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Efficacy and safety of pelvic packing after emergency peripartum hysterectomy (EPH) in postpartum hemorrhage (PPH) setting

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ABSTRACT

Objectives: To study the safety and effectiveness of pelvic packing in the control of post emergency peripartum hysterectomy (EPH) bleeding in a postpartum hemorrhage (PPH) setting.
Study design: From 39 patients with a severe PPH leading to an EPH (January 2010–December 2013), we identified a group of 17 patients requiring a pelvic packing (packing group) and a second group of 22 patients not requiring a pelvic packing (non-packing group). For each group, transfusion requirements were recorded from time of PPH diagnosis to end of the surgical procedure (P_1: Period 1) and from that point to the end management in the SICU (P_2: Period 2). Laboratory values, transfusion requirements and complications were compared between the 2 groups. Statistical comparisons were performed using Mann–Whitney test, Fisher's exact test and chi-square test. A p-value <0.05 was considered statistically significant.
Results: Pelvic packing was successful in the control of bleeding in all the cases. During the second laparotomy for pack removal, none of the patients developed complications such as bowel injuries or necrosis. The 2 groups were similar in term of laboratory values at the end of the surgical procedure and 24 h after the end of the surgical procedure. The number of PRBC units required in P_1 was higher in the packing group compared to the non-packing group (16.6 ± 5.3 vs 14 ± 5; $p = 0.04$), however the decrease in the amount of PRBCs transfused between P_1 and P_2 was higher in the packing group (13.3) compared to the non-packing group (9.1) ($p < 0.01$). The incidence of febrile morbidity was higher in the packing group compared to the non-packing group (53% vs 9%; $p = 0.04$); but no significant difference was shown in term of generalized sepsis, as well as renal failure, ARDS, deep vein thrombosis, pulmonary embolism and MOF.
Conclusion: The pelvic packing is a valuable method with a high success rate in the control of hemorrhage after an EPH in PPH setting with a low rate of complications. It is quite simple and quick to perform, and therefore should be kept in mind by all obstetricians as a lifesaving technique.

Introduction

Postpartum hemorrhage (PPH) is the leading cause of maternal mortality worldwide and especially in developing countries [1]. In Tunisia, PPH contributes to up to 42% of maternal mortality [2]. Multidisciplinary approaches and the development and consistent application of comprehensive protocols for management of PPH have resulted in improved outcome for these life-threatening situations [3]. Besides the general principles of maintaining anadequate circulatory, a sufficient tissue oxygenation and reversing or preventing a coagulopathy, PPH protocols include therapy options to eliminate the obstetric cause of PPH such as: uterotonic therapy, balloon tamponade [4], B-Lynch suture [5], uterine artery or internal iliac artery ligation [6], and uterine arterial embolization [7].

However, even with this large armamentarium for the management of PPH, intractable uterine hemorrhage could be unresponsive and emergency peripartum hysterectomy (EPH) is usually the last resort. EPH has been widely considered as a life-saving measure to manage intractable uterine hemorrhage, with a variable incidence, ranging from 0.2 per 1000 deliveries in developed countries to up to

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4.43 per 1000 deliveries in developing countries [8]. However, even after a hysterectomy with secure surgical pedicles, a secondary coagulopathy can complicate the situation by impairing hemostasis, consequently contributing to more blood loss from pelvic floor venous plexuses and raw surfaces [9].

This type of bleeding resistant to clipping, ligating or suturing [10], could be successfully controlled with a pelvic packing affording correction of coagulopathy and further stabilization [11]. The aim of this study is to investigate the safety and effectiveness of pelvic packing in the control of post EPH bleeding in a postpartum hemorrhage PPH setting. Given the relatively large experience with this procedure at Tunis Maternity and Neonatology Center (a university teaching hospital), we have conducted a retrospective study comparing women with PPH leading to an EPH and receiving a pelvic packing and those with PPH leading to an EPH not receiving a pelvic packing.

Methods

Following institutional review board approval, between January 2010 and December 2013, we identified 39 patients with a severe PPH (defined as a blood loss of 1000 ml or more within the same timeframe [12]) leading to an EPH and requiring transfer to the intensive care unit (ICU) for post-operative care.

From these 39 patients, a group of 17 patients required a pelvic packing (packing group) and a second group of 22 patients did not require a pelvic packing (non-packing group). Decision to perform an EPH was taken after the failure of standard surgical techniques, such as suturing placental site, B-lynch, uterine artery ligation and internal iliac artery ligation. Decision to pack the pelvis was taken when nonsurgical hemorrhage associated with clinical and laboratory evidence of coagulopathy had developed and blood loss could not be replaced adequately in the face of continuous hemorrhage after an EPH. Pelvic packing was performed by applying dry laparotomy pads side to side uniformly over the bleeding raw surfaces in the pelvis until any active bleeding has stopped. Intravenous antibiotics in the form of 2 g of cefoxitin and 0.5 g of metronidazole were given three times daily for 5 ± 10 days.

All women (packing group + non-packing group) were managed by a multidisciplinary team, including more than one senior obstetrician, more than one senior anesthetist, nurses, blood bank and intensive care back-up. Packing and non-packing groups were compared for maternal age, gestational age at delivery, parity, route of delivery, causes of PPH and surgical management before EPH. For each group, laboratory values (Hemoglobin, Haematocrit, platelet count, Prothrombin Ratio) were recorded at the end of the surgical procedure and 24 h after the end of the surgical procedure (hysterectomy for the non-packing group and hysterectomy + - packing for the packing group).

For each group, the number of PRBC units and blood products transfused were recorded from time of PPH diagnosis to end of the surgical procedure (P_1: Period 1) and from that point to the end management in the SICU or death (P_2: Period 2) (Fig. 1). For each group we documented the number of days spent in the ICU, total stay in the hospital, incidence of complications such as infection, deep venous thrombosis, pulmonary embolism, acute respiratory distress syndrome (ARDS), multiple organ failure (MOF), mortality. All cases were followed up until discharge home or to a rehabilitation facility or until time of death.

Statistical analysis comparing the two groups was performed using SPSS version 21.0 (SPSS, Chicago, IL, USA). Values are reported as mean or median according to distributional characteristics of the variables. Comparisons between groups were made using Mann–Whitney test, Fisher's exact test and chi-square test. A p-value <0.05 was considered statistically significant.

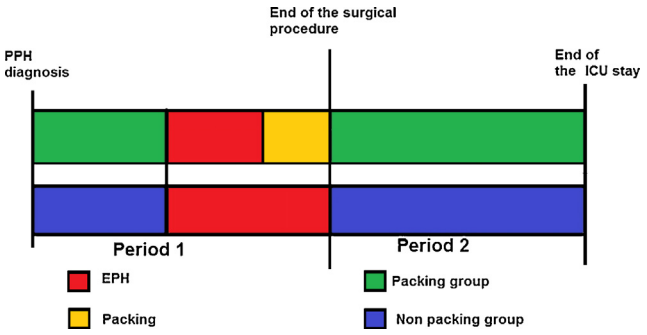

Fig. 1. Period 1 (P_1), Period 2 (P_2) in packing group and non-packing group.

Results

During the study period (4 years), among 68,306 deliveries, the total number of EPH reached 106, yielding an incidence of 1.5/1000 deliveries (106/68,306). From the 106 patients undergoing EPH, we identified 39 patients that had a severe PPH and required transfer to the ICU. In these 39 patients, the control of bleeding was successfully achieved in 22 patients at the end of the surgical procedure without packing and 17 patients required a pelvic packing for nonsurgical hemorrhage. The mean number of laparotomy pads required for each patient was 5 (range 4–8). Laparotomy for pack removal was performed 24 ± 48 h after the initial surgery when coagulation and hemodynamic disorders were corrected.

Demographic characteristics of the patients, route of delivery, causes of PPH, surgical management before hysterectomy are summarized in Table 1. No significant differences were noted between the packing and non-packing group regarding age, parity, gestational age at delivery, route of delivery, cause of PPH and surgical management before hysterectomy.

As shown in Table 2, the 2 groups were similar in term of laboratory values at the end of the surgical procedure and 24 h after the end of the surgical procedure.

Table 1
Demographic characteristics of the patients, route of delivery, cause of PPH and surgical management before EPH.

	Packing group ($n=17$)	Non-packing group ($n=22$)	p-Value
Demographic characteristics			
Age (years), mean ± standard deviation	33.9 ± 5.5	33.7 ± 4.7	0.8
Gestity, median	3	3	0.4
Parity, median	3	3	0.9
Gestational age (weeks), mean ± standard deviation	38.2 ± 1.6	36.8 ± 2.9	0.1
Route of delivery			
Vaginal	5 (29.4%)	5 (22.7%)	0.3
Cesarean	12 (70.6%)	17 (77.3%)	
Cause of PPH			
Uterine atony	11 (64.7%)	17 (77.3%)	0.6
Placenta accreta/increta	2 (11.8%)	2 (9.1%)	
Placenta previa	1 (5.9%)	0 (0%)	
Uterine rupture	2 (11.7%)	1 (4.5%)	
HELLP syndrome	1 (5.9%)	0 (0%)	
Placental abruption	1 (5.9%)	2 (9.1%)	
Surgical management before EPH			
B-Lynch suture	10 (58.8%)	12 (54.5%)	0.7
Uterine artery ligation	12 (70.5%)	15 (38.1%)	0.8
Internal iliac artery ligation	15 (88.2%)	20 (90.9%)	0.7

PPH: postpartum hemorrhage; EPH: emergency peripartum hysterectomy.