

## PERIPARTUM HYSTERECTOMY

*T. F. Baskett***HYSTERECTOMY**

Emergency peripartum hysterectomy is an unequivocal marker of severe maternal morbidity and 'near-miss' mortality<sup>1,2</sup>. Reviews of published data in the past 25 years show a variable incidence, from one in 331<sup>3</sup> to one in 6978 deliveries<sup>4</sup>. In developed countries, the incidence is approximately one in 2000 deliveries, with one population-based study in a Canadian province showing an incidence of 0.53 per 1000 deliveries<sup>2</sup>.

Because of the increasing Cesarean section rate world-wide and the concomitant rise in placenta previa and placenta previa accreta, the incidence of emergency peripartum hysterectomy is rising in many countries. For example, in Canada from 1991 to 2000 the rate rose from 0.26/1000 deliveries to 0.46/1000 deliveries (relative risk 1.76; 95% confidence interval 1.48–2.08)<sup>5</sup>. Compared to vaginal delivery, emergency hysterectomy and delivery by Cesarean section are strongly associated<sup>6,7</sup>. In addition, a recent study has shown that multiple pregnancy had a six-fold increased risk of emergency peripartum hysterectomy compared to singleton pregnancies<sup>8</sup>. Within this group, higher-order multiple pregnancies (triplets and beyond) had an almost 24-fold increased risk of hysterectomy<sup>8</sup>. It seems logical to conclude that the increase in multiple pregnancy rates associated with assisted reproductive technology provides a further contribution to the rising peripartum hysterectomy rates.

Maternal mortality rates associated with emergency hysterectomy range from 0 to 30%, with the higher rates in regions with limited medical and hospital resources<sup>9</sup>. How valid these rates are today is unclear, as they were calculated more than a decade ago. Nonetheless,

even in countries with low maternal mortality rates, associated maternal morbidity can be high due to hemorrhage, blood transfusion, disseminated intravascular coagulation, infection and potential injury to the adjacent lower urinary tract<sup>7,10,11</sup>. This chapter describes emergency hysterectomy in the immediate postpartum period following vaginal or Cesarean delivery.

**INDICATIONS**

By far the most common indication for hysterectomy is hemorrhage associated with the following conditions<sup>7,9–20</sup>.

**Abnormal placentation**

In developed countries, placenta previa, with or without associated accreta, is the most common indication for hysterectomy. This is due to the rising incidence of these conditions associated with the increasing number of women previously delivered by Cesarean section. Despite the fact that numerous other techniques aimed at preserving the uterus have been proposed and are discussed in other chapters in this book, hysterectomy is used to stem the sometimes frightening hemorrhage associated with placenta previa or accreta in the majority of hospitals.

In addition, on rare occasions, abruptio placentae, particularly of the concealed variety, may be associated with such a degree of extravasation of blood into and through the full thickness of the myometrium (Couvelaire uterus) as to make it unresponsive to oxytocic drugs, so necessitating hysterectomy. It must be emphasized, however, that in the majority of cases of abruptio placentae with Couvelaire uterus the response to oxytocic drugs is

appropriate and the hemorrhage is due to disseminated intravascular coagulation rather than failure of the uterus to contract.

### **Uterine atony**

As outlined elsewhere in this book (Chapter 27), the range of modern oxytocic drugs has greatly improved the management of uterine atony. Nonetheless, there are cases in which the uterus is refractory to all applications of such agents. This is most commonly found in the prolonged, augmented and/or obstructed labor: simply stated, the exhausted and infected uterus may respond poorly to oxytocic agents. The majority of these cases occur at the time of Cesarean section for dystocia or cephalopelvic disproportion.

### **Uterine rupture**

The most common cause of complete uterine rupture is within a previous Cesarean section scar. If the rupture is extensive and hemorrhage cannot be contained by suture of the ruptured area, then hysterectomy may be necessary. In addition, rupture of the intact uterus can occur in multiparous women in response to inappropriate use of oxytocic agents in the first and second stages of labor.

### **Uterine trauma**

Traumatic rupture, that is, perforation or laceration of the uterus, can occur with a variety of obstetric manipulations, including internal version and breech extraction in obstructed labor; instrumental manipulation, such as the classical application of the anterior blade of Kielland's forceps; manual exploration of the uterus and manual removal of the placenta or its fragments after obstructed labor with a ballooned and thin lower uterine segment; and during curettage for secondary postpartum hemorrhage.

Cesarean section in the second stage of labor with the fetal head deeply impacted in the vagina may be associated with lateral traumatic extension of the lower uterine segment incision into the major vessels<sup>21</sup>. On rare occasions, the extent of this tear may necessitate hysterectomy, especially if one or both uterine arteries is lacerated and a hematoma obscures the surgical

repair. External traumas, such as assault, a fall or motor vehicle accident, are relatively rare causes of uterine perforation and rupture.

### **Sepsis**

In the era of modern antibiotics, sepsis is not a common reason for emergency hysterectomy. However, it still may be necessary in cases with extensive uterine sepsis, particularly with clostridial infections and myometrial abscess formation, in which antibiotic treatment fails to control the sepsis. Other septic causes of secondary postpartum hemorrhage include Cesarean scar infection and necrosis, arteriovenous fistula formation secondary to uterine trauma and infection, and endomyometritis associated with hemorrhage. All may rarely require hysterectomy.

## **SURGICAL PRINCIPLES**

Although the technique of obstetric hysterectomy is similar in principle to that of abdominal hysterectomy in gynecology, numerous anatomical and physiological changes in pregnancy create potential surgical difficulties.

- (1) The uterine and ovarian vessels are enlarged and distended, often markedly so, and the adjacent pelvic tissues are edematous and friable.
- (2) Abdominal entry may have been via Pfannestiel or lower midline incision, depending on the urgency and speed required.
- (3) Maneuvers to obtain immediate hemostasis will depend on the cause of the hemorrhage. In cases of uterine rupture, Green-Armytage clamps or sponge forceps can be used to compress the bleeding edges of torn uterine muscle. The uterus should be eventrated from the abdominal wound. The structures of the adnexa on each side are pulled laterally by an assistant and the surgeon applies straight clamps adjacent to the top sides of the uterus to include the round ligament, the Fallopian tube and the utero-ovarian ligament. This serves to control the collateral

blood flow to the uterus from the ovarian arteries. Using transillumination, the avascular spaces in the broad ligament, roughly opposite the level of a transverse lower Cesarean incision, should be identified and a catheter passed through on each side to encircle the lower uterine segment just above the cervix. This should be twisted tightly closed with a clamp and should serve to compress the uterine arteries. These two maneuvers should occlude the main collateral ovarian and uterine artery supply to the uterus.

- (4) The vascular pedicles are thick and edematous and should be double clamped. Remove the proximal clamp first and apply a free tie and then replace the distal clamp with a transfixing suture. The proximal free tie should ensure that there is no hematoma formation in the base of the pedicle.
- (5) If the cervix and paracolpos are not involved as the source of hemorrhage, subtotal hysterectomy should be adequate to achieve hemostasis and is safer, faster and easier to perform than total hysterectomy. However, if the lower segment and paracolpos are involved in the hemorrhage, such as in cases of placenta previa and/or accreta, total hysterectomy will be necessary for hemostasis.
- (6) Avoid the ureters by placing all clamps medial to those used to secure the uterine arteries.
- (7) It can be difficult to identify the cervix, particularly when the hysterectomy is being done at full cervical dilatation. If there is a Cesarean incision, a finger can be placed through this and the cervical rim palpated. It is safest to enter the vagina posteriorly, identify the rim of the cervix and then proceed anteriorly.
- (8) The bladder is particularly vulnerable in cases previously delivered by Cesarean section, as it may be adherent to the lower uterine segment and cervix. It is therefore essential to check the integrity of the bladder intraoperatively. This can be done by manipulating the bulb of the Foley catheter to see if it is visible through the bladder wall. The bladder also can be filled with a colored fluid such as methylene blue or sterile milk taken from the neonatal nursery. The latter is preferable as it does not cause permanent staining of the tissues. Thus, after repair of any bladder injury, it is easier to see that this has been successful with subsequent installation of milk in the bladder. Any tear in the bladder should be repaired with two layers of 3/0 polyglactin (vicryl) or equivalent suture. Otherwise, No. 1 polyglactin (vicryl) or equivalent is used throughout the procedure.
- (9) If there is any doubt about the integrity of the bladder wall or ureters, and after repair of any bladder injury, it is wise to perform a postoperative cystoscopy to confirm that they are intact. This can be done by observing urine come from each ureteric orifice; this may be facilitated by giving intravenous indigo carmine and waiting 10–15 min.
- (10) Perioperative antibiotic prophylaxis should be continued for 24–48 h. Thromboprophylaxis with heparin should be instituted as soon as one is satisfied that hemostasis is secure.
- (11) Detailed notes should be made to include the preoperative events, indications for hysterectomy and the surgical details. After the initial postoperative recovery, the woman should receive a comprehensive outline of events from an experienced obstetrician.

In a number of series, as many as 25% of women who received an emergency obstetric hysterectomy were primigravid, for whom the fertility-ending nature of the procedure can be devastating<sup>7</sup>. Therefore, particularly in this group of women, obstetricians should be familiar with and be prepared to perform alternative procedures to control the hemorrhage. The application of other techniques to arrest hemorrhage that can be both life-saving and uterus-preserving are outlined in several chapters in this book. When conditions are recognized in the antenatal period that lead to increased risk

of severe obstetric hemorrhage, such as placenta previa and/or accreta, referral of these cases to hospitals with the equipment and personnel to provide the alternative techniques to hysterectomy should be undertaken where feasible.

Ultimately, however, one has to strike a balance between spending excessive time on alternative techniques that are proving ineffective, leading to delay, further hemorrhage and probable disseminated intravascular coagulation, and moving to the definitive and life-saving hysterectomy. Such is the art of obstetric judgement in trying circumstances.

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