Review Article

Emergency peripartum hysterectomy: Incidence, indications, risk factors and outcome

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Abstract

Background: Peripartum hysterectomy is a major operation and is invariably performed in the presence of life threatening hemorrhage during or immediately after abdominal or vaginal deliveries. **Material and Methods**: A Medline search was conducted to review the recent relevant articles in English literature on emergency peripartum hysterectomy. The incidence, indications, risk factors and outcome of emergency peripartum hysterectomy were reviewed. **Results**: The incidence of emergency peripartum hysterectomy ranged from 0.24 to 8.7 per 1000 deliveries. Emergency peripartum hysterectomy was found to be more common following cesarean section than vaginal deliveries. The predominant indication for emergency peripartum hysterectomy was abnormal placentation (placenta previa/accreta) which was noted in 45 to 73.3%, uterine atony in 20.6 to 43% and uterine rupture in 11.4 to 45.5 %. The risk factors included previous cesarean section, scarred uterus, multiparity, older age group. The maternal morbidity ranged from 26.5 to 31.5% and the mortality from 0 to 12.5% with a mean of 4.8%. The decision of performing total or subtotal hysterectomy was influenced by the patient's condition. **Conclusion**: Emergency peripartum hysterectomy is a most demanding obstetric surgery performed in very trying circumstances of life threatening hemorrhage. The indication for emergency peripartum hysterectomy in recent years has changed from traditional uterine atony to abnormal placentation. Antenatal anticipation of the risk factors, involvement of an experienced obstetrician at an early stage of management and a prompt hysterectomy after adequate resuscitation would go a long way in reducing morbidity and mortality.

Keywords: Peripartum hysterectomy, postpartum hemorrhage, placenta previa, uterine atony, uterine rupture.

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Introduction

Emergency peripartum hysterectomy (EPH) is a major surgical venture invariably performed in the setting of life threatening hemorrhage during or immediately after abdominal and vaginal deliveries [1-5]. Despite advances in medical and surgical fields, post partum hemorrhage continues to be the leading cause of maternal morbidity and mortality.

EPH is the most dramatic operation in modern obstetrics and is generally performed when all conservative measures have failed to achieve haemostasis in the setting of life threatening hemorrhage. The unplanned nature of the surgery and the need for performing it expeditiously, compound matters. Moreover the acute loss of blood renders the patient in a less than ideal condition to undergo emergency surgical intervention. The predominant indications for EPH are placenta previa/accreta and uterine atony and EPH in some of them is unavoidable. However recognizing and assessing patients at risk and appropriate and timely intervention would go a long way in ensuring a better outcome in this otherwise difficult situation.

Incidence

Hysterectomy following cesarean section (CS) was first described by Porro, and was used to prevent maternal mortality due to post partum hemorrhage [7]. The reported incidence of EPH varies from 0.24 to 8.9 per 1000 deliveries [1-6], ranging from 0.33(Netherland), 0.2 (Norway), 0.3 (Ireland), 0.5 (Israel), 0.63 (Saudi Arabia)

and 1.2 to 2.7 per 1000 deliveries in USA [2, 5, 8-10]. A difference in the incidence of EPH is noted following vaginal delivery and cesarean section [2]. While the incidence of EPH after vaginal delivery varies from 0.1 to 0.3/1000 deliveries and is rather constant between European and US studies, the incidence of EPH following CS varies widely between 0.17 and 8.7/1000 deliveries [2]. This is attributed to the proportion of women with previous CS with the concomitant risk of placenta previa and accreta [1-6].

Risk Factors

The risk factors for post partum hemorrhage include coagulopathies, uterine atony, retained products of conception, precipitate or prolonged labor, fetal macrosomia or multiparity, maternal obesity and previous primary post partum hemorrhage [1-6, 8-14]. Traditionally uterine atony was the most common indication for EPH. Recent studies however have indicated a change in the trend towards abnormal placentation [2, 6, 8, 10, 13].

Abnormal Placentation

According to one report the indication for EPH which was uterine atony in 43.45% and placenta previa or accreta in 33.9% cases in 1984 [15] changed 9 years later to placenta accreta (45%) and uterine atony in 20% of the cases [14]. Similar findings are reported by others with abnormal placentation as the predominant indication, the incidence ranging from (45 to 73.3%); and uterine atony in (26.6% to 35.6%) [1-8, 8-15]. In recent years, abnormal placentation has become a more common indication due to the greater number of pregnant women with previous Cesarean section deliveries [1-6]. The incidence of previous cesarean section ranges between 59.8% in patients with adherent placenta and 75% in patients with placenta previa [3, 13]. In view of several such reports, association between abnormal placentation and cesarean delivery has been suggested and the high incidence of EPH is directly related to the increasing number of cesarean sections [1-6, 16]. This was further substantiated by another report where the incidence of placenta previa which was 1.9/1000 after one previous CS, increased by 47 fold to 91/1000 in patients with four previous CS [2]. Patients with placenta previa and scarred uterus had 16% risk of undergoing EPH compared to 3.6% in patients with unscarred uterus [1, 2, 5]. Advancing age and parity are also reported to be important risk factors in developing placenta previa and accrete [2, 5]. The incidence of EPH was higher in patients with placenta previa and accreta than in patients with placenta previa alone. The combination of factors including high parity, number of previous cesarean sections, abortion, previous curettage, strongly increased the likelihood of placenta previa and increased risk of abnormal adherent placenta [5]. Therefore, it appears prudent for the obstetrician to prepare for the possibility of EPH for massive hemorrhage in patients undergoing cesarean section with these risk factors. Of concern however, is the limited experience of performing emergency hysterectomy among the younger

obstetricians as according to one report from Netherlands, the average chance of performing one EPH is once in 11 years [2]. The decreasing rate of abdominal hysterectomy for gynecological conditions in recent years does not help matters with regard to gaining this valuable experience. This implies that more effort should be undertaken to recognize the potential risk of patients requiring EPH and the need for involvement of an experienced obstetrician in the management at an early stage. EPH being performed by an experienced surgeon is reported to significantly reduce the operating time, number of units of blood transfusion and hospital stay [17]. The predisposing risk factors can be determined to a certain extent by performing antenatal ultrasound with color Doppler and magnetic resonance imaging (MRI) [18-20]. Persistent blood flow after the latent phase is suspicious of placenta accreta [20]. However, the limiting factor is the high cost of MRI and extensive experience needed.

Conservative measures to arrest bleeding are initially tried before considering EPH. The measures include uterotonic drugs, uterine or hypogastric artery embolisation, hemostatic sutures, uterine or internal iliac artery ligation [4, 5, 21, 22]. Conservative management is of particular importance in patients who are young, have low parity and who are haemodynamically stable [4, 5, 21, 22]. However while there are reports of 96% success rate following uterine artery ligation [21] there are others who have achieved success in only 39.4% of these cases [5]. The choice between conservative management and EPH should be individualized. In situations where conservative treatment is likely to fail or has failed, there should be no further delay in performing EPH as delay leads to increase in blood loss, transfusion requirement, operative time, DIC, and increased possibility of admission to ICU [1-6].

Uterine atony
Uterine atony is an indication for EPH in 20.6% to 43% of the cases [1-6, 8-17]. While this was traditionally the leading cause for EPH the incidence has reduced due to the use of newly developed pharmacologic treatment strategies including prostaglandins. Multiparity and oxytocin use for uterine stimulation were found to be the risk factors for uterine atony requiring EPH [1-6]. Combs et al in their large case control study of patients with post partum hemorrhage reported that pre-eclampsia, nulliparity, twins, induction, prolonged labor and augmentation were all identified as independent risk factors for uterine atony [23].

Uterine rupture
Patients with uterine rupture as an indication for EPH ranged from 11.4% to 45.5%. The risk factor for this would be multiple previous cesarean sections with a scarred uterus (Figure 1).

Total or subtotal hysterectomy
Total hysterectomy is the recommended surgical method of EPH due to the potential risk of malignancy developing in the cervical stump and the need for regular cytology and

other associated problems such as bleeding or discharge associated with the residual cervical stump. Currently the proportion of subtotal hysterectomy performed for EPH ranges from 53% [14] to 80% [1]. The proponents of subtotal hysterectomy report a lesser blood loss, a reduced need for blood transfusion, reduced operating time and reduced intra and postoperative complications [24]. Subtotal hysterectomy may not be effective in management of accreta located in lower uterus. Total hysterectomy should however be considered when active bleeding occurs from lower uterine segment as the cervical branch of uterine artery may remain intact [6]. Both total and subtotal hysterectomy are however associated with high mortality [8, 13, 14, 24]. All pedicles are doubly ligated because of hyperemia and peripartum pelvic tissue tears [6]. The final decision to perform subtotal or total hysterectomy would be influenced by patient's condition. Hence, while total abdominal hysterectomy is a more convenient procedure, subtotal EPH may be a better choice in certain conditions where surgery needs to be completed in a shorter time.
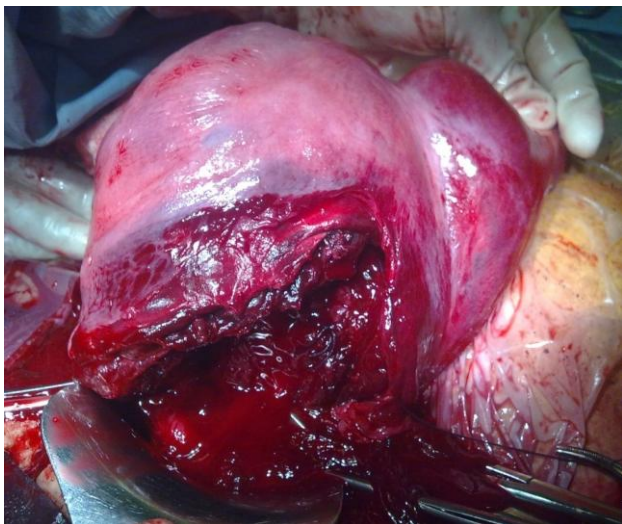

Fig. 1 Uterine rupture with life threatening hemorrhage managed by peripartum hysterectomy.

Complications

The maternal morbidity ranged from 26.5% to 31.5% [1-6, 8-17, 21-24]. The complications included blood transfusion (88%), febrile episodes (26.5%), perinatal death (22.8%), bladder injuries (8.8%), wound infection, DIC, ileus, vaginal cuff bleeding and adnexectomy [6]. The maternal mortality ranged from 0 to 12.5% with a mean of 4.8% [1-6, 8-19, 21-24].

Conclusion

Although no risk assessment system can predict all instances where cesarean delivery will be needed, a significant percentage of the patients who are at high risk for severe hemorrhage and the subsequent need of emergency hysterectomy can be identified before surgery. The preoperative risk factors include previous history of CS, placenta previa and accreta. The presence of

preoperative risk factors should facilitate consultation, referral or transfer of patients before surgery to a tertiary care facility. Due to the complexity of the surgery and decision making, the involvement of an experienced obstetrician at an early stage is desirable. Proper surgical measures such as hemostatic sutures or uterine or hypogastric artery ligation or embolization are options in attempting uterine conservation particularly in patients who are young and in whom future fertility is important and who are relatively haemodynamically stable. When conservative treatment is not feasible or has failed, prompt EPH is performed failing which the delay would contribute to the maternal morbidity and in unfortunate cases mortality.

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