

20 The surgery of pregnancy

20.1 Surgical problems in pregnancy

Train the staff in your clinics to manage most of the minor complications of pregnancy. In early pregnancy they should refer to you incomplete miscarriages, especially if septic (20.2), as well as ectopic pregnancies (20.6,7,8). Rarely, you may have to treat an abdominal gestation (20.9), a delayed miscarriage (20.2), or gestational trophoblastic disease (23.10).

Late in pregnancy, after the 24th week, your main concerns will be antepartum haemorrhage, from placenta praevia (20.11) or placental abruption (20.12). Both of these need differentiation from incidental bleeding from lower in the birth canal. Another problem will be a dead foetus, whose management before 12wks differs from that later on (20.4).

It is important to be clear about definitions. The following WHO categories are generally accepted:

Extremely low birth weight: <1,000g

Extremely preterm birth: ≥ 20 , <28 completed weeks

Very low birth weight: <1,500g

Very preterm birth: ≥ 28 , <32 completed weeks

Low birth weight: <2,500g.

Oocytes (=eggs) are stored in the ovaries (300,000 present at puberty); some mature and are then sometimes released (ovulation: maximum 500 over a lifetime) and of those, only a few, if any, are fertilized, after which they stop being called oocytes and become a **zygote**, which becomes an **embryo** after further division and later a **foetus**.

Implantation is attachment and penetration of the endometrium by the embryo (then also called a **blastocyst**) that starts 5-7 days after fertilization.

Gestational sac: a fluid-filled structure associated with early pregnancy which may be inside or outside (in case of ectopic gestation) the uterus. The total size, unlike crown-rump (*i.e.* head to buttock) length (CRL), is a poor indication for **gestational age**, which is the time since ovulation (or perhaps better, fertilization).

The **ultrasound-based definition of foetus** is where the foetal heart movement is seen as positive and/or the CRL is >1cm (38.3).

The **embryonic period** is the first 8 *post-fertilization* weeks (=10wks' gestational age on ultrasound) during which organogenesis takes place; after that mainly growth and reorganization occurs.

The **perinatal mortality** (PNM) is foetal or neonatal death occurring during late pregnancy (≥ 20 wks), during labour or up to 7 completed days after birth.

The **perinatal mortality rate** (PNR) is counted as per 1,000 births (alive or dead).

An **empty sac** is an anembryonic pregnancy; *i.e.*, a sac without clear structures and no foetal heart movement.

Gestational trophoblastic disease (GTD, 23.10): complete or incomplete, *i.e.* partial, hydatidiform mole, or molar gestation.

Heterotopic gestation is an intra-uterine plus an ectopic (tube, ovary, abdominal, cervix) gestation.

Gestation of unknown location defines a +ve pregnancy test but with localization not (yet) possible with ultrasound

20.2 Evacuating an incomplete or delayed miscarriage

SOME TERMINOLOGY

The nomenclature still often used for early pregnancy has been revised but not completely agreed upon internationally. This development was needed because of the widespread use of ultrasound, very sensitive urine pregnancy tests, artificial reproduction technology and serum human chorionic gonadotropin (β -HCG) testing. It is good to use and teach the new terms for better communication and also because the term "abortion", used usually for spontaneous early pregnancy loss, is confusing or even insulting for the patient. In some countries police personnel are allowed to read doctors' records and the patient might be in trouble if you write "abortion". So we prefer to use "miscarriage". Induced abortion implies a termination of pregnancy, whether by surgical or medical means.

(a) **Abortion**, by the WHO definition, is the *death and expulsion of the foetus (or embryo) from the uterus either spontaneously or by induction up to but not including 20 completed weeks of gestation*. This means up to and including 19⁺⁶ (after that, it becomes the 21st week). If the gestational age is unknown, the embryo/foetus should be <400g in weight to call it an abortion, according to the WHO definition.

N.B. The specific number of weeks to define induced abortion may vary from one country to another, depending on local legislation. It is agreed, however, that after 23-24wks where a gestation is potentially viable, termination of pregnancy should not be known as an abortion.

A cardinal number indicates quantity; examples are 1,2,3, etc. An ordinal number depicts rank in a series: 1st, 2nd, 3rd, etc.

Ordinal numbers are one higher than the corresponding cardinal numbers. A child 13 months old illustrates the difference: having passed her birthday, she is 1 (cardinal) year old, but she is in the 2nd (ordinal) year of life.

Gestational age is best expressed in completed cardinal weeks and days instead of ordinal weeks or trimesters. Therefore 30⁺⁶ means 30 completed weeks plus 6 completed days. 24h later, the age is 31⁺⁰.

(b) **Delivery**, by the WHO definition, is the expulsion or extraction of ≥ 1 fetuses from the mother at ≥ 20 completed weeks. If the foetus is dead at ≥ 20 completed weeks, it is a **foetal/intra-uterine death** and will most likely become a stillbirth (unless the mother dies and stays undelivered).

(c) **Live birth** is the complete expulsion or extraction of a product of fertilization from its mother irrespective of gestational age as long as there is *any* sign of life after delivery.

(d) A full-term birth is delivery from ≥ 37 to ≤ 42 completed weeks, *i.e.* >259 to <294 completed days. **Post-dates** implies more than 40^{+0} wks, and a **post-term birth** is a live birth or stillbirth after 41^{+6} completed weeks. A **pre-term birth** is a live birth or stillbirth at ≥ 20 up till 37 completed weeks.

(e) Neonatal death occurs within 28 completed days after delivery (after ≥ 20 completed weeks or when ≥ 400 g at birth). *N.B. "Trimester" is a term which should largely be abandoned: it is rather unhelpful, vague and causes confusion.* Use completed days or weeks.

(f) Miscarriages (excluding those caused by an incompetent cervix) most often go through these 4 stages:

(1) **Threatened miscarriage** (there is bleeding and perhaps cramps, but the cervix is still closed),

(2) **Inevitable miscarriage** (the cervix is open but no products of conception have been expelled; most of the time there is no foetal heart movement),

(3) **Incomplete miscarriage** (part of the products have been expelled),

(4) **Complete miscarriage** (all the products have been expelled, bleeding has virtually stopped, the cervix is closed, and the uterus is now much too small in relation to the duration of the pregnancy).

(g) Gravida (G) refers to the number of times a woman has been pregnant, **para (P)** the number of births ≥ 20 wks' gestation, and **vivo (V)** the number of living children.

If the pregnancy more or less 'falls out' without going through the preceding stages and the foetus is recognizable and alive at first (light reflections on a wet chest change with its heartbeat), then there is probably an incompetent cervix; this is unlikely to happen before 16wks. A miscarriage caused by an incompetent cervix can also start with ruptured membranes. An incomplete miscarriage and an inevitable one (if there is no foetal heartbeat on ultrasound while the foetus is >10 mm) should be evacuated with the help of instruments, misoprostol or both.

N.B. In an inevitable miscarriage, increasingly after 12wks, suction curettage alone might not succeed in removing the foetus.

In the first 12wks the distinction between an inevitable and an incomplete miscarriage is unhelpful, because you can manage them both in the same way. After 16wks, the distinction is important, because an inevitable miscarriage is not ready for instrumental evacuation (access to misoprostol treatment makes evacuation without instruments quite feasible), whereas an incomplete one must be evacuated. Before 14-16wks it is difficult to tell, by observation of the products, if a miscarriage is complete or not, because the foetus, the placenta and membranes are not sufficiently well formed for you to identify them completely. Even with ultrasound, it is often not easy to make the distinction between retained products or blood clots in the uterine cavity.

(h) Recurrent miscarriage is ≥ 2 consecutive pregnancy losses.

(i) Delayed miscarriage may be late (12 to <20 wks) or early (<12 wks) but excluding preclinical/biochemical pregnancy. This term is used when there are low positive urinary/serum β -HCG values and it is not possible to localize the gestation with ultrasound (gestation of unknown location, GUL).

(j) Early miscarriage or gestational loss represents a loss <12 wks: this is an ultrasound-based diagnosis with a persisting intra-uterine empty sac, loss of foetal heart movement and/or failure of crown-rump length growth over 1wk (38.3).

(k) Septic miscarriage is an incomplete miscarriage with signs of intra-uterine and perhaps extra-uterine infection.

(l) Post-abortal sepsis is pelvic infection after a completed miscarriage or termination of pregnancy.

(m) Retained miscarriage is an intra-uterine death before 20wks, after which the pregnancy is not expelled.

(n) Carneous mole is a continuation of a retained miscarriage, in which the dead conceptus is surrounded by shells of organized blood clot (a blood mole) and has become firm.

(o) Threatened miscarriage. Recommend refraining from sport, jolting movements (*viz.* horse riding, off-road transport, sexual intercourse) and heavy-duty work. Bed rest at home has no proven benefit. Arrange admission if:

(1) There is much bleeding (regardless of the gestational age).

(2) Gestation is >14 wks.

(3) There is a bad obstetric history or she lives far away and cannot get help if bleeding becomes much worse, especially during the night.

(p) Uncomplicated uninfected inevitable or incomplete miscarriages

(1) Before 14wks:

Monitor the pulse, blood pressure, and temperature, peripheral circulation, and the amount of bleeding. Measure the Hb, and group blood if indicated. Perform an ultrasound scan if possible (38.3). Induce complete evacuation with misoprostol (400 μ g buccal or sublingual, or 600 μ g oral or rectal) or oxytocin (10IU IV) or ergometrine (0.25-0.5mg IM).

If bleeding was copious, restrict oral intake and prepare to evacuate the uterus as soon as possible.

Retained miscarriages (with intact membranes) have much less chance of becoming infected than induced miscarriages, so there is no hurry: use 800 μ g of misoprostol PV, followed if necessary by 400 μ g 3hrly x3 till complete expulsion occurs.

If expulsion does not happen, repeat the procedure after 3 days. Such treatment may be carried out at home for gestations <10 wks if access to hospital is easy in case of brisk bleeding.

EVACUATING AN INCOMPLETE ABORTION

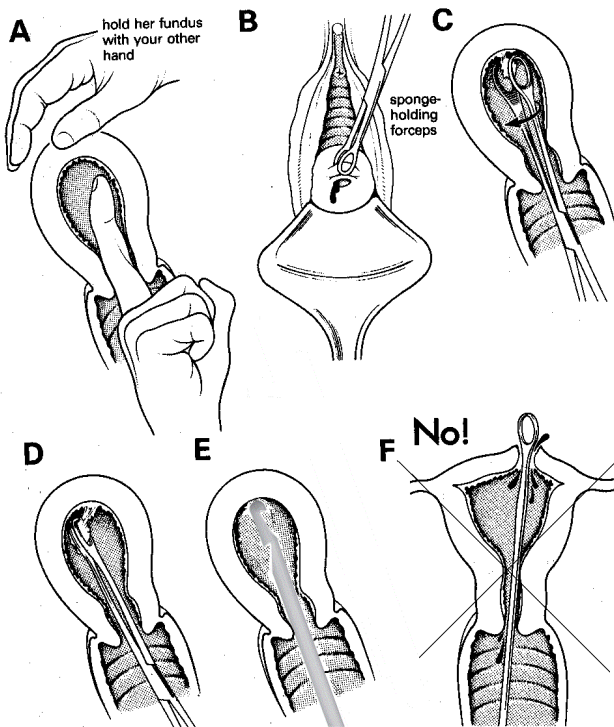


Fig. 20-1 EVACUATING RETAINED PRODUCTS OF CONCEPTION. A, explore the uterus with your finger while your other hand is holding the fundus. You may find it easier to use 2 fingers or your middle finger. B, grasp the cervix with sponge forceps and use them to pull it down. C,D, while holding the uterus with your other hand, introduce ring forceps, grasp and remove any products of conception, reinsert the forceps and do the same thing again. E, gently aspirate the uterus with a plastic flexible Karman suction catheter. F, this is the disaster you are trying to avoid!

Many miscarriages don't need evacuating, but those that do, need evacuating quickly, so don't let incomplete miscarriages wait unnecessarily. Evacuating a pregnant uterus differs from curetting a non-pregnant one (23.4) in 2 important ways:

- (1) After a partial miscarriage the cervix is open, so there is rarely any need to dilate it.
- (2) The wall of a uterus, especially if infected, is so soft that you can perforate it just as easily as the small atrophic uterus, giving rise to postmenopausal bleeding.

BLEEDING BEFORE THE 20th WEEK

Miscarriage (induced elsewhere, or spontaneous) usually presents with vaginal bleeding.

DIFFERENTIAL DIAGNOSIS includes:

- (1) ectopic gestation (20.6)
- (2) gestational trophoblastic disease (23.10).

N.B. Bleeding in late pregnancy may be due to placenta praevia (20.11) or abruption (20.12).

N.B. Remember gynaecological causes of a bloody vaginal discharge: *trichomoniasis*, *candidiasis*, venereal warts, cervical polyps, cervical ectopia (defined as uterine columnar mucosa extending further than average on the pale external cervix), and cervical carcinoma.

N.B. There may be no pregnancy, but dysfunctional uterine bleeding (24.3), or bleeding from polyps or fibroids (24.7). Much bleeding remains unexplained.

SITI (27 years) was admitted with what looked like a threatened 16-week miscarriage. It seemed to settle, and she was discharged, but she bled in the bus on the way home and was readmitted. Foetal parts were extracted through a dilated cervix, and traumatized pieces of bowel were seen through it. The diagnosis had to be adjusted to complications caused previously by an (instrumentally) induced back-street termination. A laparotomy showed a laceration in the descending colon, old clots and pus in the peritoneal cavity, and a rupture of the uterus. The lacerations in the descending colon and uterus were sutured and the abdomen closed. Some days later she passed faeces through the cervix. She was re-explored, and a proximal defunctioning colostomy was fashioned, after which she eventually recovered. She was of course counselled at that stage on the use of contraception. If this termination was performed because she thought the family complete, then a tubal occlusion should have been done together with the uterine repair. There is quite a risk, if she ever gets pregnant, that it will be an ectopic or that she will rupture the uterus.

LESSONS This true story is an extreme case. It shows the magnitude of the disasters that can follow the mismanagement of what might seem to be quite a minor condition. She was fortunate to escape with her life. The many lessons include: (1) Somebody had tried to terminate a 16wk gestation, which is dangerously late for a non-expert outside a well-equipped theatre. The availability of misoprostol in urban areas (including the black market) will often now make these late terminations far less dangerous because fewer skills are needed. (2) If an induced miscarriage is incomplete, evacuation is mandatory. She should not have been discharged before the uterus had been emptied. (3) Whenever the colon has been damaged and faecal soiling is present, a proximal defunctioning colostomy is indicated. Had this been done at the first laparotomy, she would not have required another operation. (4) If an ultrasound scan had been performed, the diagnosis would not have been missed or at least it would have been clear that there was no foetal heart movement in the presence of retained products.

EVACUATION. Mandatory indications are:

- (1) Considerable bleeding (evacuation is urgent).
- (2) Bleeding more than during normal menstruation, which continues >24h.
- (3) Where retained products of conception are obviously still present on vaginal examination or ultrasound (38.3).
- (4) Any indication of infection or physical interference to the pregnancy.

(2) After 14wks:

If the cervix is open at least one finger, there is no foetal heart activity on ultrasound or sonic aid, but the products of conception, especially the foetus, have not been expelled, assess and monitor as above. *Don't evacuate the uterus with instruments until the foetus has been expelled:* you can expedite this with misoprostol.

If evacuation is incomplete, complete it. If however the foetus and placenta are expelled together, and the membranes are complete, there will be nothing left to evacuate.

If the foetus is still in the uterus and there is a serious infection, *don't waste time!* Use misoprostol and IV antibiotics and also organize an evacuation immediately even though you may need instruments to remove the foetus because it is too large for evacuation by suction curettage alone. The misoprostol might not evacuate the retained products, but will dilate the cervix and make evacuation easier. *Don't wait >2h after administering antibiotics before doing the evacuation!*

(q) Infected miscarriage

If there is fever, a foul vaginal discharge, and perhaps signs of peritonitis, the miscarriage is septic (23.2).

EVACUATING AN INCOMPLETE MISCARRIAGE (GRADE 2.1)

Misoprostol may make evacuation unnecessary, so try it first (unless there is sepsis, 23.2). The products of conception may evacuate subsequently, and bleeding may stop. Anyway, it will dilate the cervix, maybe allowing you to perform a digital evacuation.

EQUIPMENT. A catheter. 2 ovum forceps or sponge-holding forceps without ratchets (one for swabbing the vagina and the other for removing the contents of the uterus), uterine curettes blunt and sharp, preferably a few sizes of each. A vaginal speculum (Sims', Auvard's, or Collin's). A set of Hegar's dilators (only occasionally necessary). *Don't use a sound*, because this can readily perforate the uterus. If obtainable, Karman suction curettes are best; these are boilable but will melt in an autoclave. This means that when cleaned, boiled and kept in betadine they are, certainly compared with the cervix and vagina, for all practical purposes sterile.

Have intra-uterine contraceptive devices (IUDs) readily available.

Occasionally, if the pregnancy was <10wks and was unintended and not infected, an evacuation can be combined with inserting an IUD. That might prevent a recurrence, possibly with more complications. If there was an obvious unintended pregnancy in a multipara who is not very young, you might counsel for an evacuation plus tubal ligation. Combine an IUD with antibiotics: in fact it is a good idea to administer antibiotics with every evacuation, especially because you can never be entirely certain the miscarriage was not induced. Remember the option of inserting an IUD when you perform an evacuation, *unless there was gross infection.*

CAUTION! *Don't operate until* an IV infusion of Ringer's lactate or saline is running if haemorrhage is severe, if there is hypovolaemia or anaemia. Resuscitation may be life-saving: proceed with this at the same time as the evacuation.

ANAESTHESIA

Ketamine is useful but GA is not absolutely necessary. Remember if you use 100mg pethidine with 10mg diazepam IV in the same syringe, which works well unless the patient is anaemic, septic or very small, this may produce respiratory depression.

An alternative is LA: use 20ml 1% lidocaine preferably in combination with 1:80,000-1:100,000 adrenaline para- or intra-cervically. Adrenaline can substantially decrease the blood loss *in pregnancies of >14wks*, during and after the procedure. It is therefore often useful even when GA is used. *Don't use halothane:* this may relax the uterus and cause brisk bleeding.

N.B. 20ml of 2% lidocaine can be absorbed so fast in the well-perfused uterine area as to be dangerous (epileptic fit, bradycardia, myocardial depression): so, dilute it.

Use a long *thin* needle (the cervix tends to bleed somewhat from the needle hole) and make sure the needle is well and truly pushed on the syringe because force is needed to inject into the cervix and *if the needle comes off you will get blood and LA sprayed in your face.*

Remember to dispose of the needle directly in a proper way: if you put it on your instrument tray, you might easily prick yourself or the nurse when handling the instruments later (5.3).

POSITION

Use the lithotomy position with the buttocks over the end of the table, so that you can insert your instruments comfortably in any direction. Make sure the bladder is empty before you start: ask the patient to pass urine just before the procedure.

First, perform a bimanual examination using a disposable glove with two fingers in the vagina and your other hand on the abdomen. Check:

- (1) The state of the cervix and its degree of dilatation.
- (2) The size of the uterus and the products of conception palpable inside it.
- (3) Any adnexal masses (*don't miss an ectopic gestation but don't use an examination under GA to diagnose one!* 20.6). Then put on sterile gloves.

METHOD

Clean the suprapubic area, vulva, and perineum with chlorhexidine, and put a drape under the buttocks and on the abdomen. Take careful aseptic precautions. Use a swab on a sponge-holder to clean the vagina.

If you can get your finger into the cervix, use it to empty the uterus (finger curettage). A finger is much safer than a curette, because you can feel where you are, so *avoid using a curette if you can.* Put half your hand into the vagina and use your right index or middle finger. At the same time push down the fundus of the uterus with your left hand on the abdomen, so that your finger can reach right into it. Ideally this requires good muscular relaxation. If you are using LA, be gentle, talk to the patient kindly, and persuade her to relax. Loosen all the retained tissue with your finger. If you can empty the uterus this way, there is no need to curette it. Moreover, if there has been instrumental interference to the pregnancy resulting in a uterine perforation, you can usually diagnose this easily without causing further damage.

N.B. Fishing around with any instrument in a large flabby uterus for a few fragments of tissue is likely to do more harm than good, especially if you use a non-Karman curette. Furthermore, if you start with instruments, you might not only pull out loops of bowel, but also be blamed for causing the perforation which was present already!

If you cannot get your finger into the cervix or reach the fundus, grasp the cervix with a ratcheted sponge-holder or vulsellum (20-1B). With your left hand, pull the cervix well down with the instrument attached to the cervix to straighten the uterine cavity. Keep pulling during the whole procedure. You hardly ever need a speculum at this stage anymore because the ligaments are lax and/or the vagina gaping. Without a speculum, it is easier to pull the uterus straight and hence avoid a perforation. Introduce another pair of non-ratcheted sponge-holders into the uterus with your right hand. Slide them in gently until you can lightly feel the top of the fundus. Open them, turn them into through 90°, close them, and remove them (20-1C).

Do this several times, to remove pieces of placenta hanging from the uterine wall, until the uterus is empty. If you can, check with ultrasound and/or use the suction curette with the largest diameter (1cm normally) to make sure the uterus is empty.

If you cannot insert your finger or a metal curette, as occasionally happens in the first 14wks when the cervix is not sufficiently dilated but the uterus seems enlarged, dilate it. First insert a small dilator, and then progressively larger ones. *Don't dilate the cervix in this situation further than necessary, especially if you intend to insert an IUD.* A rule of thumb is that the diameter of the Karman cannula should till <13wks be 2mm less than the number of wks if the foetus is still in the uterus. The means at 12wks a 10mm cannula is fine; at 6wks 4mm will do. Of course, at 18wks, 10mm will do if you only mean to extract a piece of placenta.

CAUTION!

(1) *Don't put a sound into a pregnant uterus.* If you want to know how long the uterus is, insert a large Hegar dilator, suction curette or sponge-holder and mark how far it goes in with your finger.

(2) Be gentle, or you will perforate the fundus. Your exploring finger will have shown you how deep it is. With your left hand on the abdomen, explore the uterus again with your finger to make sure it is empty.

If you still cannot empty the uterus fully, use a suction curette to remove the remaining pieces of placenta. While it is still well contracted (sometimes with the help of 400µg misoprostol rectally or oxytocin 10IU), use the largest suction curette you have or very gently scrape the inside of the uterus (20-1E). Let it almost rest in your hand as you use it. Leaving the retained products of conception behind is serious, but perforating it (20-1F) is more so.

If you do perforate the uterus with a suction curette, first disconnect the suction tubing and then withdraw the curette, otherwise you might pull bowel or adnexa out!

You will know that the uterus is empty by:

- (1) A characteristic grating feeling.
- (2) Your failure to remove any more tissue.
- (3) Resistance to movement with a suction curette: the retained products act as a lubricant, so when they are no longer there, you will feel more resistance.
- (4) An ultrasound performed during or directly after the evacuation. *N.B.* 10mins later, retained products are indistinguishable from blood clot.

Finally, with a large uterus that is still bleeding, perform a bimanual compression (22-10) to encourage contraction and expel clots from the uterus. Put two fingers into the anterior vaginal fornix, and your other hand onto the abdominal wall. Compress the uterus between them.

Return the patient to the ward with a vulval pad. Inspect this from time to time during the first 3h after the evacuation.

If bleeding recurs, inject another dose of oxytocin 5IU IV or IM, or use 400µg of misoprostol rectally.

POST-OPERATIVELY, monitor for further bleeding and check the vital signs. If all is well, discharge the patient and advise her on contraception, which should always be part of the ward routine. Advice is often not good enough. Providing the means at the same time is much better. If you have not inserted an IUD or an implant at the end of the evacuation, offer Depo-Provera at this stage or other contraceptive medication. Discuss the option of an early tubal ligation. Ensure that good, preferably long-acting, contraception is available to those whose pregnancy was (obviously) unintended.

If there has been a suspicion of vaginal interference to the pregnancy, or venereal infection, use an appropriate broad-spectrum antibiotic (*e.g.* doxycycline and metronidazole). If you have the resources, it is a good idea to use antibiotic prophylaxis for everyone. However, if there is overt sepsis, IV antibiotics are required (23.2).

N.B. Syphilis can cause miscarriages: if you have the resources, check for this on the spot and have the results ready within 30mins (just like with an ANC visit), otherwise only 50% will return for treatment. Treat with long-acting penicillin and make sure the partner is also treated.

N.B. It is obvious that some patients will have a complete family at this stage *e.g.* para 5 of age 40yrs, or para 3 HIV+ve. Some patients will be very grateful if you combine a uterine evacuation with a tubal ligation. Regret is usually only seen in young women <30yrs old. If the logistics of your hospital make it possible, you should give women a choice.

(r) Difficulties evacuating the uterus (23.4)

If there is profound hypotension, the cause may be severe blood loss because the placenta has become stuck or is half hanging out of the cervix (common). The external os may be tight, while the internal os and cervical canal dilate to accommodate the pregnancy. This is quite different from a cervical gestation (20.8).

Don't wait to put up an IV line. Remove the placenta with a gloved finger *on the ward* without anaesthesia. If this fails, pass a Sims, Collin's or Cusco's speculum. If you see products of conception in the cervix, remove them with sponge forceps. Blood loss usually stops miraculously. Shock may be caused by a vasovagal attack: you may then be fooled into thinking a blood transfusion is necessary.

If there is heavy bleeding, start resuscitation and administer misoprostol or oxytocin and at the same time evacuate the uterus with a finger *on the ward*. Even if evacuation is not complete, it will help stop the bleeding.

If bleeding does not stop after evacuation and you have excluded a uterine perforation, it is probably due to poor contraction of the uterus, or there may still be products of conception in the uterus. Often there is no obvious reason. Make sure the uterus is empty. Administer 800µg misoprostol rectally or oxytocin IV (40 units/L), massage the uterus to stop it bleeding, and repeat bimanual compression. Be patient at this stage: 5-10mins of bimanual compression may be necessary, but it will usually succeed.

If these measures fail to control bleeding, suction curette the uterus if you have not already done so. Sometimes packing the uterus helps; *don't pack the vagina* as that only conceals the problem; it will not usually remove the cause of the bleeding. A torn cervix is occasionally the cause and suturing might be a technical challenge. In that case, packing the vagina near the cervix might solve the problem.

If even this fails to control bleeding (very rare), tie both uterine arteries or perform a hysterectomy. Very rarely a cervical ectopic gestation (20.8) is the problem.

If serious anaemia results, *don't jump to transfusion unless the Hb is <40-50g/L*. Always supply iron to take home. The younger the patient, the easier it is for her to cope with a low Hb. *It is better to spend a few days extra in hospital because of dizziness than to get a transfusion contaminated with HIV or hepatitis B or C*. In young, anaemic, otherwise healthy women on oral iron, the Hb can increase 20·50g/L/wk. Older women and those with sepsis, malaria, or heart disease cannot, however, so easily deal with very low Hb levels.

N.B. Sometimes women abort because of malaria and therefore combine blood loss with haemolysis. This can be an extremely dangerous situation if missed. The high fever may then be diagnosed as sepsis as a result of the miscarriage (induced or otherwise) instead of the cause of the miscarriage. Severe malaria can make the Hb drop in a day by 50g/L. The jaundice seen with severe malaria is also seen sometimes in sepsis.

If you find injuries to the vagina, cervix or uterus, or physical interference with the pregnancy is suspected, and there is shock, severe sepsis or more severe anaemia than simple vaginal blood loss could explain, or there is free gas in the abdominal cavity, the uterus is probably perforated. Perform a laparotomy immediately, and inspect the uterus. *Don't forget to counsel and get consent for a tubal ligation.*

If there is no improvement after evacuation, reconsider the diagnosis. She may have an ectopic gestation, or be severely anaemic, or have a collection of pus. If you find an abscess in the pouch of Douglas, drain it (10.3).

If you think you have perforated the uterus,

(i) after emptying the uterus, look if there is fat, omentum or bowel on the forceps or in the vagina. If not, return the patient to the ward. Keep her nil orally on IV fluids with gentamicin and metronidazole, and observe the pulse, temperature, blood pressure, urine output and suppleness of the abdomen carefully. The perforation will probably heal easily, especially if it occurs before 14wks. If there are, unusually, increasing signs of infection or bleeding, perform a laparotomy to close the wound in the uterus.

(ii) before emptying the uterus, try a digital evacuation and accept that, perhaps, evacuation is incomplete. Observe carefully as before.

If there is evidence of omental or bowel injury, start resuscitation and perform an immediate laparotomy, and close the uterine perforation. Repair (11-5) or resect (11-7) the bowel and omentum.

If there is severe bleeding or an extensive tear, tie the uterine arteries at several locations in the area just after they enter the uterus (22-14). If this fails, a B-Lynch suture (22-13, 22.11) or hysterectomy (22.17) may be necessary. If you have closed a uterine tear, warn that the uterus is in danger of rupturing in later pregnancies and an elective Caesarean section (21.9) would then be mandatory.

If you feel a fibroid in the uterus (uncommon), it may have been the cause of the miscarriage (unusual). Leave it for 3 months before you treat it. If it is pedunculated and submucous with a narrow neck, *don't be tempted to twist it off vaginally at the time of the miscarriage*. This can cause severe bleeding. Leave it for 1 month while treating with iron supplements. If the cervix is closed, first use misoprostol 400µg vaginally 2h prior to excision (23.7).

If there are very few curettings, the miscarriage is probably complete. There is however a possibility that your diagnosis may be wrong, and that she has a CHRONIC ECTOPIC GESTATION (20.7).

Material removed or spontaneously aborted from the uterus with an ectopic gestation has no connective tissue-like structure. It is endometrium/decidua. If you put it in an ordinary household sieve, you can easily make it disappear if you rub it with a brush under the tap. In contrast, even the products of conception at 5wks have so much structure that this is not possible.

If you feel that she has a uterine septum, clean out each side of the uterine cavity.

BE CAREFUL WITH THE CURETTE!

20.3 Termination of pregnancy

Legislation related to termination of pregnancy differs enormously throughout the world. In some countries, doctors don't dare to terminate a pregnancy even to save a woman's life. In others, terminations are allowed on request up to 22wks.

Historically these operations were of course quite dangerous before modern techniques, prostaglandins and antibiotics were available. The extensive use of misoprostol (replacing sticks, roots, catheters, soaps, poisons and uterine massage) has now made even late terminations far less dangerous.

Up to 7-9wks' gestation, a combination of 200mg mifepristone (blocks progesterone receptors) followed 12-72h later by 800µg vaginal misoprostol tablets (prostaglandin E1 compound) is very effective. In most countries, mifepristone, the 'abortion pill', is not available. However, misoprostol (perhaps in repeated doses) without mifepristone is also quite successful.

The disadvantage of this so-called medical termination is that it is far less easy to combine with the insertion of an IUD than an early suction evacuation. In most countries induced terminations are performed with the help of suction curettes only up to around 13wks. GA is not essential but ketamine can be useful.

You should hesitate to remove pregnancies instrumentally which have proceeded further as you will need to use a combination of suction and forceps extraction. This needs experience, proper training and preferably guidance by ultrasound.

Induced terminations past 12 weeks' gestation are prohibited under most conditions in many countries. *You must acquaint yourself with the laws in force in your country before intervening.*

20.4 Foetal death: retained miscarriage and intra-uterine death

An embryo or foetus can die at any time during pregnancy. What you can do about it depends on whether death occurs before or after 20wks. Before this time this is termed a retained miscarriage, afterwards an intra-uterine death.

(a) Before 20wks, a dead foetus is usually expelled without the mother knowing that the pregnancy has ended. Occasionally, however, uterine emptying is delayed for several weeks with failure of normal growth in size of the uterus and the mother feeling symptoms of early pregnancy diminishing. Alternatively, there may be a threatened miscarriage which stops bleeding spontaneously, and is followed by a brownish discharge and no further true blood loss.

Although the loss of a pregnancy may be tragic, a missed miscarriage has few physical risks, there is little risk of a clotting defect this early in pregnancy, and provided nobody interferes with instruments, there is very little risk of infection.

(b) After c.20wks:

(1) The mother is aware of the intra-uterine death of the foetus because foetal movements stop, or don't occur when they should (18-22wks in a primipara, 16-20wks in a multipara).

(2) The foetal heart movements are not visible (6.5-8wks) on ultrasound or not heard (10-16wks) with a Doppler. Remember that using a foetal stethoscope is unreliable in obesity or polyhydramnios and enables you to hear the heart only at 20-28wks.

(3) The height of the fundus, as found by palpation, fails to match that expected from the dates. Instead, it either remains stationary or falls. For this sign to be useful, you must measure the height of the fundus above the symphysis pubis accurately with a tape measure. So, when you suspect foetal death, impress this on the midwives.

(4) Radiological signs of foetal death (after 28wks) show overlapping of the bones of the foetal skull (Spalding's sign), hyperflexion of the spine, and gas in the great vessels, though it is rare that there is a real indication for radiographs in this setting.

N.B. β -HCG tests for pregnancy take 4 or even 8wks to become -ve, so they are of little value.

There is a 50-90% chance that spontaneous delivery will occur within 4wks after foetal death, whatever the duration of the pregnancy. But, as long as a dead foetus remains inside the uterus, there is the remote but serious risk of a serious coagulation defect and catastrophic bleeding. This risk is low initially, but increases with time, particularly 4-6wks after death.

Rupturing the membranes to induce labour is dangerous, because the dead foetal tissues are easily infected by anaerobes and antibiotics will *not* reach the foetal tissues if there is no foetal circulation.

Use oxytocin and/or prostaglandins for a missed miscarriage or intra-uterine death. Throughout pregnancy there is sensitivity of the uterus to prostaglandins, although the optimal dose varies according to gestation, but its sensitivity to oxytocin increases with each gestational week and oxytocin in early pregnancy is ineffective. Misoprostol is easiest to administer (22.2).

(c) Missed miscarriage

If a mother's uterus is small for her gestational age, perhaps with a brownish vaginal discharge, suspect foetal death. Monitor the growth of the uterus carefully: it will not grow, and may even become smaller. Pregnancy tests become -ve after some weeks. Methods of detecting the foetal heartbeat vary in their sensitivity: ultrasound scanning (38.3) detects it certainly at 8wks, Doppler ultrasound at 10-16wks, and an ordinary stethoscope at 20-28wks.

DIFFERENTIAL DIAGNOSIS includes:

- (1) A normal pregnancy of shorter duration (wrong dates),
- (2) A slow-leaking ectopic gestation,
- (3) A false (imagined) pregnancy (pseudocyesis),
- (4) Fibroids.

MANAGEMENT

If spontaneous miscarriage does not follow after 4-6wks, proceed as follows:

If the uterus is smaller than 10wks, put 400 μ g misoprostol in the posterior vaginal fornix, or buccal cavity, and repeat this 3hrly for 12h. Spontaneous evacuation will usually occur; if not, dilate the cervix to Hegar (*maximum 10*), and then use a #6-10 Karman curette, depending on the largest Hegar used, with maximum vacuum. Continue until the uterus is empty, and you can feel the uterus tight round the curette.

If the uterus is larger than 12-13wks, *don't attempt an ordinary dilation and curettage*. Instead, use misoprostol.

N.B. *You can dilate the uterus to Hegar 10, and use a #10 Karman curette, which works up to 12wks but not beyond because the foetal parts become too large!* Attempting to perform a standard dilation and curettage (23.4) on a uterus larger than this can cause disastrous bleeding, and perhaps infection.

(d) Intra-uterine death (i.e. after 19⁺6wks)

The mother notices that foetal movements stop, or don't occur when they should (at around 18wks). Or, a midwife fails to hear the foetal heart after 24wks.

DIFFERENTIAL DIAGNOSIS

- (1) A normal gestation of shorter duration (wrong dates).
- (2) Gestational trophoblastic disease.
- (3) Polyhydramnios (a uterus large for dates due to excess amniotic fluid).
- (4) Multiple gestation with small foetuses.
- (5) An abdominal gestation.
- (6) Ascites, an ovarian tumour, fibroids, or a false pregnancy.

MANAGEMENT

Confirm the absence of the foetal heartbeat with ultrasound or Doppler (38.3). If you are not sure, repeat the ultrasound after 1wk.

CAUTION! A pregnancy test is no use at this stage. It may be +ve when the foetus is dead.

Do nothing for 2wks after foetal movements have stopped. Explain carefully why you are doing nothing. The patient may find this difficult to understand and her husband may try to persuade you to act prematurely. Explain that, if you attempt induction by the method below, it may fail and she may need a few days' rest before you try again.

If she is still undelivered 2wks after foetal movements have stopped, consider induction. Before you start this, check the clotting time and platelet count, if the foetus might have died ≥ 4 wks before. Misoprostol is successful in $>90\%$ of cases. Start with very low doses for grand multipara or where there is a uterine scar. If it fails, introduce the tablet(s) inside the cervix. Fever, shivering, and gastrointestinal symptoms while having prostaglandins are probably side-effects rather than due to infection.

If this also fails, provided gestation is from 13wks (before which it is unnecessary), until 28wks, try an infusion of 5U oxytocin in 500ml of Ringer's lactate or saline, at 25drops/min (22.2). You may find that labour does not start until the following day. If this fails, repeat the infusion the next day with 25 units in 500ml. If necessary, wait and repeat it after 7 days. If this does not work, wait 7 days more and try a 3rd time. You may have to use up to 100 units in 500ml (the absolute maximum). Usually, much less is necessary.

CAUTION! EXTRA SPECIAL CARE is necessary when you use oxytocin!

(1) You may have to use large doses. Oxytocin has an antidiuretic effect, and fluid overload is a danger. So:

(a) increase the concentration of the infusion, rather than the volume you use,

(b) use Ringer's lactate or saline, rather than 5% dextrose,

(c) *infuse a maximum of 3L IV fluid in 24h,*

(d) keep a fluid balance chart; if there is a positive fluid balance of $>2L$, stop the infusion.

(2) Oxytocin (and misoprostol) can rarely rupture the uterus as early as 18wks, so *don't use more oxytocin than you need.*

If drowsiness or convulsions ensue whilst on an oxytocin infusion, suspect water intoxication. Stop the infusion and let the kidneys excrete the water. Infuse 100ml 5% saline slowly IV.

If an escalating oxytocin infusion fails, and the products of conception have not been expelled within 2-4wks of presentation, check that you have not missed an abdominal gestation. Having excluded this, try the Foley catheter option: using a Cusco's or Collin's speculum and sponge forceps, pass a sterile Ch14-16 Foley catheter with a 30ml balloon gently through the cervix into the extra-amniotic space. A Foley catheter of this size will always enter a pregnant cervix. Now inflate the catheter balloon and leave it *in situ* 24h.

If the method you have used has not succeeded in 2 days of trying, try another method, or wait for 2-3 days and try again.

CAUTION! *Don't rupture the membranes.* It may hasten delivery, but it is not worth the risk.

(e) Foetal death at term or during labour (21.5,8)

A dead foetus is usually easy to deliver when death is the result of gestational hypertension or abruption, because the foetus is usually small and is often macerated. But if death occurs because labour was obstructed, delivery is more difficult. Caesarean section might seem to be the obvious answer. Unfortunately, if the head is impacted deep in the pelvis, removing it from the uterus at Caesarean section is difficult. There is also the serious immediate risk of septic shock and peritonitis, and the later one of a uterine scar. Provided the head is well down in the pelvis, an operative vaginal delivery, if necessary a destructive one (21.8), will be safer.

N.B. Make sure you exclude a dead extra-uterine gestation.

If the foetal head is high and hydrocephalic, drain its cerebrospinal fluid. You can do this *per vaginam* or, if the membranes are still intact, with a large IV cannula through the abdominal wall straight into the uterus (making sure the bladder is empty).

Otherwise, Caesarean section is the only option, but even then a hydrocephalus is often so large that you need to drain the head before you can extract it via a routine uterine incision, or you have to make your incision higher, larger or maybe even vertical and any of these scars is in real danger of rupturing in a following pregnancy.

MPHO (16yrs), gravida I, was admitted in labour in a district hospital with stalled progress. The doctor diagnosed CPD with an enormous caput. At Caesarean section, the routine incision was, by a large margin, not large enough to deliver the head now found to be hydrocephalic. The doctor perforated the skull and 2L fluid escaped. The head could now be delivered. The baby also had a large spina bifida and club feet, and was wrapped in towels and put on a table. During abdominal closure, the baby, who everybody thought had died, started crying. The wound in the skull healed afterwards but it was clear the legs were permanently paralyzed. The baby died 3 months later probably from repeated urinary tract infections. The mother was severely stressed and depressed during this time. Any further delivery should be under close medical supervision.

LESSON Hydrocephalus drainage only needs a small needle. Mothers of malformed babies need counselling before delivery if at all possible.

(f) Difficulties with a dead foetus <30wks

If you are not sure about foetal death, perform an ultrasound (38.3); alternatively, wait, and review in 2wks. By this time, it should be clear if the foetus is dead or not.

If delivery is complicated by severe bleeding, disseminated intravascular coagulation (DIC) is a possibility (3.5). Maintain the blood volume, and try to administer fresh blood, as well as packed red cells and fresh frozen plasma. If bleeding is not controlled when the uterus is empty, use an oxytocin infusion with 400µg misoprostol PR. Try compressing the uterus, pack it for 24h, and then remove the pack. This is a useful temporary measure for any bleeding uterus, and may save the need to perform a laparotomy.

If this fails to control bleeding, apply a B-Lynch suture (22-13); failing this, tie the uterine arteries (22-14). If this also fails, put a tourniquet round the cervix (22.11), which will give you time to arrange a hysterectomy (21.17) if necessary.

If you know or suspect that an IUD has been *in situ* >4wks, check the platelets. If they are very low, that is an indication for administering heparin (paradoxically). There is a risk of bleeding because of DIC. Use the dose of whatever heparin you have available normally used for prophylaxis. The platelet count will rise rapidly; start induction the next day.

20.5 Recurrent mid-term miscarriages

It is not easy to help women with a history of repeated early miscarriages. These are often the result of some foetal abnormality for which nothing can be done. The best advice is to keep trying. Most women will eventually achieve a successful pregnancy.

Although recurrent miscarriage (RM) affects only 1-3% of couples, it has a major influence on the wellbeing and psychosocial status of patients. Anatomical malformations, infectious diseases, endocrine disorders, autoimmune defects as well as acquired and inherited thrombophilia are established risk factors in RM. Treatment strategies like aspirin and low molecular weight heparin are standard, although only a few placebo-controlled trials have proven their benefit in respect to the live birth rate.

Mid-term miscarriages are different. They are not usually caused by recognizable foetal abnormalities. Some are due to maternal illness (HIV disease, syphilis, hypertension, uterine fibroid vaginitis, cervicitis, diabetes, etc.), or to a congenital malformation of the uterine cavity. A low level of progestagens may play a role. As in early pregnancy, often no cause can be found. The prognosis of a mother with repeated mid-term miscarriages depends on the cause, and is excellent if syphilis can be treated, or cervical incompetence corrected surgically. Hypertension and diabetes are more difficult to treat, and the outcome of the pregnancy is less certain. Mothers in whom no cause can be found have a reasonable prognosis: about 70% of their pregnancies go to term.

Here we are concerned with the management of patients with 'suspected cervical incompetence'. This means that the cervix opens spontaneously between 14-30wks, without the uterus contracting. Sometimes this is owing to a previous forceful dilatation of the cervix, or to a previous traumatic delivery. Usually, there is no obvious cause.

The diagnosis is difficult. It is usually made by the history alone. A typical patient gives a history of ≥ 2 spontaneous mid-term miscarriages, without much uterine contraction (until the membranes have ruptured), or bleeding. The first symptom is a watery vaginal discharge, often followed by a sudden loss of amniotic fluid. Soon afterwards the foetus is delivered, often still alive. The diagnosis is only certain in the present pregnancy if the uterus is found to be effacing and dilating, without any uterine contractions. When this is happening, it is often too late to intervene surgically.

If you have a vaginal ultrasound probe, it is easy to measure the length of the cervix. If the cervix is ≤ 1.5 cm before 32wks, you have an indication for a cervical suture if there is a history of repeated consecutive mid-term miscarriages.

N.B. In multiple pregnancies, however, 2-4cm dilation is quite frequent without an imminent delivery although, of course, multiple pregnancies are associated with pre-term deliveries.

True cervical incompetence is probably quite rare. *Don't make this diagnosis too often* or you will operate upon many patients unnecessarily. So only operate on those patients with a highly suggestive history.

N.B. Cervical incompetence does not cause miscarriage before 14wks.

A course of doxycycline (or erythromycin) and metronidazole before the next pregnancy or during this pregnancy may help.

McDONALD'S CERVICAL CERCLAGE (GRADE 2.2)

The simplest method is McDonald's, which is a variation of the original Shirodkar suture. If you do it for the right indications, it has a good chance of succeeding.

Timing is critical. If you do it too early (<14wks), an early miscarriage due to a foetal abnormality may arise, and the suture is wasted. If you do it too late (>24wks), a miscarriage may have already happened.

Don't insert a suture between pregnancies. This will cause more trouble than it is worth. Remember that the benefits of the procedure are related to good selection, especially by examination of cervical length.

SIFLOSA (20 years) had a McDonald suture inserted at 14wks, following 3 mid-term miscarriages. Her pregnancy continued uneventfully until term, when she was admitted for delivery. Unfortunately, the consultant who inserted the suture was on leave, and it was not noticed by the duty team. She complained of severe pain during the second stage of labour, but this was ignored. Labour proceeded normally, and she delivered a live baby without help. Immediately after delivery she complained of urinary incontinence and collapsed. No one took any notice of this, and she was discharged after 2 days. On examination 2 months later in another hospital, she was found to have a high 1cm vesico-vaginal fistula, which was contiguous with the cervix, which was torn and ragged. This was successfully repaired abdominally.

LESSONS (1) Always explain clearly to the patient that she must have the suture removed at 37wks or in labour. (2) Take her complaints seriously.

McDONALD'S CERVICAL SUTURE

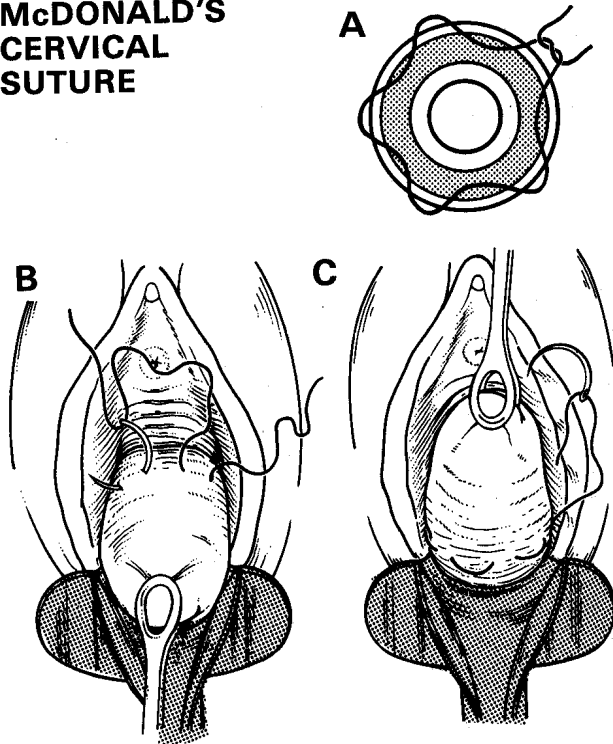


Fig. 20-2 McDONALD'S CERVICAL CERCLAGE SUTURE. A, the position of the suture. B, inserting it anteriorly. C, inserting it posteriorly.

Partly from Bonney V, *Gynaecological Surgery*, Baillière Tindall, 2nd ed 1974 with kind permission.

INDICATIONS

Two or more consecutive, almost painless miscarriages between 16-28wks especially when the foetus was alive just after birth, and/or there was initially premature rupture of membranes. There may be a scarred widely open patulous cervix. Preferably insert the suture at 14wks, when the danger of an early miscarriage is passed.

CONTRAINDICATIONS

- (1) Drainage of amniotic fluid or rupture of the membranes.
- (2) Vaginal bleeding.
- (3) Established premature labour which does not respond to β -mimetics or indomethacin.
- (4) Local vaginal or possibly intra-uterine infection.
- (5) Foetal anomalies if you can detect them.
- (6) An IUD or a retained miscarriage.
- (7) Pregnancy >28wks.

N.B. Exclude HIV disease, syphilis, hypertension, diabetes, and uterine abnormalities such as uterine fibroids.

CAUTION! Don't insert these sutures unless:

- (1) The mother has access to a hospital where at all hours of the day and night there will be someone present who will see her, and who is competent to remove the suture.
- (2) You have explained precisely what you are going to do, and that the suture must be removed at 37wks, or when labour starts.

ANAESTHESIA

- (1) Light GA
- (2) Ketamine.
- (3) Spinal. You must be able to retract the cervix and dilate the vagina widely to insert the sutures.

METHOD

Check the foetal heart with ultrasound or Doppler. Confirm the gestational age (38.3).

Insert a speculum. Grasp the anterior and posterior lips of the cervix with the same sponge forceps. Insert a #2 monofilament nylon (or special cerclage suture) superiorly in the outer surface of the cervix, near the level of the internal os, about 3mm under the surface of the cervix staying more or less at the same depth in the cervix for 90-120°, and then let your needle come out. Continue to reinsert the sutures in the cervix near the place where your previous insertion exited the cervix at regular intervals as shown, so as to encircle it.

Then tighten the suture round the cervix and knot in such a way that when it is tightened it would still be easy to insert scissors between the knot and the cervix. This is so that, later at 37wks or when in labour, you can cut on one side of the knot. The canal must be just patent as the suture is tied. As the patient is pregnant, *don't insert a dilator*. Admit her for 1wk: most failures occur in this time.

Write on the notes outside and inside in large red letters:

REMOVE CERVICAL SUTURE NOT LATER THAN 37WKS

Make a drawing to show where the knot is to facilitate removal when it is time.

Review every 2wks, and insert a speculum or examine digitally to check that the suture is still in place. Occasionally it comes out and needs reinsertion.

At 36wks, admit the patient (because she may not be able to present herself in time when labour starts) and remove the suture in early labour or at 37wks.

N.B. If labour does start with the suture *in situ*, it may cause a severe cervical tear, cervical incompetence, a vesico-vaginal fistula or rupture of the uterus.

CAUTION! Remove the suture immediately if:

- (1) signs of imminent miscarriage develop.
- (2) the membranes rupture in the absence of labour.

20.6 'Acute' ectopic gestation

In many parts of the world one in every 50-200 gestations is ectopically (*i.e.* abnormally) implanted, of which 99% implant somewhere along the Fallopian tube. Very occasionally implantation is in the abdominal cavity (20.9), or in the cervix. Trouble occurs either because the tube ruptures, or because the gestation aborts through the abdominal end of the tube, into the abdominal cavity. How soon there is trouble depends on where implantation occurs.

Ectopic gestation is more common if the tubes are affected by previous PID, if an IUD is *in situ*, or if there has been previous tubal surgery.

SITES OF IMPLANTATION

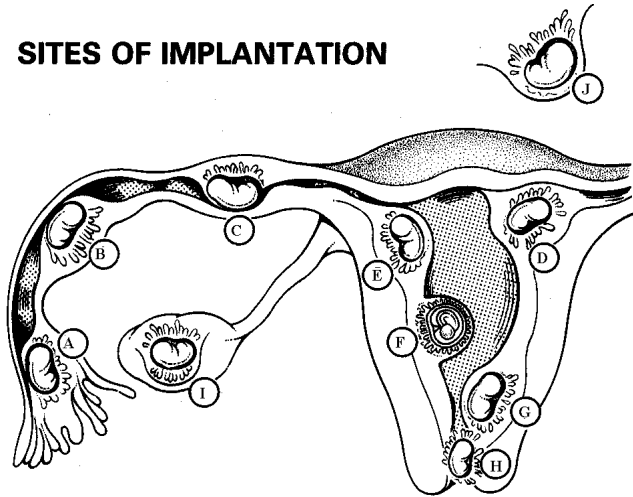


Fig. 20-3 SITES OF IMPLANTATION. A, the fimbria (the most common abnormal site). B, the ampulla. C, the isthmus. D, the uterine part of the tube. E, the angle. F, the body of the uterus (normal). G, close to the internal os, leading to placenta praevia. H, the cervix. I, the ovary. J, elsewhere in the abdominal cavity (including the rectum).

The common sites (20-3A,B) are the distal $\frac{2}{3}$ of the tube. Here, the results may be:

- (1) an acute or subacute rupture 6-10wks after the last period,
- (2) a tubal miscarriage, in which the foetus is expelled into the peritoneal cavity from the free end of the tube, which is not ruptured. Instead, chronic bleeding may continue slowly into the pelvis, to cause a pelvic haematoma (haematocoele).

In the isthmus (20-3C), it ruptures earlier at 4-6wks. In the uterine part of the tube (20-3D), it ruptures early. In an angle of the uterus, or cornu (20-3E), it may proceed to 20wks (20.8). Both close to the internal os (20-3G), resulting in placenta praevia, and in the cervix (20-3H), it leads to antepartum vaginal haemorrhage. On the ovary (20-3I) or elsewhere in the abdomen (20-3J), it may rupture around 14wks. If an ectopic gestation survives to 20wks without causing serious symptoms, it is probably in one of the less common sites, perhaps in an angle.

Patients with an ectopic gestation form 5 groups:

- (1) Those who have had a massive bleed into the abdominal cavity. These are the acute and subacute cases described below.

- (2) Those with little abdominal bleeding. A few of these 'chronic' ectopic gestations (20.7) will have a massive haemorrhage later, but many will never lose >200ml of blood into the abdominal cavity.

- (3) A miscarriage into the abdomen which resolves itself.

- (4) The gestation attaches itself to an area in the abdomen or sometimes inside the broad ligament where there is enough room even to grow to term!

- (5) Those presenting early because they think they are pregnant, often symptomless, where an ultrasound finds the uterus empty while there is a pregnancy seen elsewhere, or either the history or the β -HCG test indicates there should be a recognizable intra-uterine pregnancy present. There are also various intermediate forms.

Symptoms start when an ectopic gestation grows so large that it ruptures out of the tube that contains it. The periods are usually a few days to a few months late, and the patient may rightly think she is pregnant. Or, she may not think she is pregnant because:

- (1) the tube may rupture before she has missed a period.
- (2) vaginal bleeding due to decreasing hormone levels may begin at about the time of the expected period.
- (3) she may have an IUD *in situ*, be taking a contraceptive, or have had a tubal ligation and assume she cannot be pregnant. If the period of amenorrhoea is short, before the symptoms start, gestation is likely to be in the isthmus, and the effects of rupture worse.

(a) **An acute rupture** presents as a sudden severe lower abdominal pain, with signs of hypovolaemia. Pain and internal bleeding may be severe enough to cause vomiting and collapse. Peripheral shutdown, tachycardia and drop in blood pressure ensue as shock progresses. Some mild dark red or brown vaginal bleeding usually follows 24h after the onset of the pain, as the decidua are shed if the bleeding has not been catastrophic. Emergency surgery is mandatory.

(b) **A subacute rupture** typically presents with a history of 3-7 days of weakness, anaemia and abdominal swelling, usually with little pain. The lower abdomen may be tender, with rebound tenderness and guarding, but these signs are often minimal. Blood irritating the diaphragm may cause referred pain at the tip of the shoulder. The presentation may be with diarrhoea and vomiting in up to 40% of cases. Fainting episodes may not be mentioned. Treatment is fairly urgent; you should perhaps cross-match blood first.

(c) **A chronic ectopic gestation** presents as lower abdominal pain with a growing swelling which is easily confused with PID and does not require urgent treatment (20.7).

The diagnosis is usually easy when there has been massive bleeding in the abdominal cavity but it can be very difficult, especially if there is only a little bleeding.

Remember that any woman with a menstrual irregularity (a period or more missed or periods which have been lighter than usual) combined with abdominal pain and adnexal tenderness on one side may have an ectopic gestation. Anaemia, dizziness, shoulder pain, and a tender mass are all extras which encourage the diagnosis, but are not necessary for it.

A -ve sensitive urine pregnancy test excludes an ectopic gestation, provided the test is from a reputable manufacturer and is not date-expired. If the pregnancy test is +ve and the patient is in pain and you cannot confirm an intra-uterine gestation because it is too early or you have no proper ultrasound, you may be better off performing a laparoscopy or mini-laparotomy as an ectopic gestation is potentially fatal. Even if your diagnosis is wrong, and there is salpingitis or appendicitis in the absence of an intra-uterine gestation, you will have correctly intervened even if for the wrong reasons!

Don't let anyone who might have an ectopic gestation go home; if you opt for observation, make sure you:

- (1) monitor her carefully,
- (2) are able to operate at very short notice,
- (3) have discussed the option of sterilization if you decide to operate.

As so often, 'look and see' is better than 'wait and see'. These are rewarding patients, because they seldom die if you treat them correctly, even if they have bled severely. So be watchful.

DON'T FORGET ECTOPIC GESTATION IN A WOMAN OF CHILDBEARING AGE

The main failures are not to:

- (1) consider pregnancy as a possibility,
- (2) place importance on known risk factors,
- (3) think of an ectopic gestation as a diagnosis,
- (4) arrange suitable follow-up.

ACUTE AND SUBACUTE ECTOPIC GESTATION

EXAMINATION. Look for general signs of blood loss (shock and anaemia), and for signs of bleeding within the abdomen. Tenderness may be mild, distension, rebound tenderness and guarding are variable, and may be absent. If there is a large tender mass in the lower abdomen, bleeding has been confined there by adhesions. If you suspect free fluid in the abdomen, try to confirm this (as below). There is often a low-grade fever.

Gently perform a vaginal examination. The important signs are pain on moving the cervix, tenderness in the posterior fornix and pouch of Douglas, and perhaps acute adnexal tenderness, which is worse on one side (highly suggestive).

CAUTION! *Don't do a vigorous vaginal or bimanual examination if you are not able to start surgery in 20mins, e.g. when visiting a rural clinic or when the theatre staff have just gone home: you may worsen or even restart bleeding!*

TESTS

Do a sensitive PREGNANCY TEST, making sure your kit is not out of date!

Check the Hb: it is normal to begin with and only drops as tissue fluid or IV replacements dilute the circulating blood. A few days after a severe bleed, however, you may find an Hb as low as 30g/L.

Check for ORTHOSTATIC HYPOTENSION with a Schellong test: take the pulse when the patient is sitting up; if it is >25 beats/min faster than when she lies down for at least 10mins, this is a good sign of hypovolaemia.

Look for free fluid by ULTRASOUND (38.2,3). In case of doubt, run 200ml of normal saline *via* a giving set and cannula into the abdomen. Then ask the patient to lie on her left and then right side. Then place the bag on the ground. If clear fluid runs back in the system, you can exclude a *ruptured* ectopic gestation. If blood runs down, especially with small clots in it, this strongly supports the diagnosis.

Don't reject the diagnosis, though, on a doubtful result.

You may see the typical echogenic ring of an ectopic gestation, *but don't waste time looking for this if the patient is unstable!*

DIFFERENTIAL DIAGNOSIS

(a) OF 'ACUTE' ECTOPIC GESTATION

If there is blood present:

- (1) Uterine rupture (21.17),
- (2) Unsuspected abdominal trauma,
- (3) Abdominal tuberculosis (16.1),
- (4) Ruptured haemorrhagic ovarian cyst (23.9),
- (5) Ruptured abdominal aneurysm (35.8),
- (6) Acute haemorrhagic pancreatitis (15.13).

(b) OF 'SUBACUTE' ECTOPIC GESTATION

Most causes of an acute abdomen (10.1, 12.1), and other causes of anaemia.

If the amount of blood lost PV fully explains the extent of shock and anaemia, suspect a miscarriage.

LAPAROTOMY FOR ECTOPIC GESTATION

Prepare the equipment needed for autotransfusion (5-1).

N.B. ABOUT TRANSFUSION: A healthy woman who loses blood fast without having an infusion of fluid will die, if she does so, *not* from lack of red blood cells but from lack of circulating volume. This is the basis of hypovolaemic shock, *i.e. an insufficient response to acute volume deficit.* If then she arrives in shock and is operated immediately and her circulating volume is replaced with normal saline just before and during operation, she will have enough red blood cells left to survive.

However, if she has had volume replacement before arriving in hospital, or in hospital while waiting to be operated upon, or whilst bleeding over a prolonged period, then her circulating volume will *not* be the problem. Note that about 1/3 of saline infused IV will remain in the circulation, therefore losing 2L blood will be compensated in terms of volume by 6L saline or Ringer's lactate. With volume replacement but continuous bleeding, the cause of death is lack of oxygen because of lack of red blood cells.

So, in theory, a patient arriving in your hospital with a ruptured ectopic, operated upon immediately (with a very low dose of ketamine) while the first litre of saline is being infused rapidly, *does not need a blood transfusion.* If the patient has had IV fluids for some time, then it is much more difficult to tell if she needs red blood cells. Also because the blood in her abdomen is now partly diluted blood, she might have received the saline infusion before she was really in danger, and she might have bled after the infusion was set up.

If the total volume of blood (clots) in the abdomen is <1-1.5L (the younger she is, usually the stronger), she does not really need to be (auto)transfused unless she was previously severely anaemic, *e.g.* due to malaria or sickle cell disease. If possible, these patients (with infusions running) should be operated immediately and perhaps autotransfused.

If the patient is stable at the end of the operation and has enough circulating volume and you are certain you have stopped the bleeding, then a blood transfusion is *often not needed.*

What often happens, though, is that it takes so long to organize cross-matching of blood that the first bag is connected to a stable patient 4h or so after the operation. Because she has not actually died, she probably did not really need the blood. However, the first signs of problems are 'oxygen hunger': cardiac failure typified by crepitations over the lung bases, an impossibility to lie horizontally, and confusion. *Rapid transfusion in this situation may well prove fatal due to cardiac overload.*

The first step then is to administer 20-40mg furosemide IV. Fluid overload can also produce this syndrome rather than lack of red blood cells. Check the Hb: if <50g/L, transfuse 1 unit of red cells if available.

Remember transfusions are often just giving you an extra margin of safety. Therefore transfusion is justified if donors are abundant and safe. *If this is not the case, you should be extra-careful with your haemostasis* and manage with smaller safety margins. The above applies also to women bleeding from incomplete and/or induced miscarriages. In those cases bleeding can be often stopped immediately even without access to a fully equipped theatre. Therefore miscarriages very seldom need transfusions.

Make doubly sure bleeding is not still continuing!

N.B. Some teenage or premenopausal women arrive very pale after weeks of dysfunctional uterine bleeding (DUB: 23.3). Other women have a fibroid prolapsing through the cervix.

Often women who are bleeding are extremely anaemic. The reflex of some health workers is to give them a fast infusion of saline when there is nothing wrong with their circulating volume. This extra fluid gives extra work to the heart which is already working to capacity because the heart muscle is anoxic having to circulate the remaining red blood cells much more frequently. This fluid might actually kill the patient as a result of inducing cardiac failure.

The priorities are therefore in severe anaemia:

- (1) Administer 20-40mg furosemide IV *if there are already signs of cardiac failure.*
- (2) Stop any bleeding (suction curetting with 6mm Karman curette without anaesthesia or twisting off a pedunculated fibroid).
- (3) Treat with iron supplementation.
- (4) Lastly administer packed red cells slowly *only* if the patient is in mortal danger, and then only in addition to a further 20-40mg furosemide IV.

RESUSCITATION FOR AN ACUTE ECTOPIC GESTATION

Insert 2 large-bore IV infusions immediately and administer saline or Ringer's lactate rapidly. Cross-match blood. *Don't be too enthusiastic to restore the blood pressure above 90mm Hg systolic*, because you might promote more bleeding. Your first priority is to stop the bleeding: resuscitation is to prepare the patient as best you can in the time available. The more fluid you give, the more anaemic the patient will become!

It is possible with an acute massive bleed (*e.g.* after a vaginal examination performed on admission or in the ward) to insert the needle of a blood letting system as used by blood banks, through the abdominal wall into the pool of blood in the abdomen just before the operation. The bag with citrate in it may fill within minutes: hand it to the anaesthetist for autotransfusion (5.3). Scrub up, gown up and operate while the patient is given that blood via a filtered giving set.

Ketamine is ideal for anaesthesia. *Don't use thiopentone for induction: the blood pressure might crash!*

NTABISENG (35yrs) was suspected of having an ectopic gestation in a small mission hospital. Her Hb was 80g/L. The nurse anaesthetist there refused to take the risk of giving anaesthesia and referred the patient to the nearest government district hospital where she arrived 2h later. The Hb being 60g/L by now, the nurse there even more strongly refused to give anaesthesia. The patient was now transported to the provincial hospital where on arrival 3h later her Hb was 40g/L. Neither surgeon nor anaesthetist wanted to intervene, so she was now referred to a central hospital but did not arrive alive.

LESSON The message is clear: *don't think others in more sophisticated surroundings can do better with a patient who is much worse.*

PREPARATION

If you have time, insert a urinary catheter: leave it *in situ*. Since one ectopic gestation is followed in 30% of cases by another, discuss whether the patient wishes any further pregnancies and, if she does not, ask for permission to tie the normal tube.

TSITSI (39yrs) was a para 6 and lived more than a day's travel away from the hospital. She arrived in severe shock from an ectopic gestation over the weekend but was operated with success. The next year, the same thing happened but because there were floods, her journey to hospital took much longer and she died *en route*.

LESSON If she had had the other tube tied, or access to proper contraceptives or had at least an IUD inserted, this totally avoidable death could have been avoided.

PINCH THE BROAD LIGAMENT TO STOP THE BLEEDING

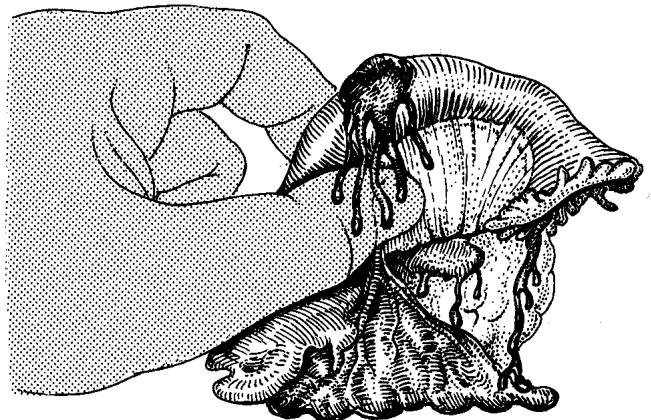


Fig. 20-4 PINCH THE BROAD LIGAMENT TO STOP THE BLEEDING. As soon as you open the abdomen while the patient is in the Trendelenburg position (otherwise the blood will spill over and is not available for autotransfusion), lift out the uterus if possible, find the ruptured Fallopian tube and if it is still bleeding significantly, grasp the mesosalpinx between your finger and thumb, so as to compress and later clamp the vessels and stop the bleeding.

METHOD

Place the patient in a 15° head-down (Trendelenburg) position. Make a subumbilical midline (11.2) or, if you are experienced, a Pfannenstiel incision. There will be blood in the abdominal cavity, which should not spill out and be lost for autotransfusion.

Put your hand into the pelvis and feel for the uterus and lift it out if possible. Find the ruptured Fallopian tube, and if it is still actively bleeding, grasp its broad ligament between your finger and thumb, so as to compress the vessels in it (20-4). Apply long curved haemostats across the tubes on either side of the ectopic gestation (20-5) so that the points meet and you leave no part of the broad ligament unclamped. Preserve the ovary.

N.B. You can put the distal clamp either over the distal tube (20-5X) or over the remaining broad ligament (20-5Y), which will result in removal of the distal tube.

If you leave the fimbria, it may prove possible later to reconstruct the tube, provided there is >4cm of it remaining, if the patient becomes infertile. On the other hand, it is possible that a zygote fertilized in the contralateral tube might be trapped in the distal part of the amputated tube, resulting in another ectopic gestation.

After you have clamped the ruptured Fallopian tube, the anaesthetist can now raise the BP without just adding to the amount of fluid pumped into the abdomen. Think about autotransfusion (5.3) if there is >1.5L blood in the abdomen: collect it all while slowly returning the patient to the horizontal position. Suck out and discard the last drops of blood, so you can see where to place ligatures at the right place.

Examine both the tubes to make sure that there isn't a double ectopic gestation. The other tube may often contain a little blood and appear violet-blue, but this is not an indication to remove it. The embryo will probably only be about 1cm long, so you won't usually find it. Or, you may find quite a large unruptured amniotic sac containing it. If the other tube seems severely damaged, record it and tell the patient. However, many patients who are told that they cannot become pregnant anymore achieve pregnancy nonetheless.

If there is a subacute ectopic, the ruptured tube will be covered with blood clot and adherent to the surrounding structures. Free it from them with scissors or a finger.

If the patient has no other children and the tube looks reasonable while the other tube is hopelessly stenosed, it is on occasion (provided the patient has easy access to a functional hospital) best to incise the tube at the place of the swelling lengthwise opposite the mesosalpinx. Remove the gestation bluntly, by combining squeezing and using the back of dissecting forceps, and then *very thoroughly* compress the area to stop the bleeding. Put a few sutures in the mesosalpinx around the blood vessels supplying the area. Repair the incision in the tube with 5/0 sutures.

If, however, the other tube looks satisfactory apart from a closed distal end, and the patient is stable, it is occasionally responsible to open that distal end bluntly with a small artery forceps and fix the 'petals' with 5/0 nylon to keep the tube open.

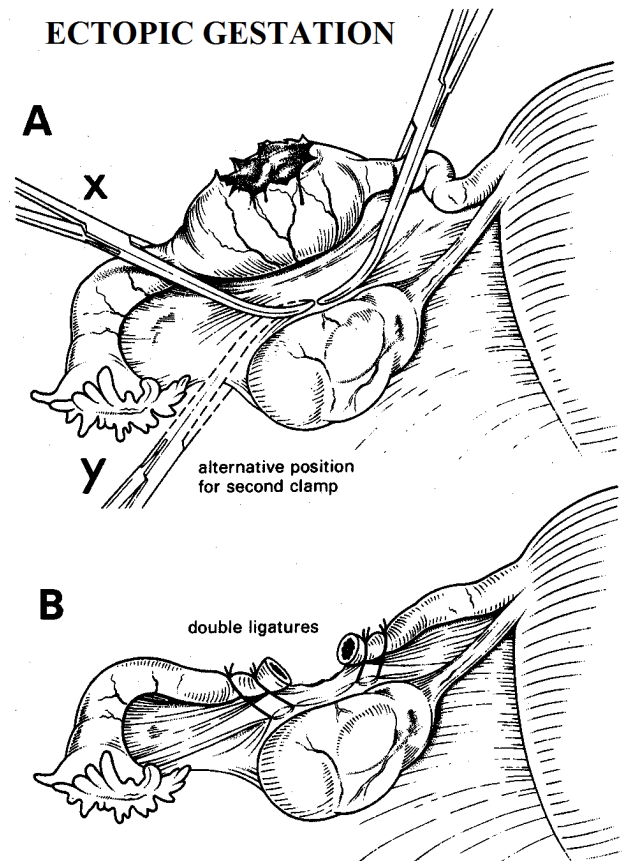


Fig. 20-5 ECTOPIC GESTATION. A, put clamps on either side of the ruptured tube. Try to preserve its fimbrial end if you can (X). If necessary, you can put the second clamp in position Y. B, remove the ectopic gestation, and put 2 ligatures round the Fallopian tube ends.

Remove the ruptured part of the tube by cutting along the free side of the clamps. Place 2 long-acting absorbable ligatures under the joints of each clamp. Tie them with a sliding knot (4.8). Leave the ends of these ligatures long, and hold them in haemostats. Place double ligatures on both sides, to make sure that no arteries are missed.

CAUTION!

- (1) Tie these ligatures carefully, or else post-operative bleeding will ensue.
- (2) If bleeding continues after you have applied 2 ligatures, re-apply the clamps and repeat the procedure.
- (3) *Don't do anything else which is not essential.*

Often, however, it is most reasonable to excise the affected tube completely; if you do so, remove the fimbrial end thoroughly. Lavage the peritoneal cavity thoroughly with warm sterile water. If the patient has previously consented, tie the other tube. Close the abdomen without drainage.

Examine the specimen. In the middle of an ill-defined placenta and blood clot you will see the amniotic sac.

If there is suspicion of gestational trophoblastic disease (23.10), send the specimen for histology.

POST-OPERATIVELY, monitor the urine output until the patient is out of danger. Treat the anaemia with folic acid orally and/or iron or, if the Hb is <50g/L, with blood transfusion. Very rarely will you need >1 unit blood transfusion.

Difficulties with acute and subacute ectopic gestations

If you cannot find the tube with the ectopic gestation, *don't panic*. Allow yourself time to scoop out blood and clots. Make sure you have tipped the head of the table down (the Trendelenburg position), so as to make the blood *and* the bowel move away from the pelvis. Feel for the uterus in the midline in the hollow of the sacrum. Lift it into the wound. If it is stuck down by adhesions, divide them with gentle traction, or cut them with scissors. Having found the uterus, feel for the affected tube. If this is also stuck down by adhesions to the omentum or bowel, separate them (usually not too difficult).

If the tube is stuck to the broad ligament on the same side (more difficult), try to get your fingers under it and the ovary, and lift them into the wound, by scraping the tip of your fingers along the back of the broad ligament. If necessary, cut adhesions between the tube and the rectum.

If the ovary is stuck to the tube, or you have torn it as you mobilized it, you sometimes have to remove it.

CAUTION! Before you remove the ovary (if you have to), make sure you separate adhesions between it and the broad ligament. *If you don't do this, you may clamp the broad ligament too low down, and so include the ureter.*

If adhesions obscure everything, search for the uterus, or the infundibulopelvic ligament (23-21). On the right this comes away from under the caecum and appendix, and on the left from under the mesosigmoid.

The blood supply to the tube and ovary comes from:

- (1) The ovarian vessels in the infundibulopelvic ligament.
- (2) The ascending branches of the uterine vessels.

If you can put a clamp across the infundibulopelvic ligament, and another one across the tube and broad ligament next to the uterus, you will interrupt the blood supply to the ectopic.

If there is a raw area in the peritoneum which oozes, after you have removed the ectopic gestation, it will usually stop spontaneously, if there are no obviously bleeding vessels. Try compressing it firmly for 5mins. If it continues to ooze, insert a drain for 24h, and monitor the patient carefully.

If you find inflamed tubes with some pus discharging from their fimbriated ends, or evidence of inflammation without pus or abscess formation, this is salpingitis (23.1), not an ectopic gestation. *Don't excise the tubes*: take a pus swab and administer broad-spectrum antibiotics.

If there is a chronic pyosalpinx, excising it will be very risky if it has stuck to the bowel, but this may be possible if it is not too friable and adherent.

If one tube is grossly swollen and full of pus, it is better to remove it anyway if you have opened the abdomen: try not to spread infection, and lavage the pelvis afterwards with warm water. If there is bilateral severe pyosalpinx in a woman with no children, you might prefer to aspirate the pus with a needle and treat with antibiotics.

If there is a tubo-ovarian abscess (23.1), drain it.

If you find the appendix adherent to the tube, peel it off. If you damage it, perform an appendicectomy (14.1).

If there is no ectopic gestation, and you find copious bleeding from the ovary as a result of ovulation, control bleeding with sutures.

N.B. Very occasionally there is blood in the abdomen from a spontaneous rupture of the spleen (15.17) or even from the needle hole you created trying to diagnose an ectopic gestation!

If there is a 2nd gestation in the uterus (very rare), removing the ectopic gestation may not disturb it. If amenorrhoea continues, its presence will soon be obvious.

If there is a large purple haematoma in the broad ligament, the ectopic gestation has ruptured into it, and not into the peritoneum, and may be quite large (12-16wk size or larger).

CAUTION!

(1) *Don't burrow into the lower part of the broad ligament*: you may damage the large venous plexuses there, or the ureter.

(2) *Don't try to control bleeding by suturing deeply*, unless this is absolutely essential: you may tie the ureter by mistake.

Try one of the following 3 methods:

(1) Clamp and divide the round ligament on the same side 2-3cm from the uterus. Check the anatomy (23-20,21).

(2) Clamp the tube and ovarian ligament close to the uterus, but *don't divide them at this stage* (if the anatomy is confused, leave this and do it later). Cut the peritoneum from the round ligament in the direction of the infundibulopelvic ligament. This will open the top of the broad ligament. As you approach the infundibulopelvic ligament, find, clamp and divide the ovarian vessels without including the ureter! This will have isolated the blood supply to the ectopic gestation. Now you can clamp and divide the tube and ovarian ligament. If the ectopic is not already free, a little blunt dissection should free it from the base of the broad ligament. If oozing from the base of the broad ligament does not stop spontaneously, clamp and tie the bleeding vessels.

(3) Or, mobilize the uterus by removing blood clot and dividing light adhesions. Apply two large artery forceps to the tube as before (20-5), but *don't excise the ectopic gestation at this stage*. Cut a ½cm opening in the back of the broad ligament, and squeeze out the haematoma by pressing it from below.

Monitor the patient.

There are several consequences possible:

- (1) The haematoma does not reform because the artery forceps have controlled the bleeding. Excise the ectopic gestation, complete the operation in the usual way, and then suture the hole in the broad ligament.
- (2) The haematoma reforms. Open the broad ligament more widely, look for a bleeding point, and tie it off.

If you find no specific bleeding point, but only a general ooze, compress the area with a pack, and wait 10mins by the clock. If this controls bleeding, complete the operation.

If a pack fails to control the bleeding, tie or underrun as many bleeding vessels as you can. Be careful to feel for the ureter to avoid including it in a ligature. Trace it from where it enters the pelvis over the sacroiliac joint (23-20). It has a characteristic firm feeling, and you can roll it between your fingers.

If you realize that you have forgotten to perform a tubal ligation when indicated, insert an IUD before the patient leaves hospital.

If you find a 'chronic' ectopic (20.7), an angular or cervical (20.8), or an abdominal gestation (20.9), see below.

20.7 'Chronic' ectopic gestation

When there is extra-uterine implantation, inadequate attachment usually causes sudden bleeding. However, 3 types of ectopic gestation do not:

- (1) One which has, so far, only caused a small bleed, with the risk of massive haemorrhage later;
- (2) One in which repeated small bleeds have caused a haematoma (pelvic haematocoele, 20-7) containing 100-500ml of blood and clot. This is the 'chronic' ectopic gestation: some of these resolve without treatment, but *don't wait for this to happen*. You can never be sure that there won't be a massive haemorrhage, which may be catastrophic;
- (3) A complete tubal miscarriage which has stopped bleeding.

Presentation may be varied:

- (1) Lower abdominal pain, perhaps combined with pain on micturition, defecation, or sexual intercourse.
- (2) A little dark vaginal blood loss (less than a normal period), perhaps preceded by amenorrhoea, and sometimes with the passage of a decidual cast, which can be mistaken for a miscarriage and thus the ectopic gestation remains.
- (3) An enlarging mass in the lower abdomen, adjacent to or centrally lying on the uterus, or in the pouch of Douglas. Occasionally, if the adnexae have a long pedicle, this mass is entirely outside the pelvis. Moving the cervix is painful, but this is not such a reliable sign as in an acute rupture. The uterus is usually slightly enlarged.

The diagnosis of a chronic ectopic can be difficult, and is often missed. Its symptoms are like those of PID; *if the patient has had several similar attacks of pain without any missed periods, she probably does have PID (23.1).*

CULDOCENTESIS

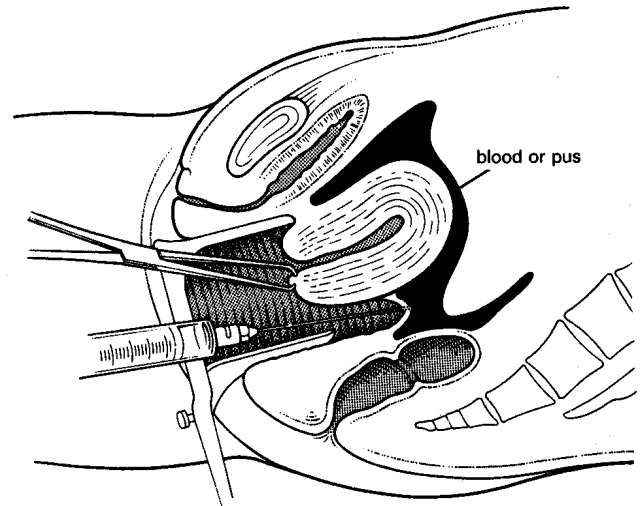


Fig. 20-6 CULDOCENTESIS can be used to confirm the presence of blood or pus in the pelvic peritoneum, and to distinguish between PID and a pelvic haematocoele (chronic ectopic gestation) as the cause of a pelvic mass. If you find clear fluid, this might be from a gestational sac in the pouch of Douglas.

CULDOCENTESIS (20-6) is the confirmatory test for rupture of a chronic ectopic gestation, or a pelvic abscess. You will be able to aspirate blood if the haematocoele is in the pouch of Douglas, but not if it is, rarely, elsewhere.

THERESA (24yrs) was seen in hospital complaining of heavy prolonged bleeding for 5 days. She had missed two periods and said that she had passed clots. She was anaemic, the uterus was slightly enlarged, and the cervix was closed and still bleeding. A doctor diagnosed her as having an incomplete miscarriage, and performed a dilation and curettage. There were few curettings, so he thought that she must have had a complete miscarriage. He prescribed iron tablets and discharged her, but she continued to bleed and to have low abdominal pain. So she went to another hospital where the doctor felt a tender mass on the left side of the uterus. He thought at first that she had an ectopic, but he read the discharge card from the first hospital, which said that she had had an incomplete miscarriage, and a 'D&C'. So he was misled and diagnosed PID with a tubo-ovarian abscess. He prescribed antibiotics, and discharged her. Nearly a month later she went to a private clinic run by a medical assistant. He correctly diagnosed an ectopic gestation, before even doing a vaginal examination, and referred her. The Hb was 40g/L. She had had 5 children, and wanted no more, so at laparotomy the tubes were tied.

LESSONS (1) *Don't be misled by other people's clinical opinions.* (2) Supposed miscarriages may be ectopic gestations. (3) PID can produce symptoms which are very like those of a chronic ectopic gestation. (4) This patient has some of the features of a subacute (severe anaemia), and some of those of a typical chronic ectopic gestation (a history of chronic pain); this shows that there is no sharp differentiation between these 2 conditions. (5) Before you diagnose PID, stop and think whether this could be a chronic ectopic gestation.

Think of a chronic ectopic gestation whenever you see a patient with irregular, missed, or prolonged periods, especially if she has low abdominal pain which began with feelings of fainting, and particularly if she has previously had an ectopic gestation.

LARGE PELVIC HAEMATOCOELE

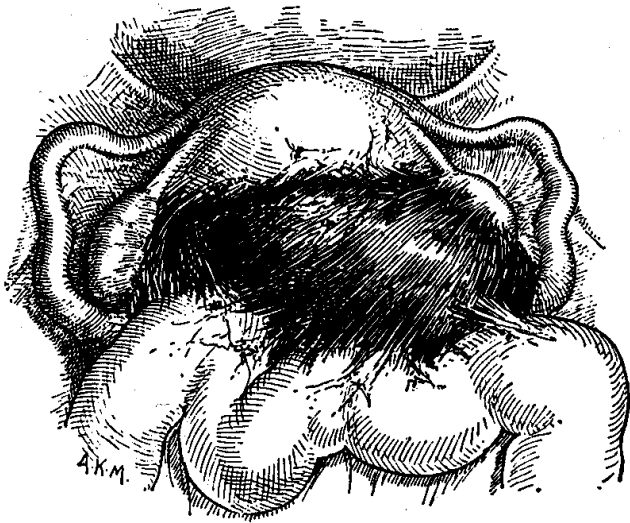


Fig. 20-7 A LARGE PELVIC HAEMATOCOELE (CHRONIC ECTOPIC GESTATION). You will only make the diagnosis if you think of this whenever you see a patient with irregular, missed, or prolonged periods.

From Young J, *A Textbook of Gynaecology*. 5th ed. 1939, Fig. 101. A & C Black.

DIFFERENTIAL DIAGNOSIS

Suggesting PID (23.1): no missed periods, no anaemia. Fever, lower abdominal pains often worse around menstruation. Vaginal discharge which may be mild. A partner treated for STI. A high ESR. Localized peritoneal irritation (with grimacing on coughing).

Suggesting a threatened, incomplete, or complete miscarriage: significant vaginal bleeding. You can make a decidual cast disintegrate between your fingers, unlike placenta/trophoblast which will have *villi* clearly visible if you float it in a glass of water.

Suggesting a fibroid uterus in pregnancy: a solid mass with much less discomfort.

Suggesting DUB (23.3): irregular periods, anaemia, no mass palpable (although an ovarian cyst may be present).

LAPAROTOMY. Perform a salpingectomy (20.6) and remove all the debris of the dead gestation.

DIFFICULTIES WITH A CHRONIC ECTOPIC GESTATION

If there are many dense adhesions between the ectopic gestation and the surrounding organs, scoop out as much blood clot as will easily come out without tearing and pulling. *Don't try to remove firmly adherent clot;* there will be much oozing. *Don't try to remove the whole 'wall' of the haematoma cavity;* you may injure the bowel.

If you injure the rectum or sigmoid colon, suture the injury and wash the pelvis thoroughly with warm water.

If you injure the small bowel, close the perforation if it is healthy or resect the damaged portion if it is ragged or badly inflamed (11.3). You may, rarely, have to fashion a diverting ileostomy (11.5).

20.8 Angular (cornual) and cervical ectopic gestation

An ectopic gestation occasionally implants towards the medial end of the Fallopian tube. If it implants at the point where the tube enters the uterus, it ruptures early, but if it implants in the intramural part of the tube near the uterine cavity (angular or cornual gestation), it may not rupture until 20wks (20-3). In either case, the whole angle of the uterus becomes a bleeding mass.

If, rarely, an ectopic gestation implants in the cervix (cervical gestation), the cervical os will be open and contain a thin-walled cavity in which you can feel fragments of chorionic tissue. This cavity bleeds massively, and may resemble a miscarriage, where the cervical os is closed tight. Whereas there is little bleeding after a miscarriage has been evacuated, a cervical ectopic gestation continues to bleed profusely (20.2).

MANAGEMENT OF AN ANGULAR ECTOPIC GESTATION

Perform a laparotomy; you will find a purple bleeding mass arising from one angle of the uterus. Bleeding can be torrential. Place a Foley catheter as a tourniquet low down towards the cervix, around the base of the uterus (22.11) if adhesions around it are not too dense. Otherwise get an assistant to compress the angle of the uterus firmly with his fingers. The uterine and ovarian arteries supply this area, so bleeding can be very severe and many patients with this diagnosis will die before they reach hospital.

Remove all products of conception bluntly with your finger and then suture the open area with large bites of #2 long-acting absorbable suture. Alternatively, perform a partial resection, aiming to remove the mass by incising the uterus around its sides. *Be careful that you don't remove too much of the outer layer of the uterus;* otherwise there will be too large a defect to close despite taking big bites.

If control of haemorrhage is inadequate, you may have to proceed to subtotal hysterectomy (21.17). At any rate, unless the patient desperately wishes for more children, ligate the remaining tube, as the risk of sudden rupture of a subsequent gestation at around 28wks is great.

MANAGEMENT OF A CERVICAL GESTATION

Pack the thin-walled cavity in the cervix tightly to stop bleeding, and resuscitate the patient. If the ectopic gestation is early, packing may be all that is needed. Bleeding may have stopped when you remove the pack 24h later.

If a pack does not control bleeding, there are 3 more manoeuvres you can do before hysterectomy: Suture the descending cervical branches of the uterine arteries (as with a cone biopsy).

Pull the cervix firmly down and insert one long-acting absorbable suture from the 2-4o'clock and one from the 8-10o'clock positions, as high as you can at the level of the cervico-vaginal junction. Provided you don't go above this level, the ureters will be safe. Also, if you stay very near or, better, inside the cervix with your suture, you will not tie (but perhaps kink) the ureter. *Don't try any dissection.*

Then insert a large (50ml or more) Foley catheter into the bleeding cavity in the cervix, inflate the balloon, and leave it for 24h. Fluid from the uterus will be able to drain through the tube. It helps to infiltrate the cervix with 10-20ml 1:80,000 to 200,000 adrenaline solution.

If this fails, perform a laparotomy and tie the uterine arteries bilaterally (22-14, 23.15) after they enter the cervix and uterus bilaterally. This way you cannot tie the ureters. You can insert 2-3 sutures on each side 0.5-1cm medially to the lateral margin in the cervix (first from anterior to posterior then the same suture posterior to anterior entering 2-3cm in the direction of the fundus) parallel to lateral margin and then tie them. Do the same in the lower uterine area. *Be careful not to penetrate the bladder* as sometimes it needs to be dissected down. If this too fails, perform a hysterectomy (21.17).

20.9 Abdominal gestation

An ectopic gestation occasionally slips backwards down a tube, or bursts out of it without causing excessive haemorrhage, and embeds itself elsewhere in the abdominal cavity. Sometimes, an ovum is fertilized outside a tube on the surface of an ovary, and then implants itself in the abdominal cavity. Such an ectopic gestation may die at any stage, or proceed to term. An abdominal gestation is thus a rare consequence of a simple ectopic gestation, so that in areas where ectopic gestations are common and not immediately attended to, the incidence of abdominal gestations is increased also. An abdominal gestation causes comparatively few symptoms. Often the diagnosis depends on the sum of many clues.

A patient with an abdominal gestation may present with:

- (1) Persistent abdominal pain from c.26-28wks onwards of variable severity, which is not well localized.
- (2) The 'uterus' (in reality the gestational sac) is ill-defined, and feels 'odd', when you palpate it. The foetal parts may be abnormally easy or abnormally difficult to feel. The foetal lie is often abnormal, and may be persistently transverse or oblique.
- (3) The foregoing features accompanied by the failure of the 'uterus' to enlarge, typically at 32wks, and foetal death.
- (4) The foregoing features combined with a 'uterus' that distends more than it should, so that you suspect polyhydramnios.
- (5) Postmaturity (>40wks).
- (6) Foetal death which is neither expelled spontaneously nor with misoprostol nor oxytocin (20.4).

Other, rarer presentations are:

- (7) An abdominal mass after 26wks adjacent to an empty uterus (or a uterus enlarged to the size of a 12-16wk gestation), which is quite separate from it, and which you may think is a fibroid.
- (8) A distended abdomen which is like a full-term gestation, and a mass which is less cystic and rubbery than a normal gestation, with accompanied 'menstruation'. On questioning, the patient may later admit having missed some periods, possibly several, in the past.
- (9) An abscess in the abdomen rupturing through the abdominal wall. You see foetal bones emerging!
- (10) An abscess ruptures into the bowel with passage of foetal bones in the faeces.
- (11) A firm mass which you presume to be an ovarian tumour in an elderly lady: it turns out to be a petrified foetus (lithopaedion).
- (12) Loss of weight and general ill health.

The diagnosis depends on recognizing that the patient is or was pregnant and that the gestation is not in the uterus.

The history is seldom helpful, but:

- (1) she may have had episodes of pain in early pregnancy;
- (2) she may have a history of a previous ectopic gestation; or
- (3) if she is an experienced multipara, she may say that the pregnancy 'feels different'.

MARY (19 years) was found to have a transverse lie at 7 months. External version failed, so she was allowed to go to term. At 40wks she had abdominal pains, but the lie was still oblique. On pelvic examination the cervix was in a curious position in front of the foetal head. At Caesarean section she did not seem to have a uterus, instead the membranes were close against the abdominal wall. After a live baby girl had been delivered, the placenta was found to be attached to the left Fallopian tube. It was left in place and as many of the membranes as possible removed. She recovered uneventfully.

LESSONS (1) If something rather unusual happens, think of the possibility of an extra-uterine gestation. (2) If you cannot easily remove the placenta, leave it.

(a) Diagnosis

Perform a vaginal examination feeling with the finger through the cervix (often easy in a multipara at term). You will note an empty space, the membranes or presenting part being missing. Sometimes you can feel the fundus opposite from the inside.

(b) Ultrasound: note the gestation attached to an empty uterus (which you may think, at first, is a fibroid).

N.B. You may miss an abdominal gestation on ultrasound if you concentrate on the foetus itself without verifying that it is inside the uterus.

(c) Radiographs

- (1) The foetus may be in an abnormal attitude and remain in it over a long period.
- (2) In an upright lateral film the foetal parts may overlap the shadow of the maternal spine. This is rare in a normal pregnancy.

ADVANCED EXTRAUTERINE GESTATION

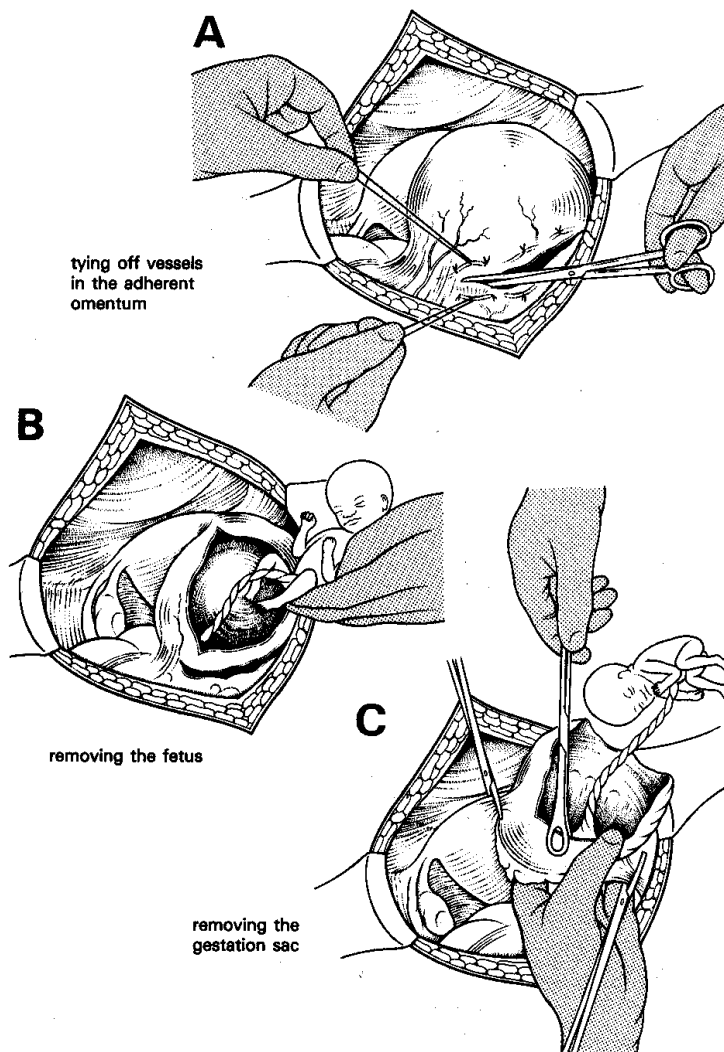


Fig. 20-8 AN ADVANCED EXTRA-UTERINE GESTATION in the omentum. A, tying off the vessels in the omentum. B, removing the foetus. C, in this patient the entire sac is being removed; if it is not easy to remove and has not started to bleed, leave it.

From Bonney V. *Gynaecological Surgery*. Ballière Tindall, 2nd ed 1974 with kind permission.

The foetus can implant itself anywhere, but because the placenta is so large, it is nearly always attached to bowel or omentum somewhere. The common sites are:

- (1) the pouch of Douglas.
- (2) the broad ligament, where it is attached to the uterus.
- (3) the pelvic wall.
- (4) the adnexa.

After 24wks, if the foetus is still alive, keep the mother in hospital to wait until 34-36wks, so as to improve the chances of foetal survival. Often, she has few children or none, and will be grateful for a live child. Bleeding before term, though uncommon, is a real risk, so this is a useful option only if there is always a theatre team available at short notice and there is easy access to blood.

After 24wks, with a dead foetus, postpone intervention for 3-4wks after the foetal movements have stopped, so that the vascularity of the placental bed is reduced.

If the foetus has been dead >6wks, check the clotting time and platelet count before you operate, because of the possibility of DIC (3.5), but plan surgery at the next available opportunity. This is difficult surgery, so refer if you can.

N.B. Sudden severe abdominal pain at any time may indicate haemorrhage, so operate immediately.

GERALDINE (38 years), after years of infertility, finally became pregnant. She kept having abdominal pains but was the last to complain about it. She was so happy and besides she lived far from the nearest clinic. She was referred to the central hospital after she was checked by a midwife in the clinic for oblique lie. That evening she complained about abdominal pains. The junior doctor was summoned and arrived after quite a delay and diagnosed PID in pregnancy and prescribed antibiotics. The ward nurse had phoned the consultant because the junior doctor took so long in coming and, arriving 5mins after the junior doctor had left, he examined the patient properly abdominally and vaginally. He found what he thought was an acute abdomen due to either an abdominal gestation or a uterine rupture. Luckily the patient got to theatre within 15mins. Upon opening the abdomen, much arterial bleeding was seen, but a live baby was delivered. The bleeding caused by the placenta being partly separated from the left adnexa was stopped by compression; the placenta was then removed together with the left adnexa and a large part of omentum. Some large Z-sutures were placed to secure haemostasis against the inside of the abdominal wall.

LESSON Don't diagnose PID in pregnancy unless you have convincing proof: other diagnoses are far more likely.

MANAGEMENT

Before 24wks, perform a laparotomy. This may be difficult, so try to refer.

LAPAROTOMY FOR ABDOMINAL GESTATION (GRADE 3.5)

Make sure you have blood cross-matched, and equipment for autotransfusion (5.3).

INCISION. Listen over the abdominal wall for a vascular bruit. This may tell you from where the placenta is getting its blood. Place your abdominal incision away from this site. If you can palpate the foetus, make an incision at that spot. If there is no obvious incision preferred, make a midline incision, extending above the umbilicus.

Open the abdomen with care, because bowel may be adherent to the abdominal wall. Search for the amniotic sac and placenta. Open the sac through a thin area where there is no placenta. If necessary, remove any bowel and omentum from the front of the sac. Dissect away the sac and remove the foetus.

If the placenta is not fixed to the bowel or some other essential structure, and you think you could shell it out quite easily, then remove it. But if it is fixed to the bowel, to the mesentery, to the parietal peritoneum over a large area, or some other vital structure, leave it. Disturbing it will cause severe bleeding.

If the gestation has arisen in a tube and/or ovary, and the sac has a vascular pedicle which you can clamp and divide, remove the sac completely with the placenta.

The placenta may have started to separate and cause bleeding, giving you no choice but to remove the rest of the placenta as gently as possible. If you have adequate blood available for transfusion, removing the placenta will reduce the risk of post-operative adhesions, which may be even more difficult to deal with later.

CAUTION!

(1) *Don't dissect in the region of the placenta.* This may cause catastrophic bleeding, especially if the foetus is still alive.

(2) *Take care not to injure the mesentery, or its blood supply:* part of the bowel may necrose, causing fatal peritonitis.

(3) *Take special care not to injure the large bowel!*

If you decide to leave the placenta, cut and tie the cord as short as possible and expel from it as much blood as possible. Then remove as much of the sac as you safely can.

(4) *Don't insert a drain:* the placenta will be absorbed anyway, and a drain might only introduce infection. Close the abdomen in standard fashion (11.8).

If you cannot control bleeding, pack the bleeding area tightly, taking care *not to include bowel loops in your pack.* Close the abdomen with one end of the pack sticking out of a separate opening lateral to the rectus muscle. It is often feasible to pull out the pack 12-24h later by injecting LA around the opening and gently pulling on the pack. If bowel is adherent or does come out, or there is evidence of further bleeding, proceed to a formal re-laparotomy.

20.10 Antepartum haemorrhage (APH)

In about 50% of patients who bleed antenatally, you never find a cause. Most often the bleeding is not severe and stops spontaneously. However, sudden severe bleeding may suddenly ensue without warning, especially if the cause is due to either (1) placenta praevia, or (2) placental abruption.

It is therefore very important to try to make the diagnosis of these potentially fatal conditions; much the best way is by use of ultrasound (38.2,3), which you should do your utmost to acquire. Otherwise you might have to make the diagnosis by a gentle vaginal examination, which itself may precipitate a massive haemorrhage. You therefore must *only do this using a speculum, never your fingers, unless you are in the operating theatre* with equipment prepared for transfusion and emergency Caesarean section. Alert your anaesthetist. Make sure you monitor your patient carefully! Act always on the side of caution.

BLEEDING AFTER THE 28TH WEEK

Admit the patient, keep her in bed, and monitor her carefully. Record the amount of all the blood lost. Look at its texture: is it mixed with mucus, is it bright red? Measure and record the pulse, blood pressure, and Hb.

Decide on the probable duration of gestation (*don't use the surfactant test* (22.1), because the amniocentesis needle may go through a low-lying placenta).

Record the foetal position, presentation, and lie. Feel for rhythmical contractions. Listen to the foetal heart. *Don't do a vaginal examination with your fingers!*

CAUTION! If you find an abnormal lie, *don't try to correct it.*

She may be:

(1) An emergency with severe bleeding ($\geq 500\text{ml}$), in shock, or in labour.

(2) A non-emergency with none of these things.

Ask yourself 3 questions:

(1) Has the uterus ruptured (21.17) due to obstructed labour?

(2) Has the scar from a previous Caesarean section (21.14) ruptured? Both these are uncommon causes of vaginal bleeding before labour and even then most bleeding will be intra-abdominal.

(3) How likely is she to have placenta praevia?

Suggesting placenta praevia:

(1) Painless bright red bleeding which may be mild to severe, especially after 32wks, and tends to stop and start again.

(2) A soft non-tender uterus that relaxes between contractions, *if there are any contractions at all.*

(3) An audible foetal heart.

(4) Shock commensurate with the measured blood loss.

(5) A high-lying head or a transverse lie.

N.B. You can only exclude placenta praevia if the head or the breech are deeply engaged in the pelvis.

Suggesting placental abruption:

(1) Painful bleeding which is slight to moderate and which does not look very fresh.

(2) The presenting part is not higher than you expect, and the lie is usually stable.

(3) A tense, tender, woody-hard uterus with poorly defined foetal parts.

(4) Absent foetal heart and movements.

(5) Shock which is worse than expected from the visible blood lost.

(6) Constant lower abdominal pain.

CAUTION! *Beware of diagnosing abruption in a patient who has had a previous Caesarean section;* rupture of the uterus is much more likely, even if not in labour.

N.B. A placenta praevia is somewhat more likely if there is a previous Caesarean scar because the placenta can grow in the scar. Such a bleed would usually be painless, as opposed to the bleeding related to abruption or rupture.

Suggesting insignificant vaginal causes:

(1) There is $< 10\text{ml}$ of blood lost.

(2) Bleeding occurs with contractions.

(3) There is no pain between contractions.

(4) Blood is usually mixed with mucus.

(5) Bleeding stops when the membranes rupture.

Suggesting uterine rupture (21.17):

ULTRASOUND (38.3). Look for the position of the placenta.

If there is no obvious abruption, or you don't have an ultrasound (or you suspect the placenta is hidden in the shadow of the foetal head), and the patient is not in labour,

you may perform a very careful speculum examination to see where the blood is coming from, and to diagnose the incidental causes of bleeding.

N.B. It is not easy, and can precipitate bleeding if you do it roughly. Even probing to find the cervix can cause bleeding if there is a placenta praevia.

Resuscitation may need to start immediately. Cross-match blood and make sure that there are always 2 units ready.

Speculum examination

You should know how long it will take you to prepare for transfusion and Caesarean section, before you do this!

Pass a sterile speculum if the membranes have ruptured. Use gentle speculum examination only.

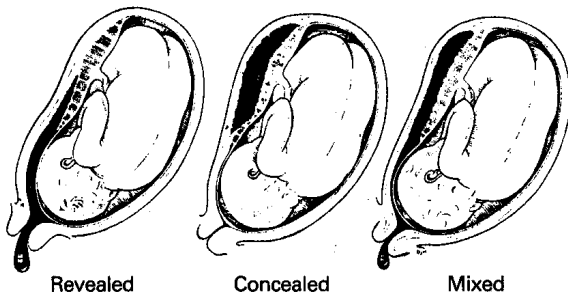
CAUTION! Never perform a vaginal examination with your fingers except in theatre with preparations for a Caesarean section ready: if there is a placenta praevia, you may cause massive bleeding.

Look for:

- (1) Cervical erosions.
- (2) Cervical polyps.
- (3) Vaginitis.
- (4) Carcinoma of the cervix.
- (5) Varicose veins (rare).
- (6) Placenta in the upper endocervix.
- (7) The presenting part, *i.e.* a hairy vertex or a buttock!

ANTEPARTUM BLEEDING

Types of abruption



Types of placenta praevia

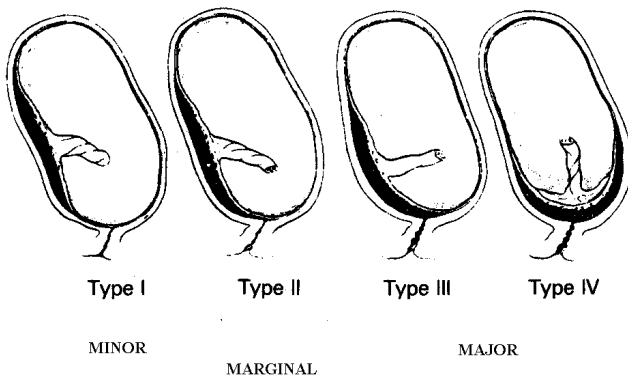


Fig. 20-9 ANTEPARTUM HAEMORRHAGE. The 3 types of abruption, and the 4 types of placenta praevia.

From Moir JC (ed) Munro Kerr's Operative obstetrics Ballière Tindall, 7th ed 1964 Figs 30.1,2 with kind permission.

If there is a placenta praevia, you may see a normal cervix, a haemorrhagic mucous plug, a blood clot in the external os, active bleeding from the cervix, or an open cervix with placental tissue prolapsing out of it. Ask an assistant to press the foetal head into the brim of the pelvis.

Explore the lateral fornices of the vagina very gently with your finger; determine whether there is thickening between the presenting part and the lower uterine segment. If so, ask yourself if this is just on one side of the os (marginal placenta praevia), or all around it (major placenta praevia).

N.B. If you mistakenly do a digital examination inside the os, there will be a boggy feeling of placenta in front of the foetal presenting part, followed often by torrential bleeding as you remove your finger!

If there is an abruption, you will see blood coming out of the cervix. If you mistakenly do a digital examination, you won't be able to feel the placenta.

N.B Finding an incidental cause (such as a small polyp) does not mean there cannot also be a placenta praevia, *so beware!* Does the incidental cause look as if it could have caused the bleeding observed? It is wise to assume there might be a placenta praevia until proved otherwise.

If there is trichomoniasis, you will see a red vaginal wall and a pale green frothy discharge. Treat this with metronidazole, and aim to treat any sexual partners also.

If there is cervical ectopy, they will usually disappear after delivery and need no specific treatment. Treat any associated trichomoniasis or chlamydia. Ectopy seldom causes more than staining of the underwear or spotting, which may be related to sexual intercourse.

If there are vulval varicosities, local pressure will probably stop bleeding. If necessary, insert a suture. Varicosities sometimes occur at the vulva or introitus of older multipara.

If there is a cervical polyp, don't twist it off during pregnancy: it may bleed severely. Leave it alone, and deal with it after delivery (23-8).

If there is carcinoma of the cervix, found in the presence of labour, perform a Caesarean section. If the lesion is confined to the cervix, proceed to a hysterectomy if you have the skill.

If there are enormous condylomata acuminata, they can easily bleed, especially with HIV-related thrombocytopenia, *but are not an indication for Caesarean section*. You should start ARV therapy (5.8) before resorting to excision of the warts (5.6).

20.11 Placenta praevia

Placenta praevia describes a low insertion of the placenta in the uterus, alongside or in front of the foetal presenting part. Its incidence is increased where there has been previous uterine injury, including curettage, Caesarean section, other uterine surgery, or termination of pregnancy. It is thus more common in multipara, in twin pregnancy, and with increasing age.

The placenta is more likely to be inserted in a scarred part of the uterus and often the placenta is then also abnormally adherent (*placenta accreta*, *incretta* or *percreta*); in these cases a delivery without an experienced operator and blood available for transfusion might easily result in a disaster. You should therefore inform a woman, if there is placenta attached to a scar, that a hysterectomy might prove necessary.

The chance of an abnormally adherent placenta is increased when there is a short interval between a Caesarean section and the next pregnancy. Placental migration from the lower segment occurs from about 15wks onwards while the lower segment of the uterus unfolds; this might cause some bleeding. Migration is less likely to happen if the placenta is posterior or over a Caesarean section scar.

Placenta praevia exists when the placenta is inserted wholly or in part into the lower segment of the uterus. If it lies over the internal cervical os, it is considered a major placenta praevia; if not, a minor placenta praevia (20-9). Vaginal ultrasound is somewhat more accurate, less inclined to over-diagnose placenta praevia than abdominal ultrasound (38.3), but requires extra equipment.

Most patients with placenta praevia bleed before labour starts. If you make the diagnosis of a major placenta praevia, admit the woman concerned from 32wks onwards, or much earlier if there is not always fast reliable transport available or if there is no constant companion present. The first bleed may be slight, and subsequent ones increasingly severe, as the area of placental separation increases. Most bleeding is painless and with bright red blood.

If you have no ultrasound to confirm the position of the placenta, to find out from where bleeding is coming, examine the patient in theatre, and get fully prepared for an elective or emergency delivery. The correct timing of this is vital. You can do it early, soon after she presents. Or, if she is not bleeding severely, you can postpone it, and manage her non-operatively in hospital until she reaches 36wks, by which time the chances of foetal survival are almost as good as they would be at term. Most of your patients with placenta praevia will present before the 36th week, so non-operative treatment will improve your perinatal mortality, but it is only justified if Caesarean section is instantly available 24h/day, 7days/wk!

Unfortunately, a major placenta praevia often does not bleed until labour starts. Even so, a high presenting part, or a persistent transverse lie, should lead you to suspect it before. Placenta praevia also increases the risk of puerperal

sepsis, and of postpartum haemorrhage, because the lower segment, to which the placenta was attached, contracts less well after delivery.

Management of placenta praevia

Once you have made the diagnosis, you must balance the risks of continuing the pregnancy with delivering the foetus.

At 32wks with minimal bleeding, the balance is in favour of bed rest and careful monitoring (with blood cross-matched and available if necessary). At 36wks you should perform a Caesarean section. Start iron supplements from the time of diagnosis to optimize the Hb level.

N.B. Don't be tempted to do a cerclage or use tocolysis if there are also contractions.

If labour has started, and you cannot immediately perform a Caesarean section, provided the cervix is fully dilated or almost so, and the membranes are presenting at the os, you may be able to arrest bleeding in a multipara with a minor or marginal anteriorly lying placenta praevia by rupturing the membranes, which often results in bringing the presenting part down to press against the placenta. *However, remember delivery will take longer than a Caesarean section, and may compromise foetal viability.* It is of course justified if the foetus has already died. For a posteriorly lying placenta praevia, this will work only if the foetus is very small.

N.B. Don't try this if the os is not dilated >5cm, or with a major placenta praevia.

If the foetus has died, and the placenta is partially prolapsing through the nearly fully dilated cervix, remove the placenta or go past or through it and deliver the foetus by leg traction. The foetal buttock will press on the placenta and reduce bleeding whilst the cervix dilates fully. This may be life-saving for the mother, especially when there is a breech presentation. Otherwise you may be able to insert a hand into the uterus, and turn the foetus round (internal version, 22-8) so that the buttock presses on the placenta.

20.12 Placental abruption

The concordance between clinical and pathologic criteria for the diagnosis of abruption is poor. This should include evidence of retroplacental clots, or vaginal bleeding accompanied by a worrying foetal status or a hypertonic uterus, together with ultrasound visualization of the abruption.

'PLACENTAL ABRUPTION' AFTER A PREVIOUS CAESAREAN SECTION IS ACTUALLY A UTERINE RUPTURE

Abruptio (20-9) is not common, and is not easy to treat. The longer you leave a patient undelivered, the worse the prognosis. If there is severe abruption, there is at least a 25% chance of disseminated intravascular coagulation (DIC, 3.5), unless you intervene before 48h. So aim for a vaginal delivery if the foetus has died as soon as you make the diagnosis.

If there is severe abruption, DIC will make it dangerous. The foetus is often dead, and is usually growth-retarded and premature, so cephalopelvic disproportion is seldom a problem.

Here is a rule of thumb with abruption and a dead foetus with a longitudinal lie: if you would be able to do a Caesarean section, *you don't need to do it* (because the situation is not desperate, and clotting factors are still adequate); if you do need to do a Caesarean section (because bleeding is severe), *you can't do it* (because there are almost no clotting factors left in the patient's blood and your incision will cause further bleeding).

The principles of management are therefore:

- (1) Replacement of blood loss.
- (2) Delivery without delay, preferably vaginal.
- (3) Prevention of: postpartum haemorrhage, DIC, and renal failure.

Management of severe abruption

Start a rapid IV infusion of 0.9% saline, or Ringer's lactate, through a wide-bore cannula. Take blood for clotting time and an emergency cross-match. If the systolic BP is <80mm Hg, infuse 1.5-2L of fluid fast; if the BP is 80-100mm Hg, infuse 1L fast. Continue infusion to try to maintain the BP at 100mm Hg.

Start whole blood transfusion as soon as it is available. If you cannot maintain the BP, use un-cross-matched O-ve or even, *in extremis*, O+ve blood. If you have fresh frozen plasma (FFP), infuse 2-4 units rapidly, and add fibrinogen 4g twice, if available. Be aware that:

- (1) Heparin is contraindicated.
- (2) *Don't use plasma expanders, such as dextran*, because these may precipitate further DIC.
- (3) *Don't try to insert a central venous line*: bleeding from puncture of a major vein may, in combination with DIC, be fatal.

Rupture the membranes. Insert a urinary catheter and monitor the urinary output, which should be >50ml/hr. Start a partogram and continue careful monitoring. Stimulate labour with an oxytocin infusion, *unless there is a previous Caesarean scar, or the patient is para ≥ 2* . Labour is usually fast. Try to effect delivery in 6-8h. Once in the active phase, labour should progress rapidly.

If the cervix is unripe, insert 200 μ g misoprostol rectally (*not vaginally as it may be washed out*) but then *don't use oxytocin within 3h of misoprostol*.

If the foetus is already dead, which is often the case, expedite delivery by attaching clamps on its head, or inserting a Foley catheter in the foetal rectum. Inflate the balloon with 50ml water in the case of the breech presentation, and apply steady traction with the help of a weight and rope (21.8). This has saved many a mother's life, because pressure of the presenting part speeds up cervical dilation and so delivery.

N.B. The tense, tender, woody-hard uterus will make contractions difficult to monitor.

If the patient is obese or a multipara, with an unfavourable cervix, she is particularly at risk; assess the progress of labour by careful vaginal examination.

The 2nd stage is usually rapid: the dead baby, the placenta, and clot may however all be expelled suddenly, and tear the vagina, perineum, or cervix. *These tears may bleed severely in the presence of DIC*. Try to prevent this by controlled expulsion of the head. If bleeding does occur, correct the clotting disorder with whole blood, FFP and fibrinogen, and pack the vagina (22-10C). Repair the lacerations (21.15,16) and remove the packs 4h later.

After delivery of the placenta, there are often problems, because of a clotting defect, and because there may be *an atonic uterus*. There is a serious risk of postpartum haemorrhage, so encourage uterine contraction immediately after delivery, and administer IV ergometrine with oxytocin ('syntometrine'). Add 15U oxytocin in 500ml of Ringer's lactate or saline, and infuse this fast to keep the uterus well contracted. Add also 800 μ g misoprostol rectally. Massaging the uterus and expressing the clots at this stage are essential. If bleeding continues, compress the uterus bimanually (22-10A).

Don't leave the patient alone trusting that the medication will do its work. She needs continuous hands-on attention for at least 1h after delivery. A short period of inattention might result in relaxation of the uterus and the loss of a critical quantity of clotting factors.

N.B. Avoid a 'trial of a Caesarean scar' (21.14) when there is an abruption, because you will not be able to recognize or exclude uterine rupture (21.17).

INDICATIONS FOR CAESAREAN SECTION include *only*:

- (1) A previously scarred uterus.
- (2) Failure to progress, despite artificial rupture of her membranes, oxytocin and traction.
- (3) A patient who is bleeding to death *with normal clotting time*. Caesarean section is a desperate step and may save her life.
- (4) A live foetus >2kg, with signs of foetal distress.
- (5) The transverse lie of a foetus at term for whom vaginal delivery is impossible.

N.B. If you decide on a Caesarean section, do it immediately! *Don't delay till clotting factors are lost!*

If bleeding does not stop after emptying the uterus, deliver it out of the abdominal wound and administer oxytocin and misoprostol. If bleeding continues, put a tourniquet round the lower segment using a rubber urinary catheter (22.11). This may give you time to replenish the circulation, organize blood transfusion, and for the clotting factors to recover.

If bleeding continues, apply a B-Lynch suture (22-13) and if necessary ligate the uterine arteries (22-14) or proceed to hysterectomy (21.17).