

Surgical Management of Massive Post-Partum Hemorrhage; a Retrospective Analysis from a Large Tertiary Hospital in Doha, Qatar

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Abstract

Objectives: To present our experience with different methods of surgical management of post-partum hemorrhage (PPH).

Methods: This retrospective analysis was conducted at Obstetrics and Gynecology department in Hamad Medical Corporation in Qatar over 2 years from 1st of November 2015 till 31st of October 2017 through Quality and patient safety department in Women's Hospital. 1640 women complicated by primary post-partum hemorrhage were included, their electronic medical records were reviewed and their data collected, grouped and statistically analyzed excluding patients with successful medical managements.

Results: The incidence of PPH in our study was 5%. 59% of cases occur after non-instrumental vaginal delivery, 20% occur after instrumental vaginal delivery while 21% after cesarean section. Maternal age ranged between 17 and 45 years old while parity ranged between 0 to 14. 13.8% of cases classified as massive PPH (n = 227) and 102 cases were managed surgically. Non-conservative surgical management was performed in 6 cases. Bakri balloon appear the most used with total percentage of 17%. There was no maternal mortality in our study.

Conclusion: Success rates with B-lynch, Bakri balloon and internal iliac artery ligation over the course of the study minimize the incidence of cesarean hysterectomy with 0% maternal mortality.

Keywords: Post-Partum Hemorrhage; Surgical Management; Maternal Mortality

Introduction

Primary postpartum hemorrhage (PPH) refers to the bleeding from the genital tract that is more than 500 ml after vaginal delivery or more than 1000 ml following cesarean section during the first 24 hours following delivery of the fetus [1]. The American College of Obstetrics and Gynecology defines PPH as a drop of hematocrit value of more than 10% from the pre-delivery value [2] or which threatens the hemodynamic stability of the patient and necessitates blood transfusion [3].

The Hamad Medical Corporation practical guidelines sub-classifies PPH into: Minor Obstetric Hemorrhage, which is 500 ml - 1000 ml blood loss, with no evidence of clinical shock and Major Obstetric Hemorrhage, more than 1000 ml blood loss or with evidence of clinical shock. The guideline further describes Massive Obstetric Hemorrhage as uncontrolled hemorrhage more than 1500 ml or acute loss requiring transfusion of greater than four units of PRBC or suspicion/evidence of Disseminated Intravascular Coagulopathy due to hemorrhage [4].

PPH accounts for most cases of maternal morbidity and mortality in developing countries [4]. The causes of PPH include trauma, retained placenta, abnormal coagulation that may be congenital or acquired, and atonic uterus, which is one of the preventable causes of primary PPH and accounts for more than 80% of cases of primary PPH [5].

It is well recognized that caesarean births are not uncommonly associated with a higher incidence of PPH. The rise in caesarean births rates remains very topical as many factors have been ascribed as being causal. The factors include, cesarean delivery on request, later maternal age at first pregnancy, decrease in number of patients who are willing to try vaginal birth after cesarean delivery, virtual disappearance of vaginal breech delivery, increasing rates of fetal macrosomia and an increase in the number of women with pre-existing medical disorders such as diabetes mellitus, ischemic heart disease and congenital heart disease in the reproductive age group.

In the Middle East, the rise in numbers of caesarian deliveries appears not unrelated to the cultural expectation of large families. Risk averseness of both patients and clinicians with low numbers of trials of labor after caesarean sections (TOLACs) could also be major contributory factors. Therefore, since it is common place to have women with previously scared uteri, the observation of relatively high numbers of major obstetric hemorrhage is not unexpected [6].

Management of PPH has gone through many modifications in the last decades. Uterine atony is responsible for most cases and can be managed with uterine massage in conjunction with oxytocin, prostaglandins and ergot alkaloids. Surgical management of massive PPH vary from repair of genital trauma, to internal iliac artery ligation, uterine artery ligation, B-lynch uterine sutures, uterine tamponade (Bakri Balloon) and ultimately, hysterectomy [7].

Tamponade administration of the uterine cavity has been found to be effective and can be performed by either packing with four-inch gauze, placing a Foley catheter, Sengstaken Blakemore tube or a Bakri balloon. The Bakri balloon is the only one of these that was designed exclusively for uterine tamponade and there have been multiple studies that have supported its efficacy in cases not only of uterine atony but also in those involving a low-lying placenta [8].

In March 1997, Lynch published his brace suture for controlling PPH when other primary measures failed. The procedure was simple and effective with the primary goal to compress the uterus without occluding the uterine arteries or uterine cavity [9]. Since this publication, more than ten variants of uterine compressing sutured have been reported [10-13].

Elective or emergency radiological interventions such as internal iliac artery ligation or embolization respectively are now common place adjuncts in the management of PPH [14]. Peripartum hysterectomy remains a lifesaving procedure in selected cases of massive PPH [15].

Peripartum hysterectomies sometimes maybe the only lifesaving procedures in same cases of massive PPH. The decision to perform a hysterectomy, although may be psychologically devastating for patients, should not be delayed in cases of severe hemodynamic instability. Regarding our culture hysterectomy is not accepted mainly by patient and her relatives that push to adopt other suitable modalities to manage PPH especially with preventive measures and medical managements.

Aims and Objectives

The aim of this study was to present our experience with surgical management of post-partum hemorrhage (PPH).

Materials and Methods

A retrospective analysis, which was done in the Obstetrics and Gynecology department in Hamad Medical Corporation in Qatar over 2 years period between November 2015 and October 2017.

This was a retrospective data extraction from the hospital database of all deliveries conducted at the Obstetrics and Gynecology Department in the Women's Hospital of the Hamad Medical Corporation over a two-year period between November 2015 and October 2017.

Information was retrieved from the hospital database. Patient who lost more than 1000 ml of blood within 24 hours of delivery either vaginal delivery or C-section, had acute blood loss requiring blood transfusion more than four units of PRBCs or presented with evidence of maternal DIC were included in the study group.

Patients diagnosed or known to have other medical condition leading to bleeding tendency were excluded.

Data collection

Patients' files were reviewed; data was organized into the following categories:

1. Demographics: Includes age, parity, antenatal care and BMI.
2. Antenatal history: Particularly regularity of antenatal clinic attendance, fetal weight, placental site, planned mode of delivery and other risk factors for PPH such as antepartum hemorrhage, pre-eclampsia, polyhydramnios, multifetal gestation and previous PPH.
3. Intrapartum information: Including duration of amniotic membrane rupture, mode of delivery, type of anesthesia, duration of labour, episiotomy, occurrence and type of vaginal tears and mode and duration of second stage.
4. Postnatal information: Estimated blood losses, different medication used to control PPH were collected.
5. Surgical information: The different surgical techniques adopted in managing the PPH were extracted. (These include the use of Bakri Balloon, B-lynch, internal iliac artery ligation, uterine artery ligation and repair of genital traumatic injuries such as cervical tears, uterine extensions and multiple vaginal tear).

Statistical analysis was performed using the Statistical Package for Social Science (SPSS Inc., NY) version 21 for Microsoft Windows. Data was described in terms of mean \pm SD (standard deviation) for continuous variables and frequencies (number of cases) and percentage for categorical data.

Results

There were a total number of 32065 deliveries in the study period. Of these, 1640 cases (five percent) of all deliveries were complicated by PPH.

Most cases (n = 965) occurred after non-instrumental vaginal delivery (59%) while 20% (n = 325) occurred with instrumental vaginal delivery and 21% (n = 350) occurred after Cesarean section. 227 cases were classified as massive PPH representing 13.8% of all PPH cases and 102 of the cases were managed surgically.

Non-conservative surgical management in the form of hysterectomy was performed in 6 cases of massive PPH while 96 cases were managed using a more conservative surgical approach.

227 cases diagnosed as massive PPH which represent 13.8% of all PPH cases with higher percentage related to emergency C-section by 42% (Figure 1).

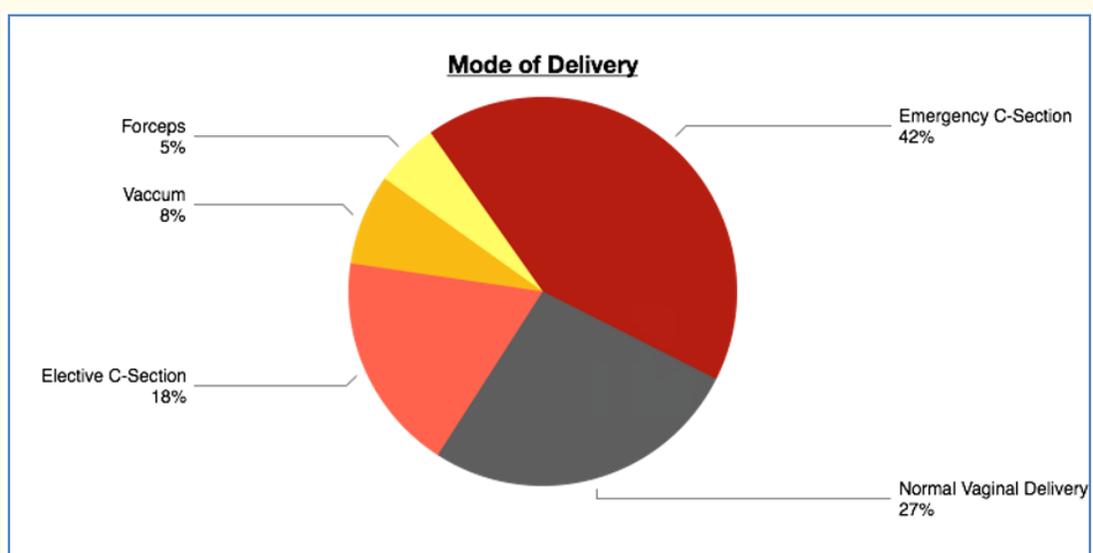


Figure 1

Maternal age ranged between 17 and 45 years old with mean of 32 ± 0.7 while parity ranged between 0 to 14 with mean of 1.85 ± 0.3 . On the other hand, gestational age was between 27 to 43 weeks with mean of 37.6 ± 0.4 (Table 1).

	Mean	Median	Range	Mode
Maternal Age (Years)	32 ± 0.7	32	17 - 45	34
Gravida	3.4 ± 0.3	3	1 - 15	1
Para	1.85 ± 0.3	3	0 - 14	0
Gestational Age (Weeks)	37.6 ± 0.4	38	27 - 43	40

Table 1

42% of cases included in this analysis were described as class I obesity as regarded BMI, 24.6% were overweight and 18.3% class II obesity. Underweight, normal weight and class III obesity were 0.4%, 6.3% and 8.4% respectively (Figure 2).

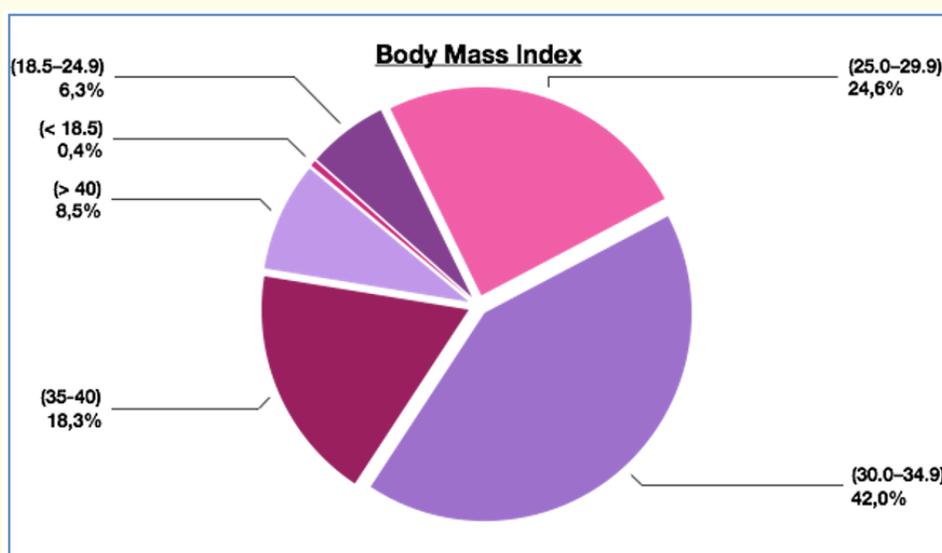


Figure 2

102 cases of massive PPH required surgical intervention which represents 44.9%. There was a wide variety of surgical interventions used but the Bakri balloon would appear the most used. 17% of total cases (n = 17) had the Bakri balloon and B-lynch was used in 12% (n = 12) of the cases while hysterectomy required in only 6% of all cases of massive PPH (n = 6) (Figure 3).

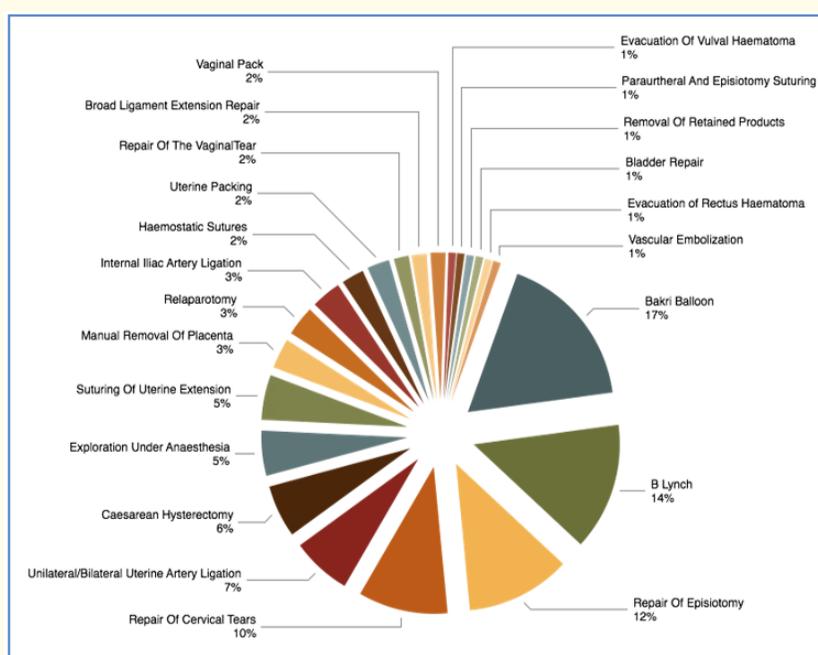


Figure 3

Discussion

PPH remains one of the major causes of maternal morbidity and mortality. PPH could raise morbidity and mortality because of delay in performing surgical techniques when medical measures have failed [16]. pelvic devascularization through uterine and internal iliac artery ligation is an alternative method. The procedure works because the major proportion of the blood supply to the pelvic viscera is via branches of the internal iliac artery. Bilateral internal iliac arteries ligation minimizes the pulse pressure of the arterial system, converting it to a venous-like system. This reduces bleeding by facilitating clot formation distal to the site of ligation [17]. Bilateral iliac artery ligation is a life-saving procedure, which has the advantage of preserving fertility and normal pelvic function. It is reported to be effective in up to 75% of cases. It has the advantage that it preserves fertility, which is particularly important in young women of low parity [18]. Within current study, three young patients with low parity were subjected to procedure due to uterine atony, none of them proceed to hysterectomy. Joshi., *et al.* [19] performed internal iliac artery ligation in 84 patients with PPH and their uterine salvage rate was 60.7%.

Emergency postpartum hysterectomy is the last life-saving procedure after other surgical techniques such as Bakri balloon, B-lynch and internal iliac artery ligation failed especially with young and low parity patients. The reported incidence of emergency hysterectomy varies in the literature from 0.2 to 1.5 per 1000 deliveries [20,21]. Our results reflected similar outcomes by 0.18 per 1000 deliveries.

Maternal complication occurred in 10 percent of cases in our study. seven patients suffered from DIC while 3 patient developed surgical site infection, total of 10 patients were admitted to the Intensive Care Unit (ICU) at our institute. Each of these complications were treated successfully. With no overall maternal mortality recorded. Our maternal mortality rate was 0%, which is comparable with that of other publications [22,23].

We performed 12 B-lynch procedures over the two years course of this study. Two patients required additional bilateral uterine artery ligation although one failed and was converted to cesarean hysterectomy to control PPH with a success rate of 93%. These results reflect similarly to the literature based success rate between 80% and 95% [24-26].

Bakri balloon was used in 17 cases with a success rate of 95% either by balloon alone or with association of B-lynch, uterine artery ligation or/and internal iliac artery ligation.

Doumouchtsis., *et al.* [27] evaluated the success rates of several methods utilized in management of PPH and found an 84% success rate of balloon tamponade. More recently, Laas., *et al.* [28] reported an 86% global success rate of uterine balloon tamponade in (a before-and-after study) to evaluate its feasibility for PPH management. Furthermore, many previous studies have reported the benefit of balloon tamponade for massive PPH and its successes rate ranging between 82%and 100% regardless of cause and suggested that balloon tamponade should be incorporated into of all PPH managements protocols [29-31].

Conclusion

Although cesarean hysterectomy could be last ultimate life-saving procedure in management of massive post-partum hemorrhage, the perceived heightened threshold of acceptance by our patient community may have aided in refining prompt and early adoption of medical and other conservative surgical procedures in managing post-partum haemorrhage. Success rates with B-lynch, Bakri balloon and internal iliac artery ligation over the course of the study probably minimized the incidence of cesarean hysterectomy with 0% maternal mortality. The collaborative approach within the department with regards to early complementation of medical, with surgical management has become a valued integral part of training of junior obstetricians.

Ethics Approval and Consent to Participate

This study was a quality assurance project and data were kept unidentifiable, and hence ethical approval was not required. It was a retrospective study, so consent for participation was not applicable.

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