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Obstetric hysterectomy: A review of cases over 16 years

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Summary
Emergency peripartum hysterectomy (EPH), is performed when life-threatening obstetric conditions occur. The authors attempt to assess the incidence of EPH as well as to investigate risk factors and patients' characteristics. A retrospective study of all cases of EPH performed at the 2nd Department of Obstetrics and Gynecology, Medical School of Athens University, from 1994 to 2009 has been conducted. Data were abstracted from individual medical charts and laboratory records. Among 16,182 deliveries, 15 EPH were performed (0.92 per 1,000 deliveries). Indication was uncontrollable haemorrhage due to placenta accreta (73.3%) or uterine atony (26.6%). Incidence of 1.54 EPHs per 1,000 caesarean sections and 0.51 per 1,000 vaginal deliveries, were noted. Morbidity rate was 46.6%. One (6.6%) mother died because of pulmonary embolism. In conclusion, peripartum hysterectomy is a severe but life-saving procedure. Caesarean section increases the risk of EPH. Obstetricians should always be prepared to confront this emergency situation.

Keywords: *Caesarean, emergency, hysterectomy, obstetric, peripartum, vaginal delivery*

Introduction

Emergency peripartum hysterectomy (EPH), either after vaginal delivery (VD) or caesarean section (CS), is a rarely performed procedure, usually undertaken as a last resort, when life-threatening obstetric conditions occur (Plauche 1988). The first documented postpartum hysterectomy took place in the USA by Horatio Storer in 1866, but the patient died three days later (Mesleh et al. 1998). It is considered as one of the most risky and dramatic operations in modern obstetrics, the rate of which ranges from 0.2 per 1,000 deliveries (Engelsen et al. 2001; Gardeil et al. 1995; Yoong et al. 2006; Bakshi and Meyer 2000) up to 8 per 1,000 obstetric consultations (Vázquez et al. 2008), while maternal mortality ranges from 0 to 29.8% (Baskett 2003). The higher rate of EPH and the associated maternal mortality are mainly met in developing countries. On the contrary, in developed countries, there is an increasing rate of CS with concomitant placental abnormalities, which is an issue of concern, as they might end to EPH, increasing its incidence in such countries (Fayez El-Jallad et al. 2004).

This review attempts to assess the incidence of EPH as well as to investigate the risk factors and the characteristics of patients that were subjected to an emergency peripartum hysterectomy.

Materials and methods

Authors retrospectively reviewed all cases of EPH performed at the 2nd Department of Obstetrics and Gynecology, Medical School of Athens University, 'Aretaieion' Hospital, from 1994 to 2009. Peripartum hysterectomy was defined as one performed for a haemorrhage after delivery which is unresponsive to other treatments. Our protocols include uterine tamponade in cases where postpartum haemorrhage (PPH) follows a vaginal delivery and the use of B-Lynch sutures when a PPH follows a CS. Data were abstracted from individual medical charts and laboratory records. In all cases, the operation was conducted in order to save the patient's life when at the time of CS or immediately after vaginal delivery, a life-threatening bleeding occurred. All uterine and placenta tissues were sent for histopathological examination. Cases with a gestational age <24 weeks and deliveries of newborns with birth weight <500 g were excluded.

Maternal parameters such as age, parity, gestational age at delivery, method of delivery, indication for CS, previous CS, other complications (maternal and fetal) and type of hysterectomy (total or subtotal), were noted and evaluated. Furthermore, parameters such as maternal death, blood transfusion, disseminated intravascular coagulation and injuries of the lower urinary tract were also noted. Additionally the possible aetiological factors leading to obstetric hysterectomy have also been investigated. Approval and informed consent of all patients have been obtained.

Results

During the study period, there were 16,182 deliveries, among which 6,469 were by CS. During this period, 15 emergency peripartum hysterectomies were performed, giving an incidence of 0.92 per 1,000 deliveries. There were 10 cases after delivery by CS (1.54 per 1,000 CS) and five cases after vaginal delivery (0.51 per 1,000 vaginal deliveries) (Table I). The mean age of women was 31.14 years (range 18–39), while the mean gestational age at delivery was 38+2 weeks (range 32–41). The median parity was 2.4 but seven women were primiparous. In cases of hysterectomy after CS, the indications

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for CS were: previous CS in four cases (two of the patients had one previous CS and the other two had two previous CS), placenta praevia in four cases and the other two on patients' demand. The most common indication for hysterectomy was uncontrollable haemorrhage due to abnormal placentation. Placenta accreta was found in 11 cases (73.3%). For the remaining four cases (26.6%) the indication was uterine atony (Table II). Total hysterectomy was performed in 12 cases and subtotal hysterectomy in three cases. The decision for a total or subtotal hysterectomy was based on the level of intraoperative risks to extract the uterine cervix.

All patients underwent blood transfusion with a mean quantity of 5.7U of red blood cell. Four cases presented postoperative fever (up to 38.5°C), while three cases of haematuria, immediately after surgery, occurred (Table II). No fetal complications were noted. One (6.6%) out of the 15 mothers died because of pulmonary embolism, 3 hours after the end of the operation.

Discussion

Emergency peripartum hysterectomy is a rare but crucial operation, performed in cases of life-threatening obstetric conditions. According to the literature, when postpartum haemorrhage occurs at 0.7% of deliveries (Fornet et al. 2008), the incidence of EPH varies widely from 0.2 per 1,000 deliveries up to 8 per 1,000 obstetric consultations (Engelsen et al. 2001; Gardeil et al. 1995; Yoong et al. 2006; Bakshi and Meyer 2000; Vázquez et al. 2008), when the mean incidence gives the impression to be approximately 0.6 per 1,000 deliveries, similar to that which Lone et al. (2010), Güngördük et al. (2009) and Rahman et al. (2008) recently reported. Despite the introduction of new pharmacological agents and conservative surgical techniques, there has been a significant increase of the EPH incidence over recent years (Lone et al. 2010; Kovavisarach 2006); up to three-fold according to recent reports (Yoong et al. 2006). The incidence in our tertiary hospital was found to be 0.92 per 1,000 deliveries.

It has been reported that placentation abnormalities are the most common indication for EPH, mainly due to the increased number of CS over the last decade (Bakshi and Meyer 2000; Kastner et al. 2002; Zelop et al. 1993). In our study, indications for EPH were adherent placenta and uterine atony, the former being more common than the later (11 vs 4 cases), which is in accordance with other reported series (Plauche 1988; Engelsen et al. 2001; Vázquez et al. 2008; Lone et al. 2010; Güngördük et al. 2009; Rahman et al. 2008; Nasrat et al. 1999; Hayashi et al. 1981; Saeed et al. 2010; Daskalakis et al. 2007).

It seems that CS increases the risk of peripartum hysterectomy in diverse ways. Many investigators have reported that CS even *per se* increases the risk of peripartum hysterectomy, which is of concern, given the increasing rate of caesarean deliveries (Engelsen et al. 2001; Bakshi and Meyer 2000; Güngördük et al. 2009; Rahman et al. 2008; Kastner et al. 2002; Eniola et al. 2006).

In accordance with the previous findings, the rate of caesarean hysterectomy (1.54/1,000 CS) in our material was three times higher than the rate of postpartum hysterectomy (0.51/1,000 vaginal deliveries). On the other hand, repeated CSs are related to placenta abnormalities such as placenta accreta and praevia (Dan et al. 2005). Even a 110-fold increase of the risk has been reported (Bakshi and Meyer 2000). As has been mentioned, placenta accreta and praevia are strongly linked to peripartum hysterectomy (Rivera et al. 2008). According to our material, four women had previous CS. As obstetric practice is characterised by a high section rate, every attempt should be made to reduce the CS rate by performing this procedure only for valid clinical indications (Daskalakis et al. 2007).

A total hysterectomy was preferred in 12 out of the 15 of our cases. This operation is usually preferred, as it reduces the potential risk for future cervical stump malignancy (Fayez El-Jallad et al. 2004). However, the subtotal hysterectomy is also preferred in certain series (Dan et al. 2005) due to the fact that it is quicker, related to less blood loss and less urinary tract injuries, as compared with the total excision. Our findings are in complete agreement with Rahman et al. (2008), as subtotal hysterectomy appeared to be a quicker and safer procedure than total hysterectomy and are in partial agreement with Saeed et al. (2010), who report that, the duration of surgery was shorter but the complications were higher in total compared with subtotal hysterectomies. In any case, subtotal hysterectomy is considered to be a reasonable alternative in emergency obstetric hysterectomy. In fact, as Yoong et al. report, (2006), subtotal abdominal hysterectomy appears to be the procedure of choice in more recent years.

Regarding the postoperative complications, EPH is associated with a severe morbidity rate (30–40%) and complications include bladder injury, disseminated intravascular coagulation, re-exploration due to haemorrhage, pneumonia, wound infection and urinary tract infection (Plauche 1988; Rivera et al. 2008). From a different point of view, as the damage of the lower urinary tract is originated by complications of obstetric or gynaecological surgery, which if not detected in time determines the formation of fistulas, Roberto Martínez et al. (2007) investigated the causes of vesicovaginal fistulas and reported that obstetric hysterectomy was the leading cause for one-third of such fistulas. In the present study, three women presented with haematuria postoperatively and were promptly managed successfully, and four women developed postoperative fever, while one maternal death took place, giving a morbidity rate of 46.6% and a mortality rate of 6.6%. Mortality rates range between 0 and

Table I. Mode of delivery and type of hysterectomy.

Hysterectomy ($n=15$)	n	(%)
Mode of delivery		
After caesarean section	10	66.6
After vaginal delivery	5	33.3
Type of hysterectomy		
Total hysterectomy	12	80
Subtotal hysterectomy	3	20

Table II. Indications for peripartum hysterectomy and causes of maternal morbidity.

Indication	n	(%)
Peripartum hysterectomy ($n=15$)		
Placenta accreta	11	73.3
Uterine atony	4	26.6
Postoperative complications ($n=7$)		
Postoperative fever	4	26.6
Haematuria	3	20

1. **EPH is asso- ciated with a severe morbidity rate (30–40 %) and complications include bladder inj...**
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11.6% according to the literature (Rahman et al. 2008). In our study, all women required blood transfusion, the mean quantity of which was 5.7U of red blood cells, which is in accordance with other studies (Eniola et al. 2006; Dan et al. 2005; Rivera et al. 2008).

Recently, other techniques have been proposed for such cases, in order to avoid removal of the uterus and to preserve fertility. Fornet et al. (2008) suggest uterine artery embolisation is a safe and effective procedure for managing massive postpartum haemorrhage while Tolikas et al. (2008) propose bilateral ligation of internal iliac arteries as a life-saving procedure in cases of massive obstetric haemorrhage.

In conclusion, peripartum hysterectomy is a severe but life-saving procedure. The decision for such an intervention should be taken after careful estimation of the emergency's severity. Both future physical and psychological wellbeing of such patients is compromised. An early decision to perform an emergency hysterectomy is essential before the patient's condition deteriorates. Therefore the obstetrician should always be prepared to confront this technically demanding situation.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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