

BLEEDING FROM THE LOWER GENITAL TRACT

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INTRODUCTION

In the first comprehensive English Language textbook on the subject, William Smellie, in his 1752 *Treatise on the Theory and Practise of Midwifery*¹, correctly identifies the atonic uterus as a major cause of postpartum hemorrhage with his statement '*This dangerous efflux is occasioned by every thing that hinders the emptied uterus from contracting*'. Although he refers to vaginal packing with *Tow or linen rags* (dipped in astringents such as oxycrate, red tart wine, alum or Sacchar-saturni), he does not specifically refer to bleeding from the lower genital tract. Because this omission was repeated in subsequent years by many standard textbooks and reviews of postpartum hemorrhage, it is not surprising that the present evidence base is poor, and a 2005 MESH search in PubMed of the National Library USA combining the terms 'Postpartum hemorrhage' AND 'Lacerations' OR 'Rupture' NOT 'Uterine rupture' came up with only 28 publications.

Maternal deaths specifically from lower genital tract bleeding as the cause of postpartum hemorrhage are rare in the developed world. The 2000–2002 United Kingdom Confidential Enquiries² reported only one death from this cause. World-wide, no accurate figures exist, but it is likely that the numbers are significant, particularly where there is significant comorbidity and a poorly resourced maternity infrastructure³.

CLASSIFICATION

Possible sources of bleeding from the lower genital tract include:

(1) Cervical tears;

(2) Vaginal tears (above and below the levator ani muscle, see Figure 1);

(3) Vulva and perineal tears;

(4) Episiotomies.

With the exception of cervical tears without vaginal extension, all of the above can lead to paravaginal hematomas, which in turn can be divided into those above and below the levator ani muscle (Figure 1). Infrlevator hematomas include those of the vulva, perineum, paravaginal space and ischiorectal fossa. Suprlevator bleeding is more dangerous, as it is more difficult to identify and control the source of bleeding, and blood loss into the retroperitoneal space can be massive.

INCIDENCE

In the UK, postpartum hemorrhage of more than 500 ml occurs in between 5 and 17% of all deliveries and postpartum hemorrhage of more than 1000 ml in 1.3% of deliveries.

Cervical tears

Minor cervical tears are common and are likely to remain undetected. However, bleeding which occurs despite a well-contracted uterus and which does not appear to be arising from the vagina or perineum is an indication for examining the cervix. Numerous cases have been described of women dying from hemorrhage due to a cervical tear, following operative vaginal delivery.

Postpartum hematoma

Because there is no agreed definition, there is no consensus as to the incidence. After

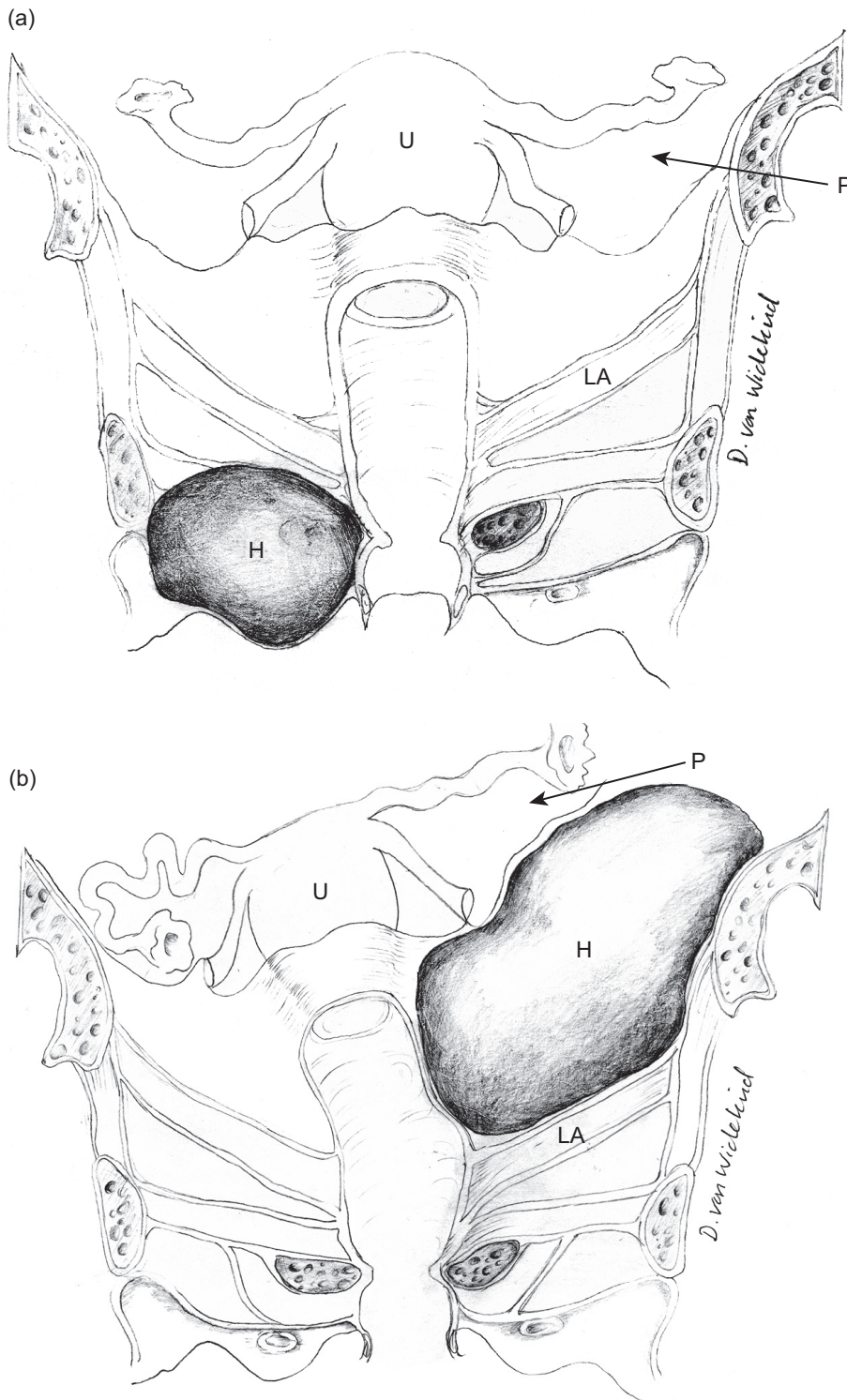


Figure 1 Paravaginal hematomas. (a) The hematoma lies beneath the levator ani muscle; (b) the hematoma lies above the levator ani and is spreading upwards into the broad ligament. H, hematoma; LA, levator ani; U, uterus; P, pelvic peritoneal reflection

spontaneous delivery, up to 50% of parturients develop a minor self-limiting infraflevator/vulva hematoma⁵. In contrast, the formation of a significant postpartum hematoma is an uncommon but serious complication after delivery, with the reported incidence of around 1 in 500–700 deliveries⁶. Major pelvic (supralevator) hematomas are rare, with widely varying reported incidence of between 1 in 500 and 1 in 20 000⁷.

Episiotomy

An episiotomy can bleed heavily, and, although there are no data on the incidence of hemorrhage from this cause alone, observational studies suggest that the relative risk of postpartum hemorrhage is increased four to five times if an episiotomy is performed⁸.

RISK FACTORS

The major causes of postpartum hemorrhage are uterine atony, retained placental fragments, morbid adherence of the placenta and lower genital tract lacerations. Data from the North West Thames District of the UK (Table 1) reviewed the obstetric factors associated with a blood loss of more than 1000 ml and apportioned a relative risk to each factor⁴. Of these, assisted delivery (forceps or vacuum extraction), prolonged labor, maternal obesity (and associated large baby) and episiotomy were most relevant to the risks of lower genital tract hemorrhage. It is worth noting that episiotomy,

with a relative risk of 5, carried the same weight as a cause of postpartum hemorrhage as did multiple pregnancy and retained placenta. Rotational forceps are a particular risk factor for spiral vaginal tears⁹.

Coagulation disorders, if present, are likely to significantly increase the risk of lower genital tract hemorrhage and hematoma and therefore should always be corrected where possible. If vaginal lacerations require repair in this situation, the threshold for the use of a vaginal pack should be low.

PREVENTION

The three main areas in which risk can be reduced all require a proactive approach:

- (1) Antenatal co-morbidities such as anemia and diabetes should be treated so that women entering labor are as healthy as possible.
- (2) A consistent proactive approach is required in both the first and second stages of labor. Active monitoring (partogram) and early intervention are essential where progress is inadequate or cephalic-pelvic disproportion is diagnosed. Coagulation defects (including iatrogenic defects due to anticoagulation) should be corrected where possible (see Chapter 25).
- (3) Postpartum, the early identification of excessive blood loss and a proactive approach to resuscitation/fluid replacement as well as identification of the source of bleeding and stopping it, are vital.

Table 1 Risk factors for postpartum hemorrhage and approximate increase in risk⁴

<i>Antenatal</i>	<i>Relative risk</i>	<i>Intrapartum</i>	<i>Relative risk</i>
Placenta previa	13	Emergency Cesarean section	9
Obesity	2	Assisted delivery	2
		Prolonged labor (> 12 h)	2
		Placental abruption	13
		Multiple pregnancy	5
		Retained placenta	5
		Elective Cesarean section	4
		Mediolateral episiotomy	5
		Pyrexia in labor	2

Because operative delivery and episiotomy are both significant risk factors for postpartum hemorrhage from the lower genital tract, efforts to reduce the incidence of both are likely to reduce the risk of hemorrhage. Where operative vaginal delivery is required, however, then a proper technique as described in standard textbooks¹⁰ will reduce the risk of vaginal and cervical tears.

DIAGNOSIS

Careful and well-documented observation after delivery is imperative as the seriousness of

concealed or persistent low-grade blood loss can be underestimated.

Bleeding, especially after instrumental vaginal delivery, that occurs despite a well-contracted uterus and that does not appear to be arising from the lower vagina or perineum is an indication for examination of the upper vagina and cervix. The characteristic feature of bleeding from upper vaginal and cervical tears is a steady loss of fresh red blood.

Exclusion of upper vaginal and cervical tears requires examination in the lithotomy position with good relaxation, good light and proper assistance⁷. A tagged vaginal tampon to absorb blood loss from the uterine cavity and the use of flat-bladed vaginal retractors will assist in visualizing the vaginal walls.

The cervix should always be examined where there is continuing bleeding despite a well-contracted uterus and also after use of all rotational forceps, which are associated with a significant increase in the risk of upper vaginal and cervical tears¹¹. The method for doing this is to grasp the anterior lip with one ring forceps and to place a second ring forceps at the 2-o'clock position, followed by progressively 'leap-frogging' the forceps ahead of one another until the entire circumference has been inspected.

TREATMENT

Hemorrhage from the lower genital tract should always be suspected when there is ongoing bleeding despite a well-contracted uterus. Generally, high vaginal or cervical tears require repair under regional anesthesia in theater.

The Scottish Obstetrics Guidelines and Audit Project (SOGAP) group provides detailed guidelines on the management of postpartum hemorrhage¹². A summary of the ORDER protocol as described by Bonnar¹³ is shown in Table 2, with additional boxes relating to hemorrhage from the lower genital tract.

Perineal tear repair

The technique has been well described elsewhere¹⁴. The principles include ensuring that the first suture is inserted above the apex of the tear or episiotomy incision, use of a continuous

polyglactin/polyglycolic acid suture on a taper-cut needle, obliteration of dead spaces and taking care that sutures are not inserted too tightly. If dead spaces cannot be closed securely, then a vaginal pack should be inserted.

Vaginal tear repair

The technique for repair of superficial vaginal tears is similar to that of perineal repair, as described above. Use an absorbable, continuous interlocking stitch, which must start and finish beyond the apices of the laceration, and should where possible reach the full depth of the tear in order to reduce the risk of subsequent hematoma formation.

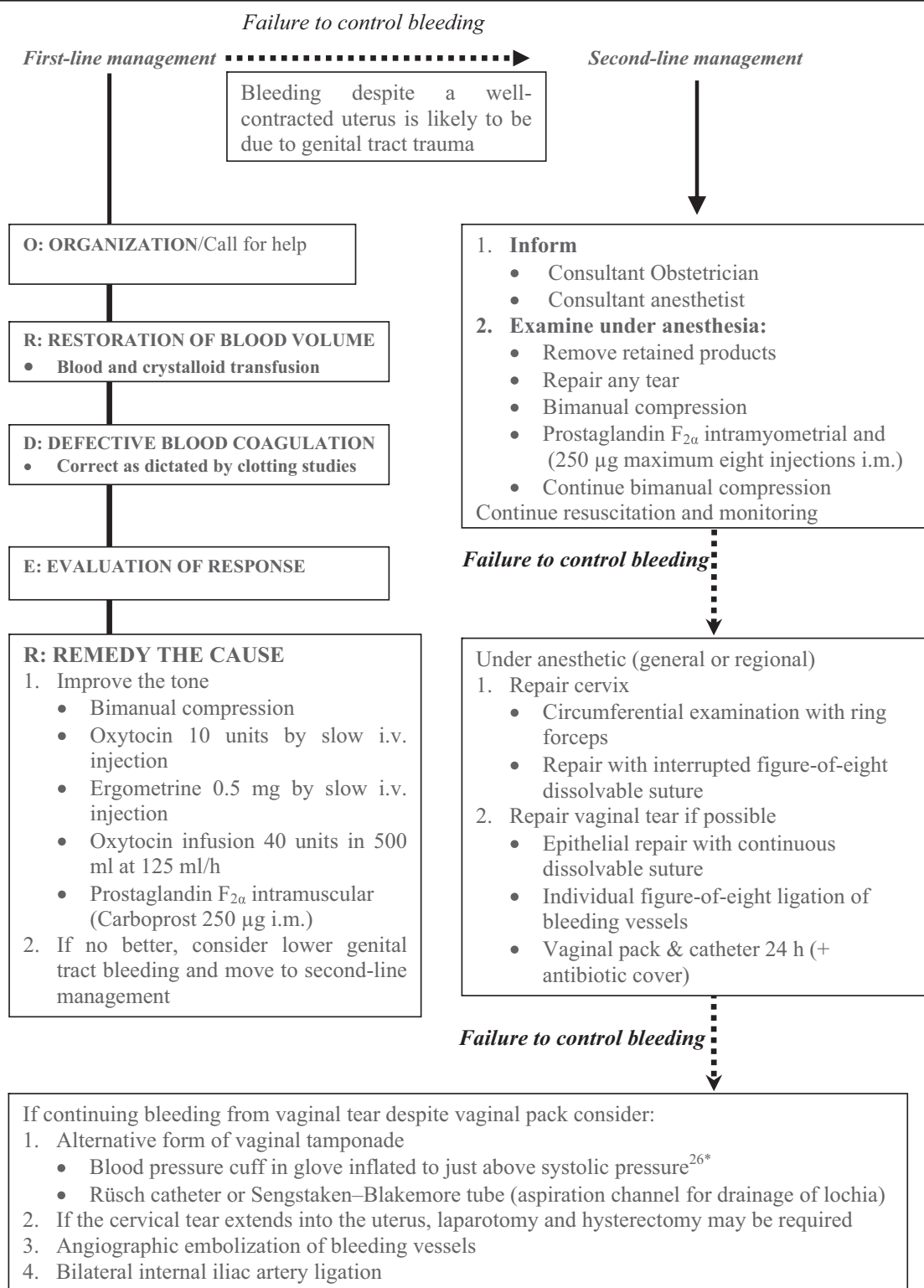
For deeper tears, an attempt should be made to identify the bleeding vessel and ligate it. If there is any significant dead space or if the vagina is too friable to accept suturing, then packing is indicated (see below), because access to deeper tears is usually difficult in an inadequately anesthetized patient. Thus, repair of such lacerations should be done in theater with adequate anesthesia.

Lacerations high in the vaginal vault and those extending up from the cervix may involve the uterus or be the cause of broad ligament or retroperitoneal hematomas. The proximity of the ureters to the lateral vaginal fornices, and the base of the bladder to the anterior fornix, must be kept in mind when any extensive repair is undertaken in these areas. Poorly placed stitches can lead to genitourinary fistulas. Vaginal packing for at least 24 h is always wise under these conditions.

Vaginal packing using gauze is the most common method to achieve vaginal tamponade. As with uterine packing, the technique of vaginal packing involves ribbon gauze inserted uniformly side-to-side, front-to-back and top-to-bottom. Vaginal packing using thrombin-soaked packs, as described for uterine packing, can also be considered¹⁵, especially where closure of all lacerations has not been possible.

Because of the risk that the raw vaginal surface will bleed on removal of the pack, povidone iodine-soaked double lengths of 4.5 × 48 inch packs can be inserted inside sterile plastic drapes (this has been well described for the management of uterine hemorrhage, but the

Table 2 Management of major postpartum hemorrhage (blood loss > 1000 ml or clinical shock) (see reference 13)



principle is the same for vaginal packing) to allow for easy removal¹⁶. Generally, packs are left in place for 24–36 h before removal¹⁷. A urinary Foley catheter and broad-spectrum antibiotic cover should be given where packs are used. Balloon tamponade using R sch catheters¹⁸ or Blakemore-Sengstaken¹⁹ tubes, as described for treatment of uterine bleeding (see Chapters 28 and 29), can also be used.

Pinborg and colleagues²⁰ described the successful use of the blood pressure cuff in two patients to control intractable vaginal bleeding following evacuation of vaginal hematoma that developed after spontaneous vaginal delivery. A blood pressure cuff was inserted into a sterile glove, which in turn was inserted into the vagina and the pressure then gradually increased to 120 mmHg, 10 mmHg above the systolic pressure, to stop the bleeding. Eight hours later, the pressure of the cuff was reduced by 10 mmHg/h and the cuff then taken out after 32 h. Both patients made an uneventful recovery.

Cervical tear

Any cervical tear extending above the internal os warrants laparotomy. Small, non-bleeding lacerations of the cervix do not need to be sutured. Any bleeding cervical tear, and certainly any tear longer than 2 cm, however, should be sutured by using an absorbable suture on a tapered (rather than a cutting) needle. A suitable method for suturing is shown in Figure 2.

Both edges of the most caudal part of the laceration are grasped with a ring forceps and then sutured with an interrupted or figure-of-eight stitch. This is then held with a hemostat to bring down into view the next part of the tear, which is sutured in the same way, and so on until the apex is secured. The laceration should be observed for a few minutes after suturing, to ensure adequate hemostasis. The ring forceps can be replaced and left on for some time if oozing persists.

Cervical and vaginal vault lacerations that continue to ooze despite treatment as detailed above or those that are associated with hematomas may be amenable to selective arterial embolization (see below).

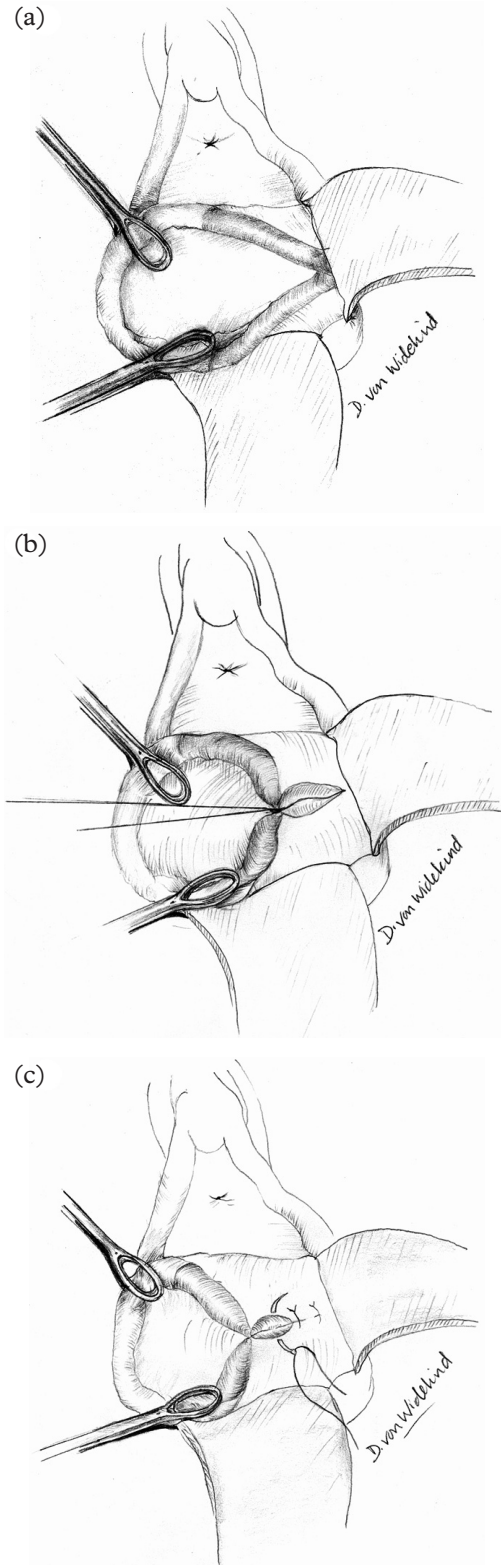


Figure 2 (a)–(c) Suturing cervical tear

Hematoma management

The literature on the management of paragenital hematomas is limited and no randomized studies of the efficacy of various treatments exist²¹.

Infraligament hematomas

As always, initial management consists of resuscitation measures and analgesia followed by a period of observation. For hematomas that are less than 5 cm and not expanding, conservative treatment with ice packs, pressure dressing and analgesia is recommended²². The visible skin margin of the hematomas should be marked to help establish whether it is expanding. For hematomas that are expanding or more than 5 cm in size, surgical intervention is recommended. Where possible, the surgical incision should be made via the vagina to minimize visible scarring. Distinct bleeding points should be under-run with figure-of-eight dissolvable sutures. The presence of any residual bleeding or a hematoma cavity is an indication for insertion of a drain, a vaginal pack and a Foley catheter, all of which should be left in place for at least 24 h. Usually, however, no distinct bleeding point can be seen, in which case a drain and pack should be inserted¹⁰.

Supraligament hematomas

Approximately 50% of broad ligament hematomas present early with symptoms of lower abdominal pain, hemorrhage and in severe cases, shock. The other 50% present after 24 h. Broad ligament and retroperitoneal hematomas are initially managed expectantly if the patient is stable and the lesions are not expanding²³. Ultrasound, CT scanning and MRI may all be used to assess the size and progress of these hematomas. Close observation, intravenous fluid resuscitation, blood transfusion, vaginal packing or balloon/blood pressure cuff tamponade and antibiotics are commenced as appropriate, but, if it is not possible to maintain a stable hemodynamic state, then active intervention is indicated, with options including the following:

- (1) *Laparotomy ± total abdominal hysterectomy*
This is indicated where there is any

possibility that a supraligament/broad ligament hematoma is due to a ruptured uterus or where a cervical tear appears to have extended up into the uterus. At laparotomy, if there is continuing bleeding from the upper vagina, then the anterior division of the internal iliac artery should be ligated in continuity, which will reduce the pulse pressure to the distal internal iliac artery branches (that supply the uterus and vagina) by 85% and the blood flow by about 50%²⁴ (see Chapters 32 and 34). A further vaginal pack should be inserted.

- (2) *Selective arterial embolization* Where there is continuing expansion of a supraligament hematoma without extension into the cervix or uterus, selective arterial embolization is seen as the treatment of choice²⁵ over internal iliac artery ligation, which in itself has an uncertain chance of success²⁶ and involves imposing a laparotomy on an already unstable patient. The blood supply to the upper vagina is from a rich anastomotic network of vessels, arising mainly from branches of the anterior trunk of the internal iliac artery (vaginal, uterine, middle rectal arteries) and the internal pudendal artery, which is the most inferior branch of the posterior trunk of the internal iliac artery. The technique of selective arterial embolization investigates these vessels by preliminary transfemoral arteriography, followed by embolization using Gelfoam (gelatin) pledgets. Pelage and colleagues²⁵ reported a series of 35 patients who underwent this procedure for unanticipated postpartum hemorrhage. Bleeding was controlled in all but one, who required hysterectomy 5 days later for re-bleeding. All women who had successful embolization resumed menstruation. The procedure, however, is not without risk and deaths have been reported due to sepsis and multiple organ failure²⁷ (see Chapter 44).

SUMMARY

In summary, bleeding from the lower genital tract should always be considered as a possible cause of primary postpartum hemorrhage where there is continuing bleeding despite a

well-contracted uterus. Primary repair of vaginal or cervical tears with full-thickness sutures using a dissolving suture on a taper-cut needle, followed by insertion of a vaginal pack and catheter for at least 24 h will stem most bleeding. Urgent resort to laparotomy is necessary if there is a cervical tear extending beyond the internal cervical os up into the uterus, or if bleeding fails to settle despite an attempt at vaginal tamponade. Internal iliac artery ligation or selective arterial embolization should be considered where there is continuing expansion of a supravaginal hematoma or upper vaginal bleeding despite the above measures. As always, regular assessments, clear documentation, a proactive approach and early intervention are vital to obtain a good outcome.

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