

Emergency Peripartum Hysterectomy: A 13-Year Review at a Tertiary Center in Kuwait

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Abstract

Objective To determine the incidence, indications, risk factors, and complications of emergency peripartum hysterectomy (EPH) and to evaluate total versus subtotal hysterectomy for EPH.

Materials and Methods This is a retrospective case series involving thorough examination of the files of all women who had EPH between January 2000 and December 2012 in the department of Obstetrics and Gynecology, Al-Jahra

hospital, Kuwait after taking approval from the ethics committee. Incidence, indications, risk factors, type of hysterectomy, and complications of EPH were obtained from patient files.

Results There were 63,337 deliveries of which 70.3 % were vaginal deliveries, and 29.6 % were by cesarean section (CS). Sixty-eight women underwent EPH representing an overall incidence of 1 case per 1,000 deliveries. The indications for EPH included abnormal placentation (77.4 %), uterine atony (14.5 %), and uterine rupture (8.1 %). There was one maternal death. Maternal morbidity occurred in 25 (40.3 %) women. The most common complications were mild to severe coagulopathy (19.35 %) and injury to the urinary tract (17.74 %). Injury to the ureter was avoided by placing ureteric stents preoperatively. Our population was significant in having higher rate of CS deliveries (91.9 %), women with prior CS (83.87 %), and high parity (mean 5.8).

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Conclusion Abnormal placentation was the most common indication to perform EPH. The relative risk of EPH was 27 for CS deliveries as compared to vaginal deliveries. There was no significant difference between subtotal versus total hysterectomy with respect to age, parity, previous CS, operative time, blood transfusion, and intra and post operative complications.

Keywords Emergency peripartum hysterectomy · Abnormal placentation · Previous cesarean section · Cesarean delivery

Abbreviations

EPH Emergency peripartum hysterectomy
CS Cesarean section

Introduction

Emergency peripartum hysterectomy (EPH) implies removal of uterus at the time of delivery or in the immediate postpartum period for hemorrhage which is unresponsive to conservative treatments and is a life saving surgery. It is one of the most demanding surgical procedures performed in obstetrics. Earlier the most common indications of EPH were uterine atony and uterine rupture [1–3].

In recent studies [4–8], these indications have been overtaken by abnormal placentation which refers to both placenta previa and morbidly adherent placenta. This shift in etiology of EPH is due to several factors. The incidence of morbidly adherent placenta is increasing mainly due to increasing cesarean section rate [5, 8–11]. The incidence of uterine atony as the indication of EPH is decreasing due to the availability of new effective conservative procedures like prostaglandins available in its management [12]. The incidence of uterine rupture is reduced probably due to practice of lower uterine segment incision rather than upper uterine segment incision for cesarean section (CS) and better labor ward management.

The incidence of EPH in the literature varies from 0.3 to 6.2 per 1,000 deliveries in the published studies [7–11, 13, 14]. It is associated with significant maternal morbidity and mortality [4, 5, 11, 12, 15]. As this procedure inevitably brings an end to woman's child bearing capacity, it can be devastating for some couples. Several studies have reported its incidence from the Middle East region ranging from 0.39 to 5.38 per 1,000 deliveries [16–18]. The objectives of this study are to determine the incidence, indications, risk factors, and complications of EPH and to evaluate the total versus subtotal hysterectomy for EPH in our institution for the period from January 2000 to December 2012.

Materials and Methods

This case series study was conducted in Al-Jahra hospital, Ministry of Health, Kuwait after taking approval from the ethics committee. The study covered the period from 1st January 2000 to 31st December 2012. For the purpose of this study, we defined EPH as hysterectomy performed after 20 weeks of gestation for uncontrolled uterine bleeding not responding to conservative measures at the time of delivery or within 24 hours of delivery.

All women who had peripartum hysterectomy during the study period were identified from the labor ward delivery register which includes all the births. This was cross-checked with the operation theater registers to make sure that no cases were missed. Information on demographic and clinical variables like age, parity, gestational age, indication for hysterectomy, blood transfusion, operating time, complications, and hospitalization period were obtained by review of the maternal case notes. All surgeries were performed by senior consultants. Information about total number of deliveries and of CS during the study period was obtained from labor ward statistics.

From the year 2004 onward, we started placing ureteric stents preoperatively in women with morbidly adherent placenta, who were being taken for elective CS delivery to avoid injury to ureter in case an EPH became necessary. In those women who underwent emergency CS and needed EPH, we confirmed the integrity of ureters by cystoscopy and ureteric catheterization before the conclusion of surgery.

Table 1 Demographic and clinical data of 62 women who had EPH

Characteristic	Mean \pm SD (range) or number of women (%) ($n = 62$)
Maternal age	34.98 \pm 5.3 (range 23–47)
Parity	5.8 \pm 3.2 (range 0–17)
Previous CS	52 (83.87)
1 prior CS	12
2 prior CS	13
3 prior CS	12
4 prior CS	7
5 or more	8
Prior uterine curettage	20 (32.25 %)
Prior uterine surgery (CS + uterine curettage + myomectomy)	55 (88.7 %)
Delivery	
Gestational age	34.59 \pm 4.1 (range 20–41) weeks
Vaginal delivery	5(8.1)
CS delivery	57(91.9)

Statistical analysis was done using online statistical software available at websites, <http://www.vassarstats.net>, <http://www.medcalc.org>, and <http://www.statpages.org>. Student *t* test was used for continuous variables and χ^2 test was used for categorical values. A *p* value of <0.05 was considered significant.

Results

During the 13-year study period, there were a total of 63,337 deliveries in our institution out of which 44,593(70.4 %) were vaginal deliveries, and 18,744(29.6 %) were CS deliveries. Sixty-eight women underwent EPH during this period representing an overall incidence of 1.07 per 1,000 deliveries. The rate of EPH was 3.25 per 1,000 CS deliveries and 0.16 per 1,000 vaginal deliveries. As the medical case notes of 6 patients could not be traced for analysis, the results reported below are based on the analysis of 62 medical records. The demographic and clinical variables associated with hysterectomy are shown in Table 1.

The study included 13 women (20.9 %) who were above the age of 40 years. Forty-one (66.12 %) women were grand multipara, and two women were primigravida. Fifty-seven women (91.9 %) were delivered by CS. Fifty-two (83.87 %) women had a previous CS delivery. Twenty-seven (51.9 %), that is, more than half of these 52 women had three or more previous CS deliveries.

The operative notes and histopathology reports were used to determine the cause of EPH. The indications for EPH are listed in Table 2. The most common indication for EPH was abnormal placentation in 48(77.4 %) women out of whom 34 had morbidly adherent placenta, and 14 had placenta previa without abnormal adherence. Thirty-three of these 34 women with morbid adherence of the placenta were associated with placenta previa. In one patient, the placenta was not previa but morbidly adherent at the fundus of the uterus. This patient had history of previous curettage.

General anesthesia was used in all the women. Prior to hysterectomy, all women received oxytocin infusion and ergometrine. Other procedures performed prior to hysterectomy were, administration of intramyometrial

Table 2 Indications for EPH

Indication	Number	%
Morbidly adherent placenta	34	54.8
Placenta previa without morbid adherence	14	22.6
Uterine atony	9	14.5
Uterine rupture	5	8.1

Table 3 Complications associated with EPH

Complication	Number of women (%)
Mild to severe coagulopathy	12 (19.4 %)
Injury to the urinary tract	11 (17.7 %)
Injury to bladder	10 (16.1 %)
Inadvertent ligation of ureter	1 (1.6 %)
Febrile morbidity	8 (12.9 %)
Wound infection	6 (9.7 %)
Return to theater	
To control persistent hemorrhage	6 (9.7 %)
To remove pack placed to control persistent oozing in the pelvis	5 (8.1 %)
To remove hemovac drain sutured inadvertently to rectus sheath	1 (1.6 %)
Reaction to blood transfusion	1 (1.6 %)
Cardiomyopathy	1 (1.6 %)
Maternal death	1 (1.6 %)

prostaglandin E2 in 4(6.6 %), uterine artery ligation in 17(27.4 %), internal iliac artery ligation in 5(8.1 %), over sewing of placental bed in 18(29 %), uterine packing in 5(8.1 %) and Bakri balloon tamponade in 4(6.6 %) women. Some of the women had received more than one conservative procedures mentioned above. In 38(60.3 %) women, total abdominal hysterectomy was performed, while in the remaining 24(39.7 %), subtotal hysterectomy was performed. Two women had significant bleeding from adnexa that necessitated unilateral salpingo-oophorectomy.

The mean \pm standard deviation (SD) surgical time was 2.3 ± 0.8 h (range 1–5 h). All women received blood transfusion. The mean \pm SD for blood transfusion was 8.2 ± 4.6 units (range 1–21). Seventeen women (27.4 %) needed intensive care unit admissions. The mean postoperative hospital stay was 9.0 ± 4.6 days (range 5–24 days).

Significant proportion of women suffered intraoperative and postoperative complications. These are summarized in Table 3. Women who suffered injury to urinary tract were identified and repaired intraoperatively with no sequelae. One woman sustained ureteric injury during EPH prior to our practice of placing preoperative ureteric stent in women undergoing elective CS with morbidly adherent placenta. From year 2004 onward, no woman undergoing elective CS for morbidly adherent placenta suffered the complication of ureteric injury when EPH was needed.

Discussion

Our paper analyzes the incidence and outcomes of EPH in a single center in Kuwait.

Table 4 Relative risk of EPH with cesarean deliveries

Risk factor-CS	No.	Total	Rate of EPH per 1,000	Relative risk	95 % confidence interval
No	5	44,593	0.16	27.04	10.8–67.5
Yes	57	18,744	3.25		

EPH is one of the most challenging procedures in modern obstetrics, due to the pregnancy-induced anatomical changes of the organs involved compared to the standard gynecologic procedures, the need for timely intervention, and performing it expeditiously in emergency setting.

The incidence of EPH of 1.07 per 1,000 deliveries in our series compares favorably with other reported incidences [4, 5, 13, 16]. In agreement with recent published studies [4–11], the commonest cause of EPH in our series was abnormal placentation (77.4 %), followed by uterine atony (14.5 %) and uterine rupture (8.1 %).

Some of the known risk factors for EPH are CS, previous CS, high parity, and advanced maternal age. Studies have shown that CS per se increases the risk of EPH [8, 10, 19, 20]. In agreement with these studies, our study showed that the rate of EPH was 3.25 per 1,000 CS deliveries as against 0.16 per 1,000 vaginal deliveries. Thus, as shown in Table 4, the relative risk of EPH was 27 for CS deliveries as compared to vaginal deliveries.

It has also been reported that the incidence of abnormal placentation and risk of EPH increase with increasing number of prior CS [8, 10, 20, 21]. A study by Kwee A et al. [8] reported an incidence of placenta accreta, increta, or percreta requiring hysterectomy as 1.9/1,000 deliveries in women with one prior CS which increased by 47-fold to 91/1,000 in women with four previous CS. In our series, 91.9 % of women were delivered by CS, and 83.9 % of women had at least one previous CS. In our study of the 48 (77.4 %) women with abnormal placentation, except for one, all had at least one prior CS (range 1–7). These two factors explain the high proportion of abnormal placentation in our series leading to EPH.

Advancing age and high parity are also risk factors for EPH. Zelop et al. [9] noted in their study that the rate of EPH increases linearly with increasing parity in women with no placenta previa or no prior CS. They also noted that the parity had greater impact on the rate of EPH in the presence of placenta previa or history of prior CS.

The incidence rate of EPH in our series is higher than in other series [4, 8, 10, 11]. Table 5 compares the above mentioned risk factors among these studies [4, 8, 10, 11]. From Table 5, it is evident that though the maternal age in our series was comparable to other studies; there were higher rate of CS delivery, higher number of women with prior CS and high parity in our series accounting for higher rate of EPH compared to these studies. Our patient population is remarkable for higher parity of 5.8 ± 3.2 (range 0–17) compared to these studies in which average parity is not more than three. In our series except for two women, all were multipara, and 66.1 % of women were grandmultipara.

In accordance with the recent observations, our study also found uterine atony and uterine rupture to be less common among women who had EPH [4–11]. This could be attributed to advances in the pharmacologic and surgical modalities for the treatment of uterine atony and better antenatal and intrapartum care.

It is often debated whether to perform subtotal or total hysterectomy during EPH. Some authors [22, 23] prefer subtotal hysterectomy compared to total hysterectomy because of reduced operating time, need for blood transfusion, and intra and postoperative complications with subtotal hysterectomy. Ogunniyi et al. [24] have reported that subtotal hysterectomy is associated with more postoperative complications than total hysterectomy. Yucel et al. [11] prefer total hysterectomy to subtotal hysterectomy when active bleeding occurs from lower uterine segment as the cervical branch of uterine artery may remain intact. In our series, total abdominal hysterectomy was performed in 38(61.3 %) women, while in the remaining 24(38.7 %), a subtotal hysterectomy was performed. The decision to perform total or subtotal hysterectomy was dependant on the presence of bleeding deep in

Table 5 Comparison of our study with other studies regarding age, parity, and previous CS and delivery by CS

Author	Incidence of EPH/ 1,000 deliveries	Mean Age	Parity Mean/ median (range)	Previous CS %	Delivery by CS %
Our study	1.07	35	5.8/6 (0–17)	83.9	91.9
Awan [4]	0.85	35.6	NA ^a /2 (1–3)	54.8	87.1
Demerci [10]	0.3	32.8	3/NA ^a	64	87
Kwee [8]	0.33	33	1.3/NA ^a	52.1	64.6
Yucel [11]	0.29	31	NA ^a /2 (0–6)	20.6	47.1

^a Not available

Table 6 Comparison of subtotal versus total hysterectomy for EPH

Variable	Subtotal hysterectomy(<i>n</i> = 24) Mean ± SD (range) or number of women	Total hysterectomy (<i>n</i> = 38) Mean ± SD (range) or number of women	<i>p</i> value
Age	34 ± 6.3	35.6(4.6)	0.30 <i>t</i> test
Parity	6.7 ± 3.4 (0–15)	5.2 ± 2.9 (0–17)	0.08 <i>t</i> test
Previous CS	2.25 ± 1.94	2.4 ± 1.6	0.72 <i>t</i> test
Operation time	2.6 ± 0.8 (1–5)	2.2 ± 0.6 (1–3.5)	0.10 <i>t</i> test
Blood transfusion units	7.5 ± 5.1 (2–21)	8.6 ± 4.3(1–19)	0.35 <i>t</i> test
Febrile morbidity	3	5	0.94 χ^2
Urinary tract injury	6	5	0.23 χ^2
Coagulopathy	6	6	0.37 χ^2
Wound infection	2	5	0.56 χ^2
Post op stay in hospital	8.5 ± 4.3	9.4 ± 4.7	0.40 <i>t</i> test

the lower uterine segment and on the level of intraoperative risk to extract the uterine cervix. We did not find statistically significant difference between subtotal versus total hysterectomy with respect to age, parity, previous CS, operative time, blood transfusion, intra and post operative complications. These are summarized in Table 6.

EPH is associated with a high incidence of maternal morbidity and mortality [4, 5, 8–12, 15]. In our series, maternal complications occurred in 25(40.3 %) women. The most common complications were disseminated intravascular coagulation and urinary tract injury in agreement with the observations made by Awan et al. [4]. Injury to the ureters is a known complication during EPH, and its rate can be up to 6.6 % [4, 8, 11]. In our study, in the year 2003, one woman (1.6 %) had inadvertent ligation of ureter by the haemostatic sutures placed to control bleeding from uterine artery stump, which was detected and rectified peroperatively. Since 2004 to avoid injury to the ureter, we have started the practice of placing ureteric stents preoperatively for easy identification of ureters in those women diagnosed antenatally as morbidly adherent placenta. We did not observe any ureteric injury after we started the practice of placing the ureteric stents. Eller et al. [25] noted injury to the ureter in 6.6 % of women who did not have preoperative urteric stents against none in cases where they placed the ureteric stents. So we feel that it is a good practice to place the ureteric stents preoperatively in all cases where there is morbidly adherent placenta.

The traditional management of morbidly adherent placenta is hysterectomy. The recent literature focuses on conservative management of morbidly adherent placenta to preserve fertility and to reduce complications. In these cases, placenta is left in situ after CS with expectant management. Additional procedures like haemostatic sutures and arterial ligation, uterine artery embolization, or

the use of methotrexate to accelerate the regression of placental tissue are practiced by some surgeons.

Steins Bisschop et al. [26] in their systematic review of ten cohort studies and 50 case series or case reports conclude that different uterus preserving treatment modalities may be effective in managing invasive placentation. However, despite the extensive review of the literature, no conclusion about the superiority of any of the above mentioned modalities of conservative management could be drawn by them. This conservative approach is not being followed in our institution. The protracted nature of recovery with this management, complications like hemorrhage and infection occurring several months after delivery, and concern for risk of recurrent placenta accreta in women who undergo conservative management have been discouraging factors [25, 27]. This conservative approach needs to be evaluated in our institution at least in nullipara or low parity women desiring future fertility.

Conclusion

In our series, abnormal placentation was the commonest indication for EPH. We believe higher rates of CS delivery, parity, and previous CS contributed to higher rate of EPH in our study. We found that EPH is significantly related to CS in index pregnancy. The relative risk of EPH was 27 for CS deliveries as compared to vaginal deliveries. Because of the grave consequences associated with cesarean sections, the decision to perform cesarean section should be undertaken only when the benefits outweigh the potential risks. Performing cesarean section at maternal request should be discouraged. Vaginal birth after cesarean section should be encouraged. Placing ureteric stents prior to cesarean section in cases of morbidly adherent placenta is a good practice to avoid injury to ureters.

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