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## Research Article

### PERIPARTUM HYSTERECTOMY - AN ELEVEN-YEAR EXPERIENCE AT AN ACADEMIC CENTER IN JEDDAH

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#### ABSTRACT

**Objective:** To estimate the prevalence and review the indications, risk factors, and complications associated with peripartum hysterectomy.

**Methods:** A retrospective analysis of all cases that underwent peripartum hysterectomy identified from the hospital records. All women who delivered at King Abdulaziz University Hospital, Jeddah, Saudi Arabia, between January 2000 and December 2011 and required emergency peripartum hysterectomy were included in the study. Cases were reviewed for indications, maternal characteristics, booking status, labor, mode of delivery, type of hysterectomy required (total or subtotal), postoperative morbidity, and maternal and fetal outcomes.

**Results:** A total of 41 peripartum hysterectomies were identified during the study period, representing a prevalence rate of 0.8%.

**Conclusion:** Cesarean section delivery remains one of the major risk factors for placenta previa and abnormal placentation, which together account for the majority of cases of postpartum hemorrhage that require emergency peripartum hysterectomy.

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## INTRODUCTION

Peripartum hysterectomy (PH) is a major surgical procedure, typically performed as an emergency measure during or within 24 hours of abdominal or vaginal deliveries due to life-threatening hemorrhage (1). It has an incidence of 0.24-8.7 per 1000 deliveries and is more common following cesarean section (CS) compared with vaginal deliveries (1, 2). Peripartum hysterectomy continues to be one of the top three leading causes of maternal mortality worldwide (3). Although proposed in 1869, the first cesarean subtotal hysterectomy was successfully performed in 1876, resulting in the survival of both the mother and her newborn (4, 5). Peripartum hysterectomy is associated with significant maternal morbidity (26.5-31.5%) and mortality (0-12.5%) (1,2). The main indication for emergency PH is abnormal placentation (placenta previa, placenta accreta, placental bed pathology), but the underlying causes for abnormal placentation can vary. Risk factors include previous CS, scarred uterus, multiparity, older age, and placenta previa (6-9). However, a change in the indication of emergency PH has been observed in developed countries, which may be due to the increasing incidence of CS performed with variable indications and their respective associations with abnormal placentation (10). Peripartum

hysterectomy is associated with high complication rates, persistent bleeding, febrile morbidity, coagulopathy, and urinary tract injury, and often requires massive blood transfusions (11-13). Peripartum hysterectomy is therefore considered an end-point in a woman's obstetric history, and it has a profound impact on the patient and her family. The aim of this study is to review cases of PH performed at King Abdulaziz University Hospital, Jeddah.

## METHODS

### Patient details

A retrospective chart analysis was performed of all women who underwent emergency PH secondary to uncontrolled postpartum hemorrhage at King Abdulaziz University Hospital, Jeddah, Saudi Arabia between January 2000 and January 2011

### Emergency PH

Emergency PH was defined as a hysterectomy performed in a life-threatening condition of postpartum hemorrhage when all conservative measures had failed to control the bleeding. All deliveries were performed 20 weeks of gestation and the emergency PH was performed shortly after delivery (within 24 hours). Both medical and surgical modalities were used to

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control the hemorrhage prior to the hysterectomy. After obtaining approval from the local ethics committee, the analysis was conducted by reviewing the literature and constructing the data sheet and its components. Information obtained from the medical records included demographic details, patients' characteristics (e.g., age, gestational age, parity, nationality, body mass index[BMI], medical and surgical history), previous obstetric history, details of the current pregnancy and delivery (onset of labor, duration of labor, and mode of delivery), indications for PH, type of hysterectomy performed, outcomes of hysterectomy as intraoperative and postoperative complications, length of hospital stay, intensive care unit (ICU) admission, amount of blood and blood products transfused, histopathology reports, and neonatal outcomes. Maternal complications, such as maternal death and serious hemorrhagic, neurological, urological, infectious, respiratory, renal, and thromboembolic complications, were also recorded.

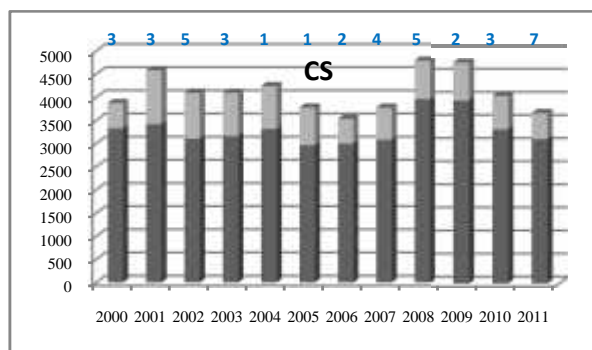
**Statistical analysis**

All statistical analyses were performed using the Statistical Package for the Social Sciences for Windows, version 16. Student's t-test and chi-squared test were used. A P-value <0.05 was considered statistically significant. Frequencies and percentages are presented as descriptive statistics.

**RESULTS**

**Patient details**

Of the 50443 deliveries that occurred at King Abdulaziz University Hospital during the study period, 41 women underwent emergency PH (Figure 1), representing a prevalence of 0.8%.



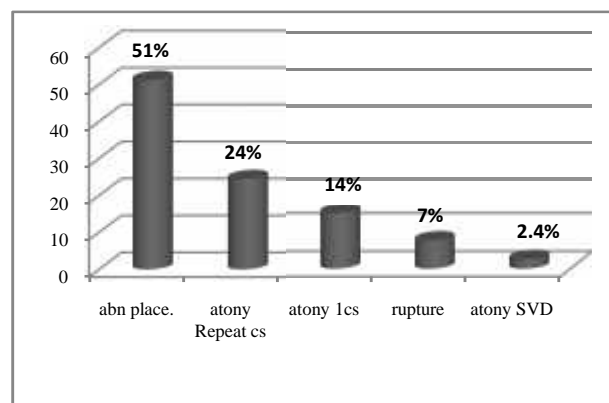
**Figure 1** Total annual births / type of delivery from 2000–2011 at King Abdulaziz University Hospital.

Most patients were young, multiparous women, with a mean maternal age of 34.0± 5.5 years (range, 19-43 years; Table 1); the mean parity was 4.0± 2.3 (range, 0-10), and the mean BMI was 32.0± 10 Kg/m<sup>2</sup> (range, 19-55Kg/m<sup>2</sup>). Most cases were booked patients receiving antenatal care; 35 (85%) were booked and only 6 (15%) were un-booked cases.

**Table 1** Characteristics of women who underwent emergency peripartum hysterectomy

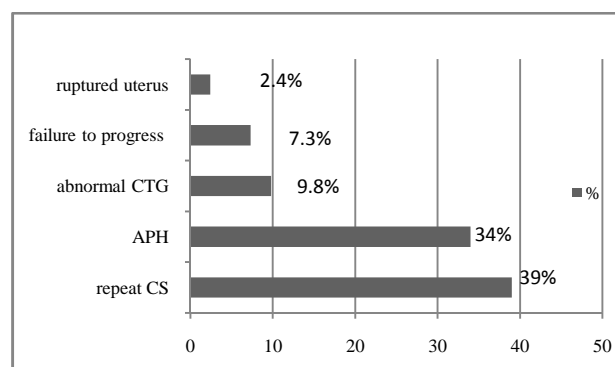
Variables	Range	Mean ± Standard Deviation
Age	19-43	34 ± 5.5
Body mass index	19-55	32 ± 10
Parity	0-10	4 ± 2.3
Gestational age	20-42	35 ± 3.8

Abnormal placentation was the cause of postpartum hemorrhage in most cases (51%), followed by uterine atony due to repeat CS (24%; Figure 2).



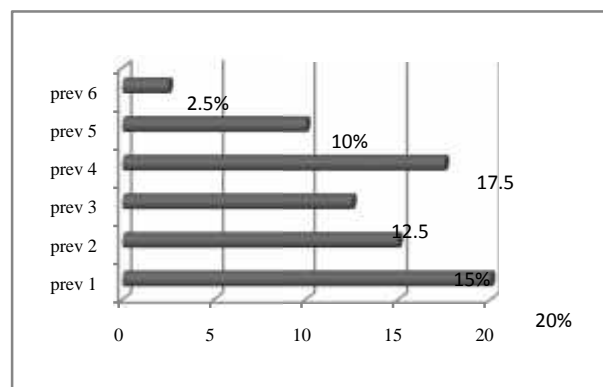
**Figure 2** Causes of postpartum hemorrhage in the sample. (Abbreviations: CS, cesarean section; SVD, spontaneous vaginal delivery.)

The mode of delivery was CS in 39/41 (95%) cases. Of these, 12/39 (29%) were elective and 27/39 (65%) were emergency cases; only 2/39 patients (5%) had normal vaginal deliveries. The indications for CS delivery were primarily due to a repeat CS (39%), antepartum hemorrhage (34%), or placenta previa (7.5%) (Figure 3).



**Figure 3** Indications for cesarean delivery in the sample. (Abbreviations: APH, antepartum hemorrhage, CS, cesarean section; CTG, ardiotocography.)

Other indications included abnormal fetal heart (9.8%), labor dystocia/failure of progress (7.3%), and uterine rupture (2.4%). A review of the patients' obstetric histories showed that most women had a history of CS (Figure 4) and, of those, placenta previa was diagnosed in 65%.



**Figure 4** Number of prior cesarean deliveries reported by the patients

Although the majority of patients had antenatal care, most patients had 10 mg/dL pre-delivery mean hemoglobin level and this reached a mean of 5.2 mg/dL. Hence, >90% of women required blood transfusion, with each woman receiving on average >2 units (Figure 5).

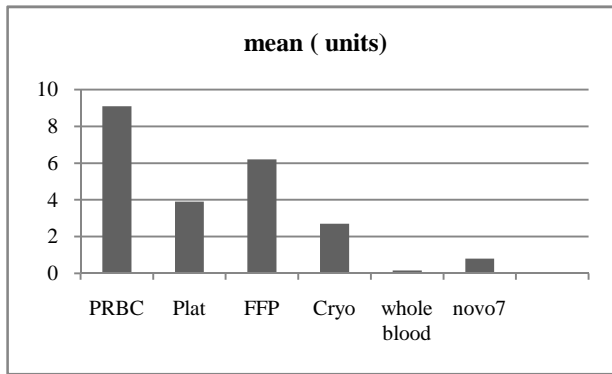


Figure 5 Type of transfusion therapy used. (Abbreviations: FFP, fresh frozen plasma; PRBC, packed red blood cells.)

In addition to other resuscitative measures, including the use of uterotonic medication such as oxytocin and ergometrine in all patients, surgical interventions to achieve homeostasis and control the bleeding were also attempted (seven patients underwent internal iliac artery ligation, one underwent uterine artery ligation, and one had a B-Lynch procedure) before the hysterectomy. Hysterectomy was either total (70%) or subtotal (30%). Decisions were made by consensus according to timed maternal bleeding status and hemodynamic stability. The decision for hysterectomy was made intraoperatively in 61% of cases, within the first hour in 12% and within 1-12 hours in the remaining 27%. The indication for hysterectomy was abnormal placentation (51%), uterine atony (42%) and uterine rupture (7%). Surgery was performed by at least one consultant. The mean operative time was 201 ± 66.5 minutes, with an estimated blood loss of 4 ± 2.2 L (Table 2).

Table 2 Duration of surgery, intensive care unit length of stay and estimated blood loss in the sample

Variables	Range	Mean ± SD
Duration of hysterectomy (mins)	105–340	201 ± 66.5
Estimated blood loss during hysterectomy (L)	0.5–12	4 ± 2.2
Length of stay post-operative (days)	3–40	11 ± 7.4

Abbreviation: SD, standard deviation.

In 70% of the cases, intensive care management was required during ICU stay (2.7 days). There was one maternal death in the study group. The neonatal outcome in the study group (Table 3) had been correlated to obstetric risk factors and not to maternal outcome.

Table 3 Neonatal outcome in the sample

Variables	Frequency	Percent
Male	16	39
Female	25	61
IUFD	1	2.4
Still birth	2	4.9
Nursery	28	68.3
SCBU	2	4.9
NICU	8	19.5

Abbreviations: IUFD, intrauterine fetal death; NICU, neonatal intensive care unit; SCBU, special care baby unit; SD, standard deviation.

Approximately 7% were lost *in utero* or in the immediate post partum period and approximately 25% required critical care. The maternal mortality case (0.1/100000) was a patient with three previous CSs and a diagnosis of placenta previa in the current pregnancy; she underwent elective CS and developed postpartum hemorrhage without any positive response to all measures of resuscitation.

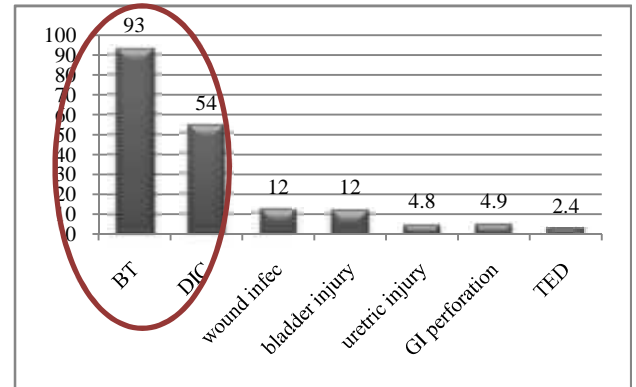


Figure 6 Frequency of maternal complications in the sample. (Abbreviations: BT, blood transfusion; DIC, disseminated intravascular coagulation; Thromboembolic disease: TED, .)

## DISCUSSION

Hysterectomy following CS was first described in 1969 and performed to prevent postpartum hemorrhage-related maternal mortality (7). In recent years, differences in the incidence of emergency PH have been observed following vaginal delivery and CS(2). While the incidence of PH after vaginal delivery is consistent across European and US reports, the rate of CS is highly variable (2). Historically, the most prevalent indication for emergency PH was uterine atony. However, a number of studies have suggested that abnormal placentation (including placenta previa, increta, accrete, and percreta) is a major risk factor of CSs, which are increasing in number (2,6,8,10,13) and resulting in the higher incidence of emergency PH (1-6, 16). In modern obstetrics, the overall incidence of emergency PH is 0.05%; however, perceptible differences exist in different parts of the world. It is advised to initially perform conservative procedures to control uterine hemorrhage before resorting to drastic surgical procedures such as PH. The most severe complication of hemorrhage is maternal death, with an estimated risk of approximately 1 in 100000 deliveries in developed countries and this has been increasing. In developing countries, this risk is as high as 1 in 1000 deliveries, likely due to the higher prevalence of CS deliveries. Optimizing antenatal care for patients is necessary, therefore, to reduce the number of CS deliveries and, thereby, reduce the mortality and morbidity-associated emergency PH.

## CONCLUSION

Cesarean section remains one of the major risk factors for placenta previa and abnormal placentation, which together account for the majority of cases of postpartum hemorrhage that require emergency PH. Standardized and well-structured clinical pathways for repeat CS and placenta previa are highly recommended.

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