



## POST PARTUM HEMORRHAGE; EFFICACY OF BALLOON TAMPONADE IN THE MANAGEMENT

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**ABSTRACT** ... Primary postpartum hemorrhagic, rightly called as obstetrician's nightmare, refers to excessive blood loss of more than 500ml during the third stage of labour or in the first 24 hours after delivery. It continues to be one of the leading causes of maternal mortality and morbidity all over the world including Pakistan where it is responsible for 21-31% of maternal mortality and morbidity. **Objectives:** Objective of study was to determine the efficacy of balloon tamponade in the management of primary PPH, so that a low cost, easy to use technology is available for conserving future fertility by treating postpartum hemorrhage. **Settings:** Department of Gynae & Obs, Allied Hospital, Faisalabad. **Study Design:** Descriptive cross sectional study. **Study Period:** 6 months from 1<sup>st</sup> Oct, 2015 to 31<sup>st</sup> March, 2016. **Material & Methods:** All patients delivered vaginally at term (after 37 completed weeks of gestation) who developed PPH due to uterine atony after failure of conventional medical therapy were included in this study. Patient selection was based on inclusion and exclusion criteria. Their demographic profile and efficacy of balloon tamponade was checked in terms of time required to control hemorrhage and need of laparotomy. **Results:** During study period total no. Of vaginal deliveries were 3000. Out of these 298 developed PPH, 220 had PPH due to uterine atony and did not respond to conventional medical therapy. The age of patients ranged between 22 and 40 years with mean age of 30 year ( $\pm 4.88SD$ ). The parity of the patients ranged between 1 and 14 with the mean parity of 4 ( $\pm 2.26SD$ ). The condom catheter was introduced in all the selected 80 patients and was successful in 73 patients. **Conclusions:** In developing countries such as Pakistan where the maternal death rate from PPH is very high, this safe, in expensive and easy procedure (it does not require any expertise) can be applied in any situation to save a life and to save the uterus in young patients to conserve reproductive capacity and prevent them from surgery and its morbidity. This will protect the patients from irreversible shock and even death with a success rate of 85-95%.

**Key words:** Postpartum Hemorrhage, Balloon Tamponade, Uterine Atony.

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## INTRODUCTION

Primary postpartum hemorrhage, rightly called as obstetrician's nightmare, refers to excessive blood loss of more than 500 ml during the third stage of labour or in the first 24 hours after delivery.<sup>1</sup> It continues to be one of the leading causes of maternal mortality and morbidity all over the world<sup>2</sup> including Pakistan where it is responsible for 21-31% of maternal mortality and morbidity.<sup>3</sup>

It's an obstetric catastrophe leading to hemorrhagic shock and even death.<sup>4</sup> For the arrest of hemorrhage medical and surgical measures are employed that involved uterine

massage, uterotonic infusions use of prostaglandin analogues, artery ligation (both uterine & internal iliac) and ultimately the most drastic measure that is hysterectomy with loss of fertility and other short term and long term sequelae.

A lot of conservative procedures have been developed and adapted over the years involving balloon tamponade techniques, radiological interventions (internal iliac embolization) and brace sutures (B-lynch) to preserve future fertility.<sup>5</sup> Limitations of these procedure are: radiological interventions need expertise and local facilities.<sup>6</sup>

°B-lynch needs laparotomy but balloon tamponade technique that involves creation of tamponade with the help of various types of balloons inside the uterine cavity to compress the open uterine sinuses has gained popularity over the past few year especially in cases of failed medical treatment.

After the failure of medical measures the difficulty in the decision to perform a laparotomy may be due to in experience or the concern of preserving future fertility. The role of balloon tamponade comes here after excluding retained tissue and traumatic causes of hemorrhage. It will not only help to avoid unnecessary surgery but will also predict within minutes whether bleeding is likely to stop or surgery is required. It will reduce the blood loss and need of blood transfusions even if surgery is needed. Review of literature tells us its success rate of 85 to 95 percent<sup>6</sup>in the form of arrest of hemorrhage and avoidance of surgical intervention with a mean requirement of 3.2 units of blood. It is simplest, easiest, least invasive, most rapid technique and is a reasonable option in postpartum hemorrhage refractory to medical treatment.

## METHODOLOGY

### Study Design

Descriptive cross-sectional

### Settings

Department of Gynae & Obs, PMC and its affiliated Allied hospital Faisalabad.

### Period

Six month.

### Sample Size

Eighty patients were included.

### Sampling Technique

Non-probability Consecutive

### Inclusion Criteria

All the patients with primary PPH being delivered vaginally at term (after 37 completed weeks of gestation) in labour room having uterine atony

(relaxed uterus) as the cause of hemorrhage and not responding to conventional medical treatment.

### Exclusion Criteria

Patients of PPH with previous surgery (to avoid scar dehiscence, which can act as confounding variable by causing hemorrhage) having genital tract trauma or retained tissue as cause of hemorrhage (to control bias as different cause of hemorrhage behave differently to corrective measures) or having infection (as it can flare up infection) such as case of chorioamnionitis (infection of fetal membrane) where excluded.

### Data Collection Procedures

Patient fulfilling inclusion criteria were selected. After getting informed written consent procedure was started. After aseptic measures in lithotomy position, cleaning of vulva and surrounding area was done with pyodine. A condom was attached to 16 No. Foley's catheter by black silk No. 1. Under minimal analgesia with the help of Cusco's speculum and sponge holding forceps (to grasp anterior margin of cervix) condom catheter was inserted in the uterus with another sponge holding forceps. It was then inflated with 250-300 ml of isotonic warm saline solution until the distended balloon became just visible at cervical canal. The proximal end of catheter was folded and tied with thread so that the saline solution could not escape. Rolled gauze was packed in vagina to keep the inflated condom in place. An intravenous drip containing oxytocin (40-50 units/500ml) was kept for at least 8 hours to maintain uterus contracted. Intravenous broad spectrum antibiotics were commenced for first 24 hours. Condom catheter was retained for 24-48 hours. Parameters including urine output with the help of indwelling catheter, blood pressure, pulse rate, temperature, oxygen saturation, fundal height assessment and vaginal blood loss were monitored. Patients responding to the technique were stabilized and monitored. Once the parameters were within normal limits, the balloon was deflated in 2 stages 2 hours apart and the patients were observed for any active bleeding. Following variables were noted. In each patient.

1. Time required to hemorrhage

2. Need of laparotomy

**Data Analysis**

The collected data was entered into SPSS version 10 and analyzed. The quantitative variables (Age, parity) were presented as mean and standard deviation and qualitative variable i.e ( time required to control hemorrhage and need of laparotomy) were presented as frequency and percentage.

**RESULTS**

During six months period total number of deliveries were 3000. Out of these 298 patients went into post-partum hemorrhage. Thus frequency of PPT was 9.99% Among 298 patient, 73% (220 patients) had uterine atone, out of these 220 patients, 80 patients, were selected who did no respond to medical treatment. Demographic characteristics (Age, parity) and other variables i.e time required to laparotomy were studied. The age of patient ranged between 22 and 40 year with mean age was 30 year with mean age was 30 years ( $\pm 2.26$  SD).

Out of 80 patients, 4 patients (5%) were primigravida, 44 patients (55%) were multigravida, 32 patients (40%) were grand multigravida.

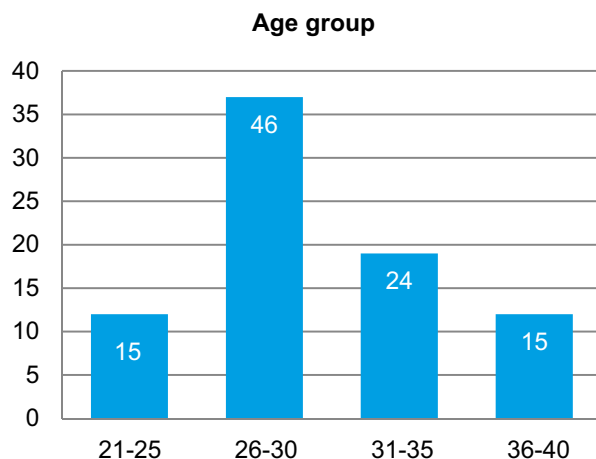
Bleeding stopped in 73 patients within 15 minutes and there was no need of laparotomy in these patients. Thus the success rate of balloon tamponade was 91%. None of these patients went into irreversible shock. The condom catheter was removed after 24+-48 hours. There was no intrauterine infection documented by clinical signs and symptoms. In the remaining 7 patient bleeding could not stopped within 15 minutes aid urgent laparotomy was performed D.B- lynch was applied on all these 7 cases (8.75) successful in 4 cases (5%), failed in 3caded (3.75).

Age in Years	No. of Patients	Percentage
21-25	12	15%
26-30	37	46%
31-35	19	24%
36-40	12	15%

**Table-I. Demographic characteristics:**

**Distribution According to Age**

Mean Age 30-64 YEARS  
Standard Deviation + 4.88



**Figure 1**

Parity	No. of Patients	Percentage
Primigravida	4	5%
G2-G4	44	55%
>G4	32	40%

**Table-II. Distribution according to parity:**

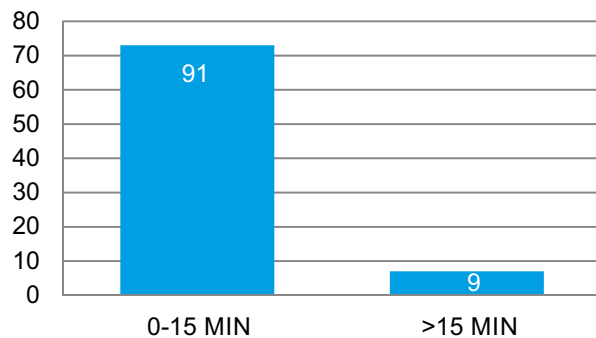
**Distribution According to Parity**

Mean Parity 4.13  
Standard Deviation + 2.26

Time Req. to Control Hemorrhage	No. of Patients	Percentage
0-15 Min	73	91.3%
>15 Min	7	8.8%

**Table-III. Distribution according to time required to control hemorrhage:**

**Time req. to control hemorrhage**



**Figure 2**

Need of Laparotomy	No. of Patients	Percentage
No	73	91.3%
Yes	7	8.8%

Table-IV. Distribution according to need of laparotomy:

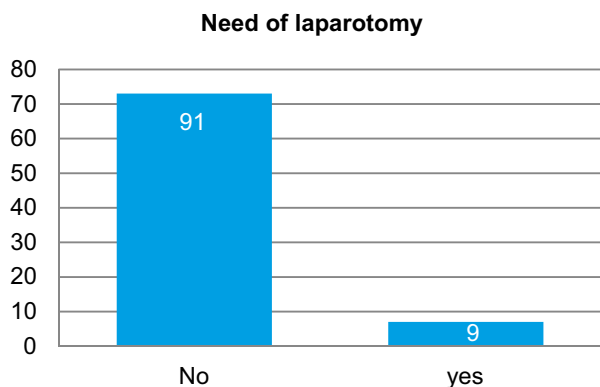


Figure 3

Outcome	No. of Patients	Percentage
Successful	73	91.3%
Unsuccessful	7	8.8%
Total	80	100%

Table-V. Distribution of outcome:

**DISCUSSION**

The most common cause of Maternal Mortality is postpartum hemorrhage, accounting for one third of maternal deaths.

Although most cases can be treated with medication (prostaglandins, oxytocin and uterine massage), about 10% of the woman with PPH require major surgical procedures and even hysterectomy with a disastrous consequence of loss of future fertility.

When the failure of medical treatment has occurred, before resorting to the ultimate solution of PPH that is hysterectomy, it is important to have conservative methods of management.

A variety of conservative techniques have been discovered and employed at this very point in the management of PPH, including application of compression sutures, pelvic devascularization (ligation of uterine, ovarian, internal iliac arteries), radiological intervention (arterial embolisation) and tamponade techniques (uterine packing or

balloon tamponade). Each method has benefit and risks. In most cases the above mentioned procedures are effective in avoiding hysterectomy, but delay in carrying out the procedure due to lack of expertise and facilities carries a poor prognosis. B-Lynch suture compresses the uterus without compromising major vessels. The advantage of this procedure is that the identification of specific blood vessels is not required, which is a difficult part in ligation of arteries. Although helpful in caesarean section, it otherwise requires a laparotomy in an already compromised patient.

Pelvic devascularization also requires laparotomy and expertise, and there is a potential risk of ligature of external iliac vessels, ureteric injury, and further hemorrhage.

Similarly, radiological interventions need expertise and local facilities which are not available even in most of the tertiary care centres of our country.

Among the conservative techniques tamponade techniques have gained popularity. They involve creation of tamopnade inside the uterine cavity to compress open uterine sinuses. This can be done either by uterine packing or balloon tamponade.

Once the medical measures fail, the best conservative method employed at this point is balloon tamponade as it does not need laparotomy. It is easy, quick, does not require expertise and facilities. It not only diminishes blood loss but also it predicts within minutes whether bleeding is likely to stop or surgery is required that is it acts as a diagnostic tamponade test. It decreases the No. of blood transfusion even if surgery is needed.

Various types of balloons have been used in this purpose. 30 ml Foley catheter, Sengstaken-Blakemore tube, Rusch urologic hydrostatic balloon catheter and condom catheter have been employed. 30 ml Foley balloon catheters only hold 150 ml before the burst so their effectiveness in a uterus beyond 20 weeks of gestation is doubtful. The Sengstaken-Blakemore tube is complex to use and is very expensive. The present study was carried out in Allied Hospital Faisalabad from

1<sup>st</sup> Oct 2015 to 31<sup>st</sup> March, 2016. The incidence of PPH was found to be 9.99%. While range of 5-17% have been reported following deliveries in the UK. All major studies showed incidence near to 10%. Cameron et al concluded in his study that Postpartum Hemorrhage is a potentially life-threatening complication of childbirth occurring in up to 10% of birth.<sup>8</sup> Shamoona from Federal Government Services Hospital, Islamabad, reported a frequency of 3.7%-8.6%.<sup>9</sup> Roohi et al showed frequency of 13% in her study done in Punjab Medical College and its affiliated hospital Faisalabad.<sup>10</sup> Richard J German showed incidence of 9.9% in randomized controlled trial of India.<sup>11</sup> Fauzia Rizvi from Dublin Ireland quoted incidence of 5% in her study done in May 2004.<sup>12</sup> In developing world incidence of PPH is higher because of lack of antenatal care, transportation facilities, non availability of injectable uterotonics, their storage difficulties, lack of guideline and proper staff education and lack of blood bank availability.

In our study, 70% (220 patients) had uterine atony. These findings were similar to study done by Fauzia Rizvi in which in which 76% developed PPH due to uterine atony.<sup>12</sup> The commonest causes was uterine atony in 54% cases included by Zohra Khanum.<sup>13</sup> Fahmida et al concluded in postpartum hemorrhage: still a challenge that commonest cause of PPH was atonic uterus (65%) followed by traumatic lesions (33%) and retained placenta (27%).<sup>14</sup> Lumaan Sheikh et al concluded that most important cause was uterine atony in his study done in Agha Khan Hospital found that 18 patients (56.3%) had uterine atony.<sup>15</sup>

In our study mean age of patients suffering from PPH is 30 years ( $\pm$  4.88) which is similar to Fauzia Rizvi showed a mean age group of 27.6 years.<sup>12</sup> In another study done in Tanzania showing PPH more prevalent in 20-30 years which is prime reproductive age group.<sup>16</sup> In Africa where problem is more prevalent have shown mean age group of 24 years. Hofmeyr reported mean age of 27.1 years.<sup>17</sup> Walraven G showed mean age of 24.6 years.<sup>18</sup> In Africa where PPH appears to be more prevalent, studies had shown that at least 70% of woman are less than 30 years of age.<sup>16</sup>

Regarding parity, 55% were multipara, 40% cases were grand multipara. Arshad Chohan et al concluded in his study that major predisposing factor was grand multiparity which was in twenty-five (50%) patients.<sup>19</sup> Fahmida Shaheen et al concluded multiparity in 45% of cases.<sup>14</sup> The elevated risk associated with multiparity in this study was compatible with the finding of other studies. Higher frequency of postpartum hemorrhage is contract. However Fauzia Rizvi et al stated in her study that grand multiparity is no longer considered to be risk factor for postpartum hemorrhage.<sup>12</sup>

The efficacy of balloon tamponade was assessed by its ability to arrest hemorrhage within 15 min and the need of laparotomy. The success rate 80% to 100% has been reported in previous studies, the success rate of 91% was observed in my study. A study done in 2003 by G.S. Condous and colleagues showed success rate of more than 87% which is similar to the success rate of my study.<sup>21</sup> A systemic review of conservative management done by Doumouchsis and colleagues done in 2007 showed a success rate of 84% for balloon tamponade. Other two studies done one bakri balloon and sengstaken tube showed success rate of 80%.<sup>20</sup>

So the use of least invasive, easiest, and most rapid technique of balloon tamponade should be considered as the first step in the management of intractable PPH, which is not due to genital tract trauma or retained tissue, and which does not respond to medical treatment.

## CONCLUSION

PPH is a major cause of maternal mortality and serve morbidity in the form of loss of future fertility especially in developing countries like Pakistan. This PPH related mortality and disastrous morbidity of loss of fertility can be reduced if effective conservative measures are employed before resorting to invasive surgical procedure like hysterectomy.

My study concluded that balloon tamponade with condom catheter is the technique which is safe, quick, easy to perform, cost effective, and can be

effectively employed after the failure of medical measures to reduce hemorrhage related mortality in PPH and preserve future fertility by preserving the reproductive organs.

This technique not only reduce the blood loss and the need of surgical intervention but it acts as a diagnostic test also which predicts within minutes whether bleeding is likely to stop or surgery is required.

In remote areas where primary health care providers are unable to detect or repair the injury in those cases, this intrauterine tamponade followed by vaginal packing will minimize the blood loss until the patient's arrival to the hospital, which will protect the patient from irreversible shock and even the death. So this easy and economic tamponade technique with the help of condom catheter should be employed at all level of health care when medical management is not effecting to control the bleeding in PPH.

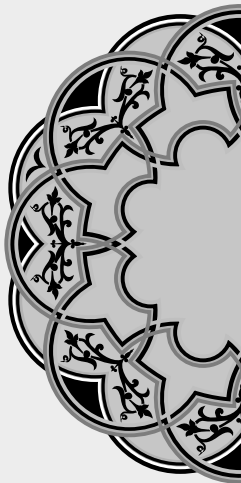
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*“When setting out on a journey,  
do not seek advice from those  
who have never left home.”*

**Rumi**

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