hypovolaemia until she has lost a large proportion of her blood volume.

CASE 25: BREECH PRESENTATION

History

You are asked to see a woman in the antenatal clinic. She is 37 years old and pregnant with her third child. Her previous children were both born by vaginal delivery after induction of labour for post dates.

First-trimester ultrasound confirmed her menstrual dates and she is now 37 weeks. At her last appointment at 36 weeks' gestation, the midwife suspected that the baby was in a breech presentation. An appointment has been made for an ultrasound assessment and to discuss the situation.

Examination

Blood pressure is 140/85 mmHg and abdominal examination suggests a breech presentation with the sacrum not engaged.

INVESTIGATIONS
Urinalysis: negative Ultrasound report: Indication for scan: suspected breech presentation Gestational age: 37 weeks 3 days Frank breech presentation (hips flexed, knees straight) Estimated fetal weight: 3.2 kg Placenta: high anterior Liquor volume: normal (amniotic fluid index 18 cm)

Questions

• What are the options available to the woman?

• What management would you recommend in this case?

ANSWER 25

At 30 weeks the incidence of breech presentation is around 14 per cent, but is only 2–4 per cent by term.

! Causes and associations for breech presentation
• Grand multiparity (lax uterus) • Uterine abnormality (bicornuate, septate, fibroids) • Placenta praevia • Polyhydramnios • Oligohydramnios • Multiple pregnancy • Congenital fetal abnormality • Prematurity

The three options available are:

1. external cephalic version

2. elective caesarean section

3. vaginal breech delivery.

All three options should be discussed with the woman and her partner with important counselling points.

• Vaginal breech delivery:

• found to be less safe for singleton term fetuses than planned caesarean section

• carries a high chance of necessitating an emergency caesarean section

• needs involvement of an experienced obstetrician with continuous fetal heart monitoring and ideally an epidural

• should only be allowed if the labour progresses spontaneously – augmentation of breech labour is generally not recommended

• contraindicated with placenta praevia, large baby, footling breech or maternal condition such as pre-eclampsia.

• External cephalic version:

• involves using external manipulation of the fetus, encouraging the baby to turn to the cephalic presentation by way of pressure on the maternal abdomen

• is often performed after giving a uterine relaxant such as terbutaline

• carries a very small chance of abnormal fetal heart rate during or after the procedure which could necessitate an emergency caesarean section

• has approximately 50 per cent success rate overall

• some fetuses revert to breech position even after successful external cephalic version

• contraindicated with previous caesarean section, other uterine surgery, preeclampsia, intrauterine growth retardation, oligohydramnios

• can be painful.

• Elective caesarean section:

• is safer than vaginal breech delivery

• is suitable where contraindications exist to external cephalic version

• can be planned for in advance, which women may find more convenient

• does not necessarily mean a woman would need a caesarean section for any future pregnancy.

In this case the woman should be recommended external cephalic version as soon as possible, with options for an elective caesarean section or possible trial of breech delivery if this is unsuccessful.

Postnatal paediatric review should focus on the baby's hips, with a neonatal ultrasound arranged within 6 weeks to rule out congenital hip dislocation (10–15 times more common in breech presentation).

KEY POINTS
• Breech presentation is associated with increased perinatal morbidity and mortality. • If a woman has a frank breech at 37 weeks she should normally be offered external cephalic version, and if unsuccessful an elective caesarean section or possibly a vaginal breech delivery.

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