

Uterus Preserving Management Strategies for Atonic Postpartum Hemorrhage Refractory to Medical Measures

Neetu Sangwan*, Smiti Nanda***, Meenakshi Chauhan**, Vani Malhotra**, Dinesh Tomar****

Abstract

Introduction: More than half of all maternal deaths occur within 24 hours of delivery; most commonly from postpartum hemorrhage (PPH). Uterine atony is the most common cause of PPH. Majority of the cases respond to medical measures. However, few cases are refractory to medical measures and need further interventions. The present study was conducted to highlight uterus preserving management options for refractory cases of atonic PPH. *Material and Methods:* A retrospective review of all cases of atonic PPH refractory to medical measures was carried out in the department of Obstetrics and Gynecology, Pt. B.D. Sharma PGIMS, Rohtak, Haryana, India from January 2014 to June 2015. *Results:* Out of 446 cases of PPH, uterine atonicity was responsible for 300 cases (67.26%). Of these 300 cases, 62 (20.67%) were refractory to medical measures and required further interventions. Foleys condom tamponade (FCT) was used in 34 patients, uterine compression sutures were used in 18 cases, and uterine devascularization was opted for in 7 cases. The success rate of FCT, uterine compression sutures and devascularization for controlling refractory atonic PPH was 85.29%, 94.44%, and 85.71% respectively. *Conclusion:* Foleys condom tamponade should be tried to manage refractory atonic PPH following vaginal delivery. It is technically simple, easily available and highly effective modality. Doctors and health workers posted in peripheral health centres should be trained for uterine tamponade. So that referred patients do not reach higher centre in moribund state. In cases of refractory atonic PPH following cesarean section, both uterine compression sutures and FCT can be used depending on expertise of the operating person. The technique of compression sutures can be easily taught to senior residents and consultants. In cases of placenta previa with uterine atonicity, the preferred modalities are uterine devascularization with or without FCT.

Keywords: Atonic PPH; Intrauterine Tamponade; Uterine Compression Sutures, Uterine Devascularization.

Author's Affiliation:
*Associate Professor,
Professor, *Senior
Professor, Department of
Obstetrics and
Gynecology, Pt B D
Sharma Postgraduate
Institute of Medical
Sciences, Rohtak, Haryana,
India. ****Consultant,
Department of
Paediatrics, Aastha
Hospital, Vikas Nagar,
Rohtak, Haryana, India.

Reprint Request:
Neetu Sangwan, Aastha
Hospital, 223/22, Vikas
Nagar, Sonapat Road,
Rohtak-124001, Haryana,
India.
Email:
drneetutomar_in@yahoo.co.in

Introduction

Obstetric hemorrhage is the single most significant cause of maternal death worldwide especially in under resourced settings. More than half of all maternal deaths occur within 24 hours of delivery; postpartum hemorrhage (PPH) being the most common cause [1]. Postpartum hemorrhage is defined as blood loss in excess of 500ml following vaginal delivery and 1000ml after cesarean birth. But estimates of blood loss after childbirth are usually inaccurate. Perhaps a more useful definition of PPH

would be blood loss sufficient to cause symptoms of hypovolemia and hemodynamic instability. Postpartum hemorrhage complicates 18% of all deliveries and accounts for 25-30% of all maternal deaths [2]. Uterine atony is the most common cause of PPH [3]. Majority of the cases of atonic PPH respond to medical measures (uterine massage and uterotonic drugs). However, few cases are refractory to medical measures and need further interventions. The present study was conducted to highlight uterus preserving management options for refractory cases of atonic PPH.

Material and Methods

After getting approval from concerned authorities, a retrospective review of medical records of PPH cases managed in the department of Obstetrics and Gynecology, Pt. B.D. Sharma PGIMS, Rohtak, Haryana, India was carried out from January 2014 to June 2015. Every case of atonic PPH refractory to medical measures was included in the study. Exclusion criteria were PPH due to trauma, tissue or thrombin abnormality. Data regarding etiology of PPH, socio demographic details, treatment modality used, outcome, no of blood transfusions, ICU admissions was collected. In addition, the success rates of different modalities were also recorded.

All cases of atonic PPH were managed by medical measures (uterotonics and bimanual uterine massage), following failure of which the cases were considered refractory and subjected to other interventions like Foleys condom tamponade (FCT), uterine compression sutures, uterine devascularization and finally hysterectomy in some cases.

Results

A total of 446 cases of PPH were managed over the study period of 18 months. Of these, uterine atonicity was responsible for PPH in 300 cases (67.26%). Rest 146 cases (32.74%) were due to genital tract trauma,

tissue abnormality or coagulopathy. Etiology of PPH is shown in table I. Out of 300 cases of atonic PPH, 238 cases (79.33%) were managed by medical measures. Sixty two cases (20.67%) were refractory to medical measures and required further interventions.

Out of 62 cases of refractory atonic PPH, majority were between 21-35years of age (91.93%) and multipara (66.13%). Maximum number of patients was referred from other health centers (87.10%). Socio-demographic details of patients are shown in table II.

Table III depicts management of refractory cases of atonic PPH. Out of 62 cases, FCT was used in 34 patients (54.84%); 12 cases after cesarean birth and 22 cases after vaginal delivery. Bilateral uterine artery ligation (UAL) was also done in 9 cases of FCT. Of these 9 cases, 7 cases were due to placenta previa with uterine atonicity. Uterine compression sutures (Haymans suture) were applied in 18 patients (29.03%). Out of these 18 patients, bilateral UAL was also done in 13 cases. All except 1 case were applied during cesarean section. The only case in which uterine compression sutures were applied after vaginal delivery was following failed FCT. Uterine devascularization was done In 7 cases (11.29%), all were the cases of placenta previa with atonic PPH. During the study period, hysterectomy was done in only 8 cases. Three cases were following failure of FCT, 1 case was failure of uterine compression sutures. Out of 62 cases, 56 needed blood transfusion (PCV: range 1 -12 units, FFP 2-16 units) and 12 were shifted to ICU.

Table 1: Etiology of PPH (total : 446)

Etiology	Number	Percentage (%)
Atonic	300	67.26
Tissue, trauma, coagulopathy	146	32.74

Table 2: Socio-demographic details of refractory cases of atonic PPH (total: 62)

Characteristic	Number	Percentage (%)
	Age (years)	
Up to 20	2	3.23
20-35	57	91.93
>35	3	4.84
	Parity	
Primipara	21	33.87
Multipara	41	66.13
	Antenatal booking	
Booked	8	12.90
Unbooked	54	87.10
	Referral details (total -54)	
Referred for delivery	31	50
Referred after delivery	23	37.10
	Mode of Delivery	
Spontaneous Vaginal	35	56.45
Forceps delivery	2	3.23
Cesarean Section	25	40.32
	Place of delivery	
Tertiary care centre	39	62.90
Peripheral health centres, General hospitals	20	32.26
Home delivery	3	4.84

Table 3: Management strategies for refractory cases of atonic PPH

Technique used	Number (n)	Percentage (%)
FCT	34	54.84
Without vessel ligation	25	40.32
With bilateral UAL	9	14.52
Hayman compression suture	18	29.03
With bilateral UAL	13	20.97
Without vessel ligation	4	8.06
Bilateral UAL	7	11.29
Hysterectomy	8	12.90

Footnote 3: cases of failed FCT & 1 case of failed uterine compression sutures were followed by hysterectomy. One case of failed bilateral UAL was followed by FCT

Table 4: Success rate of different techniques

Technique	Success rate (%)
FCT	85.29
Uterine compression sutures	94.44
Bilateral UAL	85.71

The success of different conservative methods is depicted in table IV. Out of 34 cases of FCT, hemorrhage was successfully controlled in all except 5 cases. Of these 5 cases, 3 underwent hysterectomy, 1 was managed by uterine compression sutures with ligation of bilateral uterine and ovarian vessels. One patient expired before any other intervention could be done. Out of 18 cases of uterine compression sutures, one patient had persistent bleeding so underwent hysterectomy. All the 6 cases of failed FCT and failed uterine compression sutures were referred from outside after delivery in moribund condition; 4 cases were referred with shock and 2 patients had developed coagulopathy. Out of 7 cases of uterine devascularization, 1 patient had persistent bleeding so FCT was done to arrest hemorrhage. The success rate of FCT, Hayman compression sutures and devascularization for controlling refractory atonic PPH was 85.29%, 94.44%, and 85.71% respectively.

Discussion

Postpartum hemorrhage is associated not only with maternal deaths globally but is also one of the leading causes of maternal morbidity due to significant blood loss. Sequelae include adult respiratory distress syndrome, shock, loss of fertility, and pituitary necrosis [1]. Hence prevention and treatment of PPH are vital steps towards improving maternal health. Active management of third stage of labor (administration of uterotonics after childbirth, delivery of placenta by controlled cord traction, fundal massage) can reduce the incidence of PPH by up to 60% [4].

PPH occurs in response to an abnormality of one of the four basic processes, referred to as the four Ts; tone, trauma, tissue and thrombin abnormality. Uterine atonicity is the most common cause [3,5]. In

the present study also, uterine atonicity was responsible for majority of the cases of PPH (67.26%). Relaxed myometrium fails to constrict the blood vessels that traverse its fibres, thereby allowing hemorrhage.

Sixty two cases of atonic PPH were refractory to medical measures and required further interventions. Foleys condom tamponade was used in 34 patients with a success rate of 85.29%. When uterotonics fail to cause sustained uterine contractions after vaginal delivery, uterine tamponade can be effective in decreasing hemorrhage due to uterine atonicity [1]. Tamponade acts by creating inward to outward pressure which is greater than systemic arterial pressure. The technique of FCT does not need special training so can be easily taught to peripheral health workers. Besides, cost effectivity and ready availability make FCT an ideal method for managing PPH especially in developing countries. It also allows time to correct any consumptive coagulopathy. Hence, in developing countries, uterine balloon tamponade should be considered as part of training for all health care workers who attend mothers at birth [6]. The success rate of FCT reported in various studies varies from 87-100% [7-9]. In the present study, FCT was successful in 85.29% cases. Five cases in which FCT failed were referred to our hospital after vaginal delivery either with shock or coagulopathy secondary to PPH. Poor condition of the patient on admission compromises the efficacy of treatment modality used.

Uterine compression sutures (Haymans suture) were used in 18 patients. All except 1 case were applied during cesarean section. In 1997 Christopher B-Lynch devised a continuous suture to mechanically compress the uterus in an attempt to treat uterine atony so as to avoid hysterectomy [10]. Hayman suture, the modification of B-Lynch offers the advantage that it can be applied faster and easier, avoiding lower segment hysterotomy, when PPH occurs following vaginal delivery [11]. In the present

study, hemorrhage was successfully arrested in 94.44%. In a study conducted by Majumdar et al (2012), bleeding was controlled in all 43 cases with Hayman sutures thus averting hysterectomy [12]. Uterine compression sutures have replaced other complicated surgical procedures like Internal Iliac Artery Ligation, embolization and finally postpartum hysterectomy to a greater extent for the surgical treatment of uterine atony. This technique is successful in avoiding hysterectomy in 82% cases of PPH [13,14]. It requires minimal training, conserves the uterus, and is less technically challenging and associated with less blood loss than hysterectomy [15]. Bilateral UAL was done in 7 cases to control PPH with a success rate of 90%. Fahmy et al (1987) reported 80% success rate with 20% cases requiring subsequent hysterectomy [16]. AbdRabbo (1994) reported a stepwise uterine devascularization procedure, involving normal and low bilateral UAL with bilateral ovarian vessel ligation with 100% avoidance of hysterectomy in a 103 case series [17]. Hysterectomy was done in 8 cases, 4 of which were following failed conservative techniques. In our hospital, we always use FCT in cases of refractory atonic PPH after vaginal delivery. If bleeding stops and patient vitals improve, tamponade is kept for a variable period of time with continuous monitoring followed by removal of tamponade during next day (routine hour). In case FCT fails, patient is shifted for laparotomy. Uterine compression sutures constitute the technique of choice to control hemorrhage following cesarean section. Patients with PPH often deteriorate very rapidly and often do not survive referral to another level of care. It is vital that all levels of health care can deal with the emergency management of PPH.

Conclusion

Foleys condom tamponade should be tried to manage refractory atonic PPH following vaginal delivery. It is technically simple, easily available and highly effective modality. Moreover it gives times to correct coagulopathy. Doctors and health workers posted in peripheral health centres should be trained for uterine tamponade. So that referred patients do not reach higher centre in moribund state. In cases of refractory atonic PPH following cesarean section, both uterine compression sutures and FCT can be used depending on expertise of the operating person. The technique of compression sutures can be easily taught to senior residents and consultants. In cases of placenta previa with uterine atonicity, the preferred modalities are uterine devascularization with or without FCT.

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