23 Gynaecology

23.1 Pelvic inflammatory disease (PID)

PID will probably be one of the commonest gynaecological diseases you will see, and may account for a ⅓ of your surgical admissions. It describes a syndrome of pelvic infection as seen in women. If it is common in your area, many of the women of childbearing age, who are *not* pregnant and who present with abdominal pain may have it. You may admit 2-3 every week, and treat ten times as many as outpatients. The numbers of these patients, their frequently long stays in hospital, the surgery they need, the complications that follow and their mortality, make PID a major public health problem.

Infection elsewhere in the abdominal cavity usually originates in the bowel, but infection in a woman's pelvis usually starts in the genital tract. With the rare exception of tuberculosis, it always ascends from the vagina and cervix.

PID is thus only a disease of women. It is even more common and severe with HIV disease, although it may appear less impressive because of the body's failure to mount a counter-attack.

Be very careful with the diagnosis of PID in pregnancy. You may only make this diagnosis if you have actually seen it during laparoscopy or laparotomy. Otherwise it is far more likely that the diagnosis is something else, *e.g.* torsion of adnexae/fibroid/bowel, an ectopic gestation, an extra-uterine pregnancy, malaria, septic miscarriage, appendicitis, uterine rupture, red degeneration of a fibroid, typhoid, urinary tract infection or obstruction.

Infection spreads from the vagina to cause:
(1) cervicitis.
(2) endometritis.
(3) salpingitis or pyo- or hydro-salpinx.
(4) salpingo-oophoritis or a tubo-ovarian abscess.
(5) pelvic peritonitis or pelvic abscess.
(6) generalized peritonitis or peritoneal abscesses.

Infection may also spread through the uterine wall into the broad ligaments to cause metritis, pelvic cellulitis (parametritis), a broad ligament abscess, or septic thrombophlebitis of the ovarian or the uterine veins. This is very serious and causes septicaemia with few local signs. This occurs mostly after a pregnancy and is then called either puerperal sepsis (22.14) or post-abortal sepsis. This is by definition *not* called PID although the first-line treatment is the same.

If antibiotics do not help in an infection related to pregnancy, a hysterectomy may be necessary to save a patient's life. Hysterectomy is not helpful in severe PID, but of course if both tubes are blocked or need removal because of pus, the result is just the same: infertility.

Both acute and chronic PID may cause an inflammatory mass involving the inflamed tubes, the ovaries, the uterus, the omentum, and loops of bowel. Between all these there are collections of pus, and in chronic cases fluid-filled collections between peritoneal surfaces (pseudocysts). PID is often but not always bilateral.

It is convenient to discuss separately:
(1) Infection unrelated to pregnancy, that is PID which does not obviously follow miscarriage or delivery. Because PID typically follows a period, it is sometimes called 'postmenstrual PID'. It is one of the most serious effects of sexually transmitted disease in women.
(2) Post-abortal infection (septic miscarriage: 23.2).
(3) Infected obstructed labour (21.5).
(4) Puerperal sepsis (22.14).
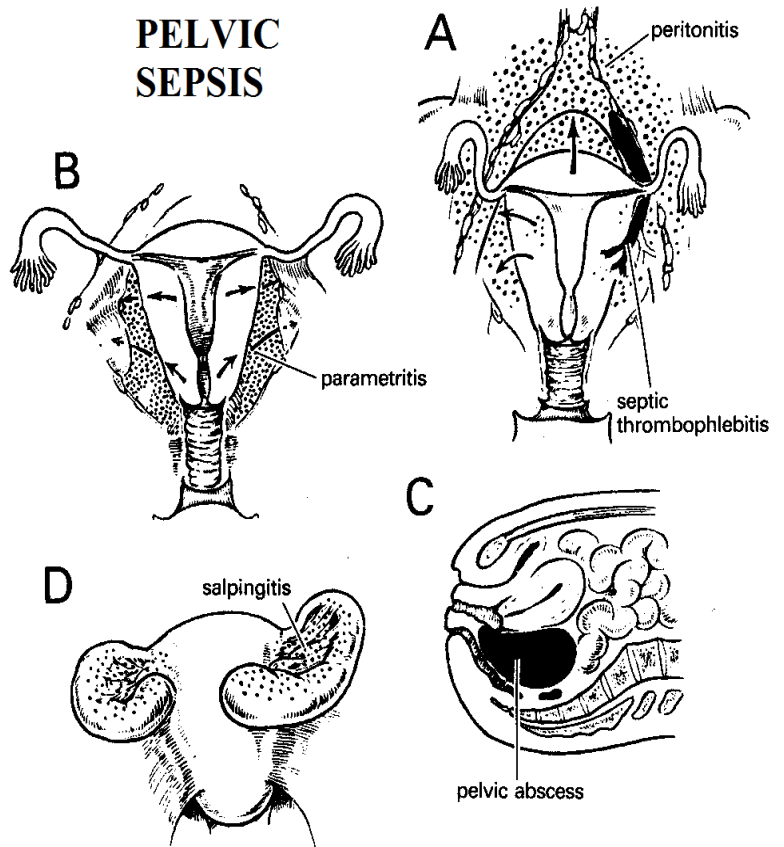(5) Sepsis after Caesarean Section (21.13)

Fig. 23-1 PELVIC SEPSIS. A, infection spreading from the uterus to cause peritonitis. Infection can also spread as an infected thrombus (thrombophlebitis). B, infection of the connective tissue beside the uterus (parametritis). Infection may spread into the broad ligament, round the vagina or uterus, or up into the loin. C, collection of pelvic pus. D, salpingitis. *After Garrey MM. Obstetrics Illustrated Churchill Livingstone 1974, p.319-20 with kind permission.*

A patient with 'postmenstrual PID' is not pregnant; she has suffered no birth trauma and there are no infected products of conception. She may however have an intra-uterine device (IUD) in the uterus, which increases the risk of infection, but not as seriously as was previously supposed. PID is seldom fatal, and never causes septic thrombophlebitis. The pregnancy-related infections are all dangerous, and can kill. Post-abortal peritonitis is particularly deadly and has a mortality of 50%.

The organisms (*gonococci, mycoplasma, chlamydia*) responsible for PID may be sexually transmitted. These can pave the way for other organisms, especially anaerobes, and through tubal damage allow infestation by other organisms which may normally live in the vagina; *viz.* coliforms, various anaerobes, especially *bacteroides*, and rarely *actinomyces*. The latter organisms (and sometimes even the former) live harmlessly in the vagina and cervix, and only cause disease when the barriers to spread are removed by:
(1) Miscarriage or delivery.
(2) Menstruation.
(3) After D&C, IUD insertion, or hysterosalpingogram.
(4) HIV disease.

Many *gonococci*, and typically all *chlamydia* and *mycoplasma* are sensitive to tetracycline. But when infection follows pregnancy or a miscarriage, a mixture of organisms is responsible, including anaerobes, for which the patient needs metronidazole with chloramphenicol. By the time many patients present, secondary infection is likely, whatever the primary cause of the infection.

The clinical manifestations of pelvic sepsis are wide. They range from an otherwise symptomless infertility caused by blocked tubes, to generalized peritonitis, septicaemia and septic shock, with everything between these two extremes. Like a fire, PID can be of any degree of severity, from smouldering to fulminating. Also, like a fire, it can die down, only to light up again later.

The typical acute presentation is of fever, bilateral lower abdominal pain, and tenderness, but seldom severe rigidity. There is also usually urinary frequency, dyspareunia, irregular or prolonged periods, and also a vaginal discharge. The patient may not mention all these symptoms, especially if she is a young unmarried girl.

The symptoms are usually mild, but can be severe with signs of peritonitis and occasionally septic shock.

Acute cases are often atypical, either because the disease is mild, or because it has been modified by previous treatment or HIV disease.

On pelvic examination, there is usually acute tenderness especially with moving the cervix side-to-side (cervical excitation). The pain may be so intense that you have to repeat the examination after you have administered an analgesic. There may also be a lower abdominal mass, vomiting, fever and a very high ESR.

Then you might find a minimally tender swelling in the left or right iliac fossa from which you can aspirate greenish pus (which typically does not yield a responsible organism on culture).

The typical chronic presentation includes infertility, and pelvic pain, often with dyspareunia, heavy and irregular menses, dysmenorrhoea, perhaps a chronic vaginal discharge, poor general health, and much misery. The diagnosis may be difficult; the differential diagnoses includes endometriosis and psychosomatic pain.

ULTRASOUND will show thickened adnexae, uterine enlargement and free fluid in the pelvis, especially the pouch of Douglas, and will reliably confirm the diagnosis (38.2J).

You can usually treat PID non-operatively, but remove an IUD if present. *Make sure she can then get an alternative contraceptive.* Condoms provide some protection against sexually-transmitted infections (STI) and hence PID; depo-provera, implants and the contraceptive pill do not prevent STI but often prevent PID, which is a complication of STI and hence reduce infertility.

Occasionally, you will need to drain pus. Unfortunately, once PID has become chronic, there may be recurrent pain. The pain threshold is likely to be low if there is also infertility. *Don't operate on chronic PID*, because once it has been present for >4wks, the pelvic organs will be so densely stuck to one another that freeing them will be difficult and dangerous: *you can easily injure the bowel.* If surgery is indicated, be conservative. Leave the pelvic organs intact unless there is a tubo-ovarian abscess. Removing this can be difficult, so open it and drain it. If you leave the uterus and some ovarian tissue intact, menstruation will continue. Otherwise (if the ovaries have to be removed) advise hormone supplements for younger women (in the form of the contraceptive pill) till the age of 45yrs, but *beware: oestrogen therapy increases the risk of breast and uterine cancer.*
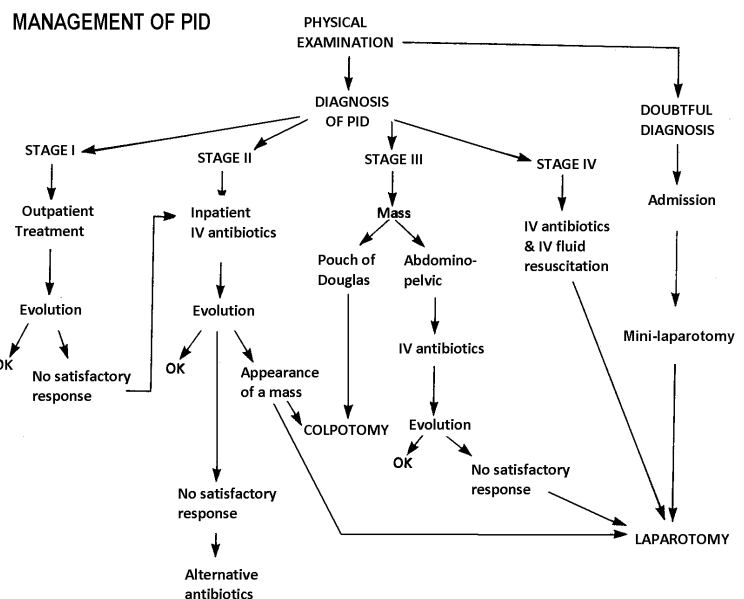

Fig. 23-2 A PLAN FOR MANAGING PID.
Stage I: there is no peritoneal irritation, and no pelvic mass.
Stage II: there is peritonitis as shown by bilateral lower quadrant rebound tenderness. Stage III: there is a mass in the adnexa (tubo-ovarian abscess) or pouch of Douglas. Stage IV: there is generalized peritonitis. *After De Mulder X, Pelvic inflammatory disease in Zimbabwe, Tropical Doctor 1988;2:85.*

A. ACUTE PID
DIFFERENTIAL DIAGNOSIS.
Acute PID has mostly to be distinguished from other causes of acute lower abdominal pain (10.1), including appendicitis (14.1), mesenteric adenitis and a urinary infection. The main gynaecological differential diagnosis is a ruptured ectopic gestation (20.6), torsion of an ovarian cyst or uterine fibroid, or a corpus luteum haemorrhage. *Fixity of the pelvic organs on vaginal examination is no help in distinguishing* between PID, tuberculosis, and endometriosis, because all have these features.

Suggesting a ruptured ectopic gestation (20.6):
(1) Significant anaemia or circulatory shock.
(2) One or more periods missed by more than a few days, often followed by a small loss of dark or brownish blood vaginally.
(3) More tender on one side of the vagina than the other.
(4) A mass on one side or in the pouch of Douglas, which is not growing.
(5) No fever.

N.B. A -ve monoclonal urine pregnancy test excludes an ectopic gestation.

N.B. If an ectopic gestation is suspected, *do not perform a vaginal examination if there is no immediate access to a theatre*. Numerous are the tales of patients collapsing in shock because a vaginal examination re-ruptured the ectopic.

An elegant diagnostic tool is peritoneal lavage: run 200ml of warm saline, via a drip system, into the lower abdomen. Then ask the patient roll herself a few times from left to right. Then put the fluid bag on the floor. Observe fluid running back into the bag: you may need to manipulate the cannula a little to achieve a nice flow. If the fluid is clear, there is most probably no acutely bleeding ruptured ectopic gestation.

Suggesting a twisted ovarian cyst or uterine fibroid:
very acute colicky lower abdominal pain, sometimes with vomiting; a mass with no fever initially.

CAUTION!
(1) The amount of vaginal discharge is not proportional to the severity of PID. *Candida* and *Trichomonas* cause a profuse discharge, but do not cause PID. *Gonococci* and *Chlamydia* cause a less obvious mucopurulent discharge.
(2) Expect the diagnosis of PID to be wrong in about 20% of patients but examine the partner if possible: if he has a urethral discharge, PID is virtually certain.

GRACE (17yrs) was admitted with vaginal bleeding and fever, having attempted to induce an abortion on herself at 16wks. The cervix was wide open, the products of conception were visible, and there was a foul discharge. She was treated with antibiotics for 24hrs and then the uterus was evacuated. A few days later she was very ill with a distended abdomen. 3l of thin pus were washed out of the abdominal cavity and tetracycline was instilled abdominally. There was no perforation of the uterus. She was treated with more antibiotics, and intravenous fluids, and high calorie liquid fluid was given orally in the hope to prevent severe acute malnutrition affecting her immune system. After 2wks, she was still febrile and very ill. A 2nd laparatomy was done to drain residual abscesses. Chronic sores developed at the sites of the drainage tubes, which continued to discharge pus. She did not eat well, and vomited from episodes of subacute obstruction, but was not well enough for a 3rd laparotomy. Three months after admission she died extremely wasted. She did *not* have HIV disease.
LESSONS (1) This is a typical history; any septic abortion, particularly an unskilfully induced one, is dangerous. (2) Re-laparotomy should have been done earlier at 48hrs and the abdomen left open. Although it is dramatic, this should probably be combined with a hysterectomy to save her life if the first operation does not result in an obvious improvement. An off-pink flaccid non-elastic feeling uterus will in this situation probably maintain its sepsis. Hysterectomy is also needed in case of post-abortal tetanus. (3) Septic retained products of conception are not reached by antibiotics and are an ideal meal for micro-organisms. IV antibiotics followed as soon as possible by an evacuation is the correct treatment: no 24hr delay is justified.

MANAGEMENT.
You can usually treat PID as an outpatient if there is no peritoneal irritation and no pelvic mass (stage I). Otherwise arrange admission if:
(1) There is: lower quadrant peritoneal irritation and/or an IUD *in situ*, (stage II).
(2) There is an adnexal mass (stage III).
(3) There is septic shock (stage IV).
(4) You cannot exclude an acute surgical condition, especially an ectopic gestation.
(5) Outpatient treatment has failed.
(6) There is poor patient compliance.

ANTIBIOTICS.
N.B. Cervical smears and cultures are of little help in choosing an antibiotic, because the organisms in the cervix may not be those which are causing the infection elsewhere. *The absence of gonococci in a cervical smear does not exclude gonococcal infection*. Usually, you will need to treat blindly with a broad-spectrum antibiotic.
If possible, follow up and treat any sexual partners.
N.B. The regional university, preferably with an adequate laboratory, should perform culture and sensitivity testing of pus obtained from the abdominal cavity of a number of PID's every few years and inform you about the best antibiotics to use (initially, blindly) in your region.

For Stage I, use tetracycline 500mg qid and metronidazole 400mg tid, for 7-10days (2.8). Doxycycline 100mg bd is better than tetracycline but is more expensive. Insist on completion of the course. Also, use an analgesic, advise abstinence from sexual intercourse until symptoms have resolved, and until all sexual partners have been treated.
If there is no response (no better, rising temperature, more pain), check:
(1) Is the diagnosis correct?
(2) Is there a mass or collection of pus somewhere which needs draining?
(3) Are you using the right antibiotic at the right dose with the right frequency for at least 3days?
(4) Is there an IUD which has not been removed?
Otherwise, proceed to Stage II.

For Stage II, use broad-spectrum IV antibiotics:
(1) benzylpenicillin 1·2g qid,
(2) chloramphenicol 1g stat followed by 500mg qid, and/or depending on severity,
(3) gentamicin 240mg od, plus
(4) metronidazole 500mg tid rectally.

If there is no response or a mass develops, (STAGE III), check whether the mass is in the pouch of Douglas, or if it is extending from the pelvis into the abdomen.
N.B. Many patients with acute PID develop a mass of matted viscera (distinct from an abscess which needs drainage). Check with an ultrasound (38.2K). This may take 6wks to resolve, but *there is no point in continuing antibiotics for more than 2wks*. If the illness persists (raised ESR with a spiking temperature after 2wks), there probably is an abscess which needs draining vaginally (colpotomy, 10.3) or suprapubically.

If you are not sure of the diagnosis, which may be beyond Stage II, perform a MINI-LAPAROTOMY to examine the pelvic organs, looking for red, sticky, and oedematous tubes. *This is safer than laparoscopy, which may result in bowel perforation if there are dense adhesions*, and the incision can be extended to a formal laparotomy if required.

LAPAROTOMY FOR ACUTE PID (GRADE 3.2)
INDICATIONS.
(1) After 2wks of treatment with IV antibiotics for Stage II PID without resolution.
(2) Failure of 48hr IV antibiotic treatment for post-abortal or post-partum sepsis. Of course if there is a hole in the uterus with peritonitis present, the operation cannot be postponed that long. Make sure the uterus is empty.
(3) Generalized peritonitis due to rupture of a tubo-ovarian abscess. This may be spontaneous or it may follow a vaginal or rectal examination.
(4) Septic shock *after adequate IV fluid resuscitation*.
(5) The diagnosis is in doubt, and there is a possibility that there might be an ectopic gestation or appendicitis, for example: start with a mini-laparotomy.

N.B. This is not an easy operation and has a significant mortality.

PREPARATION. Resuscitate with IV fluids: you may need to infuse 3-4l saline or more during the first 24hrs. There may be considerable bleeding from the raw surfaces that will form when you free the adhesions between the loops of the bowel, so have 2 units of blood cross-matched. If the patient is seriously ill, there is danger of renal failure, so insert an indwelling catheter and monitor the urine output. Pass a nasogastric tube. Start antibiotics before the operation, if this has not already been done. Discuss the possibility of salpingectomy and/or hysterectomy, and get consent.

INCISION. Make a lower midline incision (11.2, 11-1) and extend it above the umbilicus if necessary. Be prepared on occasion to find some other quite unexpected condition. *Do not use a Pfannenstiel incision.*

If the infection is limited to the pelvis, examine the upper abdominal cavity before you explore the pelvis and disturb the adhesions, which are limiting the spread of infection.
Examine the subphrenic and subhepatic spaces, and the paracolic gutters; look for pus between the loops of the small bowel as far as you can reach them. If you find pus, wash it out with warm fluid. If you find dense adhesions, separate them very gently (12-8). If you don't find pus in the upper abdomen, carefully protect the upper uninfected part of the abdominal cavity with large abdominal packs. Slowly and methodically divide the adhesions between the bowel and the uterus, and look for pus. Divide the adhesions round the tubes and ovaries, and release the pus you find there. Try to get right down into the pouch of Douglas.

There is usually no need to remove the tubes or ovaries, however diseased they may look. The tubes have a double blood supply which prevents them becoming gangrenous: anyway, *you need consent for sterilization in order to remove both tubes!*
Even if there is a ruptured tubo-ovarian abscess, leave the Fallopian tube.

When you find the uterine fundus, push your fingers down behind it, between the tubes, which will almost meet in the middle. You need not fear perforating the bowel here.

Gradually work your fingers down below the tubes. Free them from the bowel from below upwards. Remember the anatomy. Both tubes will be stuck down behind the uterus, over the top of each ovary. The rectum and colon will be adherent from below upwards to the back of the uterus, and then to both the tubes. Loops of small bowel and omentum will have stuck to them on top. If you can find the fundus, you will know where you are.

Don't panic when you find a mass of adherent bowel and omentum. It will always come clear in the end. First get down to the fundus by carefully easing off the bowel and omentum. *Do not use force!* Divide all adhesions and release all the pockets of pus.
Do not be tempted to remove a normal appendix.

CAUTION! *Never pull the bowel*. Avoid tearing it by going slowly, and squeezing and pinching the plane of cleavage between your fingers (12.6). Cut dense adhesions with scissors.

If there is generalized peritonitis (10.1), suck away as much pus as you can, then suck out the paracolic gutters. Wash with copious amounts of warm fluid. Make sure you release any collections of pus under the abdominal wall, between the large bowel and the abdominal wall, and under the diaphragm and the liver (subphrenic & subhepatic spaces). Bring out the whole small bowel over its full length in stages. Break down adhesions between loops of bowel, by careful blunt dissection, to release the many collections you will find there. Cover the bowel with moist warm cloths. Then go to the pelvis, and proceed as above for a localized pelvic infection.

LAVAGE depends on the extent of the sepsis (10.1):
If the pus is localized to the pelvis, wash it out of the pelvis only, before you remove the packs protecting the rest of the abdominal cavity.
If there is generalized peritonitis, wash out the whole abdominal cavity with warm fluid.

CLOSURE. Close the abdomen as a single layer, taking care to pick up the peritoneum and posterior rectus sheath which may be retracted, and leave the skin open for secondary closure if there is a great deal of pus (11.8). *Do not insert tension sutures.*

DIFFICULTIES WITH ACUTE PID

Be prepared for small bowel fistulae (11.15), and a burst abdomen (11.14), especially if abdominal distension persists for some time postoperatively.

If there is a septic miscarriage, you will have to make the difficult decision as to whether or not to perform a hysterectomy. Assess the state of the uterus and adnexa perform a hysterectomy if:
(1) the uterus is perforated.
(2) the patient is no longer young and has had children (*though even if you leave the uterus she will probably be infertile).*
(3) you are not so experienced (a subtotal hysterectomy will be enough).
Perform a salpingo-oophorectomy (*avoid a hysterectomy*) if generalized peritonitis seems to originate in an abscess in one of the adnexa only.

If there is a mass and you are not sure if there is a ruptured ectopic gestation or pelvic abscess, and you have no reliable pregnancy test, perform a culdocentesis (20-6) preferably with ultrasound guidance, under GA. If you find pus, drain it through the vagina. If you find blood which fails to clot, or liquor, perform a laparotomy (20.6).

If there is an IUD *in situ,* and fever with great tenderness, infuse IV antibiotics and remove the IUD. Otherwise, if the fever is not high and the response to IV antibiotics good, you can leave the IUD *in situ.*

   N.B. Sometimes PID is related to the insertion of an IUD while there is an existing chlamydia or gonococcal infection.

If you enter the abdomen, and find little or no pus and few signs of inflammation, examine the pelvic organs and particularly the infundibulo-pelvic ligaments (23-21). One or both may be thickened and oedematous, and the thickening may extend under the ovaries to the uterus. This is SEPTIC THROMBOPHLEBITIS of the ovarian veins. If you find nothing, the thrombophlebitis is probably in a uterine vein which is not so easily seen. Continue with antibiotics in high doses. If possible, 2hrs after the operation start SC or IV heparin 1,000-10,000 units by bolus qid, controlled by estimating the clotting time and lengthening it to about 15mins (dosage varies depending on the type of heparin you use). Continue this for 1wk.
Watch carefully for abnormal bleeding, particularly from the abdominal incision, the urinary or intestinal tracts. Improvement should be quick.

If you find disseminated yellowish-white nodules throughout the pelvis, or a localized infection in the pelvis with nodules on the tubes and perhaps a CASEOUS ABSCESS or a shrunken thickened omentum, suspect TUBERCULOSIS (16.1). Take a biopsy and send this for histology. Start treatment early, and check for HIV disease (5.7)

If you inadvertently tear the small bowel, repair the perforation transversely in two layers. If there are several holes in the bowel, it is better to sacrifice a segment and perform one formal anastomosis (11.3) than close several holes which may leak. Lavage the abdomen thoroughly and be prepared to reopen the abdomen in 48hrs to inspect the bowel, and do a further lavage.

If you accidentally tear the pelvic colon, what you should do depends on the size of the tear and where it is. If it is small, oversew it in two layers. If it is large, but there is minimal soiling, freshen the edges and repair it formally, lavage the abdomen thoroughly and leave a drain. If there is considerable faecal spillage, close it as before and make a defunctioning colostomy (11.5,6) higher up. There is rarely a need to perform a Hartmann's procedure (12.9).

If there is persistent sepsis in the abdominal cavity, in spite of repeated attempts at drainage, leave the abdomen open (laparostomy) for daily irrigation (11.10).

B. CHRONIC PID

DIFFERENTIAL DIAGNOSIS: urinary tract infection, endometriosis, schistosomiasis and pelvic tuberculosis.

ANTIBIOTICS.
If there is recurrent or continuing infection suggested by raised ESR counts, try doxycyline with ceftriaxone, and maybe adding azithromycin for a maximum of 14days.

If there is no improvement, either your diagnosis is wrong, or there is a collection of pus, perhaps a chronic tubo-ovarian abscess or a pyosalpinx.
Always consider TB.

Suggesting endometriosis: no children, >30yrs, chronic menorrhalgia since puberty, getting worse.

DIFFICULTIES WITH CHRONIC PID

If, on laparoscopy or laparotomy, you see bluish or brown nodules on the surface of the peritoneum and particularly on the utero-sacral ligaments, surrounded by serosal folding, suspect ENDOMETRIOSIS. You are most likely to see such nodules on the utero-sacral ligaments, in the pouch of Douglas, on the ovaries, on the posterior surface of the broad ligament, or on the fimbrial ends of the tubes.

If there is pain use a non-cyclical progestagen to suppress menstruation, such as norethisterone 10mg od starting on the 5th day of the cycle (increased if spotting occurs to 25mg od in divided doses to prevent break-through bleeding) for at least 6months. Or, use depo-provera 150mg monthly for 3months and then 3monthly: this will probably cause amenorrhoea and hence also stop the bleeding in the ectopic endometrial mucosa.

N.B. Norethisterone in the above formulation is, in most countries, far more expensive than a progestagen-only contraceptive pill. The amount of norethisterone in the progestagen-only pill is 0·35mg. It is financially far more feasible for women to use this instead of the special norethisterone tablet: if used for endometriosis 28 tablets (a whole monthly packet) are needed per day (in divided doses).

In a young woman who complains of infertility, menstrual irregularity, and chronic pelvic discomfort, TUBERCULOSIS (16.1) is a possibility.

If there is chronic PID and the woman is worried about PAIN but is not worried about having any more children, unilateral or bilateral salpingectomy without hysterectomy is usually possible but this is difficult, so *don't attempt it* unless you have considerable operative experience, because the trouble with complications will be greater than the pain she had before!
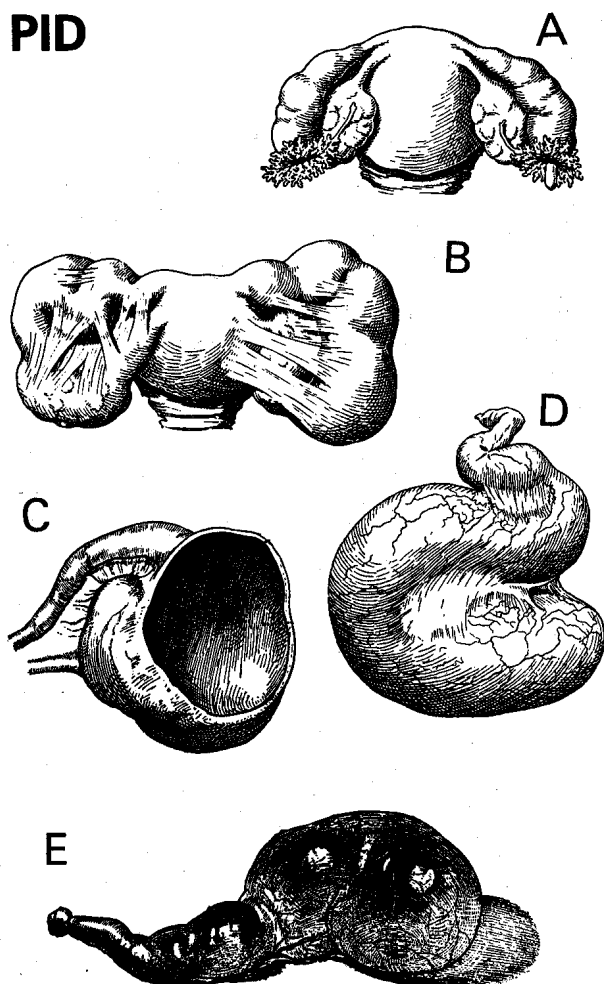

Fig. 23-3 PID AND PELVIC TUBERCULOSIS.
A, acute salpingitis with swollen congested tubes and pus leaking from the ostium. B, chronic salpingo-oophoritis with the tubes and ovaries densely bound by adhesions. C, tubo-ovarian cyst. D, tuberculous pyosalpinx. E, hydrosalpinx. *After Young J, A Textbook of Gynaecology, A&C Black 5ᵗʰ ed 1939.*

23.2 Septic miscarriage

If there is fever and pus discharging from the cervix after an incomplete miscarriage, the products of conception have almost certainly become infected. This can follow a neglected spontaneous miscarriage, or it can follow unskilled interference. It is nearly impossible to prove which of the two is the case unless you find a perforation or foreign body.

N.B. In some cultures it is dangerous for the woman if you document *'criminal abortion'* in the notes. If women know that going to the hospital might result in prison, they will not come or arrive much too late. If a woman is brought by the police or angry members of her family for you to examine her, judge carefully where your professional duties lie. Note that it is virtually impossible to collect water-tight proof of criminal interference as long as she denies this. Remember you are not the judge! Most of the time you can only state that a pregnancy was there but is now lost.

The diagnosis is usually easy if the history is clear of an actual or recent pregnancy. Unfortunately, the woman may be so frightened that she denies having tried to induce an abortion, even when she is very ill. The only way to avoid a misdiagnosis is to remember that any acute pelvic inflammation in a woman of childbearing age may be the result of a miscarriage.

Fortunately, the uterus is usually a good barrier to the spread of infection, but sepsis does sometimes spread as pelvic cellulitis or localized peritonitis. You can usually treat this without a laparotomy, although usually you should evacuate the uterus. If there is generalized peritonitis, perform a laparotomy.

Bleeding is often best controlled by emptying the uterus as fast as possible. If need be (no facilities, waiting list, the anaesthetist refuses to get involved because of anaemia), you can often do this digitally. One hand pushes down the uterus while the gloved index finger of the other hand evacuates the uterus. This is painful for the woman but better than waiting for possibly dangerous transfusions. Another advantage is that in this way you might detect a hole caused by an unskilled abortion before you have pushed instruments through it. You are very unlikely to make a hole yourself with your finger. In a septic miscarriage the speedy removal (just after a initial dose of IV antibiotics) of infected products of conception may make the difference between life and death.

Dramatic bleeding can also be caused by a piece of placenta hanging out of the cervix. You can deal with that rather painlessly with the help of a speculum and a sponge holding forceps. Alternatively, 800μg Misoprostol PR while waiting for an evacuation might easily reduce bleeding enormously and even empty the uterus for you.

Rarely, a hysterectomy may be the only way to save life. The great dangers are septic shock and renal failure.

**IF A WOMAN IS OF CHILDBEARING AGE,
DECIDE IF PELVIC INFLAMMATION IS THE
RESULT OF A MISCARRIAGE
OR PREVIOUS PREGNANCY**

DIAGNOSIS should not be difficult. Serious illness and fever (>38°C) after a miscarriage is typical. There is a foul bloody vaginal discharge, and sometimes frank pus.

Start by taking an endocervical swab for culture aerobically and anaerobically (if possible). This is better than a high vaginal swab. *Do not delegate this task.* Then use your fingers to remove any of the products of conception, which will come away easily.

Examine the uterus bimanually: it is tender bilaterally, perhaps with a mass. Sometimes there is local or general peritonitis (10.1). You might find a foreign body *in situ.* Look also for anaemia, jaundice (caused by haemolysis from septicaemia) and chest signs (septic emboli from thrombophlebitis). Your main concern will be to know how far infection has spread, and if you should perform a laparotomy.

CAUTION! There may be haemolysis, jaundice and high fever from severe malaria or dengue. *If you misdiagnose this as a septic miscarriage, the patient may well die.*

If the pulse is >120/min, the infection has probably spread beyond the uterus.

If moving the cervix causes great pain and the lateral fornices are hot, thickened, and tender, perhaps with a mass, the infection has spread to the pelvic connective tissue (parametritis, uncommon).

If you are uncertain about the diagnosis, yet the patient is very sick, resuscitate her, start antibiotics, and arrange to aspirate the posterior fornix of the vaginal vault in theatre. A seriously infected uterus can be silent, apart from a very sick patient.

If the history suggests that the uterus has been perforated with some instrument, the prognosis is worse. If it is leaking pus into the abdominal cavity, you may ultimately have to perform a hysterectomy.

TREATMENT

If the patient is not very ill, and there are no signs that infection has spread beyond the uterus, a single broad spectrum antibiotic, such as ampicillin 500mg IV qid may be enough. Alternatively, use gentamicin 240mg IV od.

If the patient is very ill, with signs of spread outside the uterus, treat as peritonitis with septic shock (10.1). Resuscitate with rapid infusion of Ringer's lactate or normal saline. Measure the Hb, and cross-match blood. Get blood cultures. Transfuse blood if the Hb <6g/dl.
N.B. Antibiotics will not control the infection if infected products of conception remain inside the uterus. So empty it; you will not cure the patient until you have done so.

ANALGESIA. Treat with pethidine or NSAIDs.

CONTROL THE BLEEDING. While waiting to perform an evacuation, or if there is bleeding with an empty uterus, administer ergometrine with oxytocin ('syntometrine') 1ml IV, or ergometrine alone.
Better, if you can, use misoprostol (800μg PR): this will make the uterus contract, stop post-evacuation bleeding and might complete an incomplete miscarriage before you have used mechanical means, *but do not rely on this alone*!

EVACUATION. Empty the uterus (GRADE 2.1) after starting antibiotics. Use a suction curette, but if there is serious bleeding or severe anaemia, do it immediately digitally. The uterus will be infected and soft, so be especially careful not to perforate it. Continue antibiotics after the evacuation.

POST-EVACUATION MANAGEMENT.
Monitor the patient carefully, especially the urine output. There should be a dramatic improvement, and fever should settle in 48-72hrs.

If there is no improvement within 24hrs after evacuation, but signs of peritonitis are not obvious, there is probably a pelvic abscess. Try to confirm this by ultrasound (38.2K). Aspirate the posterior fornix. *Avoid the lateral fornices*, or you may injure the ureters or the uterine arteries. If you aspirate pus or blood-stained smelly fluid, drain it through the posterior fornix (colpotomy: 10.3).

If there is no improvement within 24hrs after evacuation, and clear signs of generalized peritonitis (pain, tenderness, rigidity, and abdominal distension), this indicates serious trouble. The uterus may have been perforated by an unskilled abortionist, or some harmful fluid might have been injected into the uterine cavity. *The laparotomy needed may well be difficult.* Improve the general condition as best you can by rehydration, transfusion (if Hb <8g/dl), and have at least 2 units of blood available. Then perform a laparotomy (10.1).

N.B. Failure to counsel a woman about contraception if she has had an induced abortion (septic or otherwise) is malpractice. If she wants contraceptive services, provide them and *do not refer her elsewhere.* An IUD can be inserted immediately after an evacuation if there is no obvious sepsis.

DIFFICULTIES WITH SEPTIC MISCARRIAGES

If you perforate the uterus when you evacuate a septic miscarriage, there is no easy answer. If you stop with an incompletely evacuated uterus, the risk of sepsis remains. If you complete the evacuation, you may enlarge the hole and even damage bowel. This also is dangerous. As a general rule, if you perforate a pregnant uterus, filled with infected products of conception, complete the evacuation as best you can *using your fingers*, then proceed with a laparotomy.

Repair the uterus with a single layer of interrupted sutures (21.17), and perform a tubal ligation if there is a complete family anyway. If the tissues do not hold, try to plug the laceration with omentum, if there is minimal bleeding. Otherwise you may be forced to perform a hysterectomy (23.15). Look for any structures, especially small bowel, which may have been damaged in the perforation.

N.B. The treatment of an accidental perforation of a non-pregnant uterus or a small perforation in the midline of a uterus without infected products is different (23.4).

If septicaemia develops, treat vigorously with IV fluids, broad-spectrum antibiotics, and oxygen. Correct the acidosis and support the ventilation.

If you feel crepitations in the tissues, suspect GAS GANGRENE (6.24).

23.3 Abnormal and dysfunctional uterine bleeding (DUB)

Abnormal uterine bleeding includes any bleeding which is abnormal in its degree and timing. Dysfunctional uterine bleeding (DUB) is irregular, heavy or long-lasting bleeding *not* related to infection, pregnancy, medication or neoplasm.
In low-resource countries, abnormal uterine bleeding usually has some obvious pathology. The list of its possible causes is a long one and is given below. Only diagnose DUB after you have excluded obvious pathology. DUB occurs most commonly at the extremes of reproductive life, in young girls not long after menarche, and in older women nearing the menopause, before complete amenorrhoea sets in. DUB should be an uncommon diagnosis in the prime of life; if you make it often, you are probably misdiagnosing miscarriages, *Chlamydia* and *Trichomonas* infections, cervical cancer, submucosal fibroids, or chronic ectopic gestation.

The commonest cause of DUB is the failure to ovulate. Because ovulation does not occur in the middle of a cycle as it should, the corpus luteum does not develop and produce progesterone normally. The endometrium grows abnormally thick under the influence of unopposed oestrogen, and eventually begins to shed unevenly. Courses of progestagen stop bleeding temporarily, and when these are stopped normal periods usually follow.

The important diseases not to miss are carcinoma of the cervix (very common), and, usually in women >35yrs, mostly post-menopausal, carcinoma of the endometrium. The investigation of abnormal bleeding often requires intervention, but you may have to limit yourself to priority cases. These are inter-menstrual bleeding, and especially post-coital bleeding, which does not have some more obvious cause. Heavy regular periods are a common complaint, and are usually benign but may result in severe anaemia.

HISTORY. A careful history and examination will nearly always reveal some obvious cause.

ONSET "When did the bleeding start?" "For how many days do you bleed and when?" "Are you bleeding now?" "Were you bleeding last week? Last month?"

Ask the woman to describe the bleeding pattern by giving approximate dates and amounts. Make sure the patient distinguishes blood escaping vaginally, from blood in the urine. If she sometimes does not bleed at all for a week or so, a malignancy is unlikely.
CAUTION!
(1) *Avoid labels like 'polymenorrhoea', 'menorrhagia' 'metrorrhagia' etc.* because they are too vague.
(2) Ask about post-coital bleeding.

EXAMINATION. Is there anaemia? Examine the pelvic abdomen bimanually. Examine the cervix with a speculum.

DIAGNOSE DUB by exclusion, and remember that *a D&C is not automatic treatment for all forms of uterine bleeding*. Exclude:
(1) Chronic PID (23.1), vaginitis (due to foreign body, *chlamydia, trichomonas*, or atrophic menopausal change), cervicitis & cervical ectopy
(2) Miscarriage (20.2), ectopic gestation (20.6),
(3) Contraceptive medication, devices or hormone treatment,
(4) Fibroids (23.7), cervical or intra-uterine prolapsing polyp (23-8),
(5) Ovarian cysts and tumours (23.9),
(6) Cervical or endometrial carcinoma (23.8),
(7) Gestational trophoblastic disease (23.10).
(8) Tuberculosis (16.1)

At age <10yrs, there is probably a foreign body *in* situ.
At age <20yrs, this is probably truly DUB.
At age 20-40yrs, there may be any of the pathology listed above. Don't miss carcinoma of the cervix. If there is inter-menstrual or post-coital bleeding, be sure to take a biopsy of any hard, friable, or ulcerated area on the cervix.
NB. A D&C will not diagnose carcinoma of the cervix nor will a Papanicolau (Pap) smear (23.8); you can almost always diagnose carcinoma advanced enough to bleed by looking at the cervix with a speculum and taking a biopsy. In early pre-malignant cases you need to inspect it with 4% acetic acid. However, if you need acetic acid to see if there is something wrong with the cervix then the bleeding is not caused by carcinoma in the visible part of the cervix, but there might coincidentally be a very early carcinoma, or one situated in the cervical canal or endometrium.
At age >40yrs, and especially if there is postmenopausal bleeding (bleeding ≥1yr after the menopause), always inspect the cervix, and if normal, do a suction curettage to exclude carcinoma of the endometrium. Other common causes include fibroids, especially prolapsed submucosal fibroids (23-7), and atrophic vaginitis.

TREATMENT.

Use the contraceptive pill bd for 10days, then od. Bleeding will probably stop while taking the medication. There will be a withdrawal bleed (normal, scanty, or heavy) 2-3days after stopping, but this should not last >1wk, after which normal periods should restart. Explain this to the patient. Review her again in a month, to see if treatment has worked, and bleeding has stopped. Of course, if she needs contraception, continue the pill.

If bleeding has not stopped:
(1) your diagnosis was wrong, or
(2) she did not take the tablets regularly, or
(3) the DUB is unsuited to hormonal treatment.
Perform a suction curettage because this will be either curative or diagnostic (23.4)**.**

In young girls with such severe anaemia that does not allow for time for pills to take effect, and which makes GA dangerous, suction the uterus with a 4mm cannula; this will often cure the problem instantly, dramatically and avoid the need for blood transfusion, which may be dangerous unless you add furosemide to prevent fluid overload.

23.4 Dilation & curettage (D&C)
(GRADE 1.4)

There are two superficially similar operations: the evacuation of an incomplete, or septic miscarriage, which does not usually require that the cervix be dilated (20.2), and dilatation and curettage of the uterus, which is described here. Although both operations have similar complications, they have different indications.

Most gynaecologists now use SUCTION CURETTAGE if there is a pregnancy involved, and for the outpatient diagnosis of postmenopausal bleeding and (although rarely indicated) in case of infertility investigation.

D&C is complement to a carefully taken history and examination, and is not a substitute for them. It is also one of the commonest operations in gynaecology, and one of the most abused, *so make sure that you only do it on the proper indications*:
(1) To diagnose the cause of abnormal bleeding.
(2) To diagnose carcinoma of the endometrium and tuberculous endometritis.
(3) To make sure that a patient is ovulating, when you are investigating for infertility and you have a poor history and no other means: (vaginal ultrasound, or laboratory test for progestagen).

Ideally, all curettings should be sent for histology. Unfortunately, this is unlikely to be possible, so send priority cases. At age <40yrs, sending curettings for histology is probably unnecessary, unless they look abnormal macroscopically (profuse, thick, 'cheesy', or infected), or you suspect gestational trophoblastic disease (23.10).

Although D&C is usually simple, the long list of difficulties described below show that it can be dangerous, and even fatal.

The main risks are:
(1) Perforating the uterus, perhaps followed by haemorrhage or sepsis.
(2) Injuring a nulliparous cervix. Most complications listed are rare.

DILATION & CURETTAGE

Beware: it is easy to perforate the uterus!

A No!

Passing the sound

B

C

Passing Hegar's dilator

keep your index finger along the stem of a sound, dilator, or curette, and you will be less likely to perforate the uterus
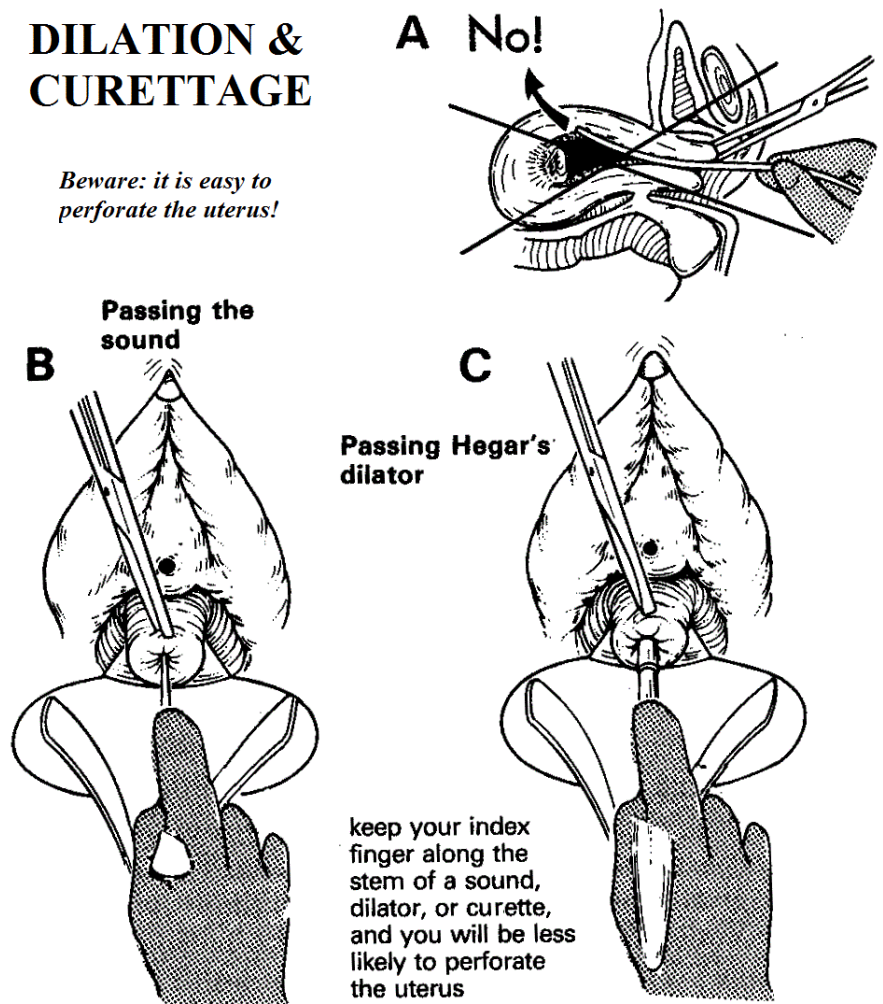
Fig. 23-4 DILATION & CURETTAGE.
A, the main danger is perforating the uterus. B, pass a sound. C, insert Hegar's dilator. Perforation of the uterus is less likely if you use your finger as a guide and steadier like this, with the finger acting as a brake. *After Bonney V. Gynaecological Surgery. Baillière Tindall, 1964 with kind permission.*

INDICATION.

Dilatation followed by curettage:
(1) To investigate abnormal bleeding. It may reveal: carcinoma of endometrium, endocervical adenocarcinoma (but not squamous carcinoma of the cervix, see below), choriocarcinoma, 'chronic endometritis', tuberculous endometritis, chronic anovulation, or submucous fibroids.
(2) To treat post-menopausal cervical occlusion causing pyometra, and to exclude carcinoma as its cause.

Dilatation only, without curettage:
(1) To correct cervical stenosis after amputation or cone biopsy (23.8).
(2) To permit the insertion of an IUD.

CAUTION!
(1) *Don't perform a D&C to treat dysmenorrhoea occurring for the first time*, even if other methods have failed. Persevere with analgesics. If necessary treat with the combined contraceptive pill or depo-provera to suppress ovulation.
(2) Where menses have never occurred, check if there is a uterus at all, after failing to produce a withdrawal bleed with hormones.
(3) Where menses have occurred and then stop, after also failing to produce a withdrawal bleed with hormones, check if, after an earlier traumatic evacuation, the anterior wall has fused with the posterior wall of the uterus (Ascherman syndrome).
   N.B. D&C will not diagnose carcinoma of the ecto-cervix, for which a biopsy is necessary (23.8). *Don't do a D&C if you suspect there is a tubo-ovarian abscess*, which you should be able to diagnose clinically. Infection will have fixed the uterus; *dilating it with dilators may perforate it, spread the pus, and cause a fatal peritonitis*.
   N.B. Ovulation can be proved by a regular period of biphasic basal temperature curve or by examination of the cervical mucus: a D&C is not necessary. Anovulation outside pregnancy can be investigated not by D&C but by seeing if you can initiate a withdrawal bleed with progestagens. If so there are likely to be enough oestrogens. If not there are anatomical problems (the Ascherman syndrome, a blocked vagina or absent uterus) or she is postmenopausal. If withdrawal from using a combined oral contraceptive pill produces bleeding, then the anatomy is in order *(unless there is a bicornuate uterus)*.
   N.B. If you only want to take an endometrial biopsy, use a pipette or small Karman cannula; you can do this as an out-patient procedure.

You will usually make the diagnosis of tuberculosis histologically, but look at a separate specimen under microscopy, especially in the presence of HIV disease and if you are working in an area of high incidence.

EQUIPMENT.

A catheter, Sims' and Auvard's vaginal specula, 2 Vulsellum forceps, a pair of narrow ovum forceps, sharp curettes of different sizes, and a set of Hegar's uterine dilators. Arrange these in order of size on the trolley.

EXAMINATION.
(1) Effect a bimanual examination with disposable gloves to feel the size, position, and mobility of the uterus (feel also for disease in the adnexa). *Note particularly if the uterus is retroverted*, because this increases the chance of perforating it with a misdirected dilator.
(2) Then put on sterile gloves. If it is not already empty, drain the bladder.
(3) Swab the vulva and vagina. When you dilate the cervix, you will need a mental picture of its shape. Measure the depth of the uterus with a dilator or suction curette, except when you suspect a miscarriage.

   CAUTION. *Do not use a sound, which is thin and can easily perforate the uterus.* A sound is useful, however, outside pregnancy, if there is a tortuous cervical channel. Adapt the curve of the sound to the cervical channel, and carefully try to find your way into the uterine cavity. If you succeed, you do not need to push it against the fundus. Sometimes sideward pressure or massaging (up or down) is needed to make it possible to follow the sound with a small dilator (for a D&C), a suction curette (DUB, PMB) or for insertion of an IUD.

DILATION.

If you expect a difficult dilation, insert misoprostol 200μg into the vagina a few hours before the procedure. (This is routine in many places for inserting an IUD, especially in nullipara.)

Start by making sure that the buttocks are well over the end of the table. If you are not using GA, inject the cervix with 3-4ml 1% lidocaine, using the thinnest needle possible and making sure it is fixed tightly onto the syringe. Then grasp the anterior lip of the cervix with a vulsellum forceps transversely. Then inject more lidocaine, just under the surface of the vagina in the fornices beside the cervix at 2,6,10 & 12 o'clock. Or, perhaps better, inject from inside out, *i.e.* from endocervix into the body of the cervix. Wait 2mins.

Pull the cervix well down. This will bring a sharply anteverted or retroverted uterus towards the axial position, and reduce the risk of perforation. If it is very soft, as after labour, use sponge forceps.
With the picture of the uterine cavity in your mind, dilate the cervix, starting with the smallest dilator. As you do so, place a finger beside it to act as a 'brake', if you enter the cervix suddenly.

Insert the dilator in the direction which minimizes the resistance to it. When it has been in place for ≥30sec, insert the next size without delay, and without waiting for the cervix to contract again. Dilate a large uterus more than a small one. Stay in the midline: if you cause a perforation in the fundus, it is much less dangerous than in the parametria where there are large blood vessels.

CAUTION!
(1) Be gentle.
(2) Dilate slowly, leaving each dilator in place for ≥30sec.
(3) *Don't twist the dilators.*
(4) *Be particularly careful not to perforate the uterus*, especially in the first few months after delivery, or if you suspect a missed or incomplete miscarriage, carcinoma of the endometrium or trophoblastic disease. All these make it soft, friable and easily perforated.
(5) If you suspect a carcinoma, make sure you dilate the cervix enough to let you explore the uterus adequately.

CURETTAGE.
Start scraping at the fundus, and scrape towards you all round the anterior, posterior, and lateral surfaces of the uterine cavity. Continue until there is a scratching feeling.

EARLY DIFFICULTIES DURING A 'D&C'

If you cannot pass a sound or small dilator, the uterus is probably acutely flexed, either forwards or backwards. Feel it carefully:

If the uterus is anteverted (flexed forwards), pass the sound under direct vision though the external os, remove the speculum, and depress the handle of the sound posteriorly on to the perineum. When it is in the axis of the uterine canal it will probably pass.

If the uterus is retroverted (flexed backwards), it may be held in place by adhesions. If a bimanual examination shows that it is fixed, abandon the operation *unless a D&C is essential.* Then put the vulsellum on the posterior lip of the cervix and pull it well down; pass the dilators with their points backwards.
    CAUTION! If you tear the adhesions that are holding the uterus, she may bleed into the pouch of Douglas, or into the peritoneum. You may then have to open the abdomen to secure haemostasis.

If the cervix is so rigid that the larger dilators will not pass without the risk of causing tearing, leave one dilator in place for several minutes, before introducing the next one. If a dilator is tightly gripped as you remove it, reinsert it and leave it in a little longer before inserting the next largest size. A nulliparous or old person's cervix is often stiff. *Don't use excessive force.* You can usually do an adequate suction or curettage with a small, sharp curette, even if the cervical canal is only dilated to Hegar 6 (Ch20).

If larger dilators do not pass as far as smaller ones, you are inserting successive dilators a progressively shorter distance into the uterus. If you fail to realize what you are doing, you may only curette the cervical canal, and not the body of the uterus. Return to the smaller dilators, and start again.

If you find inserting larger dilators is unnaturally easy, *stop*! You have probably lacerated the cervix, and increased the risk of bleeding and sepsis.
The tear may run into the vaginal vault from the external os, or it may start near the internal os, so that the tips of succeeding dilators ultimately enter the broad ligament.

If a dilator suddenly slips in much further than the one before (not uncommon), you have probably perforated the uterus into the peritoneal cavity, or into the broad ligament on either side, or into the bladder. Even experts occasionally do this, especially if a patient is pregnant, postpartum, or post-miscarriage, or if the uterus has been softened by an endometrial carcinoma, or gestational trophoblastic disease:
(1) Abandon the operation, and *don't try to confirm the diagnosis by probing the uterus*.
(2) *Don't irrigate the uterus*.
Infuse Ringer's lactate or normal saline IV and monitor the pulse, blood pressure, and temperature ½hrly. Treat with IV gentamycin, ampicillin and metronidazole. Expect recovery, but if there is deterioration, perform a laparotomy.

If you perforate the uterus and a loop of bowel appears at the vagina, *don't be tempted to resect it and anastomose it at the vagina,* and *don't push it back through the tear and plug the uterus with gauze*. Instead, perform a laparotomy, reduce the herniated bowel holding it firmly in your fingers to prevent spillage. Clean it, resect it, if it is damaged, and inspect the rest of the bowel.

If you split the tight vagina of a post-menopausal woman with a speculum, suture it, especially if it bleeds.

LATE DIFFICULTIES WITH A 'D&C'

If, postoperatively, there is pain on one side and a swelling in the broad ligament, a haematoma has formed. Occasionally, it may be so severe as to raise the peritoneum of the side wall of the pelvis, and extend even to the loin. If so, she will have the signs of a mass and of hypovolaemia: hopefully volume replacement will suffice to stabilise her. Otherwise perform a laparotomy to secure haemostasis, which is very difficult in that area. Try compression of the broad ligament for a full 15mins, before you start looking for a bleeding point. If this fails, put in packs of large gauzes to maintain the compression: when you remove them the following day, bleeding has usually stopped or is readily controllable.

If symptoms of low abdominal pain and fever ensue, suspect salpingitis (23.1).

If peritonitis develops: either
(1) there has probably been bleeding into the peritoneal cavity after a perforation,
(2) you have missed an ectopic gestation and ruptured it with your D&C,
(3) there is severe PID,
(4) there is iatrogenic bowel perforation, or
(5) there is a non-gynaecological cause.

Immediately explore the pelvis through an abdominal incision. Find and suture any uterine perforation. If it is extensive, and sutures will not control the bleeding, you can buy time by passing a rubber catheter around the uterus as far down towards the cervix as possible, and tightening it as a tourniquet. *N.B.* This tourniquet occludes the uterine and ovarian arteries and so cause necrosis of the uterus and ovaries if left on >3hrs. You can, however, pass the tourniquet bilaterally through a vessel-free area of the mesosalpinx instead and spare the ovaries and some blood supply to the uterus. This might be your best option if you are afraid to remove the uterus and are referring the patient. If you remove the uterus, leave the vagina open to allow free drainage. If there is extensive sepsis, wash out the peritoneal cavity. Look for damage to the bowel, and repair it.

23.5 Bartholin's cyst and abscess

If a cyst develops within the labia minora, it is usually due to blockage of a duct of a Bartholin's gland, *don't try to excise it completely*; marsupialize it instead, which means everting its wall as a pouch, and then allowing it to heal. This is easier than trying to excise it, which is liable to be bloody and cause painful scars. Use a balloon catheter to keep a Bartholin's abscess open as its wall is unlikely to hold sutures.

MARSUPIALIZING A BARTHOLIN'S CYST. (GRADE 1.3)
Ask your assistant to immobilize the cyst with sponges on forceps. Make a longitudinal incision, with extensions at either end, in the margin between the pink vaginal and vulval skin, on the inside of the labium minus (23-5). Let the fluid escape. Apply Allis forceps on the edges of the labium minus, and retract them laterally. If necessary, push the cyst forwards by putting a finger behind it. Use interrupted absorbable sutures to tie the edges of the cyst wall to the skin, and to stop bleeding.

DRAINING A BARTHOLIN'S ABSCESS. (GRADE 1.3)
Insert a small amount of LA subcutaneously; then open the abscess with a stab incision to allow pus to drain. Cut the end of the smallest Foley catheter available carefully and introduce it (with the balloon deflated) through the stab wound you have made.

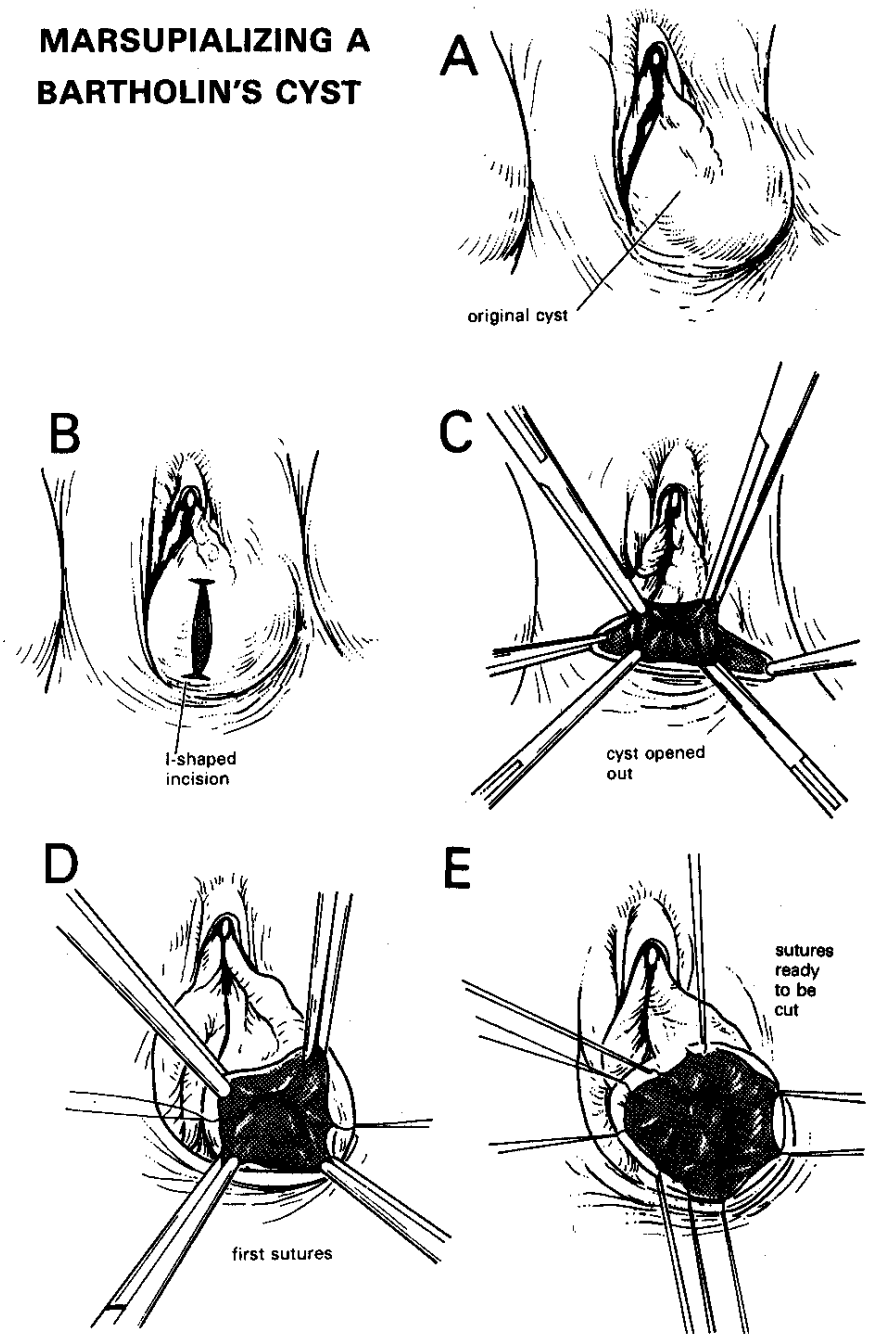**MARSUPIALIZING A BARTHOLIN'S CYST**

Fig. 23-5 MARSUPIALIZING A BARTHOLIN'S CYST.
A, the cyst. B, the incision with its extensions. C, opening out the cyst. D, the first sutures. E, sutures almost complete.

Place the balloon within the abscess cavity and inflate the balloon with a few ml of water. Tie a knot very tightly round the catheter and cut excess tubing off so that the balloon, still inflated, remains in the cavity. Leave it there for 7-10days; if it hasn't fallen out on its own by then, remove it after deflating the balloon.

23.6 Urethral prolapse

In some communities prolapse of the mucosa of the urethra is common in young black girls between 6months and 8yrs. It usually causes no symptoms, but a child may have slight dysuria, or the mother may notice blood on the clothes. While most of the urethra remains in its normal place, its mucosa is gradually extruded at the external orifice to form a deep red or bluish tubular mass, which swells and becomes oedematous, and occasionally even gangrenous. You cannot replace the prolapsed urethral mucosa. Distinguish it from a schistosomal granuloma, a urethral caruncle (23.17), a wart, or a sarcoma. Treat it with oestrogen creams. Only operate if this fails; *don't do so just to appease the mother.*
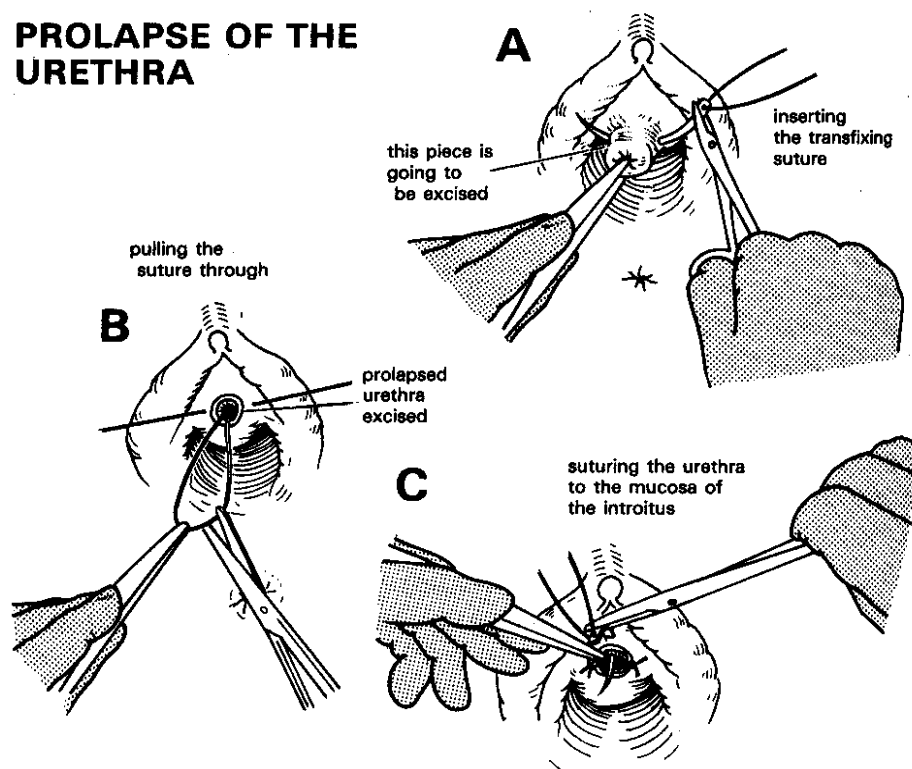

PROLAPSE OF THE URETHRA

Fig. 23-6 PROLAPSE OF THE URETHRA. A, pass a suture through the prolapsed urethra. B, cut the suture so as to make 2 separate sutures at either side. C, insert further sutures as needed.
After Bonney V. Gynaecological Surgery, Baillière Tindall 1964 Figs 92-4 with kind permission.

URETHROPLASTY FOR URETHRAL PROLAPSE (GRADE 3.3)
Use a small sound to find the meatus in the prolapsed mass of tissue. Pass a catheter, withdraw it, and then replace this by fine artery forceps. Open the points slightly to distend the urethra. With the forceps as a guide, transfix segments of the prolapsing mucosa from side to side and then from front to back with strands of 3/0 absorbable. Use a knife or scissors, or, better, diathermy, to cut off the mucosa distal to the point at which the sutures cross the lumen. Pull the strands down as two loops, cut them, and then tie each of the four pieces, so as to join the edge of the urethral mucosa to the skin. Insert a Foley catheter for ≥24hrs. Warn the patient that her vulva will be sore for at least 1wk.

23.7 Fibroids (Uterine myomata)

Fibroids, or myomata, are uncommon in young, but common in older, particularly black, women. There is also certainly a relation between low parity plus not having used hormonal contraception and fibroids; women with blocked tubes, women with infertile husbands, nuns, women sterilised at a young age, and women postponing their first pregnancy till they are >35yrs have fibroids more often.

They present with: (1) Infertility or subfertility.
(2) Recurrent miscarriage.
(3) Abnormal bleeding.
(4) An abdominal swelling.
(5) Lower abdominal pain, usually pre-menstrual or more rarely, acute, if a pedunculated fibroid twists.
(6) An intra-vaginal mass if a pedunculated fibroid prolapses (23-7). The cervix dilates to allow it to pass, and remains partly dilated around it.
(7) Chronic infection similar to PID where the fibroid has degenerated and itself becomes septic.

The mass may be large, necrotic, and infected. The severity of the symptoms depends less on the size of the fibroids, than where they are; a small submucous fibroid can cause severe bleeding, whereas a huge interstitial one may hardly be noticed. Chronic bleeding may result in severe anaemia.

ULTRASOUND (38.2J) scan shows a heterogeneous hypo- or iso-echoic mass attached to the uterus, maybe with cystic or calcific changes.

Decide whether myomectomy (just removing the fibroid) or hysterectomy, ideally total, removing the cervix also, is best. You can perform myomectomy occasionally *per vaginam.* Total hysterectomy will remove the later risk of cervical cancer.

CAUTION! *Do not simply amputate a prolapsing fibroid* because it may pull the peritoneum down with it. Surgery can be difficult, or because of associated subacute or chronic PID, the need to avoid a hysterectomy, and the technical difficulties of doing a myomectomy.

DIFFERENTIAL DIAGNOSIS is that of a pelvic mass:
(1) Pregnancy.
(2) A full bladder.
(3) An ovarian cyst (23.9).
(4) A chronic ectopic gestation (20.7).
(5) PID with an inflammatory mass (23.1).
(6) A miscarriage.

CAUTION!
(1) A centrally placed fundal fibroid may feel like a pregnant uterus, but is much harder, mobile and lumpy.
(2) Pregnancy *can* occur in a fibroid uterus: so check for pregnancy before doing a hysterectomy!
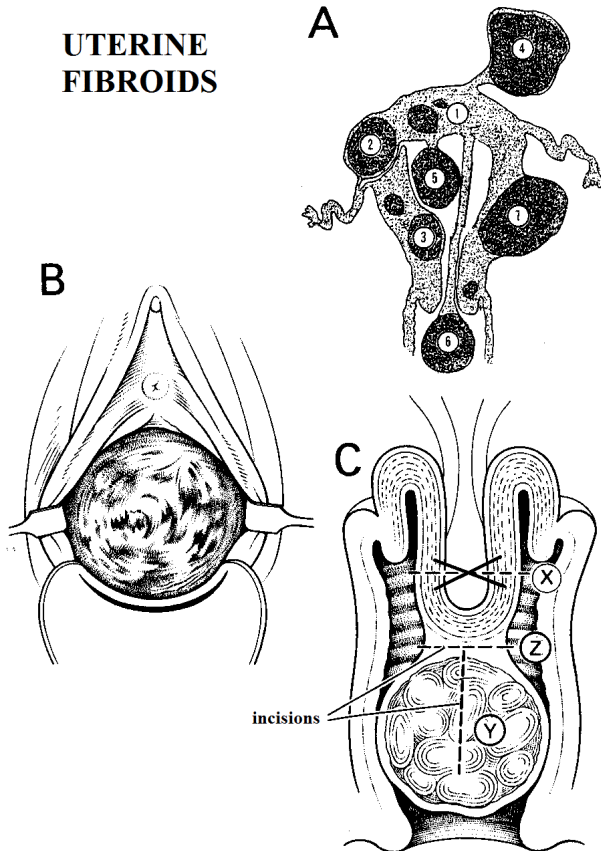
UTERINE FIBROIDS

Fig. 23-7 UTERINE FIBROIDS. A, sites of uterine fibroids: (1) intramural. (2) subserous, distorting the tube. (3) submucous. (4) subserous and pedunculated. (5) intra-cavity (6) prolapsing percervical. (7) parametrial. B, a submucous fibroid polyp has brought the fundus of the uterus down with it. C, the correct site for incision. First, incise the fibroid longitudinally (Y) to find the level of its pseudo-capsule. Then cut or twist off and transfix the pedicle transversely just above (Z), with no danger of entering the peritoneal cavity. *N.B. Don't incise at level X*!

INDICATIONS FOR SURGERY.

The rate at which a fibroid grows varies greatly. If it causes no symptoms, leave it alone unless it is the size of ≥12wk pregnancy. At this size it will probably cause symptoms, so if the family is complete, recommend hysterectomy.
The indications for removing a fibroid depend more on symptoms (bleeding, anaemia, and premenstrual pain) than on its size. *Many patients don't need surgery,* especially when menopause is a few years off because the fibroids then stop growing or even reduce in size.
If the woman is older and does not want children, consider performing a total hysterectomy (23.15).
If the uterus and the mass seem fixed and tender, and especially if there is fever, this is more likely to be PID, with or without fibroids. Treat with antibiotics first, and reassess in 3-4wks.

If the temperature does not settle after a reasonable time, and the uterus remains tender, repeat the examination under GA. There may be:
(1) A tubo-ovarian abscess which fluctuates and needs draining. If so, leave the fibroids until later.
(2) Mobile degenerating fibroids that you can operate on.
   N.B. 'Red degeneration' can occur in a fibroid most often during pregnancy, and can cause pain and a tender mass, but not the degree of fever that is common with pelvic sepsis.
If the patient is younger and wants children, **or has suffered with infertility and repeated miscarriages,** consider doing a myomectomy with a tuboplasty (if needed). Make sure she understands that:
(1) If it is found to be impracticable, she may have to have a hysterectomy, or to have the abdomen closed with nothing being done.
(2) She may grow more fibroids later, especially if she does not conceive.

MYOMECTOMY (GRADE 3.3)

INDICATIONS.
A woman with fibroids who wants children.
   N.B. Fibroids may be the result of infertility rather than its cause. Myomectomy is hazardous, and has more complications than hysterectomy. Most patients are better with a hysterectomy (subtotal if necessary), or with no surgery at all.
If you are inexperienced, *don't attempt it unless there is*:
(1) A single fibroid <10cm in diameter.
(2) A fibroid which is subserous (pedunculated into the peritoneal cavity), or submucous (pedunculated into the uterine cavity, and coming through the cervix into the vagina: 23-7).

CONTRAINDICATIONS.
(1) Active sepsis.
(2) Dense adhesions of both tubes which make pregnancy anyway impossible.
(3) A large posterior fibroid in the pouch of Douglas. Leave it unless you are an expert: removing this without damaging the bowel or ureters is difficult, and can be bloody.

METHOD FOR INTRAMURAL FIBROIDS.

Bleeding is the great danger: cross-match 2 units of blood. Use tourniquets to prevent bleeding. Wind a rubber sling around the uterus, and push it down as far as you can in the direction of the bladder; *do not encircle the Fallopian tubes and ovaries, making sure they stay above the tourniquet.* Pull the rubber sling (or Foley catheter) tight and fix its tension by applying a clamp across both ends just above the bladder.
Make an incision over the fibroid which exceeds its diameter by 2-3cm. The correct plane to remove it in may not be easy to find. Cut into the fibroid and you should see it. Shell it out. If necessary, remove some of the wall of the uterus to reduce the size of the dead space.

Be very careful not to remove too much normal uterus; if you have to repair the outer layer of the uterus under tension, the sutures will cut through.

See if you can remove more fibroids through the same incision; grasp a small fibroid with a towel clip or vulsellum forceps to make it easier to remove and extract from surrounding tissues. Try to prevent incisions in the lower posterior wall of the uterus. Dense adhesions fixing the adnexa and the uterus in the pouch of Douglas can easily result: there is then little chance of pregnancy and frequent dyspareunia

Repair the uterus with at least 2 rows of #1 absorbable mattress sutures Remove the catheter and sling. If the uterine incisions bleed, insert more mattress or Z-sutures.

N.B. Bleeding in the uterine wall will always stop once the pressure within the wall becomes great enough.

Close the abdomen without drainage. Make sure the patient knows what you have removed, and understands that she must nearly always have an elective Caesarean Section for a subsequent pregnancy: *these are usually elderly women and their last chance of pregnancy must not end in uterine rupture and foetal death!*
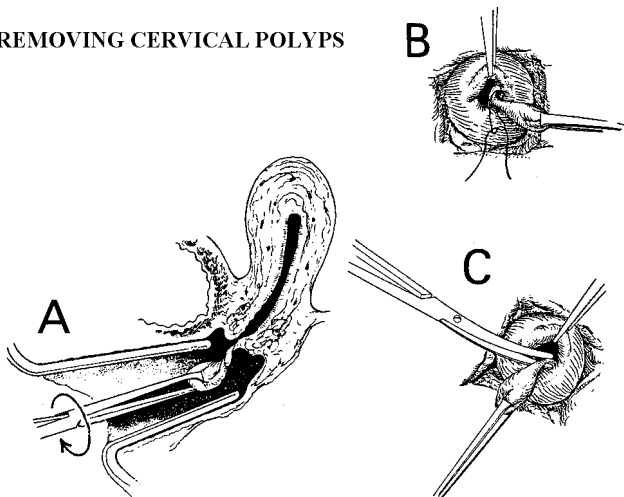
REMOVING CERVICAL POLYPS

Fig. 23-8 THREE WAYS OF REMOVING MUCOSAL POLYPS. A, by twisting. B, by ligation. C, by section. These mucosal polyps are much more common and are more easily removed than fibroid polyps. *Kindly contributed by Jack Lange.*

METHOS FOR A SUBMUCOUS FIBROID POLYP.
There may only be a single vaginal fibroid. If there are others, they can be removed later by myomectomy or hysterectomy.

If the pedicle of the polyp is thick and is attached well within the cavity of the uterus, *be careful*. Incise it if you have access to find the level of the capsule of the fibroid first (23-7). You can then cut and tie the pedicle just above this, with no danger of entering the abdomen.

Transfix the pedicle as far as you can away from the uterine wall, and divide it distal to the ligature, so that you minimize the risk of opening the peritoneal cavity. If you don't remove it completely, it will recur, but *do not cut a broad-based pedicle too near the uterus leaving a defect that you cannot close.*

If there is a large fibroid prolapsing through the dilated cervix, define it as well as you can with your fingers first and then twist it by rotating it with 2 vulsellum forceps in the same direction till it comes loose and then remove it vaginally. If it does not yet prolapse through the cervix, you can soften the cervix by inserting 600µg misoprostol PV; wait ≥ 4hrs and then grasp the fibroid and twist it.

N.B. Chronic bleeding may result in severe anaemia, so use iron medication but rarely blood transfusion pre-operatively. If there is post-operative bleeding, pack the vagina. The alternative is a hysterectomy, *but don't do this till you have administered antibiotics.*

DIFFICULTIES WITH FIBROIDS

If the fibroid is painful, either spontaneously or on palpation, with perhaps mild fever, this is due to aseptic necrosis (red degeneration), or associated torsion of a pedunculated fibroid.

If you discover a small submucous fibroid when you are doing a D&C for abnormal vaginal bleeding, you may be able to twist it off with the curette or ovum forceps.

If there is an endometrial mucosal polyp, you may only find it when you do a D&C if you haven't done an ultrasound before.

If during a Caesarean Section, you find a fibroid, *don't remove it*, unless it is pedunculated.

If a woman just before menopause with moderate sized fibroids has heavy bleeding, try depo-provera 300mg stat, then 150mg after 2months, and then again 3-monthly till the expected time of menopause. Bleeding may stop and the fibroids shrink or stop growing, so you may avoid a hysterectomy. Medicated IUDs/implants probably inhibit the growth of fibroids also, or at least reduce the associated bleeding.

23.8 Cervical & endometrial carcinoma

A. CARCINOMA OF THE CERVIX
Cervical carcinoma is among the commonest tumours in the world, and causes much suffering. Most tumours are squamous carcinomas but a few are adenocarcinomas arising from the endocervix. Treatment is the same for the two subtypes. Carcinoma of the cervix is more common in grand multipara, in those with a history of many sexual partners, in partners of the uncircumcised, in women who smoke, and those with HIV. Even with ARV therapy, cervical carcinoma is 10 times as common in HIV+ve women as HIV-ve (5.6).
Human papilloma virus (HPV) is the cause of cervical carcinoma. Many women become infected with this virus which has different subtypes, of which 16,18,31,52 are the ones most often causing carcinoma. Other subtypes are non-oncogenic and cause genital warts, for example.

Some women are not able to conquer the initial infection of HPV which then becomes chronic, changes her DNA and can cause cancer after many years. Smoking, pregnancy, HIV infection, and probably malnutrition inhibit the ability to overcome HPV. There are now vaccines against the most common subtypes of HPV which could have a dramatic impact on the incidence of cervical carcinoma if given to girls (and boys, so they don't spread the virus) before they are sexually active. Tragically this vaccine is too expensive for widespread use in many low-income settings.

Presentation is with:
(1) inter-menstrual bleeding, often bright red,
(2) post-coital bleeding,
(3) postmenopausal bleeding,
(4) vaginal discharge, which is not always blood-stained, and is usually watery.

The premalignant phases of cervical cancer can be identified in a woman without symptoms by examining a smear of cervical cells on a slide: a Pap smear.
N.B. Pap smears are nearly impossible in the presence of cervical bleeding!

Unfortunately, a screening program needs good laboratories and a system to recall and monitor patients with abnormal cells. A cheap and effective screening method is to apply Lugol's iodine or 4% acetic acid to the cervix and examine it after 1min. Look for the squamo-columnar junction, where the outer pink squamous and inner reddish columnar lining of the cervix meet. The presence of dense, opaque, well-defined 'aceto-white' lesions or growths here is highly suggestive of a pre-malignant lesion (severe dysplasia). If this is present, a cone biopsy would prevent this lesion becoming malignant (see below). However, carcinoma is usually recognized later by an irregular, ulcerative lesion of the cervix, which bleeds easily. Cervical carcinoma is less common in those who use condoms, so encourage patients with multiple sexual partners, or those with partners, who themselves have multiple partners, to use them.

DIAGNOSIS. Take a careful history and establish the timing and appearance of the bleeding; a patient may confuse vaginal bleeding with haematuria. Examine the abdomen, and the groins. Examine the vagina and cervix first digitally, then with a speculum *using a good light source*. Perform a rectal examination and a bimanual examination of the pelvic organs. Do all this as an outpatient procedure. You may see:
(1) An ulcer on the cervix, often extending into one or more fornices.
(2) A cervical polyp (less common).
(3) An enlarged barrel-shaped cervix which may look relatively normal.
(4) Erosion into the bladder or rectum causing a vesico-vaginal or recto-vaginal fistula.
N.B. In all these situations, take a biopsy if you are unsure of the diagnosis. A Pap smear is for lesions invisible to the naked eye.

DIFFERENTIAL DIAGNOSIS includes a simple cervical ectopy, a cervical or endometrial polyp, a submucous fibroid, various stages of miscarriage, irregular bleeding near the menopause, carcinoma of the endometrium, senile vaginitis, urethral caruncle (23.17), syphilis and a tuberculous or schistosomal granuloma.
N.B. this last may look exactly like cancer!

Suggesting carcinoma: the lesion feels hard, it is friable (bits break off easily), a raised edge, you can feel it rectally extending into her parametrium.

Suggesting cervical ectopy (normal and physiological): an area of glandular columnar epithelium (usually found inside the cervical canal) around her external os surrounded by normal squamous epithelium with *no raised edge and which does not feel hard and gritty*. There is usually no contact bleeding.

If an acetic acid test is suspicious, freeze it with the help of liquid CO_2 (available via cool drink producers). This will cure 80-90% of patients (with some innocent over-treatment). Nurses can easily learn to do this. Otherwise you need to take an excisional cone biopsy, but this is not feasible if your patient cannot return for follow-up, pay for pathologist fees etc.
N.B. D&C is not necessary for investigating carcinoma of the cervix. This does occasionally reveal carcinoma of the body of the uterus or of the endocervix. Invasion of the body of the uterus by a carcinoma of the cervix is not one of the staging criteria for this tumour. Officially, staging includes a cystoscopy but staging is usually quite possible without it.

STAGING AND MANAGEMENT
If you suspect the carcinoma is in one of the earlier stages, with some hope of cure or palliation, take care to stage the disease under GA in the lithotomy position. Use a speculum to inspect the vagina for Stage IIA or III disease and for fistulae. Do a rectal examination to assess spread beyond the uterus. Do a vaginal examination at the same time, and feel the rectovaginal septum between your fingers.

If there is an advanced lesion, an examination under GA is unnecessary, and is possible as an outpatient if you are gentle, and remove a small piece of tissue for histology. You may however need to suggest admission on social grounds, especially if home is far away, but beware if you are dealing with terminal disease. Death in your hospital might result in very steep transport costs for the family, *and no improvement to your reputation*. Death caused by cervical carcinoma is usually not accompanied by pain. It is mostly caused by uremia or blood loss. Arrange that there is access to analgesia/sedatives if needed.

Stage 0, carcinoma in situ. This is a histological diagnosis, made from either a cone (or wedge) biopsy, or a +ve Pap smear. The cells look malignant, but have not yet invaded the surrounding tissue, and may not do so for many years, if ever. Freezing (cryosurgery, see above) or cone biopsy (see below) is curative at this stage.
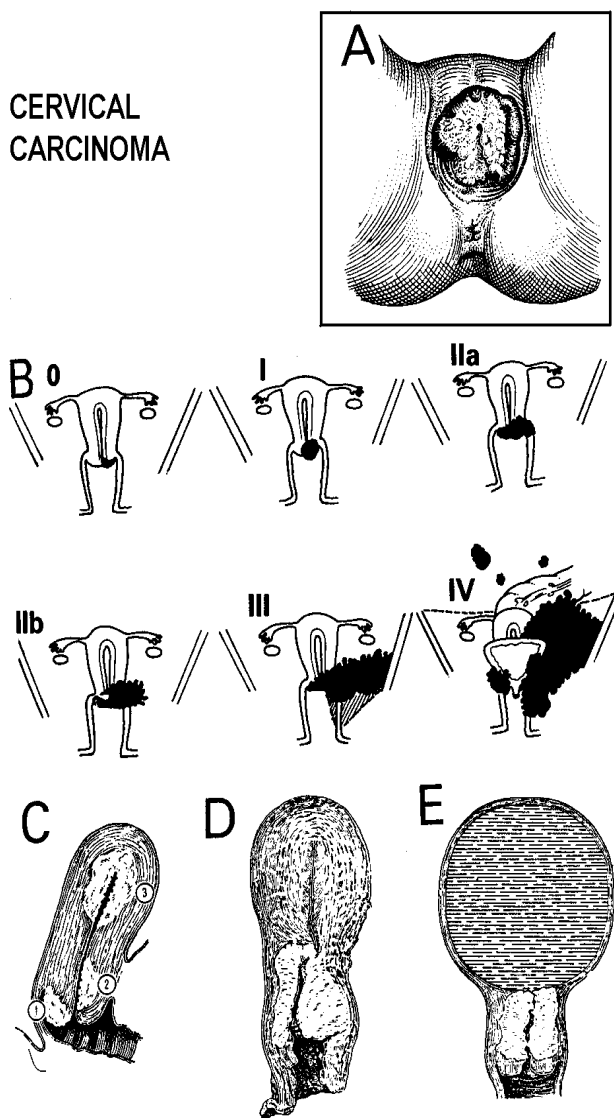
CERVICAL CARCINOMA

Fig. 23-9 CARCINOMA OF THE CERVIX.
A, a woman with a neglected carcinoma of the cervix involving the vulva (Stage IV). B, staging the disease. Stage 0, carcinoma in situ. Stage I, tumour is confined to the cervix (this can easily be seen and felt). Stage IIa, it extends into the upper vagina or uterus, but not into the parametrium. Stage IIb, it extends into the parametrium, but not to the pelvic wall. Stage III, it involves the side wall of the pelvis, or the lower ⅓ of the vagina or produces hydronephrosis. Stage IV, it involves the mucosa of the bladder, or rectum, or there are distant metastases. C, sites of uterine carcinoma: (1) Squamous carcinoma of the vaginal cervix. (2) Adenocarcinoma of the endocervix. (3) Adenocarcinoma of the endometrium. D, carcinoma of the cervix (Stage I or II). E, pyometra; the body of the uterus is filled with pus above a Stage I carcinoma of the cervix. *After Pinter and Roberts; Young J. A Textbook of Gynaecology A&C Black, 5ᵗʰ ed 1939*

Stage I. The tumour is confined to the cervix and can be cured, either by radical hysterectomy, or by radiotherapy. there is an 85-90% chance of surviving 5yrs. A total hysterectomy may be of some benefit, if radical hysterectomy, *i.e.* with the parametrium (the round, uterosacral, broad and cardinal ligaments) and the upper ⅓ or ½ of the vagina, and usually also a pelvic lymph node dissection, is not feasible.

Beyond Stage I, cure is difficult to achieve by surgery alone.

Stage IIA. The tumour extends out from the cervix into the upper vagina or uterus, but not into the parametrium. Stage IIa is uncommon because progress to stage IIB is so rapid. Manage as for stage I. There may be a 50% 5yr survival. Radical, *but not simple,* hysterectomy is of some value. Try to arrange radiotherapy for all cases of stages II & III.

Stage IIB. The tumour extends into the parametrium but not as far as the pelvic wall. Radical surgery is impossible, but radiotherapy may be of benefit. Even if it fails, it is nonetheless good palliation.

Stage III. The tumour involves the lower ⅓ of the vagina (IIIA) or the side wall of the pelvis (IIIB). Manage IIIA as for stage IIB. Radiotherapy can achieve 5yr survival rates of 30-40%.

Stage IV. The tumour involves the mucosa of the bladder or the rectum, or has spread beyond the pelvis. Palliate the patient with chlorpromazine, diazepam and analgesics, as the pain increases (37.1, 2).

CAUTION!
(1) A Pap smear –ve does not exclude invasive carcinoma, nor does a +ve smear prove it (there may be *carcinoma in situ, i.e.* cells with cancerous changes only within the surface layer of the cervix which with time can develop into cancer).
(2) *Carcinoma in situ does not cause abnormal bleeding or other symptoms.*

CONE BIOPSY (GRADE 2.2)
INDICATONS.
(1) To confirm a +ve or suspicious acetic acid test or Pap smear. If the cervix is clinically normal, repeat the acetic acid test before you take the biopsy.
(2) As treatment *for carcinoma in situ,* as shown by a +ve Pap smear.
(3) As primary treatment for a lesion considered to be *carcinoma in situ* or possibly stage I, in order to obtain reliable distinction between the two.
CAUTION!
(1) *Don't do a preliminary cervical dilation.* If it is necessary, do it after you have taken the biopsy.
(2) *Don't use cutting diathermy*: it spoils the specimen.

METHOD. Put the patient in the lithotomy position. A cone biopsy is notorious for postoperative bleeding, both reactionary and secondary. Minimize this by inserting a preliminary absorbable suture to prevent bleeding, exactly as with McDonald's cervical suture (20.5).
Either, start by inserting a #0 absorbable suture (23-10B), and tie it. Put it all round the cervix, as high up as you can, and pull it tight to occlude the descending cervical vessels.
Or, use vulsellum forceps to grasp the anterior aspect of the cervix away from the lesion. Transfix the descending cervical vessels (23-20) on each side with #0 absorbable suture, leaving the ligatures long as stays.
N.B. Schiller's test (optional) helps to define the extent of the atypical epithelium, but is not absolutely reliable. Apply 1% iodine to the lesion and the surrounding epithelium. Normal epithelium stains brown, atypical epithelium may not.

Incise the normal epithelium c.5mm from the abnormal epithelium, and extend your incision all round the cervix.

If you have cutting diathermy, cut (with your cold knife) in small steps while in every stage of the procedure arresting the haemorrhage. Apply Vulsellum forceps to the lips of the cervix at 12 & 6o'clock positions.

Deepen the incision to remove a cone, with its apex at the cervical canal, keeping its edge 3-5mm away from the abnormal tissue. Use diathermy for haemostasis if possible. Leave the raw surface open. Cut the cone open in the 12o'clock position, (23-10E) and send it intact for histology.
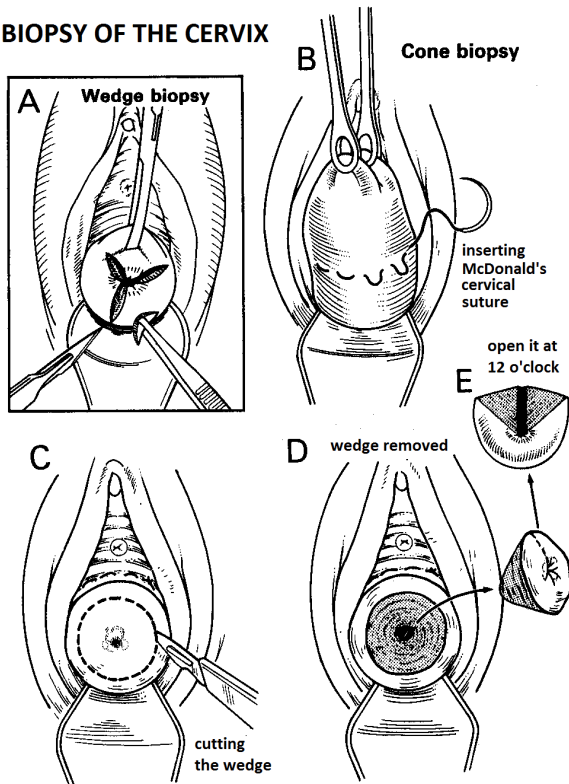

Fig. 23-10 BIOPSY OF THE CERVIX
A, a wedge biopsy. B, insert McDonald's suture before doing a cone biopsy. C, cut the cone. D, remove the cone. E, open the cone out with an incision in the 12 o'clock position.

CAUTION! For a pathologist to examine a cone biopsy:
(1) it must be big enough,
(2) its orientation on the patient must be identifiable (hence the 12 o'clock cut).
(3) it must be in one piece,
(4) it must be injured as little as possible.
The pathologist must be able to report whether the edges of the cone are normal, and if not, where the suspicious tissue is situated.

WEDGE BIOPSY (GRADE 1.2)
INDICATIONS.
To check for malignancy in an ulcer of the cervix.

METHOD. This is similar but not the same as a cone biopsy. At ≥3 sites on the ulcerated area, excise ellipses ≥3mm deep, crossing the margin between the ulcerated and the normal area (23-10A).

B. CARCINOMA OF THE ENDOMETRIUM
Endometrial carcinoma occurs mostly in post-menopausal women, and presents with vaginal bleeding. *The older the woman, the larger the chance that vaginal blood loss is a sign of malignancy*. When disease is advanced, abdominal pain with or without bowel and bladder symptoms dominate.

STAGING
Do this either after a hysterectomy or pre-operatively when the disease is very advanced and you note involvement of the bladder or bowel. If the cervix shows macroscopic tumour of endometrial carcinoma, the stage is at least IIB.

Endometrial Carcinoma	STAGE	
In situ	0	
Confined to corpus	I	
Tumour limited to the endometrium		IA
Up to <½ of myometrium		IB
>½ of myometrium		IC
Extension to cervix	II	
Endocervical glandular only		IIA
Cervical stroma		IIB
Local and/or regional as specified below:	III	
Serosa/adnexa/positive peritoneal cytology		IIIA
Vaginal involvement		IIIB
Regional lymph node metastasis		IIIC
Mucosa of bladder/bowel		IVA
Distant metastasis		IVB

DIAGNOSIS. Confirm the diagnosis by doing a suction curettage under LA, if possible. Otherwise, do a D&C and sending scrapings for histology. If you have a vaginal ultrasound probe, measure the 2 layers of endometrium: (the basal and functional layer, the latter being shed during menstruation). If they add up to >4mm, this is indicative of carcinoma, but you still need histology.

MANAGEMENT. This depends on staging and histological grade. If you have post-operative radiotherapy available, you don't need to take a vaginal cuff with the hysterectomy; otherwise this is advisable. You need to perform a *total* abdominal hysterectomy (TAH) with bilateral salpingo-oophorectomy (BSO), and add post-operative radiotherapy (POR) and lymph node ablation as well in certain cases.
Performing inadequate surgery will not benefit the patient.

Stage	Grade	Age	Treatment
IA, IB	1, 2		TAH+BSO
IA, IB	3	< 60yrs	TAH+BSO
IA, IB	3	≥60yrs	TAH+BSO + POR
IC	1, 2	< 60yrs	TAH+BSO
	1, 2	≥60yrs	TAH+BSO + POR
IC	3		TAH+BSO + POR
IIA	1, 2, 3		TAH+BSO + POR
IIB-III	1, 2, 3		Radical TAH+BSO + Lymphadenectomy + POR

Alternatively, especially with a well-differentiated tumour (grade 1) where operative cure is not an option, or there is recurrence, you can stabilize the cancer by high-dose progestogens, using 150mg medroxyprogesterone acetate od for 3wks, then weekly for 12wks, then monthly.

SURVIVAL
The 5yr survival after surgery and radiotherapy worsens for each higher stage: Overall under the best circumstances all stages combined, the survival is 75%.
Recurrences occur mostly in the vaginal vault and can be temporarily controlled by radiotherapy.

23.9 Ovarian cysts & tumours

Many ovarian tumours are cystic, but many cysts are not malignant and some tumours are not cysts. Their classification is complex; this is a simplified scheme.

Benign:
(1) Functional cysts of the follicles and corpus luteum.
(2) Benign serous or mucinous cystadenomas.
(3) A dermoid cyst (contains tissue derived from embryonal germ layers, such as hair or teeth).
(4) Unclassified benign cysts (simple cysts).
(5) Endometriosis ('chocolate, *i.e.* brown, cysts')

Malignant:
(1) Serous or mucinous cystadenocarcinomas.
(2) Stromal cell or sex cord tumours (which can produce high levels of oestrogens or androgens).
(3) Germ cell tumours.
(4) Metastatic tumours (from bowel, or breast).
(5) Burkitt's lymphoma.
(6) Other rarer tumours.

Borderline: tumours that look benign but metastasize or recur 20yrs later.

Pseudocysts are post-inflammatory collections of fluid between adhesions in the pelvis (23.1), and are not true ovarian cysts; but the distinction is not always easy, even at operation.

Most common ovarian malignancies are epithelial carcinomas. They arise in the ovaries or tubes. They metastasize in the peritoneal cavity, most commonly on and around the ovaries, in the pelvis, in the omentum and eventually in the whole peritoneal cavity. They also metastasize to the retroperitoneal lymph nodes. Finally they metastasize to the lungs. They rarely metastasize to the liver. If liver metastases are obvious, consider another primary malignancy.

The greatest challenge when dealing with an ovarian tumour is to know whether it is malignant or not. Manage a benign cyst conservatively e.g. by cystectomy in young women or adnexectomy in older women. Expectant management is also justifiable.

Try to drain very large cysts through a small incision and then remove the cysts. The final diagnosis (pathology) will only become clear after the operation.

An ovarian cyst can be of any size, from 1-30cm or more in diameter, and may:
(1) Present as a mass, or as abdominal distension, which may be massive.
(2) Cause abdominal pain due to torsion.
(3) Be confused with pregnancy.

Very large cysts, the size of term pregnancies, are usually benign and cause no pain. Cysts <5cm are usually benign. Postmenopausal tumours are more often malignant. Pre-pubertal tumours are usually germ cell malignancies.

Before the operation make a malignancy risk assessment. The most useful diagnostic tool is ultrasound (38.2J). If ascites is already obvious clinically, then most often the disease has spread through the whole abdomen.

EXAMINATION bimanually reveals a round, solid or cystic mass, which is dull to percussion and separate from the uterus.

ULTRASOUND (38.2J, especially with a vaginal probe) will usually clinch the diagnosis, although if the cyst is very large, it may be difficult to be sure where it originates.
A benign cyst is usually: unilateral, single, and echo-translucent (just like water). Completely smooth cysts are usually benign functional, or endometriomas. If white marks (solid parts) are also present, they are dermoid cysts or occasionally cystadenocarcinomas.
Malignant cysts are usually: bilateral, multicystic, showing solid and cystic areas, especially with papillary formations inside.
Ascites is a strong sign (in the absence of suggestions of tuberculosis or cirrhosis) of malignancy. A cyst of >5cm diameter is significant. Solid ovarian tumours are more likely to be malignant, and produce early metastases.

A RADIOGRAPH may show teeth inside a dermoid cyst.

DIFFERENTIAL DIAGNOSIS varies according to the presentation:

As a simple cyst:
(1) Pregnancy.
(2) A distended bladder, which may contain 5l of urine.
(3) Pseudocysts.
(4) Hydrosalpinx (blocked Fallopian tube full of liquid).
(5) Fibroids.
(6) A chronic ectopic gestation (haematocele).
(7) A broad ligament cyst arising from the Wolffian ducts (which contribute to male genital development but regress in females).
(8) An appendix mass, or a small-gut mass.
(9) Mesenteric cysts.
(10) An enlarged spleen with a long pedicle.
(11) Hydronephrosis.
(12) Hydatid Cyst.

As torsion:
(1) Appendicitis or an appendix mass (14.1).
(2) Acute ectopic gestation (20.6).
(3) Degeneration, bleeding, or infection in a fibroid (23.7).
(4) A mass due to PID (23.1).

As a huge cyst:
(1) Ascites (dullness to percussion in the flanks, rather than in the centre of the abdomen).
(2) Obesity (fat is usually generalized).
(3) Pregnancy.
(4) An enormous bladder from chronic urinary retention.
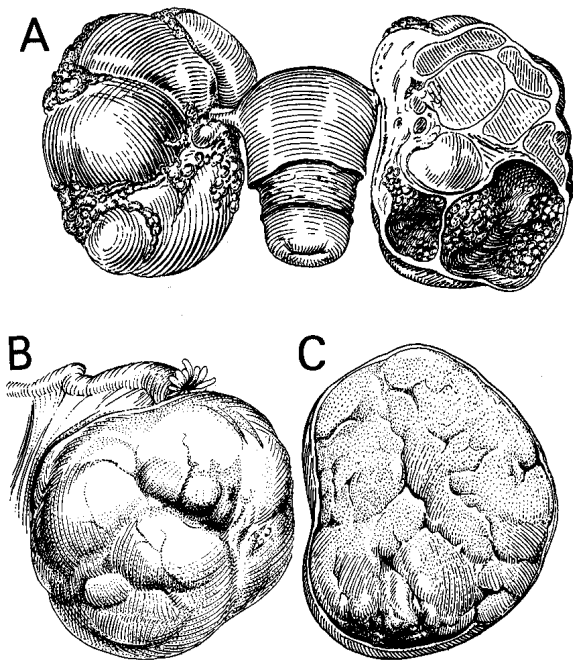(5) Haemato-colpos/-metrium from an imperforate hymen, so the blood of menstruation cannot escape (23.17)

OVARIAN TUMOURS

Fig. 23-11 OVARIAN TUMOURS.
A, a pseudomucinous papillary cystadeoncarcinoma shown in cross-section on the right. B, a solid primary carcinoma. C, the same carcinoma in cross-section.
Adapted from a drawing by Frank Netter with the kind permission of CIBA-GEIGY Ltd, Basle Switzerland.

MANAGEMENT OF AN OVARIAN CYST

If a cyst is <5cm diameter, **and the patient is <50yrs,** it is usually a functional (follicular or luteal) cyst, and may be associated with dysfunctional uterine bleeding (23.3). The simple rule is that a cyst like this need not come out. Review the patient in 8-12wks, and only operate if the cyst persists. Most functional cysts will have disappeared. If you find such a cyst at laparotomy for some other condition, leave it. If it looks benign, open it.

If the patient is <15yrs (before menarche), many cysts are benign, but there is an increased risk of malignancy, which is sometimes low-grade. At operation the decision to remove the ovaries is particularly difficult. Only remove large (>10cm), solid ovarian tumours, and be sure to send them for histology. If ovarian cystectomy is not possible, remove only one ovary!

If the patient is 15-35yrs, and the cyst is >5cm diameter, it is probably a dermoid, especially if it is firm. Perform an oophorectomy. If it is bilateral (15%), try to leave some ovarian tissue by doing ovarian cystectomies if there are no signs of malignancy.

If the patient is 30-55yrs and the cyst is >10cm diameter, it is likely to be a cystadenoma, which may be bilateral (20%). The contents may be serous, and there may be papilliferous growths inside its wall (a sign of dysplasia or frank malignancy), or outside (virtually diagnostic of malignancy). Large cysts are more likely to be malignant than small ones.

If the cyst is very large, its contents are likely to be mucinous. Malignant change is unusual. If however the mucin spills into the peritoneum, further benign tumours may re-grow all over the abdomen (MYXOMA PERITONEI) and cause dense adhesions. Some large cysts are serous cystadenomas; some are cystadenocarcinomas.

Try to remove a cyst without spilling the fluid, because if you do, you may spread a malignant tumour and harm the patient greatly. If a tumour has not spread through the wall of a cyst, its removal intact without spilling will usually be curative. Aspirating a cyst (using a purse-string suture around the suction device) before you try to remove it, makes it easier to remove, requires a smaller incision lower in the abdomen, *but may not make dissection of adhesions any easier.* However this is likely nevertheless to cause some spillage, whose effects can, though, be minimized by packing off the rest of the abdomen.
If you decide not to aspirate a cyst, you will obvious cause no spillage unless it bursts or you cut into it: this is then a much worse spillage than if you had aspirated it in the first place! Even large cysts are, however, not too difficult to remove intact, if you make an incision large enough. However, *don't make a huge incision to avoid the minor risk of spillage, for example in a frail elderly lady.* Ultrasound will give good information whether a cyst is likely to be malignant (38.2J).

Most ovarian cysts have few adhesions. If adhesions are dense you may be dealing with:
(1) Old PID.
(2) A malignant cyst in which the growth is already spreading into the peritoneum.
(3) Previous peritonitis that has left adhesions which have stuck the cyst to the peritoneum.
(4) A cyst which has previously undergone torsion.
(5) Endometriosis.

If there are dense adhesions it might be possible to shell out a benign cyst leaving the extreme outer layer, thus preventing damage to the surrounding tissues. Sometimes you are forced to empty a large cyst first because otherwise it is impossible to reach the blood vessels behind it.
   N.B. Don't ruin a suction machine by letting the drainage bottle overflow and allowing foam or fluid spill into the mechanism while you attempt to drain a huge ovarian cyst!

If the other ovary is also cystic, and the patient is relatively young, perform an ovarian cystectomy, unless there is a suspicion of malignancy. Avoid removing both ovaries on a woman <40yrs for bilateral benign tumours (usually dermoids containing hair or teeth). *Remember that operating on a pseudocyst, or a cyst in the broad ligament, is particularly hazardous*, because of bleeding.

N.B. If you have to remove both ovaries, the cheapest hormone replacement therapy is the contraceptive pill.

If the patient is post-menopausal, the risk of malignancy is increased. Be prepared to perform a hysterectomy, at the time that you remove the cyst.

N.B. Suspect malignancy on the combination of these factors:
(1) a woman >40yrs,
(2) a solid or lobulated tumour,
(3) papillary excrescences (23-12A) on the ovarian surface (especially) or inside it,
(4) ascites,
(5) metastatic deposits on the peritoneum,
(6) a fixed and immobile cyst.

If the patient is pregnant, delay surgery till between 16-24wks gestation or later at a Caesarean Section if obstructed labour is likely.

MANAGEMENT OF AN OVARIAN TUMOUR

If there is a bilateral, papilliferous, or obviously malignant ovarian tumour, what you should do depends on your skills, and how far the tumour has spread:
(1) Perform a bilateral adnexectomy (removal of the cyst with the ovary and tubes) if there is no peritoneal spread, and no tumour on the uterine surface.
(2) Perform a bilateral adnexectomy if you can clear limited localized tumour spread.
(3) Biopsy a peritoneal deposit if there is wide peritoneal spread. *Do not attempt heroic pelvic surgery*, because you will not be able to cure the patient thereby.

If there is a palpable mass, ascites, or oedema of the legs (due to lymphatic obstruction from peritoneal deposits), consider the possibility of a solid adeno- or undifferentiated carcinoma of the ovary, which typically presents like this. It is often bilateral, and the prognosis is poor whatever you do.

If the tumour is solid, remember the possibility that it may be a fibroma, which is benign, but can cause ascites and a pleural effusion (Meig's syndrome). Perform an oophorectomy. If you remove the tumour, the fluid resolves. It may be a thecoma, an oestrogen-producing generally benign tumour producing lipid rich, yellow-orange fluid, or granulosa cell tumour, which may be malignant and present with abnormal uterine bleeding and in 20% with endometrial cancer. Most patients are >40yrs.

If you are in an endemic area and the patient is 10-25yrs, remember Burkitt's lymphoma (17.6), which is often bilateral, or hydatid cyst (15.12).
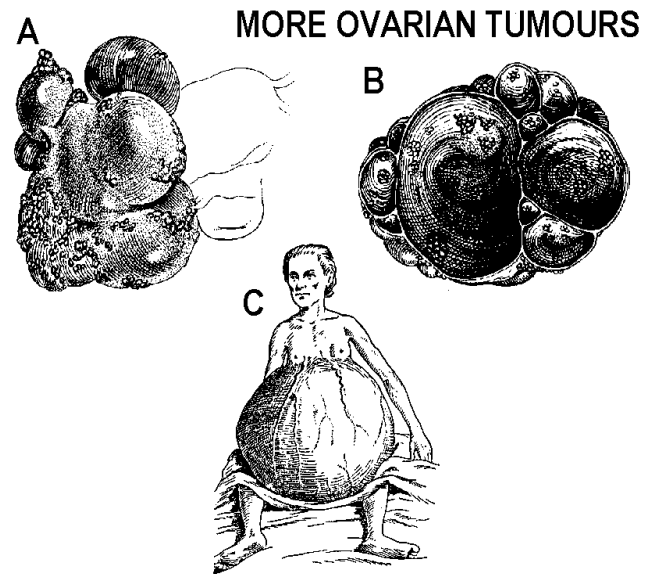

Fig. 23-12 MORE OVARIAN TUMOURS.
A, probably a papillary serous cystadenocarcinoma. B, the same in cross-section. C, a very large ovarian cyst showing dilated veins on the abdominal wall. *A,B, adapted from drawings by Frank Netter with the kind permission of CIBA-GEIGY Ltd, Basle Switzerland. C, after Young J. A Textbook of Gynaecology A&C Black 5th ed 1939*

INDICATIONS FOR SURGERY.
(1) Treatment or prevention of complications: torsion, bleeding, or infection.
(2) Suspected malignancy.
(3) Discomfort due to size.
(4) Causing obstructed labour.
   CAUTION! *Infertility is not an indication.*

OOPHORECTOMY FOR SMALLER CYSTS (GRADE 3.2)

INCISION. Make a midline or Pfannenstiel incision, big enough to allow you to insert your hand, and to remove the cyst intact.
If you are sure the cyst is benign, make an incision just small enough to aspirate the cyst, and perform an ovarian cystectomy (see below). If not, feel its whole surface for adhesions. Search for metastases in the rest of the peritoneal cavity, over the surface of the liver, and under the right diaphragm.
When the cyst is free of adhesions, deliver it through the abdominal wound, and hand it to your assistant, taking care not to pull on its pedicle, which may be so thin that it easily tears, causing the proximal end to slip into the pelvis and bleed (23-13C).
   CAUTION! Before you remove the cyst with the ovary, examine the other ovary.
The pedicle of an ovarian cyst consists of:
(1) the infundibulo-pelvic ligament and ovarian vessels superiorly (21-18, 23-20, 23-21),
(2) the ovarian ligament, which connects it to the uterus,
(3) part of the broad ligament, and
(4) frequently, the Fallopian tube.

BEWARE OF THE URETER, which runs under the infundibulo-pelvic ligament more deeply and posteriorly.

If the pedicle is wide (often it is not), clamp it with several clamps, taking a bite of ≤2cm in each of them. Cut through the pedicle at some distance from each clamp; it will be less likely to slip off if you do this.

Transfix the pedicle in each clamp with double '2' absorbable sutures, taking care to avoid the plexus of veins as you insert the needle. Finally, ask your assistant to hold the clamps, and pass a further ligature round the entire pedicle. This will tie any veins which may have escaped the other ligatures. Swab the stump, and, if bleeding has been controlled, cut the ligatures. Remove the cyst from the operation site, and ask an unscrubbed assistant to open it. If it looks malignant and she is >40yrs, perform a bilateral adnexectomy (see below). If the patient is younger, wait for histological confirmation of malignancy, and advise more radical surgery later if necessary.

OOPHORECTOMY FOR A VERY LARGE CYST (GRADE 3.2)

POSITION.
Lay the patient with a sandbag under the right buttock. This prevents the supine hypotensive syndrome, if she lies on her back.

INCISION.
Make a midline incision. If you hope to remove the cyst intact, make it ≥5cm longer than the diameter of the cyst.

If you are not sure if you can remove the cyst intact with the ovary, or whether this is really necessary, make the incision just long enough to examine it properly, separating such adhesions as you can see, without too forceful traction on the wound. If you cannot dissect further safely, enlarge the incision to see the outline of the cyst and any adhesions. Aspirating fluid may help you to deliver it through the abdominal wall, but seldom helps in dissecting adhesions. A flabby cyst has an edge which is difficult to define, so that vital structures, such as the ureter, are more easily cut. If you do decide to aspirate fluid, use a powerful sucker attached to some tubing you can secure to the cyst wall; *don't contaminate the operation site with the fluid you have aspirated*!

CAUTION: A wound which is too small is dangerous because you cannot dissect safely, and you are obliged to exert excessive traction. A large wound is more likely to dehisce or give rise to other complications.

Remove the cyst by clamping its pedicle (23-13). Be careful not to pull it so hard that you tear this.
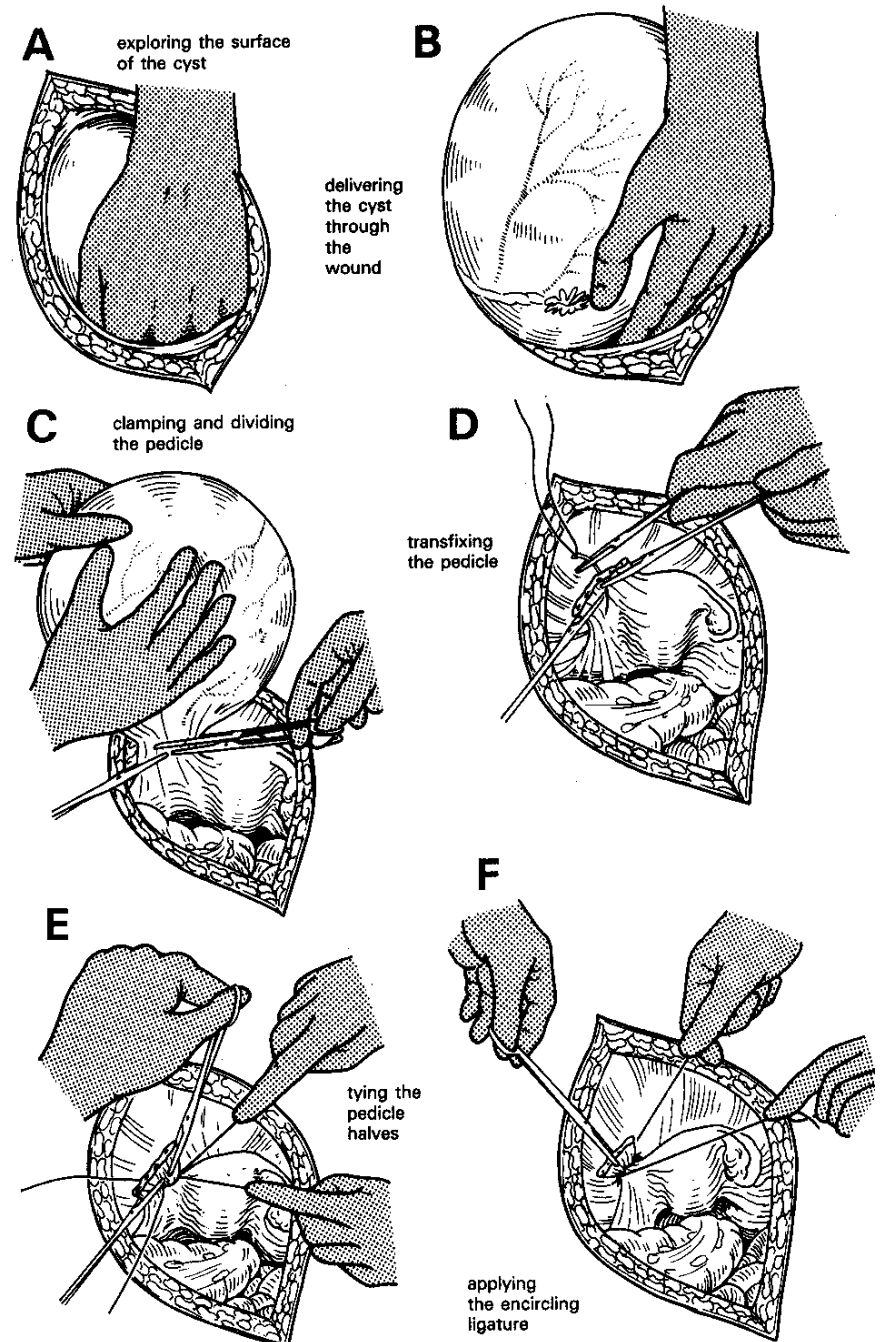
REMOVING AN OVARIAN CYST

Fig. 23-13 REMOVING A LARGE OVARIAN CYST.
A, explore the surface of the cyst. B, deliver the cyst without rupturing it. C, clamp and divide the pedicle. D, transfix the pedicle. E, tie the pedicle in halves. F, apply the encircling ligature.
After Bonney V. Gynaecological Surgery, Baillière 1964 Figs 4.29-34 with kind permission.

OVARIAN CYSTECTOMY (GRADE 3.2): this removes the cyst but leaves behind the tissue of the ovary.

INDICATIONS.
(1) The patient is <40yrs, and the other ovary is also damaged.
(2) The cyst is >5cm.

(3) The cyst must be benign, a reasonable amount of normal ovarian tissue should be present.

N.B. If the cystic ovary is the only remaining one, it is not important if its tube is intact or not. The patient needs its endocrine function, regardless of possible fertility. You may be able to shell out even quite large cysts, and retain some ovarian tissue. The cyst lies in the substance of the ovary and is covered by the ovarian capsule.

N.B. Don't remove an ovarian cyst early in pregnancy: the corpus luteum needed for its progesterone to prevent miscarriage may be in that cyst or ovary!

INCISION.
Make a midline or Pfannenstiel incision. Cut around the edge of the cyst, well away from the remaining mass of the normal ovary. Using scissors or fingers, dissect between the cyst and the ovarian tissue. Control bleeding with 2/0 absorbable, and close the outer layer of the ovary with continuous locking sutures. Cover any raw surfaces with omentum, to avoid adhesions.

SALPINGO-OOPHORECTOMY (ADNEXECTOMY)
(GRADE 3.3): this removes both Fallopian tube and ovary.

INDICATIONS.
(1) Both tube & ovary have been affected by torsion, bleeding, or infection.
(2) A possibility of malignancy.
(3) Extensive adhesions between tube and ovary.
(4) Combined with a hysterectomy in a woman >50yrs (usually means a bilateral adnexectomy).

N.B. The tube and ovary receive their blood from 2 sources which anastomose with one another, the ovarian vessels in the infundibulo-pelvic ligament and the ascending branches of the uterine vessels (21-18, 22-14, 23-20, 23-21).
.

INCISION.
Make a midline or Pfannenstiel incision. Carefully divide any adhesions between the ovary and broad ligament, approaching them from below and behind. Raise the tube and ovary, find the infundibulo-pelvic ligament, and identify the ureter, so that you can avoid it. Clamp, divide, and tie the ovarian vessels in the infundibulo-pelvic ligament. Clamp, divide, and tie the ovarian ligament. Clamp, divide, and tie the tube.

CAUTION! *Be sure not to tie the ureter*. This is not a problem if the structures are mobile. But if there are adhesions, and especially if the ovary and tube have stuck to the back of the broad ligament, be sure to identify and mobilize them before you resect them.

DIFFICULTIES WITH OVARIAN CYSTS
If there are EXTENSIVE ADHESIONS, this may be a post-inflammatory cyst. *Don't try to deliver the tumour until you have divided the adhesions*, or you may lacerate the bowel or tear large veins. Separate them using your hands, swabs, or scissors (*not a scalpel*!). Gently pass your hand between the cyst wall and the floor of the pelvis. *Don't mistake the parietal peritoneum for the cyst wall. Don't tie off any colon when you tie off adhesions.*

CAUTION! It is safer to leave a little cyst wall on the bowel or the bladder, than to remove a little bowel or bladder with the cyst wall. There may be many of these cystic collections; just aspirate them rather than trying to remove them all.
If the cyst is not freely mobile, but seems to be embedded in the broad ligament, it may be arising from the remains of the Wolffian duct. Removing it may be difficult. It may be stuck to the broad ligament, or inside it. The distinction is usually unimportant. If it is inside the ligament:
(1) *Be sure to avoid the ureter,* which may run anywhere over the cyst.
(2) *Don't damage the venous plexuses in this region*. Study the anatomy carefully before you start.
If the cyst does not shell out easily, and extends down close to the ureter, you would be wise to remove as much as you can, and leave the remains open to the peritoneal cavity (marsupialization). Take a biopsy to exclude malignancy.
If you can define the cyst clearly by finger dissection, and are able to push the ureter out of the way, you may be able to remove it completely. It is covered by peritoneum which you need to dissect off. Divide the round ligament on the same side, to open up the broad ligament. Then dissect off the peritoneum posteriorly, until you reach the ovarian vessels in the infundibulo-pelvic ligament. Tie them. Then dissect anteriorly and medially, and divide the tube and ovarian ligament close to the uterus. Finally, slowly and carefully dissect the cyst from the posterior leaf of the broad ligament, so as to avoid the ureter.
If the infundibulo-pelvic ligament is grossly thickened, so that the ovarian vessels are difficult to distinguish from the ureter, open up the peritoneal tissues lateral to them, and extend the incision towards the pelvic brim. Grasp the ovarian vessels and draw them medially. You will then see the ureter attached to the peritoneum, crossing the common iliac artery.

DIFFICULTIES WITH GIANT OVARIAN CYSTS
If the patient develops cardiac failure, which may be delayed for a day or two postoperatively, treat her with a diuretic.

If the patient develops respiratory failure, due to the paradoxical movement of the diaphragm, which is lax and overstretched, now that the cyst has been removed, treat her with oxygen and sit her up.

If the abdomen distends postoperatively, it is probably due to ileus. Mobilise the patient and if this fails, insert a nasogastric tube for 1-2days and infuse IV fluids till bowel function returns.

If the abdomen is abnormally lax, apply an efficient binder postoperatively.
CAUTION! *Don't be tempted to resect any redundant abdominal wall*. This will make the operation much more extensive and bloody. Abdominal compartment syndrome may result (11.10).

CHEMOTHERAPY without a complete debulking operation is only palliative for ovarian malignancy. Chemotherapy may be useful however in treating ascites, and may prolong survival in patients in Stages II (peritoneal spread within the pelvis) and III (peritoneal spread throughout the abdomen). It also delays the onset of this distressing problem. 40% of patients respond to cyclophosphamide $1\cdot5g/m^2$ od every 21days for up to 6 courses. Other régimes are more effective against epithelial ovarian carcinomas.

23.10 Gestational trophoblastic disease (GTD)

One of the most important advances in oncology was the discovery that many cases of choriocarcinoma could be cured with methotrexate. In a normal pregnancy many placental (trophoblastic) cells are carried to the lungs, but do not grow there: they have a normal DNA-structure. Trophoblast is only malignant when it grow*s* outside the uterus, or abnormally within it. There are various possibilities:

A Benign GTD is an overgrowth of the trophoblast, in which the chorionic villi form fluid-filled, grape-like vesicles, up to 1cm in diameter. Such a MOLE can be *complete* without an embryo (more common), or *partial* (less common), when some fetal tissues are present

A COMPLETE HYDATIDIFORM MOLE develops mainly because a sperm has fertilised an 'empty' egg (contains no nucleus or DNA). All the genetic material comes from the father's sperm. Therefore, there is no fetal tissue. Up to 20% of patients with complete moles will need additional surgery or chemotherapy after initial evacuation of the mole because of the presence of persistent trophoblastic material. A small percentage of complete moles may develop into choriocarcinoma, which is a malignant form of GTD.

A PARTIAL HYDATIDIFORM MOLE develops when two sperms fertilise a normal egg (triploidy). These contain some fetal tissue (most often blood vessels containing immature nucleated red cells, as opposed to mature red blood cells in adults, which appear as denucleated discs). But this tissue is often mixed with the trophoblastic tissue. No viable fetus is formed. Only a small percentage of patients with partial moles need further treatment after initial evacuation. Partial moles rarely develop into malignant GTD.

Moles of either kind can present as a miscarriage, or an ectopic gestation. In a binovular (non-identical) twin pregnancy, one twin may be normal and the other a mole. Moles vary widely in incidence from 1:120 to 1:2000 pregnancies, and are more common in Asia than they are elsewhere. Thus haemoptysis in a female in the East Asia may be more likely to indicate GTD than TB.

B Persistent/invasive GTD (invasive mole) is a tumour-like process which invades the myometrium and arises from GTD, more commonly from a complete mole. The risk of this developing is greater if:
(1) there was a long time (>4months) between the last menstrual period and evacuation,
(2) the uterus has become very large,
(3) the woman is >40yrs,
(4) the woman has had GTD in the past. These lesions occasionally regress spontaneously.

C A metastasizing trophoblastic neoplasm (chorio-carcinoma) arises from the trophoblast after a live birth (25%), a stillbirth or miscarriage (25%), an ectopic gestation, or a hydatidiform mole (50%)**.**
These may all present as heavy irregular bleeding, often being mistaken for an incomplete miscarriage.

D Placental site trophoblastic tumour is a rare form of GTD that develops where the placenta attaches to the uterus. This tumour most often develops after a normal pregnancy or miscarriage. Most placental-site tumours do not spread to other sites in the body. Sometimes, though, these tumours penetrate the muscle layer of the uterus. Although most forms of GTD are very sensitive to chemotherapy, placental-site tumors are not and, therefore, they must be completely removed by surgery.

After an evacuation of GTD, there may be
(1) complete recovery (80-95%),
(2) non-metastasizing trophoblastic neoplastic change (invasive mole) (5-15%), or
(3) metastasizing trophoblastic neoplastic change (choriocarcinoma) (0-5%), of either high or low risk may develop. A subsequent new gestation will be a mole in c.1·5% of cases.

Early diagnosis, effective treatment, and energetic follow-up are essential. GTD is treatable without too much difficulty, but a choriocarcinoma is different. Try to make sure choriocarcinoma patients get treatment in a recognized centre in your country where enough experience is present to monitor patients who have a potentially fatal disease but which can be cured with potent drugs.

A BENIGN GTD

HISTORY AND EXAMINATION.

Enquire about the times of bleeding, and ask about the passage of tissue ('grapes') vaginally. Note the size and feel of the uterus, especially changes after 2wks. Measure the fundal height. Listen for the absence of the fetal heart (you should hear it at 18wks in a normal pregnancy). Doppler fetal heart monitoring is useful. The presence of a fetal heart reduces the probability of a mole, but does not exclude the much rarer occurrence of a mole in a twin pregnancy. Look for signs of gestational hypertension.

PRESENTATION

Commonly <20 or >40yrs, usually presenting before 18wks gestation with:

(1) Rapid enlargement of the uterus, which feels abnormally soft.
(2) Excessive nausea and vomiting.
(3) Vaginal bleeding which starts at the 6th-8th wk.
(4) Passage of vesicles though the cervix.
(5) Enlarged often palpable cystic ovaries (50%).
(6) Signs of gestational hypertension.
(7) Hyperthyroidism (occasionally).
or any combination of these signs.

If gestation exceeds 18wks, also the inability to palpate fetal parts and the lack of perceived fetal movements

ULTRASOUND (38.2J) gives a classic appearance of multiple cysts (or 'snowstorm') in the uterus but even with the best machines with a vaginal transducer and in the best hands the diagnosis is missed in 50% of cases and confused with an incomplete or missed miscarriage. Invasion of the myometrium can sometimes be seen and cystic ovaries are often present (23-14).

In Asia histological examination should, resources permitting, be performed of every evacuated incomplete/missed miscarriage in case an embryo was never seen.

In Africa that should also be the case ideally, but you should insist on it for women who need a re-evacuation with the diagnosis of incomplete evacuation.

TESTS FOR GONADOTROPHIN.

The level of β-HCG in the blood is somewhat related to the prognosis but irrelevant on the whole in most circumstances for diagnosis. A mole needs evacuation; after that there will be a dramatic drop in HCG anyway.

DIFFERENTIAL DIAGNOSIS includes:

(1) a multiple pregnancy,
(2) a miscarriage, especially a missed miscarriage,
(3) acute polyhydramnios,
(4) retention of urine with a retroverted gravid uterus,
(5) a subacute or chronic ectopic gestation.

MANAGEMENT

ANAEMIA, Correct the anaemia by blood transfusion. If the Hb is <5g/dl, transfuse packed cells slowly, and precede each unit with furosemide 20mg unless there is rapid blood loss.

N.B. High levels of β-HCG may be difficult to detect except in diluted urine (see below);

N.B. High levels of β-HCG may have a thyrotoxic effect (25.2)!

EVACUATE THE UTERUS.

Cross-match blood. It is advisable to use at least 2 drugs to limit blood loss and, if available 3. Start with high doses of oxytocin IV (10U/500ml, running at 30drops/min), ergometrine 0·5mg IM and misoprostol 800μg PR.

You can then wait and see, but if you have some expertise, a suction curettage after you have felt the uterus become as hard as a stone is then best.
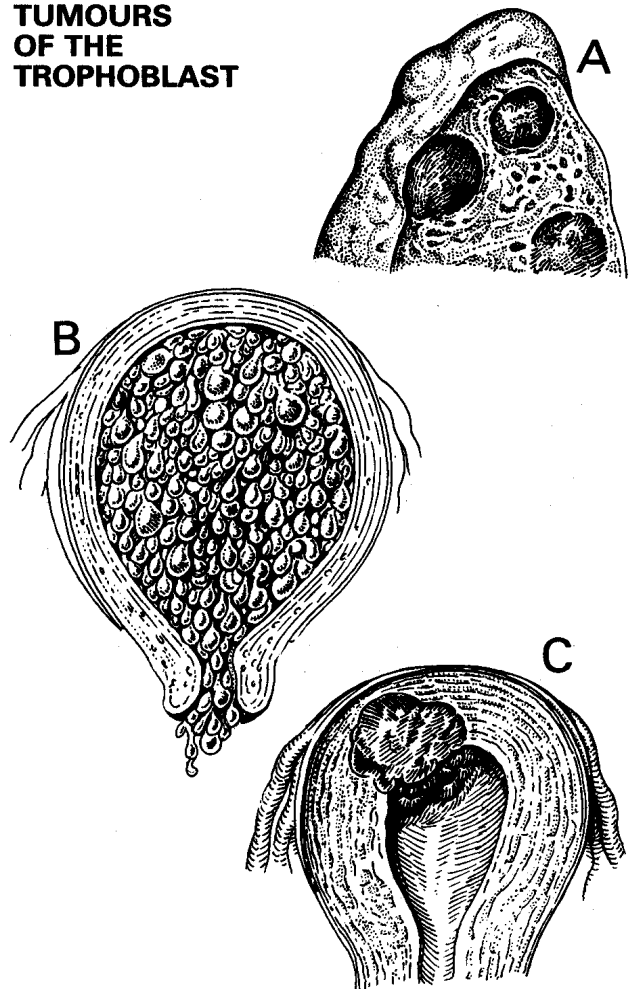
TUMOURS OF THE TROPHOBLAST

Fig. 23-14 TROPHOBLASTIC TUMOURS
A, a choriocarcinoma has already metastasized to the lungs (typical 'cannon-ball' lesions). B, a hydatidiform mole. C, a choriocarcinoma invading the wall of the uterus. *Adapted from drawings by Frank Netter with the kind permission of CIBA-GEIGY Ltd, Basle Switzerland.*

You are then present with the patient when it is most important to be so. If the patient has a serious tachycardia without severe anaemia, 8mg salbutamol orally 30mins before the procedure might prevent a thyrotoxic crisis.

As soon as you start suction or even dilatation (never use a sound), bleeding will start and it will only stop when the uterus is empty and very well contracted. You can sometimes use your fingers to check if it is empty.

Very Important Points: Make sure *before you start* that the suction machine works properly (at maximum capacity): you must be able to lift the tubing with your finger attached by vacuum suction to the end of the tube. It must also have a large diameter & high flow rate. An aspirator is no good because the syringe will fill up with fluid and blood in a second and you will not be able to empty the uterus. Blood will then collect faster in the uterus than you are able to evacuate it, let alone allow you to remove the mole. Use wide bore tubing because the tube must not block halfway through the procedure when the patient is bleeding. Also the Karman cannula should be large, preferably 12mm in a 16wk sized uterus or otherwise ≥10mm if in a uterus <14wk size.

You should be able to empty, change, and reconnect the bottle fast or have 2 excellent suction machines in theatre.

N.B. This procedure can be done slickly (emptying the uterus in 30secs)*, but it can also become a disaster if you have not checked the equipment!*

CAUTION! *Take great care not to perforate the uterus.*

If you think that evacuation is incomplete, or if bleeding continues slightly, accept this, and repeat the curettage in 3days. Torrential bleeding can occur, so have 2 units of blood available, but don't transfuse unless forced to do so.

After you have evacuated the uterus, you may feel cystic ovaries: leave them alone. Repeat the evacuation if there is still bleeding after 7-10days.

If you still cannot control the bleeding, take the patient to theatre to apply a B-Lynch suture (22-3). This will stop most bleeding and not interfere with a pregnancy later.

If even then, bleeding persists, tie a tourniquet round the base of the uterus (as for a myomectomy: 23.7) and leave it for 12-24hrs. Then re-open the abdomen to remove the dead uterus; this transforms a horrendous procedure into an easy one!

N.B. Avoid a hysterectomy without the tourniquet as the GTD may have invaded the large vessels. *During a hysterectomy clamps and sutures will cut through and you might be unable to stop the haemorrhage.*

FOLLOW UP is essential to identify those patients (up to 20%) who need cytotoxic drugs. However, >98% of women who become pregnant following a cured molar conception will not have a further GTD and these pregnancies are at no increased risk of other obstetric complications. You can follow the expected drop in β-HCG by routine urinary pregnancy tests. If a routine modern monoclonal sensitive pregnancy test is -ve (can take 2-3months) then the trophoblastic disease has most likely virtually disappeared. You should however repeat it then 2wkly for 3months (while the patient is using proper contraception) and then monthly for 1yr. If it is still -ve you can consider her cured. She can stop contraception if she wants, and become pregnant.

If the pregnancy test stays +ve then try a 2nd suction evacuation carefully (even if an ultrasound scan indicates a normal empty uterus) and send the material for histology. If after that, the pregnancy test stays +ve, it is then time for a work-up (chest radiograph, ultrasound of uterus, kidneys liver, laboratory) and a quantitative β-HCG test because the patient will probably need chemotherapy. You need a baseline β-HCG level to see later how successful the chemotherapy is. The β-HCG value should preferably be reduced by ≥90% after every course.

Commercial kits measuring the quantity of β-HCG in serum are easiest but expensive. You could try pregnancy tests on serial dilutions of a 24hr-urine specimen (keeping it cool during collection to detect the greatest dilution showing a +ve result. This is an inexpensive way of doing a quantitative test, and although it is not ideal, *you have to do it carefully.*

A modern urine test is just +ve with 25mIU/ml (check the leaflet in the box). This means that if the test is just +ve and you have collected 1½l of urine, there are 37·5IU in a 24-hr collection. If x10 dilution is just +ve, there are 375IU present.

You must insist on a reliable form of family planning method for a year. If the husband cannot be relied on to use a condom (unfortunately usual), either insert an IUD, even though its side effects may be confused with choriocarcinoma, or use depo-provera.

Suspect a trophoblastic neoplasm if during follow up:
(1) dark vaginal bleeding continues,
(2) the uterus remains large after evacuation or delivery,
(3) you see a haemorrhagic nodule near the urethral meatus, vaginal vault or cervix,
(4) amenorrhoea continues.

Establish the diagnosis by ultrasound and by measuring serial β-HCG levels as above.

B INVASIVE TROPHOBLASTIC NEOPLASM
(INVASIVE MOLE)

DIAGNOSIS.
A titre of β-HCG of >200IU in a 24hr specimen after 2-3months, or a rising or unimproved titre after 2months is abnormal.

Look for absence of metastatic disease in the vagina, pelvis, liver, brain, and chest (23-14A).

The differential diagnosis includes the incomplete evacuation of a normal placenta, placenta accreta, or ectopic gestation.

If you make the diagnosis within 4months of delivery you have a 95% chance of cure.

Treat with oral methotrexate $15mg/m^2$ od in courses of 4days. Repeat the courses every 14days for 2 courses after the β-HCG is normal, to a maximum of 6 courses.

If the β-HCG is still >2,000IU/24hrs, after 6 courses of methotrexate, start actinomycin D $2mg/m^2$ (or 1mg on days 1 & 3), one course every 3wks. Repeat this every 3wks for 2 courses after the β-HCG test is -ve.

If the β-HCG test remains +ve, start therapy, as for choriocarcinoma (see below).

C METASTASIZING TROPHOBLASTIC NEOPLASM
(CHORIOCARCINOMA)

PRESENTATION.
(1) A history of heavy irregular bleeding, sometimes following a miscarriage, especially with the need for repeated evacuation, particularly if an embryo was never seen by ultrasound or within the evacuated material.
(2) Persistent amenorrhoea following GTD.
(3) A haemorrhagic nodule on the urethral meatus, vaginal vault or cervix.
(4) Cough, chest pain, 'unresolved pneumonia' or a bloody pleural effusion.
(5) An acute haemoperitoneum like a ruptured ectopic gestation, due to perforation of the uterus by the tumour.
(6) Neurological symptoms.
(7) Gastro-intestinal bleeding.
(8) Haematuria.

ULTRASOUND (38.2J) shows an irregularity in the uterine wall.

CHEST RADIOGRAPHS may show round metastases.
CAUTION! If the choriocarcinoma arose from a hydatidiform mole, you will already have evacuated it.

If it presented in other ways, *don't do a diagnostic curettage*, because:
(1) A 'negative' one does not exclude the diagnosis.
(2) You can easily perforate the uterus, or cause catastrophic bleeding.
(3) You may spread the tumour.

PROGNOSIS. All untreated patients die from multiple metastases. Try to diagnose this disease early. You may, if you cannot refer to a special centre, treat 'low risk' patients, but do not attempt to treat 'high risk' patients who need different complicated expensive chemotherapy:

Low risk, after normalisation of β-HCG, 2 more courses	1. Index pregnancy was a mole or miscarriage. 2. Metastases only in vagina <u>or</u> lungs. 3. No previous chemotherapy. 4. Interval between evacuation & chemotherapy <12months.
High risk, after normalisation of β-HCG, 3 more courses	1. Insufficient success with previously administered chemotherapy. 2. Metastases in >1 organ outside the uterus. 3. Metastases in one of: liver, spleen, kidney, GI tract, brain, bones. 4. Index pregnancy was a term delivery. 5. Interval between evacuation & chemotherapy >12months.

LOW RISK PATIENTS:

Methotrexate (MTX)	1mg/kg	IM	day 1,3,5,7
Folinic acid (Leucovorin)	15mg	oral.	24hrs after methotrexate on day 2,4,6,8

Repeat the courses every 14 days (i.e. start day 15) as long as the β-HCG decreases by a factor of 10 by every course; repeat 2 more courses after a sensitive β-HCG test is negative.
If this is unsuccessful, and if β-HCG (in blood) is <100IU, use:

Actinomycin D	0·5mg	IV	day 1,3,5,7

If this is unsuccessful, the patient is re-classified high risk and needs treatment in a specialist centre.

23.11 Uterine prolapse

Childbirth may so injure the pelvic organs that the uterus, the bladder, or the rectum may prolapse, either singly, or in combination. In nullipara, it also occurs after the menopause. There are large regional differences in the prevalence of prolapse, most likely related to the quality of the ligaments.
In Southern Africa prolapse is rare but stress incontinence even more so, possibly related to the ubiquitous use of the squatting position, which strengthens pelvic floor muscles. Women working on the land with long skirts can easily squat frequently and keep their bladder content small. Travelling long distances in buses or taxis might become embarrassing; this also applies to shopping in circumstances where there are few toilets for clients. However absorbent 'Makapads' can be made from dried crushed raw papyrus processed into a thick paste with waste paper and water, cut to size and placed in absorbent inserts.
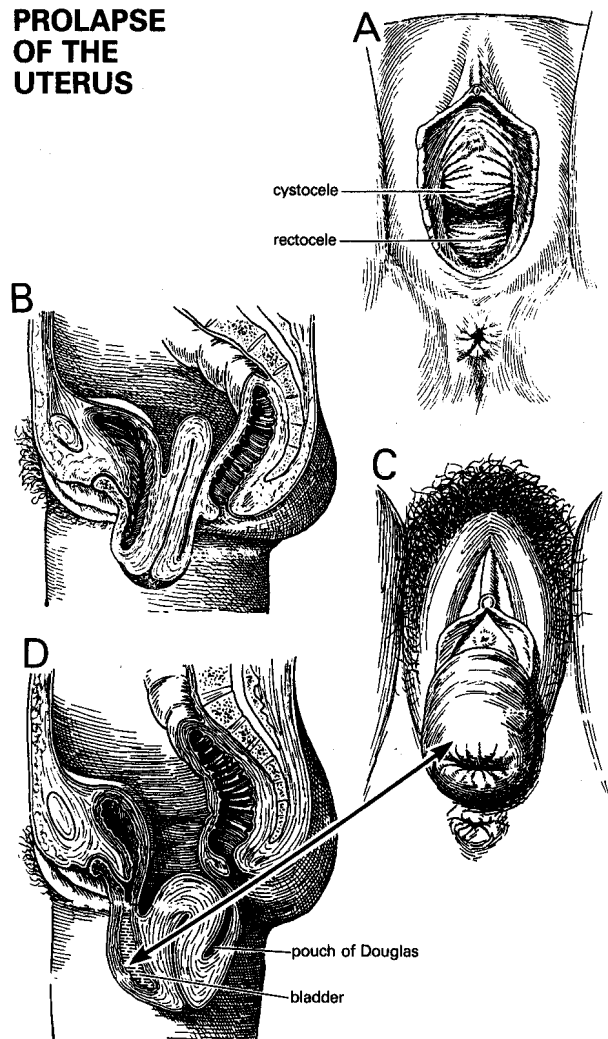(Makapads from t4tafrica.co, PO Box 21049, Kampala, Uganda)

Fig. 23-15 PROLAPSE OF THE UTERUS.
A, a cystocoele and a rectocoele. B, 3rd degree prolapse. C,D, proccidentia; the fundus is outside the introitus. Ideally, all these patients need a vaginal hysterectomy and an anterior (23.13) **and posterior colporrhaphy** (23.14)**.** *After Young J. A Textbook of Gynaecology A&C Black, 5th ed 1939. permission requested*

If the bladder or urethra prolapse as a cystocoele, perform an anterior colporrhaphy (23.13).
If the rectum prolapses as a rectocoele, perform a posterior colporrhaphy (23.14).
If the uterus prolapses arrange a Manchester repair (23.12) if it is to be left *in situ*, or a vaginal hysterectomy if it is to be removed. A simpler alternative is a ventrisuspension (23.12).

N.B. A vaginal hysterectomy, when the uterus is completely prolapsed out of the vagina, is much easier than an abdominal hysterectomy: the uterine arteries are far away from the ureters, so you can readily ligate them and amputate the vagina.
If there is ulceration of the prolapsed uterus, apply oestrogen cream: (you can make this up by crushing tablets in vaseline).

MARY, 80yrs, complained that her husband was accusing her of having given him an STI, because he was having pain in passing his urine. She wanted a letter she could take to the court saying that she was free of any STI. On examination the uterus was grossly prolapsed, ulcerated and stinking, but she had no evidence of any STI. A Manchester repair cured her completely. LESSON Patients' diagnosis are not always correct!
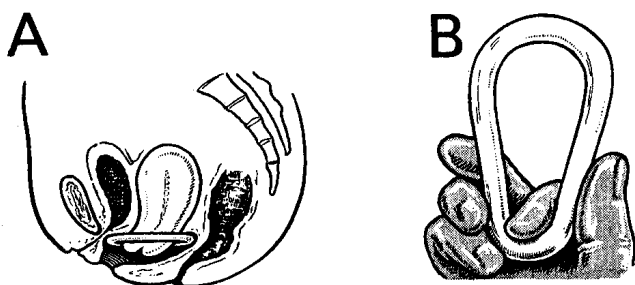
INSERTING A PESSARY

Fig. 23-16 A RING PESSARY is often very acceptable to an older patient with moderate prolapse. Choose its size *(40-120mm)* as you would a diaphragm, by measuring the depth of the vagina with your fingers. *After Garrey MM. Obstetrics Illustrated Churchill Livingstone 1974, permission requested.*

RING PESSARIES FOR PROLAPSE
Many old women prefer to avoid surgery, and can be treated with a pessary. Semi-rigid polythene ring pessaries are suitable. If they are comfortable they can be left in indefinitely and may even not be noticed by the patient. Menstruation and sexual intercourse can take place as usual

INDICATIONS.
(1) Moderate prolapse especially in an older patient.
(2) Weak perineal muscles; they will not hold a pessary and it will keep falling out. If too big a ring is required, the vaginal wall or cervix may prolapse through.

CONTRA-INDICATIONS.
(1) Ulceration of the prolapsed uterus.

METHOD. Choose the size of a ring pessary, as you would a diaphragm, by measuring the depth of the vagina with your fingers. It will usually be c.70mm. Lubricate it, compress it, and insert it like a diaphragm, with the posterior part behind the cervix, and the anterior part behind the symphysis.

It will resume its ring shape and take up a position in the coronal plane. If a 70mm pessary falls out, try a larger size in 5-10mm intervals. If it feels very tight and uncomfortable, so that the patient cannot pass urine, try a smaller size. Let her walk around, drink a lot, go to the toilet and return in c.1hr to see if it is likely to be satisfactory. She should not feel it, and be able to pass urine. Make her also strain hard (when standing) to see if it comes out. Many women can learn to remove it and replace it themselves: it is not difficult and only needs some explanation/encouragement.
Teach the old ladies how to remove and insert it: it is probably better off for sexual intercourse and most women do not need it at night anyway. This will help in reducing discharge and ulceration. Also sometimes the ring comes off (*e.g.* after defecation), so it is helpful if a woman can wash and replace it herself rather than visiting hospital just for this.
Review her in 3months; if all is well then, review annually and ask if the pessary is comfortable. Ideally, she needs a new silicone pessary each year. This may become permanently coated with solid material which you cannot wash off; then replace the pessary.
If the vagina is ulcerated at the annual check-up, leave the pessary out for 1-2months and apply oestrogen cream nightly. When the ulcers have healed, insert a smaller pessary, and review in 3months.

23.12 Ventrisuspension

In this operation the prolapsed uterus is sutured to the anterior abdominal wall. This relieves both the prolapse, and the rectocoele or cystocoele, which will probably also be present. Ventrisuspension alone does not interfere with the bladder, the urethra, the rectum, or the vagina. It is not difficult, and is a convenient operation if you are inexperienced; it does however sometimes fail.
Aim to make the anterior wall of the uterus, cervix, and bladder stick to the rectus muscles, and to make the peritoneum over the bladder, and the anterior wall of the cervix stick to the back of the pubis, so that there is no chance of bowel herniating between them.

INDICATIONS.
(1) Prolapse involving a considerable descent of the uterus.
(2) Prolapse in old postmenopausal patients.

CONTRA-INDICATIONS.
A woman who still wants to become pregnant.

METHOD. (GRADE 2.5)
Open the abdomen through a Pfannenstiel or midline incision, extending well down towards the symphysis pubis. The upper limit of the incision will depend on how far up you can pull up the uterus, when you have examined it. Separate the uterus and adnexa from any adhesions, bring them into the wound, and examine them.
Identify the peritoneal reflexion of the bladder, so that you can avoid it. Separate the *rectus abdominis* muscles from the peritoneum, along their whole length on each side of the wound (23-17C).

VENTRISUSPENSION

rectus
muscle

rectus
sheath

abdominal wall

B

peritoneum

C

D

no gap
between
uterus and
anterior
abdominal
wall

E

F

A

bare area
on the
uterus

G

bladder
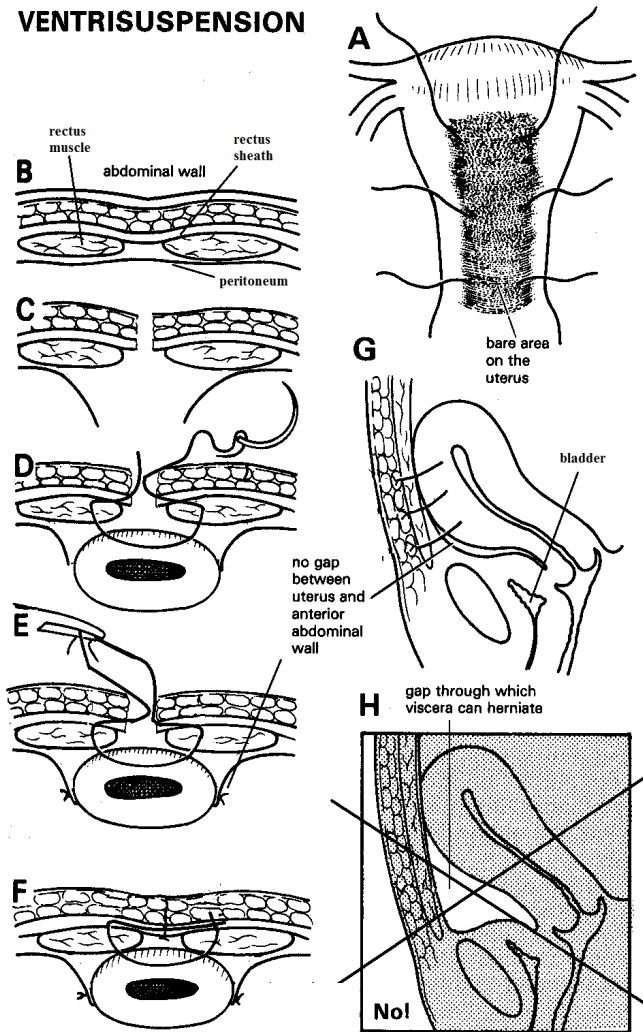
H gap through which
viscera can herniate

No!

**Fig. 23-17 VENTRISUSPENSION.
A, the bare area you aim to create on the uterus, with the sutures in place. B, the abdominal wall before starting the operation. C, open the abdominal wall and reflect the peritoneum. D, E suture the rectus sheath and peritoneum to the uterus. E, F, tie the sutures. G, a side view of the completed operation, showing the uterus close up against the abdominal wall. H, the space needing closure to avoid internal bowel herniation.**
Kindly contributed by Andrew Boddham-Whetham.

Use a scalpel vigorously to excoriate the anterior surface of the body of the uterus, to within 1cm of its upper and lateral borders (23-17A). *Don't excoriate the cervix.* Instead, elevate and remove a strip of peritoneum about 2cm wide off the cervix, the bladder, and the anterior abdominal wall, to join up with the skin incision.
Decide how high up the uterus should come behind the abdominal wall.

Pass three #2 parallel monofilament sutures through the outer surface of the rectus sheath on one side, through the rectus muscle, and then out of its bare posterior surface. Then pass it deeply in and out of the bare area of the anterior wall of the uterus, across into the bare area of the other rectus muscle, and out through the anterior rectus sheath on the other side. *Leave no gap between the uterus and the anterior abdominal wall*.

As you do this, avoid the peritoneum, which will fold inwards (23-17D). Apply clamps to each suture, and leave them until later (23-17E).

Using 2/0 long-acting absorbable suture on a round-bodied needle, and starting at the apex of the bladder (but without penetrating it), suture the peritoneum continuously to itself along the line that you have previously excoriated. When you have closed this gap, suture the peritoneum to the edges of the excoriated area on the uterus. In this way, you will have closed the peritoneal cavity, still leaving most of the uterus and all the adnexa intra-peritoneally, but with the excoriated area of the anterior uterine wall exposed in the open abdominal wall.
Now bring the anterior rectus sheaths lightly together with a continuous #1 monofilament suture, and tie the three large sutures which you previously passed through the anterior wall of the uterus (23-17F). The main strength of the suspension is the adhesions that are formed, *not these sutures*.

N.B. In a pre-menopausal woman, perform tubal ligation in addition.

If a ventrisuspension is not enough, add a simple diamond-shaped excision of the anterior or posterior vaginal wall to tighten up the vagina without doing a full Manchester repair. This consists of anterior & posterior colporrhaphy, amputation of the cervix, and plication of the transverse cervical ligaments, sutured to the front of the cervical stump.

23.13 Anterior colporrhaphy

The anterior vaginal wall, and with it the bladder, may bulge towards the introitus when a patient coughs or strains (cystocoele). The same thing can happen to the rectum (rectocoele) (23.14).

An anterior colporrhaphy mobilizes the bladder, returns it to its normal place, and fixes it there by exposing the peritoneum of the uterovesical pouch, and then suturing the fascia on either side, so as to make a supporting buttress from the urethra to the cervix.

EXAMINATION. Lay the patient on her side in the left lateral position. Insert a Sims' speculum posteriorly and anteriorly and ask her to cough and strain downwards. The cystocoele or rectocoele will then show its full size and the degree of uterine descent. Distinguish this from a urethral diverticulum (23.17).

If the cervix comes down to the vulva, she needs a Manchester repair (23.12), not just an anterior repair.

If she is postmenopausal, treat her with a course of oestradiol cream before operating.

If there is a rectocoele, usually accompanied by a deficient perineum, repair this at the same time.

ANTERIOR COLPORRHAPHY (GRADE 3.4)

INDICATIONS. Prolapse of the anterior vaginal wall which is troubling, especially if the patient has to push it back to micturate, provided there is little or no descent of the uterus. Preferably wait until childbearing is ended, because a prolapse may recur after pregnancy.

CONTRAINDICATIONS.
(1) Ascites.
(2) A severe chronic cough.
   N.B. Having a period is certainly not a contra-indication.

PREPARATION. The tissues must be clean before you operate, so insist on a bath just before surgery. Clear the rectum with an enema.
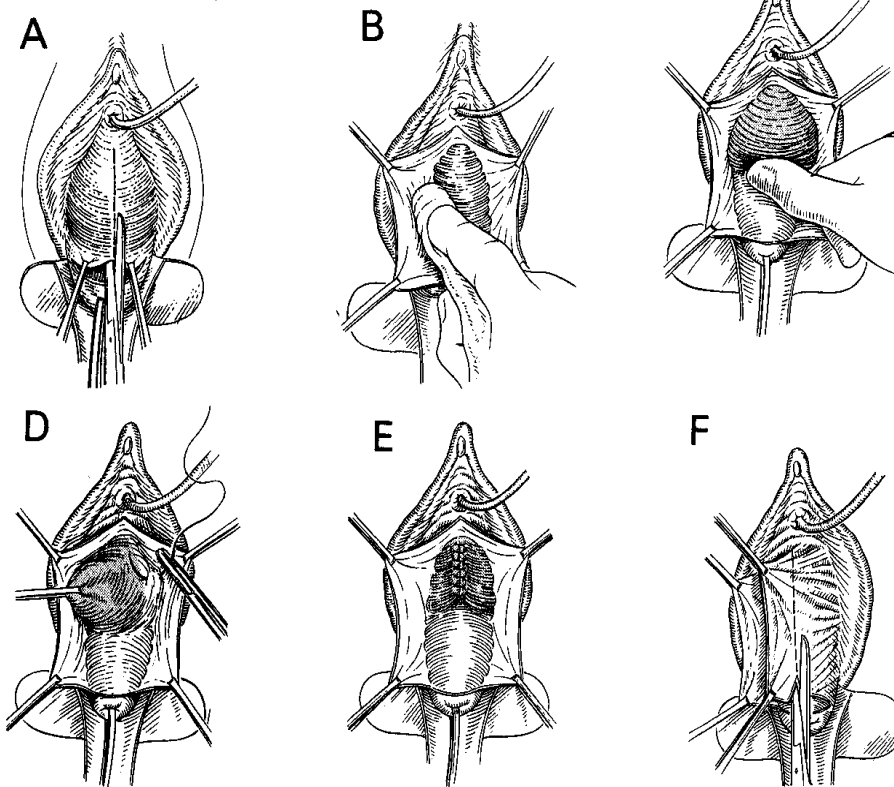
ANTERIOR COLPORRHAPHY

Fig. 23-18 ANTERIOR COLPORRHAPHY.
A, incise the anterior vaginal wall. B, mobilize the cystocoele. C, mobilize the cystocoele from the cervix. D, insert the tightening suture as far laterally as you can. E, obliteration of the cystocoele is complete. F, left anterior vaginal wall pulled to the right, and redundant wall cut off. *Do not cut off too much!*

METHOD.
Place the patient in the lithotomy position and clean the vulva and vagina. Suture the labia minora to the skin c.4cm from the vulva. Infiltrate the tissues, from the anterior urethral orifice to the anterior lip of the cervix, with 1/200,000 adrenaline; you will probably need 20-30ml.

Insert a catheter to identify the urethra. Put vulsellum forceps on the cervix and draw it down. Incise the vaginal wall covering the cervix about 1·5cm from the cervical os, and continue this laterally for 2cm on each side.
Undermine the edge away from the cervix, and continue to within 1cm of the urethral orifice, using the 'push and spread technique' with scissors (4-9).

   CAUTION! Keep close to the vaginal wall to avoid injuring the bladder. Distending the tissues with adrenaline solution makes this easier. The key to success is to work in the right layer.

Cut the wall of the vagina in the midline (23-18A). Dissect the vaginal wall away from the underlying tissues with a combination of blunt and sharp dissection, until you expose the bulging bladder fully on both sides. Where possible, use a gauze-wrapped finger (23-18B). Take great care to separate the bladder from the vagina in the lateral part of the flap near the cervix. Dissection should be almost bloodless, until you reach the veins which lie well laterally.

Dissect the bladder away from the cervix (23-18C). If necessary, draw up the bladder with dissecting forceps and cut it from the cervix with Mayo's scissors. Separate the bladder from the cervix with a retractor and expose the peritoneum of the uterovesical pouch, but *don't open the peritoneal cavity.* Using gauze dissection, separate the lateral extensions of the bladder from the lateral border of the uterus.

Feel for a stout pillar of fascia on each side of the uterus. The secret of success is wide and courageous dissection to find the pelvic perivaginal (cardinal) fascia laterally. Use a series of interrupted simple, or, better, mattress sutures of long-acting absorbable, to pick up this fascia as far laterally as you can, starting superiorly (23-18D).

If this fascia is difficult to identify, insert the sutures into the fascial envelope of the bladder. When you reach the cervix, secure the fascia to it. Tying the sutures will suspend the bladder (23-18E).

Remove redundant vaginal wall (23-18F); this usually needs to have a diamond-shape. If there is a large cystocoele, you will have to remove much vaginal wall, but if you remove too much, the vagina will be too narrow. Close it with interrupted sutures.

23.14 Posterior colporrhaphy

POSTERIOR COLPORRHAPHY

A posterior colporrhaphy, reduces the gaping introitus, reconstitutes the perineal body, reinforces the pelvic diaphragm by approximating the *levator ani* muscles, corrects the rectocoele and eliminates the hernia of the pouch of Douglas. You can feel the *levator ani* muscles of a normal nullipara 5cm from the introitus. The key sutures in this operation bring the *levator ani* muscles together in this position.

If the cervix descends more than a little at the same time, a Manchester repair (23.12) or a vaginal hysterectomy is necessary.

POSTERIOR COLPORRHAPHY
(GRADE 3.4)
INDICATION.
Prolapse of the posterior vaginal wall, with little or no descent of the cervix. Do this at the same time as an anterior repair, if indicated (23.13).

CONTRA-INDICATIONS & PREPARATION are as for an anterior colporrhaphy (23.13).

METHOD. Infiltrate the subepithelial tissues with adrenaline solution. On each side place Allis forceps 2cm apart over the posterior termination of the labium minor, just inside the fourchette (where the labia minora meet posteriorly) at the level of the little skin tags remaining from the hymen, and retract them. If you place them lower than this, the repair produces a bridge of skin which may cause dyspareunia. Retract the forceps, and use scissors to remove a little ellipse of skin between them (23-19A).

Hold the posterior vaginal wall with forceps. Use blunt dissection, and the 'push and spread technique' with scissors (23-19B), to dissect to a point where the posterior vaginal wall bulges less. When you have established a plane of cleavage, you can use your index finger (23-19C).

CAUTION! Keep near the vaginal wall to avoid incising the rectum.

At this point you usually need to excise some posterior vaginal wall (23-19D,E). How much you remove will decide how tight you leave the vagina. (23-19F: assumes that you have not removed any).

Use #1 long-acting absorbable sutures on a curved needle to pick up: (1) The *levator ani* muscles high in the wound on each side. (2) The fascial layer, which is rather thin, and tie it on each side. This will support the rectal wall (23-19F). Then pick up the *transversus perinei* muscles on each side to reconstitute the perineal body (23-19G).
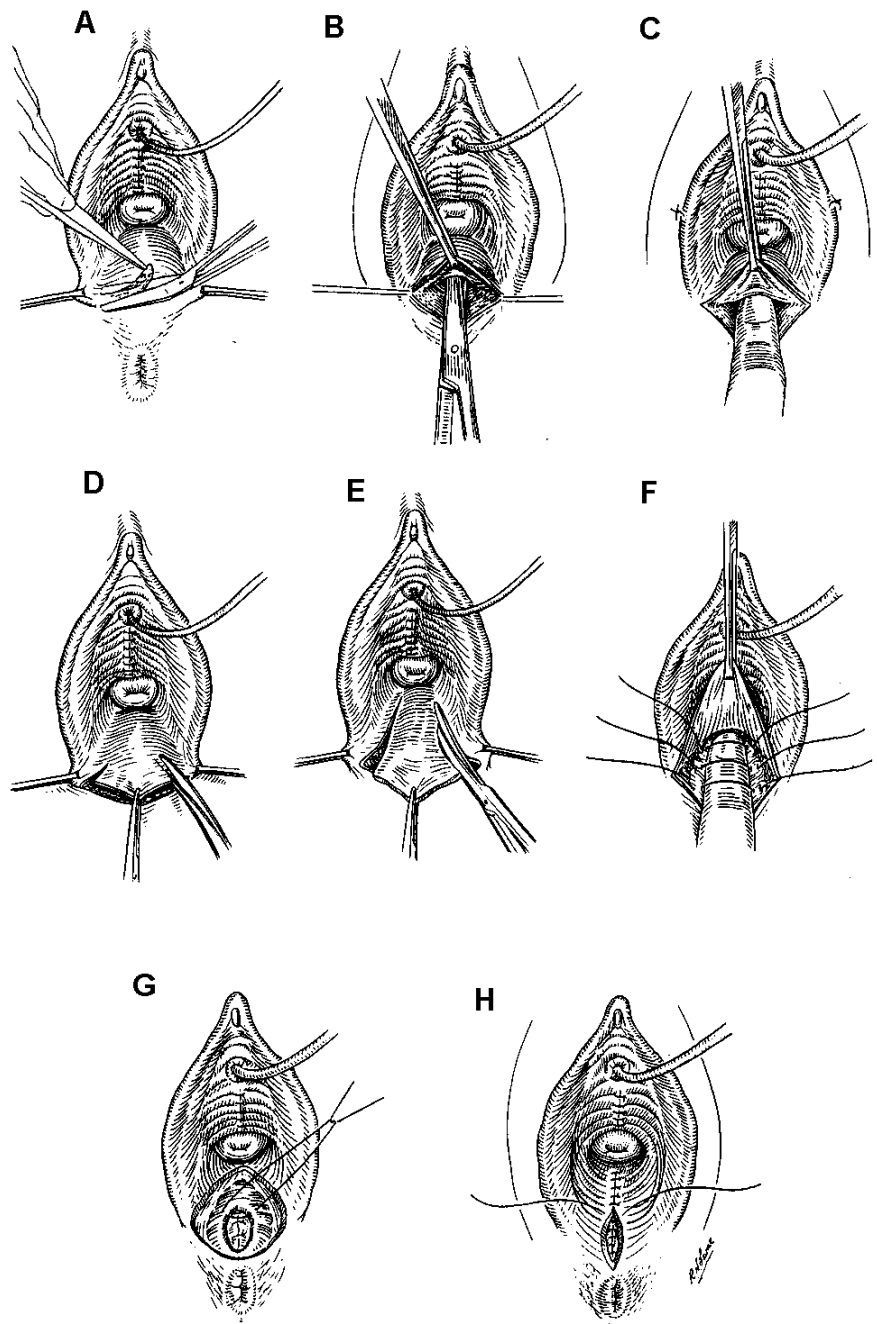

Fig. 23-19 POSTERIOR COLPORRHAPHY.
A, excise an ellipse of skin at the junction of the vagina and perineum. B, mobilize the posterior vaginal wall with a push & spread technique. C, separate the rectocoele from the posterior vaginal wall. D remove some skin from the posterior vaginal wall. E, carry the excision up to the apex of the freed vaginal skin. F, obliterate the rectocoele by tightening the fascial layer. G, suture the perineal muscles together. H, operation nearly complete.

Finally, close the posterior vaginal wall and perineum longitudinally in the sagittal plane (23-19H).

If you have done an anterior and a posterior repair together, the vagina should admit 2 fingers easily. If you can only insert 1 finger, there will be some dyspareunia. Remove the outer 2 sutures, and reconstitute the margin (fourchette) transversely.

POSTOPERATIVELY, drain the bladder. Remove the catheter on the 5th day. About 6hrs later ask the patient to pass urine and then re-catheterize her.

If the residual urine is <100ml on ultrasound (38.2H), let her pass urine normally.

If the residual urine is >100ml, reinsert the catheter for another 2days and repeat the process.

DIFFICULTIES WITH COLPORRHAPHY

If there is much bleeding:
(1) If it is venous, inject adrenalin solution and wait 3min. If necessary, pack the vagina. *Don't try to control venous bleeding with haemostats and ligatures*, because you won't find specific bleeding points.
(2) Undersew a bleeding artery with a suture.

If you open the bladder by mistake, repair it with a purse string suture and reinforce it with a second layer of Lembert sutures (11-5). Leave a catheter in the bladder for 10days.

If you open the rectum by mistake, this is not a disaster. If it is a large wound, close it transversely with long-acting absorbable sutures.

23.15 Hysterectomy

You may occasionally need to perform an *emergency hysterectomy* if a patient has:
(1) A ruptured uterus, and repair is impossible (not uncommon).
(2) Uncontrollable postpartum haemorrhage.

N.B. Hysterectomy for a ruptured uterus (21.17) differs in approach from the operation described below.

N.B. If possible, try to refer all elective cases. They may have disastrous complications, even in the hands of experts, and their patients even die occasionally. So *don't perform a hysterectomy, unless you are experienced*. Fibroids may cause disability, but they seldom threaten life.
A total hysterectomy removes the entire uterus; the advantage being that you remove the cervix, which is a common site for carcinoma.
A subtotal hysterectomy leaves a stump of cervix behind. It is contraindicated if there is any suspicion of carcinoma in either the cervix or the body of the uterus. But it is an easier operation, because you can more easily avoid the ureters. It may also prevent a vaginal prolapse later, in populations prone to this complication.
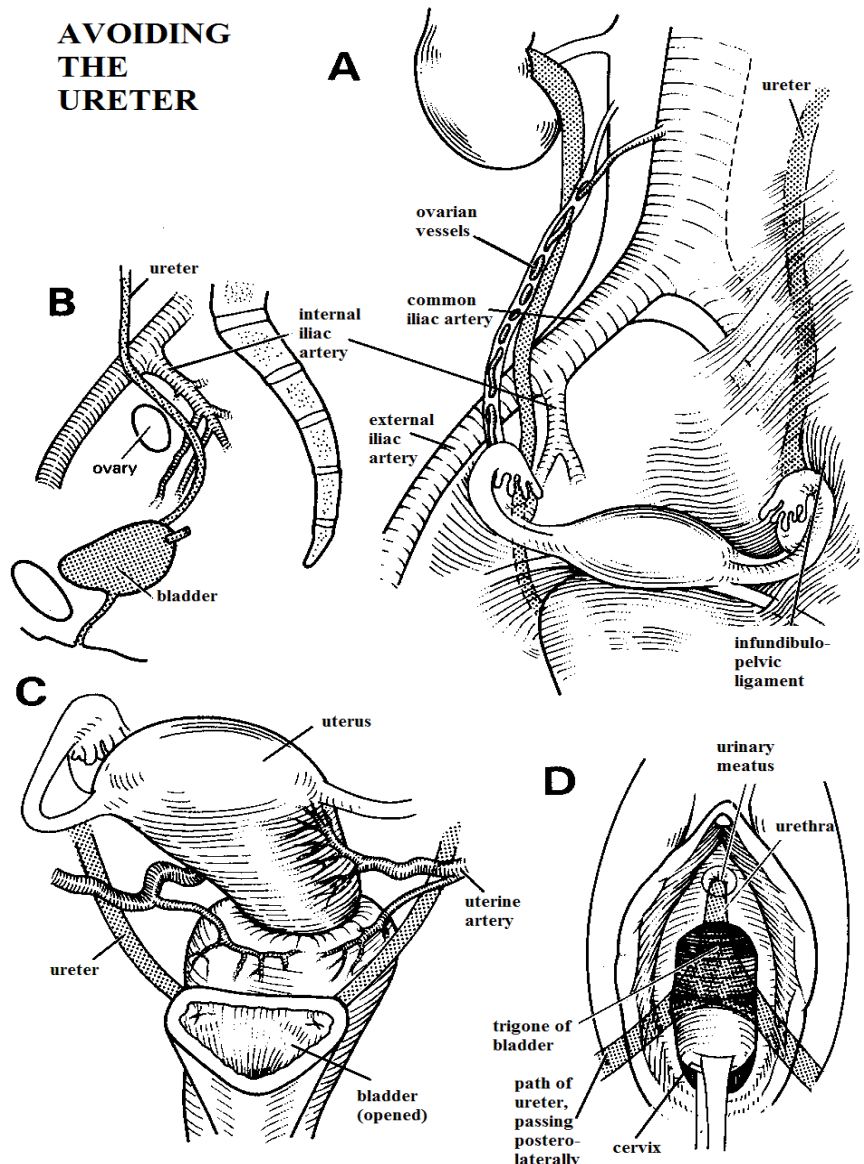

Fig. 23-20 AVOIDING THE URETER.
A, notice how the ovarian vessels pass in front of the ureter. B, the ureter passes over the pelvic brim, (*i.e.* the pelvic inlet at the level of the promontory of the sacrum and the pubic symphysis, 23-21C), just after the common iliac artery has divided into its internal and external iliac branches. C, the ureter passes close round the vault of the vagina *under* the uterine artery *(remember this by 'water under the bridge').* D, the relation of the urethra, the trigone of the bladder (a smooth surface delimited by the openings of both ureters and the urethra) and the ureters when you retract the cervix.
After Garrey MM. Gynaecology Illustrated Churchill Livingstone, 1977, p.308-9. with kind permission.

If you are inexperienced, start by doing a subtotal operation, particularly if you are operating for fibroids. But even this can be difficult, if there are adhesions from chronic PID.

Don't attempt a radical hysterectomy which also removes the pelvic lymph nodes. It is the only adequate surgical treatment for carcinoma of the cervix, but this really is a task for an expert with services of an expert anaesthetist and urologist available.
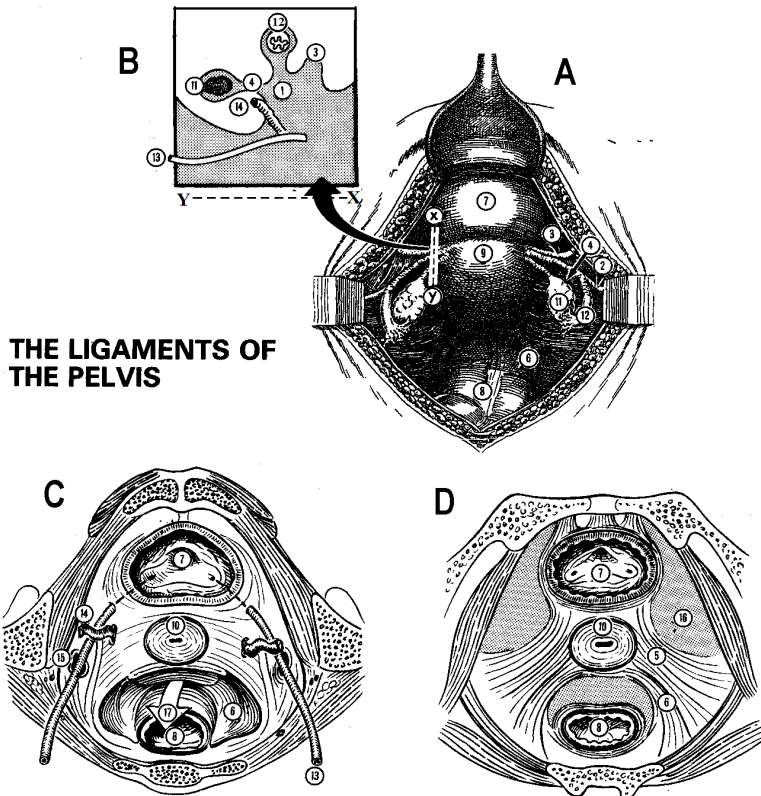
THE LIGAMENTS OF THE PELVIS

Fig. 23-21 THE LIGAMENTS OF THE PELVIS.
A, View through a laparotomy, looking down into the pelvis with the bladder at the top of the illustration. B, a sagittal section of part of the pelvis along line YX. C, a section through a the pelvis, parallel with the pelvic brim. (*i.e.* the pelvic inlet at the level of the sacral promontory and the symphysis). D, the main supporting ligaments of the pelvis viewed from above.
(1) the broad ligaments. (2) the infundibulo-pelvic ligaments. (3) the round ligaments. (4) the ovarian ligaments. (5) the cardinal (transverse cervical) ligaments. (6) the utero-sacral ligaments. (7) the bladder. (8) the rectum. (9) the fundus of the uterus. (10) the cervix. (11) the ovaries. (12) the Fallopian tubes. (13) the ureters. (14) the uterine arteries. (15) the veins of the pelvis. (16) fat filling the odd spaces in the pelvic connective tissue. (17) the arrow shows how an opening can be made from the posterior fornix into the pouch of Douglas. *A, after Young, J. A Textbook of Gynaecology, A&C Black, 5th ed 1939. C, after Last RJ. Anatomy, Regional and Applied. Churchill Livingstone 5th ed 1972 D, after Jeffcoate TNA. Principles of Gynaecology. Butterworths 3rd ed 1967.*

ANATOMY. The most critical items of a patient's pelvic anatomy are the ureters (23-20). 'Ligaments' mean quite different things to gynaecologists and to orthopaedic surgeons. To gynaecologists a 'ligament' is a fold of peritoneum, or a local thickening of the pelvic connective tissue. These are:
(1) The broad ligament which is a fold of peritoneum running from the Fallopian tubes towards the floor of the pelvis. The ureter and the uterine artery lie in the base of the broad ligament; vessels run round its edge, and its middle is avascular (21-18).
(2) The infundibulo-pelvic ligaments are folds of tissue which run from the lateral ends of the tubes to the pelvic wall. Their importance is that the ovarian vessels run in them.
(3) The round ligaments are folds of tissue which run from the uterus close to its junction with the tubes, antero-laterally towards the brim of the pelvis. They are really anterior folds or leaves in the broad ligaments.
(4) The ovarian ligaments support the ovaries, and hang off the back of the broad ligaments.
(5) The cardinal (transverse cervical) ligaments are thickenings of the pelvic connective tissue which run laterally from the cervix to the sides of the pelvis.
(6) The utero-sacral ligaments run from the lower segment to the sacrum on each side of the rectum. They are, in effect, the posterior edges of the cardinal ligaments.

The great danger at hysterectomy is that you may damage the ureter by cutting, tying or clamping it. The ureter is at risk at several stages:
(1) when you tie the ovarian vessels. So, lift these clear of the ureters beforehand.
(2) when clamping and tying the exposed broad ligament, and where the ureter is displaced by a large uterine fibroid.
(3) when unexpected bleeding is controlled and clamps and sutures are placed blindly and too deep. So before you do anything in this region which might injure the ureters, feel for them carefully. You can roll a ureter between your finger and thumb, and when you pinch it, it vermiculates (moves like a worm).

Bleeding can be severe, especially from the uterine vessels. Even when you have divided them, you are still in a bloody triangle at the sides of the vaginal vault. If you are not careful, you can also cause a vesico-vaginal fistula. This will be much less likely if:
(1) You develop a bladder flap.
(2) You carefully separate the bladder from the cervix.
Gentle continued traction is the secret of all pelvic surgery:
(1) It demonstrates the tissue planes.
(2) You are less likely to pick up structures that you do not want to cut.
(3) Vessels stand out more clearly.
(4) You are less likely to injure the bladder or the ureter
(5) You can find the relation of the bladder to the cervix and vagina more easily.

After the operation, it is painful to bear down to defecate; so, make sure your patient is not constipated, and provide laxatives if they have such a tendency.

HYSTERECTOMY (GRADE 3.4)

INDICATIONS.
(1) Severe anaemia or mechanical problems from large fibroids.
(2) Endometrial carcinoma (Stage I, IIA)
   N.B. A total hysterectomy with adnexectomy is needed for cervical carcinoma (23.8)
(3) Severe dysfunctional uterine bleeding (23.3).
(4) Severe post-abortal or postpartum uterine sepsis.
(5) Chronic pelvic pain due to PID which fails to respond to medical treatment.
(6) Complete or nearly complete uterine prolapse.
   N.B. In this last case, a vaginal hysterectomy is more appropriate (23.11).

CONTRAINDICATIONS
(1) An inexperienced operator.
(2) Active PID, but distinguish this from post-abortal or postpartum uterine sepsis.
(3) A uterus 'fixed' in the pelvis.

INITIAL STEPS IN HYSTERECTOMY

N.B. **Dense adhesions**, such as those due to PID, fibroids in the broad ligament, and obesity may pull the ureters out of place and make the operation very difficult and hazardous.

EQUIPMENT. A general set, a catheter, a uterine probe and sounds, a suitable self-retaining retractor, preferably Kirschner's, Gosset's, or Balfour's; also a Deaver's retractor and a tenaculum forceps. At least 4 and preferably 6 long curved uterine clamps, either Hunter's or Maingot's. 2 large packs with cloth tapes, T-tube for ureter repair.

PREPARATION.
Make sure that consent is signed and the patient understands that she will have no more children and no periods.

Set up an IV infusion, and have blood cross-matched.
Start prophylactic metronidazole 1g PR together with gentamicin 240mg or chloramphenicol 1g IV.
Find yourself a competent assistant, who, if inexperienced, should go through this account with you first.

Place the patient in the lithotomy position, perform a vaginal examination (with non sterile gloves) to reassess the size, position and mobility of the uterus. Then clean the vagina with aqueous iodine solution. Catheterize the bladder. Compress it suprapubically to make sure it is empty, and leave the catheter in for continuous drainage.
Then lay the patient supine on the table and remove the lithotomy poles. Tip the table slightly head-down to let the bowel fall away from the pelvic cavity. Provided the angle is not too steep, it will not make anaesthesia difficult. Ideally, adjust the break in the table so that the knees are slightly flexed. Stand on the left if you are right-handed.

Fig. 23-22 HYSTERECTOMY.
A, put clamps on either side of the fundus. B, put clamps on the tubes & round ligament and make a hole in it with your finger. C, reflect the bladder. D,E, incise the peritoneum in front of the cervix. F, feel for the tip of the cervix. G, clamp the ovarian pedicle laterally if you are removing the ovary or, H, clamp it medially if you are retaining the ovary. I divide and tie the stumps. J,K, isolate and tie the round ligaments. L, find the uterine arteries and cut the posterior leaf of the broad ligament almost as far as the artery. M, lift up the uterus. N, divide and tie the utero-sacral ligaments. O, reflect the peritoneum off the back of the cervix. P, doubly clamp the uterine arteries. *After Parsons L, Ulfelder H. An Atlas of Pelvic Operations. WB Saunders 1968 p.21ff with kind permission.*

N.B. The illustrations here assume you are standing on the left, which most right-handed surgeons find easier.

INCISION. If you are inexperienced, make a midline incision from the symphysis to the umbilicus. If you are skilled, and the uterus is not >15cm high (equivalent to a 14-16wk pregnancy), a Pfannenstiel incision gives the best cosmetic result and avoids incisional hernias.

CAUTION! *Make sure your incision is long enough*, and that you have divided the rectus sheath and muscles as far as the symphysis pubis (an extra 1cm at the bottom is worth 5cm at the top). If necessary, extend the incision generously above the umbilicus.
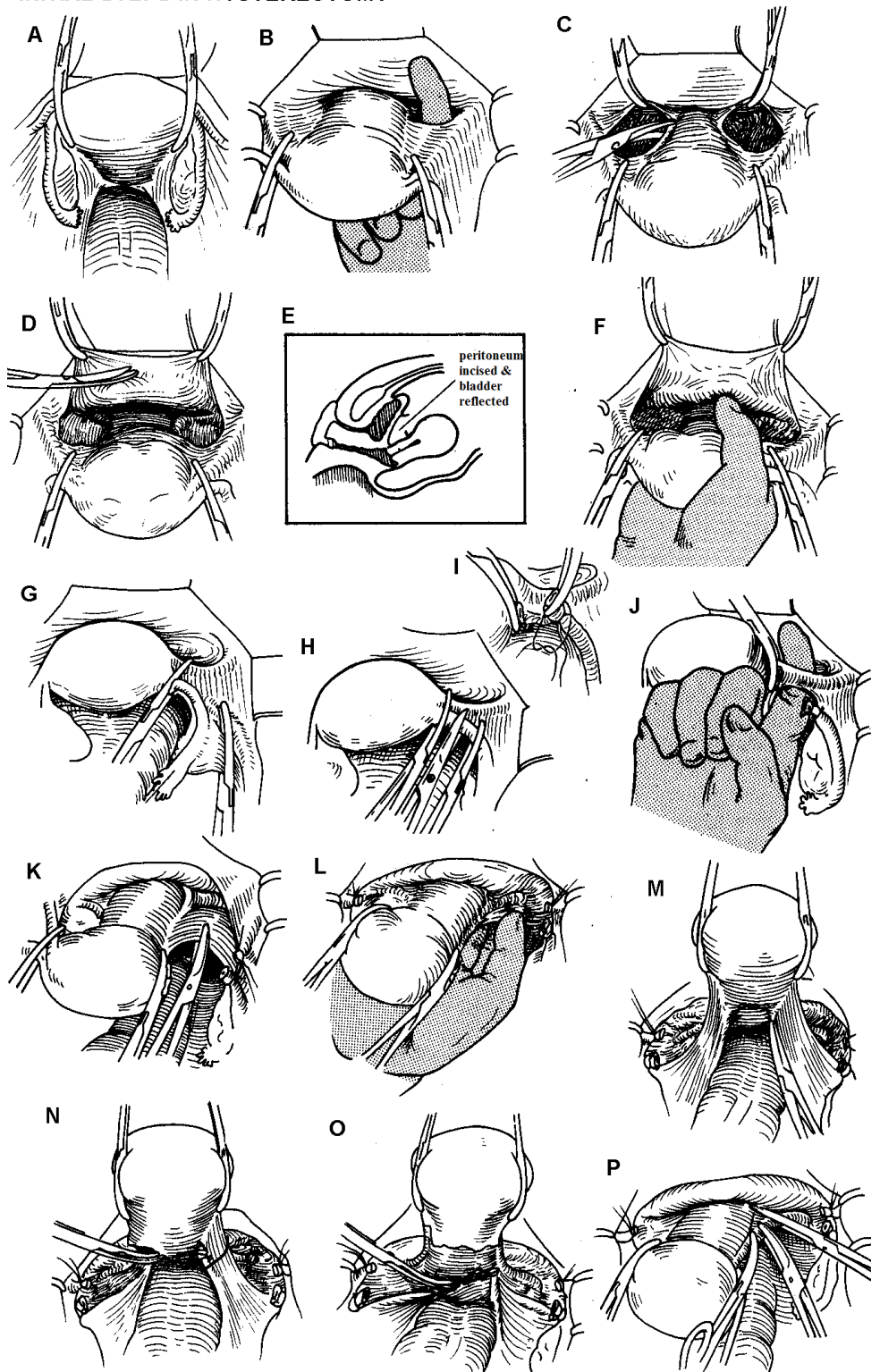
With a Pfannenstiel incision, arrest all the bleeding before you enter the abdomen; you might otherwise forget later and the result will be an enormous haematoma.

Open the peritoneum with your finger in the middle of the incision, firstly upwards, so as to avoid the bladder more easily.

N.B. An improvement on the Pfannenstiel is the Joel-Cohen incision. The incision is not curved and slightly closer to the umbilicus; the skin (and later the rectus sheet) is only incised full thickness transversely for 3-4cm across the midline. The rest of the skin is not incised full thickness. With digital blunt dissection, the wound is opened further, again after the horizontal incision of the middle portion of the rectus sheath. The *rectus* muscle (vertically) and peritoneum are separated/opened with the index finger. The opening in the wall is made as large as that in the skin by manual traction *after* the peritoneum is opened (to prevent disrupting vessels between posterior rectus sheath/peritoneum and *rectus* muscle). This approach is very fast, works also excellently with a Caesarean Section and minimises blood loss from the abdominal wall.

Exploration is the first step: inspect the pelvic cavity. *If you find an inflammatory lesion, don't proceed to explore the upper abdomen*, because you may spread the infection. Otherwise, put your left hand into the wound to feel the organs in the abdominal cavity quickly and thoroughly. Follow a set pattern: look particularly for metastases in the liver.

Clear the operative field. This is often the most difficult part of the operation. *Don't start removing any organs until you have cleared the site of operation.*

Carefully pack the bowel out of the way with large damp packs, attached to a cloth tape, to which a haemostat is fixed. Protect the wound edges with moist gauze, and insert a 3-blade self-retaining retractor. You can put the crossbar towards the head or towards the feet, and use the 3rd blade to retract the bladder. Make sure it does not compress the caecum, the sigmoid, the small bowel, or the iliac vessels. When necessary, use Deaver's retractor.

Clear any adherent bowel or omentum from the pelvis. Use blunt dissection to free any loose adhesions between the uterus and its surrounding structures: the sigmoid colon, the ovaries, or the walls of the pelvic cavity. The tubes and ovaries may be stuck down behind the broad ligaments; get your fingers under them and free them from below upwards. You may have to divide denser adhesions with scissors, or if you think they are likely to contain blood vessels, clamp, divide, and tie them. Divide any adhesions between the fundus of the bladder and the fundus of the uterus.

If you can deliver the uterus out of the abdomen, especially if it is very big, this will help greatly.

If you restore the proper anatomy first by removing adhesions, you are far less likely later to damage ureters, bladder or bowel.

Put clamps on either side of the fundus of the uterus, (23-22A) and over the tubes and round ligaments (23-22B). Use them to exert traction, and control arterial bleeding.

Alternatively, if these structures are friable, use a myomectomy screw or traction sutures to hold the fundus.

Ask your assistant to pull on the clamps, so as to demonstrate the thin avascular part of the broad ligament more clearly. Push your finger through this thin part near the uterus, from behind forwards, to make a hole (23-22B). Do the same on the other side.

Reflect the bladder. Incise the peritoneum on the front of the cervix, near to its vesico-cervical reflexion (23-22C).

Dissect the bladder off the front of the cervix and upper vagina (23-22D,E), until you can feel the tip of the cervix (23-22F). This dissection is best done bluntly with your gloved finger or a gauze while your force is exerted in the direction of the uterus & cervix, *not the bladder.* If there was a previous Caesarean Section, you often need sharp dissection: so cut even into the cervix superficially, rather than into the bladder. Feel the cervix from in front and behind. Separate the bladder from the underlying tissues somewhat laterally also.

Find the ureters. They enter the pelvis at the bifurcation of the iliac vessels. Trace them distally to beyond the tip of the cervix; recognize them by their feel: they are rather hard, they do not pulsate, and you can roll them between your finger and thumb (23-20).

CAUTION! *Ureters are apt to be easy to find when they are in no danger, and almost impossible to find when you need to find them!*

If you cannot find the ureters, these steps will protect them:

(1) Free the adnexa from adhesions before you remove them.

(2) Lift the infundibulo-pelvic ligament and find the ovarian vessels before you clamp them.

(3) Very carefully dissect the bladder away from the cervix, and the adjoining part of the broad ligament.

(4) Cut and mobilize downwards the posterior peritoneal leaf of the broad ligament from the posterior surface of the cervix and somewhat beyond, and a tiny bit laterally so that it is possible to apply a clamp from lateral just under the cervix at the last stage of the hysterectomy without having any peritoneum in the clamp.

Now deal with the ovaries. You must now decide if you want to retain them or not. If they have multiple large cysts, they are better removed, but try to retain at least one ovary if the patient is pre-menopausal, or <5yrs post-menopausal. If there are any cysts it is better to remove the ovaries in an older postmenopausal woman.

To remove an ovary, going lateral to it, but very near it, clamp its vessels, taking care not to clamp the ureter at the same time (23-22G). *You do not need a counter clamp* if you have already placed clamps on either side of the fundus (see above): this makes it possible to ligate very near to the ovary. Otherwise place the other clamp medial to the ovary. Divide the ovarian pedicle medial to the lateral (*not the counter*) clamp, and tie it with a double transfixion suture using #1 absorbable. Ease and squeeze the clamp while tightening the suture to make sure the tissues can be compressed properly by the suture.

If you remove the ovary, be sure also to remove the Fallopian tube with it.

If you want to retain an ovary, apply a clamp across the Fallopian tube and its pedicle, 1cm lateral to the first clamp that you applied to these structures near the uterus (23-22H). Divide the tissues between these clamps (23-22I). Ease and squeeze and then remove the lateral clamp and tie its pedicle as above. Do the same thing on the other side, removing or retaining the ovary, as you decide.

Define, tie, and divide the lateral end of the round ligament. Do this by pushing your finger under it and tying it (23-22J,K).

Find the uterine artery (23-22L). Cut the posterior leaf of the broad ligament with the loose areolar tissue inside it, almost as far as the artery (23-22K,L). If your assistant stretches the broad ligament well by pulling on the clamps, you may see the artery through the tissues you are going to cut. Repeat this on the other side.

Ask your assistant to lift up the uterus again (23-22M).
This will demonstrate the utero-sacral ligaments. Clamp, divide, and tie them (23-22N). Dissect the peritoneum off the back of the cervix (23-22O), if it is not too adherent, otherwise leave it.
The uterus will now be much more mobile.

Feel for the uterine arteries again. There is no need to dissect them out. Next feel for the ureters on each side of the distal cervix. Again, identify them by their feel: firm cords which you can roll between your finger and thumb. Doubly clamp the pedicle containing the uterine artery (23-22P), well away from the ureter, with the tip of the clamp biting the side of the cervix, and leaving little or no tissue on the uterine side.

Use scissors, or a knife. Cut as near, or even just in the uterus, as possible. If you do not use 2 clamps on each side, apply bilateral single clamps before you start cutting because the uterus will start bleeding on one side when the uterine artery on the other side is not clamped. Using, in this way, 2 clamps instead of 4 makes it possible to divide and clamp nearer to the uterus/cervix decreasing the risk to the ureters; there is also less clutter in the operative field.

Put the convex side of the clamp near the uterus so that it is easier to get the clamp very near it.

If the bladder is well down and the posterior leaf of the broad ligament out of the way and the clamp (and suture) very near to the uterus, then the ureters should be out of harm's way. The clamp is then not on the slippery peritoneum. Sometimes it needs 2-3 steps to clamp the tissues on each side of the uterus. Place the suture 1mm medial and 1mm distal from the point of the clamp while laterally, tie it c.1cm under the clamp. This will prevent oozing later.

Complete the task of pushing the bladder down the cervix, if you have not already done so (23-23A). Blunt dissection is usually enough.

Now decide if you want to proceed with a subtotal or total hysterectomy. If you are inexperienced, do the former.
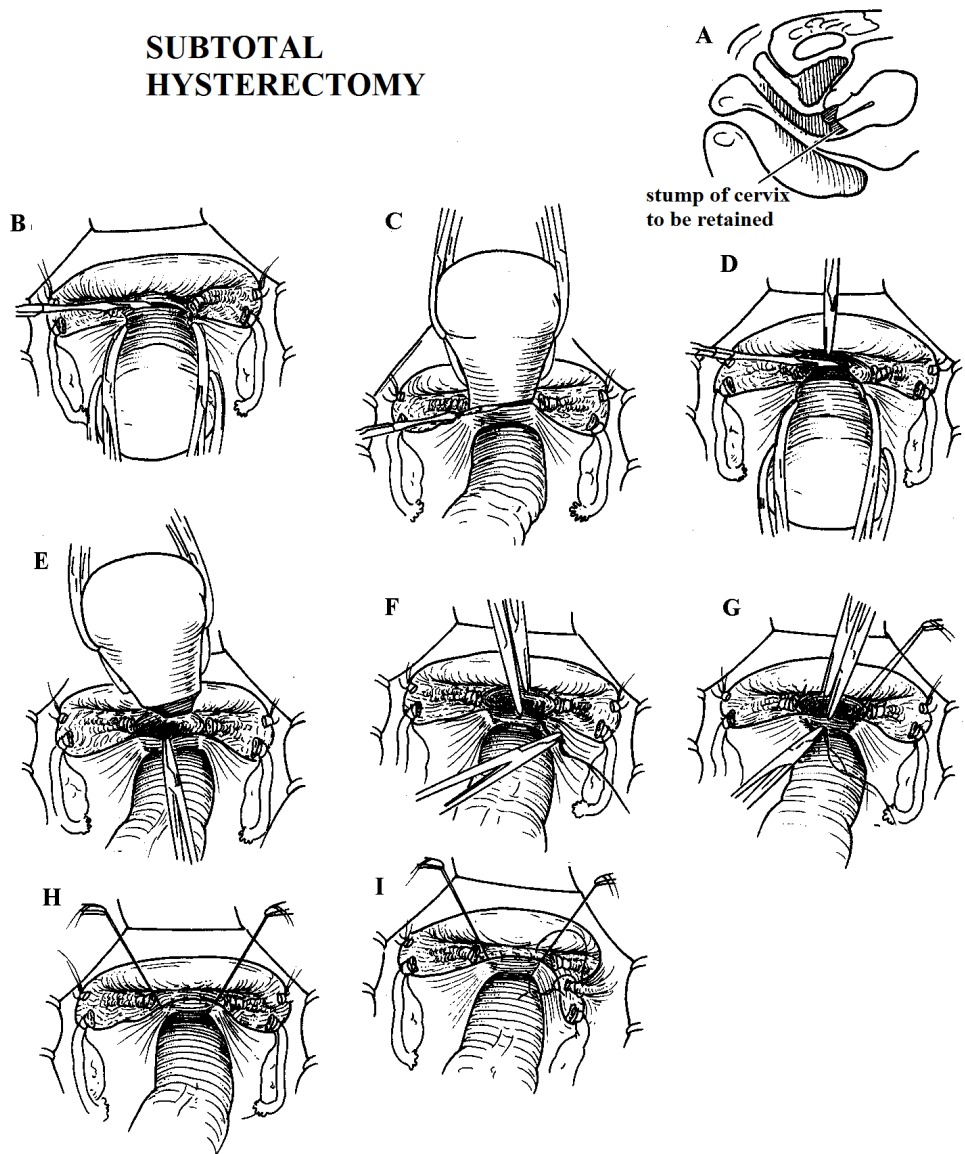
SUBTOTAL HYSTERECTOMY

Fig. 23-23 SUBTOTAL HYSTERECTOMY.
A, The part of the uterus to be retained. B,C, incise the anterior and posterior walls of the cervix. D,E, grasp the cervix stump and make a cone-shaped cut. F,G,H, close the cervix and control bleeding by placing sutures through the posterior peritoneal reflection deep into both lips of the cone. I, suture the round ligaments to the cervix.
After Parsons L, Ulfelder H, An Atlas of Pelvic Operations, WB Saunders 1968 p.45,47, with kind permission.

SUBTOTAL HYSTERECTOMY

If you have placed 2 clamps for the uterine vessels with their points 1·5-3cm above the distal end of the cervix on the lateral uterine wall, release each slightly in turn, squeeze again and tie them individually after the ligating needle has gone *through* the uterus just under the point of the clamp. In this way, you will be sure to have tied all the vessels lateral to the uterine part you are going to remove.

When you are sure you have reflected the bladder adequately (23-23A), pull on the clamps attached to the uterus and incise the anterior wall of the cervix, above the reflexion of the bladder and the stump of the uterine vessel (23-23B). Then draw the uterus sharply forwards towards the symphysis, and incise the posterior wall of the cervix (23-23C). Place a clamp on its anterior incised edge (23-23D).

Place a clamp on the posterior cut edge of the cervix (23-23E), so that you can maintain traction. Bring the two cut edges of the cervix together to control bleeding. Use a cutting Mayo half-circle needle, and place the first stitch in the edge of the cervix, close to the point where you tied the uterine arteries. Control bleeding by placing the sutures through the posterior peritoneal reflection, deep into the muscle of both lips (23-23F,G,H). Suture the round ligaments to the cervix if you can do this easily (23-23I).

TOTAL HYSTERECTOMY

Cut through the cardinal ligaments flush with the cervix, until you feel their ends on each side (23-24A). You should now be able to feel the cervix abdominally through the wall of the vagina from in front and behind with your finger and thumb (23-24B).

Often it is possible with a total hysterectomy to have the cardinal ligament including the utero-sacral ligament in the same clamp and hence in the same pedicle as the uterine artery.

So, on one side, you should have the following pedicles:
(1) the round ligament;
(2) the doubly ligated infundibulo-pelvic ligament;
(3) the doubly ligated uterine artery including the cardinal ligament;
(4) tissue *just* lateral to the distal cervix plus the top ⅓ of the vagina.
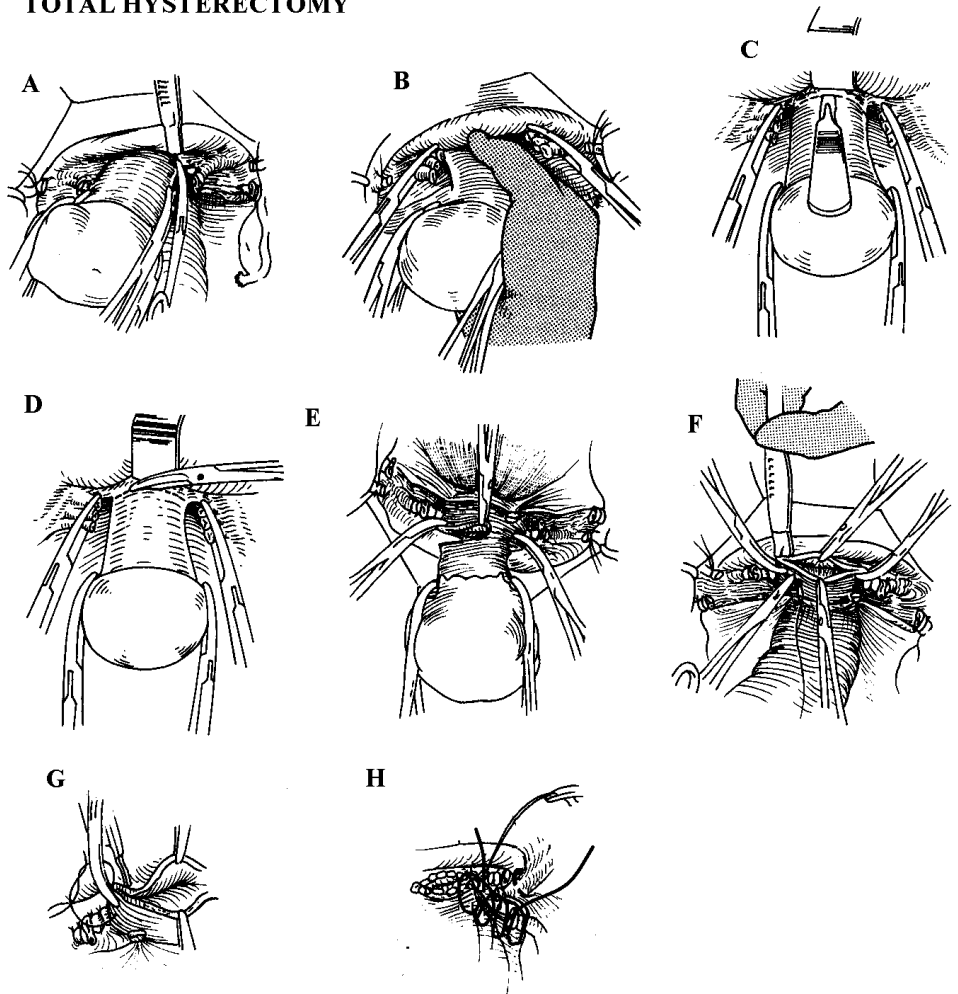
TOTAL HYSTERECTOMY

Fig. 23-24 TOTAL HYSTERECTOMY.
A, Reflect the bladder. B, feel for the cervix. C,D, incise the fornices of the vagina. E, cut the uterus free. F,G, close the vagina. H, suture the round ligaments to the plicated vaginal vault. *After Parsons L, Ulfelder H, An Atlas of Pelvic Operations. WB Saunders 1968 p.33,34, with kind permission.*

Before you open the vagina, insert clamps on the vaginal angles immediately below the cervix. Ask your assistant to pull up the uterus. Make absolutely sure no bowel or bladder is in these 2 clamps placed below the cervix. Use a broad-bladed or right-angle retractor to pull back the bladder carefully.

Cut the vagina above the clamps as near as possible to the cervix. If you can see easily, complete the cut with curved scissors (23-24D).

CAUTION! *To avoid damage to the ureters, always make sure you find them.* Clamp the uterine pedicles away from them, and cut the vaginal wall very close to the cervix.

Use #1 long-acting absorbable transfixion sutures to tie the vaginal angle and top pedicles bilaterally, *making sure that you do not include the ureters*, keeping the ends long in order to tie the uterine artery on each side, once again for extra security. If there is some oozing from the open part of the vagina, control it with mattress or figure of 8 sutures (4-9H).

If you can easily do so, suture the round ligaments to the ends of the vaginal vault (23-24H). This will help to prevent prolapse, but is not essential.

Remove the swab holding the bowel, and close the abdomen in the usual way. There is no need for a drain if the operation was not for an infection in the first place and the bowel or urinary tract was not damaged. Otherwise leave the vagina open to help drainage. In serious infection leave a large tube draining into the vagina, fixing it from inside the abdomen with a thin absorbable suture.

POST-OPERATIVELY, check the vaginal pads, pulse, BP and urine production to make sure there is no bleeding.

THE SPECIMEN. Open the uterus to see if there is a carcinoma of its body. Do this after the operation, to avoid contaminating the wound with tumour cells if any are present.

DIFFICULTIES WITH HYSTERECTOMY

If adhesions from old PID or endometriosis prevent you starting, begin by dividing the round ligaments. Then put your hand behind the uterus and push a finger through the broad ligament under the tube and out through the divided round ligament. You now have the tube and ovarian vessels and can clamp and divide them safely.

If the uterus is so large that it obstructs your access to the pelvis, perform a subtotal operation first, and cut across the cervix quite high up. When you have removed the body of the uterus you will have plenty of room to complete the operation.

If you cannot find the ureter, but must proceed with the operation, keep extremely close to the uterus. You will nearly always be safe there. Perform a subtotal hysterectomy only.

If a fibroid extends into the broad ligament, this may be: (1) growing out from the uterus and displace the uterine vessels and ureter downwards, laterally or upwards; (2) separate from the uterus and arise *de novo* from the connective tissue in the broad ligament. Both are difficult to dissect out.

In the 1st case, divide both the ovarian vessels and dissect out the upper part of the fibroid. Then proceed with the operation as usual on the normal side of the uterus only. Clamp and tie the uterine artery and utero-sacral ligament. Cut across the vagina. As you reach the affected side of the vagina you will see the uterine artery on that side. Clamp and divide it (it may be large) and shell out the remainder of the fibroid.

In the 2nd case, open the broad ligament by dividing the round ligament, as you would for a broad ligament cyst. The ureter will be attached to the posterior edge of the broad ligament above; lower down it will be displaced downwards and medially by the fibroid.

If there is a fibroid in the cervix, removing it can be very difficult. Limit yourself to a subtotal hysterectomy.

If there is a fibroid low in the posterior uterine wall, make a transverse incision over it and shell it (partly) out with your finger: this will help mobilise the uterus. If the uterus is thus mobilised, a hysterectomy will be routine. You may then be able to ligate the vessels leading to the fibroid and can then close the resulting cavity, so that the hysterectomy is no longer necessary**.**

If you divide the ureter and recognize that you have done so, repair the ureter with continuous 3/0 or 4/0 absorbable over a fine feeding tube which you have inserted into the proximal and distal ends of the divided ureter. If you can perform a cystoscopy, you will be able to withdraw the feeding tube after 10days. If not, make a small cystostomy and find the distal end of the tube: *do not pull on it!* Attach its distal end through the eye of a Foley catheter that you have placed in the bladder. You can then remove the feeding tube simply by removing the catheter.
Otherwise, fix the feeding tube in place in the proximal ureter, and lead the other end of the tube out of the abdomen through a separate stab incision, and allow urine to collect in a sealed bag. This will preserve kidney function till you can refer the patient for ureteric re-implantation later. Place a tube drain into the abdomen.

If you open the bladder, repair it in at least 2 layers with long-acting absorbable. Leave a catheter in for 10days. The tear is likely to heal uneventfully.

If you have injured the colon, repair the tear in 2 layers. Fashion a defunctioning colostomy if there is severe soiling, or if there is severe scarring, and you are uncertain of the reliability of your closure.

If there is bleeding at the end of the operation, try packing the pelvis with warm packs and tie off any arterial bleeding vessels. If this fails, *don't close the vaginal vault*. Instead, insert a purse string suture in the vaginal vault around a tube drain and pull it tight. This will leave a central hole in the vagina through which any fluid can escape.

If there is postoperative retention of urine, it is likely to be due to *detrusor* failure, and to be difficult to treat. First of all, make sure urine is being produced. Try 4wks of catheter drainage and urethral dilatation. If this fails, teach intermittent self-catheterization, which is effective and safe. Use a clean but not sterile simple plastic catheter, which she can use for at least a week. *A retentive bladder is much more comfortable than a leaky one, and easier to manage.*

23.16 Vulval carcinoma

If a patient has an ulcerating lesion of her vulva, this may possibly be a carcinoma which may need a wide and mutilating excision of the primary, with a margin of normal tissue of ≥2cm all round, and 1cm deep to the lesion. If the groin nodes are involved, she needs a bilateral groin dissection. This is a major intervention.
There is often an offensive discharge, and dyspareunia, as well as dysuria.

DIFFERENTIAL DIAGNOSIS includes:
(1) vulval warts or condylomata (23.17),
(2) syphilis (2^0 or 3^0: 23.17),
(3) chancroid (23.17),
(4) tuberculosis (23.17),
(5) donovanosis (granuloma inguinale: 23.17),
(6) lymphogranuloma venereum (23.17),
(7) *Schistosoma haematobium* (23.17),
(8) extensive anorectal cancer, particularly in HIV+ve patients (26.7).

CAUTION! Before contemplating a radical operation on the vulva, be sure to take a biopsy: it is tragic to perform a mutilating operation for an innocent lesion. *Inguinal lymphadenopathy does not necessarily mean cancer!*

23.17 Other gynaecological problems

CONGENITAL ABNORMALITIES OF THE GENITAL TRACT

If a girl 12-16yrs has low abdominal pain & an abdominal mass, examine the vagina and vulva. If you find a bulging membrane (the hymen), the first menstrual discharges have distended the vagina (haematocolpos) and perhaps the uterus (haematometra) (23-25). The distended vagina may cause retention of urine by compressing the urethra.
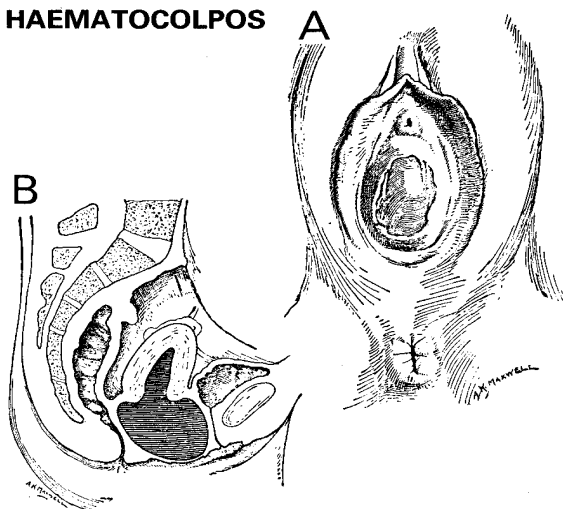
HAEMATOCOLPOS

Fig. 23-25 HAEMATOCOLPOS. A, the bulging membrane retaining a girl's first menstrual discharges. B, a cross-section shows that there is also some degree of haematometra. *After Young, J. A Textbook of Gynaecology, A&C Black, 5th ed 1939 permission requested.*

Make the diagnosis by inspecting the introitus and when in doubt, by a finger in the rectum. If the membrane feels thin, incise it with a cross-shaped incision. *Don't do anything more than make a cruciate incision in a thin membrane. Don't insert a drain*; you risk introducing infection.

If the gap between the upper and lower vagina is more than a membrane, the operation to establish patency is not easy. Re-stenosis is common. The problem is not urgent: you would be best to refer to a specialist.

If a girl 6-24months after puberty has a lower abdominal mass, one of the possibilities is a haematometra in the horn of a uterus didelphus (double uterus with double cervix) with one cervix stenosed so that a haematometra develops. You can usually manage this by repeatedly dilating the stenosed cervix. Rarely, an isolated horn is not connected at all to the vagina; then a laparotomy is needed. *Beware: abnormalities of the ureters are likely as well.*

If there is a swelling in the anterior vaginal wall behind the urethra, especially before the reproductive years, consider the possibility of a URETHRAL DIVERTICULUM, and *don't confuse it with a cystocoele or a urethrocoele*. If you can squeeze its contents into the urethra, the diagnosis is confirmed.
If you are not sure, perform a urethrogram (38.1). Consider excising the diverticulum, which is usually not difficult. Operate with a urethral catheter in place. Repair the small defect in the urethra which was the neck of the diverticulum.

OTHER ABNORMALITIES

If there is a vaginal stricture from chemical irritants (including crushed beetles) or trauma (including genital cutting), or existing congenitally, consider inserting a skin graft on a large mould, as soon as the vaginal cavity is clean. A dentist may have suitable material for the mould. Make it otherwise round a syringe barrel with the distal end cut of and made smooth, so as to make a passage for the menstrual fluid to escape. Hold the mould in place with sutures through the flanges (wings) of the syringe. Remove these 21days later, and immediately re-graft any raw areas. You can use Hegar's dilators of different sizes to dilate a narrow vagina.

If there are condylomata acuminata, normally these are small and look like warts and are caused by a virus. When women are pregnant they tend to grow and they can become huge if she is also HIV+ve (5.6). *Do not operate on them in pregnancy*: there will be much bleeding, and topical cytotoxics (like podophyline) are contra-indicated in pregnancy. You will reduce transmission of HIV by performing a Caesarean Section in such cases. Check if a tubal ligation is also desired.

Outside pregnancy, ARV therapy is indicated if there are huge condylomata. Repeated diathermy is successful and it is surprising how the large 3rd degree burns created by the treatment re-epithelialise within 1wk. Wear a mask and make sure the operating theatre is well aerated, to prevent aerosol spread of the condylomata.

If there is a spontaneous recto-vaginal fistula, this may develop in baby girls without a congenital or traumatic reason, related to HIV infection (5.6). Differentiate this from a congenital lesion where the anus is usually closed (33.6). *Do not be tempted to operate*. The baby does not know there is a problem! The best treatment is the use of a seton (as well as ARV therapy).

If there are papular nodules in the lower genital tract, consider SCHISTOSOMA.
These take various forms:
(1) Frond-like (fern-like) lesions with a narrow base or plaques developing on the vulva, usually from 6-15yrs. These are often single, cause no problems, seldom bleed, and can be removed easily.
(2) Multiple granulomata of the vagina and cervix in the reproductive years and after them. These also seldom bleed, but they may be so extensive that they distort the bladder/urethral angle and cause incontinence.
(3) Cervical ulceration or papillomas, closely resembling carcinoma.
(4) Granulomata might present as infertility by blocking the tubes.
Look for ova in the urine, stool, vaginal discharge, and tissue scrapings or biopsies.
   CAUTION!
(1) If schistosomiasis is endemic, *don't think all suspicious vulval or cervical lesions are carcinoma*.
(2) Carcinoma may co-exist with some other pathology. *Don't excise large vulval lesions without a biopsy first*.
(3) There is an increase in bladder carcinoma in these areas. These might present as supposed vaginal bleeding.

If there is a profuse vaginal discharge or post-coital bleeding, one cause is CERVICAL ECTOPY. The normal columnar endothelium of the endocervix bulges out onto the ectocervix, visible when you do a speculum examination. Cervical ectopy usually causes no symptoms. Exclude *Chlamydia* cervicitis, cervical carcinoma, severe trichomonal infection or a foreign body. Use diathermy to make 6-8 radial burns from the external os to the junction of the glandular ectopy (the erosion) with the normal squamous epithelium. Or, using a stick of silver nitrate, just touch all the glandular epithelium. Warn that the discharge will get worse for 1wk before it improves. No anaesthesia is necessary. Cryotherapy also needs no anaesthesia and is very effective.

If there is chronic or recurrent vulval ulceration, the differential diagnosis includes:

(1) **Small and usually ulcerated granulomata** arising in a perineum that is permanently wet from a vesico-vaginal fistula (VVF) (salt baths will improve this temporarily, but a barrier vaseline/silicone cream will be best).
(2) **Cellulitis, furunculosis, folliculitis, candidiasis**; test the blood or urine for glucose. High humidity related to obesity or nylon underwear might also be involved.

(3) **Secondary syphilis**; painless, greyish, moist, flat-topped broad-based raised swellings (condylomata accuminata). You may also see these around the anus in the patient's baby.

(4) **Tuberculosis**; ulcers, sinuses and gross thickening are the most common types of vulval TB, which is usually transmitted sexually. Histology will help if there is a suspicion, especially if the woman is HIV+ve. Chronic skin TB is notorious for developing into cancer.

(5) **Donovanosis** (granuloma inguinale); beefy, red, angry, destructive, irregular sometimes tender lesions develop with a raised edge. It is caused by *Klebsiella granulomatis.* Initially no swollen groin nodes are present, but these may appear after secondary infection. The inguinal nodes can also become involved by extension of the original infection. Donovanosis can cause a pseudoepitheliomatous hyperplasia, which may be mistaken histologically for carcinoma.

(6) **Lymphogranuloma venereum** (LGV, 26.11). The initial vulval lesion, caused by *chlamydia*, is painless and small and may be missed. Later there are enlarged, matted, firm, painful nodes (more often in men than women) which can suppurate and cause several sinuses. A 'groove' caused by the separation of the inguinal and femoral glands (the bubo) by the inguinal ligament is typical. A so-called genital syndrome can develop, an oedematous swelling (elephantiasis) of the genitalia combined with destructive painless hypertrophic lesions involving often urethra and/or rectum. This might result in fistula (watering-can perineum) and strictures.
Distinguishing between (6 & 7) can be difficult, and both may be present. Fortunately, they both respond to tetracycline or chloramphenicol over 3wks.

(7) **Herpes simplex** (type 1 or 2); the first manifestation can be very painful and can even cause urine retention. Vesicles soon rupture and become skin lesions which can become secondary infected. Repeat infections appear in a subgroup of patients. These are far less painful start with itching, pain or a 'funny' feeling. Small, itchy, painful vesicles lasting for 2-3wks appear.
These lesions are typically grouped. If you treat with acyclovir cream at the earliest suspicion that a new attack is coming, an attack can be shortened.

(8) **HIV** infections might facilitate all sorts of chronic ulcerations (5.6) of the vulva (and penis). Micro organisms which normally are not a problem or only a minor nuisance, now grab the opportunity like the different herpes infections, molluscum contagiosum, candidiasis, vulvar warts, chancroid, and LGV to cause huge and chronic sores, erosions, necrosis and warts. It is best to restore immune competence with ARV's before intervening surgically.

(9) **Amoebiasis** (rare); painless ulcers which may mimic carcinoma and usually respond dramatically to metronidazole (14.5).

(10) **Chancroid**; single or multiple, painful/tender, soft, bleeding shallow ulcers with minimal to no surrounding induration arising within 1wk of a sexual contact. The inguinal nodes are enlarged, tender and may suppurate.

(11) **Schistosomiasis**, (see above)

(12) **Carcinoma** (23.16).

If an old woman complains of sudden severe vaginal bleeding, suspect a vaginal tear usually in the posterior fornix as the result of sexual intercourse, especially after a period of abstinence. You will see the tear on speculum examination:
(1) if bleeding has stopped, do nothing.
(2) if bleeding continues, insert 1 or 2 mattress sutures.
(3) if the tear has penetrated the posterior fornix, replace the bowel and repair the laceration. Use antibiotic prophylaxis.

If there is a small round red lump on the posterior margin of the urethral orifice, it is probably a URETHRAL CARUNCLE. Usually, it needs no treatment; if it is pedunculated and bleeding, excise it (23.6). Distinguish this from a choriocarcinoma, if it appears after pregnancy.
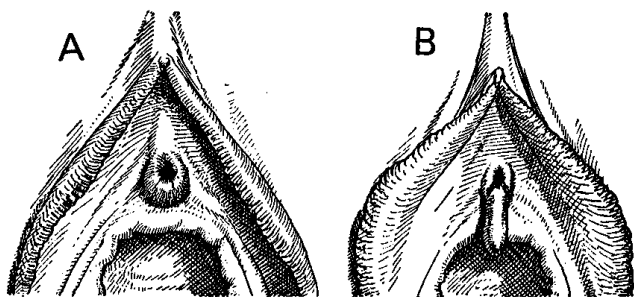
URETHRAL CARUNCLE

Fig. 23-26 URETHRAL CARUNCLE.
This usually needs no treatment (A); if it is pedunculated (B), excise the excess. *After Young, J. A Textbook of Gynaecology A&C Black, 5th ed 1939, permission requested*

If there is lymphoedema of the vulva, think of:
(1) tuberculous lymphadenitis in the groin (17.4),
(2) lymphogranuloma venereum (LGV: 26.11),
(3) donovanosis (see above).
(4) filariasis (27.34, 34.14),
(5) 2^0 or 3^0 syphilis.

N.B. Vulval oedema, especially in donovanosis and filiarisis can sometimes be so gross as to mimic elephantiasis of the scrotum. *Don't excise associated lymph nodes*; this will only make the condition worse.

Suggesting LGV (26.11): a fistulated inguinal adenitis with a sour smell, a concealed indolent sore of the vaginal vault, vesicovaginal or rectovaginal sinuses and rectal strictures; absence of pain. Histology is often non-specific.

Suggesting donovanosis or hydradenitis:
extensive destruction with oedema with scarring.

Suggesting filariasis or chronic cellulitis:
oedema without scarring. Treat any local sepsis. A large swelling of the vulva may need excising. Use prophylactic antibiotics. Excise a wide area of skin, so that the incision goes through healthy skin; this will assist healing, and make recurrence less likely. Catheterize the patient for 1wk. Apply a well-padded dressing of petroleum jelly gauze.