



ORIGINAL ARTICLE

## Appraisal of Foley's Catheter as Intra-Uterine Balloon Tamponade in controlling Post-Partum Hemorrhage.

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**ABSTRACT... Objective:** To appraise the efficacy of Foley's catheter as balloon tamponade in controlling PPH. **Study Design:** Monocentric Retrospective Impact study. **Setting:** Department of Obstetrics and Gynaecology of MTI, Hayatabad Medical Complex Peshawar. **Period:** January 2020 to December 2020. **Material & Methods:** This is a tertiary care hospital receiving all kind of patients including complicated cases referred by other health care units. All patients of PPH due to uterine atony who failed to respond to medical treatment were managed by using a Foley's catheter balloon tamponade and made part of this study. Patients with PPH due to genital tract trauma and retained products or whom responded to medical treatment were excluded. The information and relevant data was obtained from the patient's record and mortality register. Data was analyzed using simple statistical measures and the outcome expressed as frequencies and percentages etc. **Results:** In this study, 204 patients of PPH due to uterine atony were managed. 83 patients who failed to respond to medical treatment were managed by using a Foley's catheter balloon tamponade. Balloon tamponade was effective in controlling PPH in 78 (93.98%) cases. Only 5 (6.02%) patients needed further surgical intervention. **Conclusion:** This study concludes that Foley's catheter can effectively be used for controlling PPH to save lives and morbidity.

**Key words:** Postpartum Hemorrhage, Uterine Atony, Foley's Catheter.

### INTRODUCTION

Defined as bleeding in excess of 500 mL after delivery or 1000ml following caesarean section (CS) from the birth canal within 24 hours<sup>1</sup>, PPH is a dangerous and life-threatening event. It persists to be the chief cause of maternal deaths worldwide and especially in low income countries.<sup>2</sup> According to reports 30% of maternal deaths occur due to PPH.<sup>3</sup> In Pakistan, PPH accounts for 41% of maternal deaths.<sup>4</sup> Therefore in order to achieve the WHO's Sustainable Development Goal 3 maternal health targets, there is need to control PPH which is the most significant contributor to maternal deaths.

PPH can be attributed to various causes like uterine rupture, uterine inversion, retained placental tissues, lower genital tract trauma, and coagulation disorders but uterine atony is the commonest cause<sup>5</sup> and involved in up to 80% of

all bleedings.<sup>6</sup>

Management of PPH entail a stepwise approach starting with the exclusion of retained products and genital tract trauma. In the case of uterine atony, the first line treatment includes medical treatment comprising of giving uterotonic agents such as oxytocin, misoprostol and prostaglandin followed by invasive therapies and surgery as a last remedy. Other minimally invasive option exists in the form of interventional radiology, however it is not easily available in most obstetric units owing to the requirement of special equipment and trained interventional radiologists.<sup>7</sup> Uterine balloon Tamponade is a recent addition to the options available to a clinician to manage PPH.<sup>8</sup> Owing to the ease of insertion and least invasive, use of balloon tamponade is preferred by most clinicians over the roller gauze packing nowadays as the first step in the management of PPH after

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medical treatment fails and prior to surgical intervention and possible hysterectomy.<sup>9</sup>

Successful use of a variety of balloon devices have been recounted by various researchers, including Blakemore probe, Rusch balloon, the Bakri balloon and Foley catheters<sup>8</sup> and its effectiveness for severe hemorrhage is encouraging.<sup>10</sup> Intra-uterine balloon tamponade devices are safe and effective, with a success rate of 85% to 95% for treating PPH not responding to medical management<sup>11</sup> however most of the commercial tamponade devices are often not available in rural communities, and if exist, these are expensive. In resource lacking communities, cost effective options such as condom-based uterine balloon or Foley’s catheter is frequently used to arrest massive atonic postpartum hemorrhage.

When inflated the intrauterine balloon is presumed to exert “inward-to-outward pressure” that is greater than the systemic arterial pressure to prevent continual bleeding.<sup>12</sup>

In this study we present our appraisal of the use of Foley’s catheter as tamponade balloon in controlling PPH.

**MATERIAL & METHODS**

This monocentric retrospective impact study was conducted in the department of Obstetrics and Gynaecology of MTI, Hayatabad Medical Complex Peshawar from January 2020 to December 2020. This is a tertiary care hospital receiving all kind of patients including complicated cases referred by other health care units.

A total of 204 cases of PPH due to uterine atony following a vaginal delivery, instrumental delivery or CS were managed in our unit during the study period. Medical therapy was successful in 121 patients while 83 patients who failed to respond to medical treatment were managed by using a Foley’s catheter tamponade balloon and made parts of this study. Patients with PPH due to genital tract trauma and retained products or whom responded to medical treatment were excluded.

Ward protocol of balloon tamponade procedure comprised insertion of a two way Foley’s catheter tamponade transvaginally into the uterus and inflation of the balloon with 80 to 100 ml of normal saline. Considering the low volumes of Foley’s catheter balloons, multiple balloons were placed until resistance was felt or stoppage of bleeding. The Foley’s catheter balloons were left in the uterus for a minimum period of 24 hours while closely monitoring the patient’s vitals and any trace of bleeding through cervix. After 24 hours, the balloon was gradually emptied and removed when no further bleeding transpired. Balloon tamponade was labelled effective when no further intervention was needed.

All the information including maternal age, parity, gestational age and mode of delivery were recorded in a pre-structured proforma. Data was analyzed using simple statistical measures and the results presented as frequencies and percentages etc. Prior approval of the ethical committee of institution was obtained to conduct the study (522/HEC/B&PSC/2021).

**RESULTS**

In this study, 204 patients of PPH due to uterine atony were managed. 83 patients who failed to respond to medical treatment were managed by using a Foley’s catheter tamponade balloon and included in the study. Balloon tamponade was effective in controlling PPH in 78 (93.98%) cases. Only 5 (6.02%) patients needed further surgical intervention (Table-I).

Procedure	Efficacy	Frequency	%age
Foley's Catheter balloon tamponade	Yes	78	93.98%
	No	5	6.02%

**Table-I. Efficacy of Foley’s catheter balloon tamponade**

Maternal age of the patients ranged from 18-40 years with mean age of 27.90 ± 4.96 years. 45 (56.63%) patients were in age range 26-33 years. Grouping of patients based on the demographic and obstetric characteristics is shown Table-II.

With respect to mode of delivery 72 (95.83%) women were vaginally delivered and 9 (10.84%)

had instrumental delivery and 2 (2.41%) women delivered with c/section.

30 (36.14%) cases were booked while 46 (55.42%) cases were un-booked women admitted through

emergency. 7 (8.43%) women had been referred from other hospitals. Women in whom the balloon tamponade was not effective, 3 (60%) were un-booked patients and 2 (40%) were referred cases from other hospitals.

Category	Total	%age	Efficacy of Balloon Tamponade		Success Rate	
			Yes	No		
Age	18-25	26	31.33%	25	1	96.15%
	26-33	47	56.63%	45	2	95.74%
	34-40	10	12.05%	8	2	80.00%
Parity	primigravida	28	33.73%	27	1	96.43%
	multigravida	46	55.42%	43	3	93.48%
	Grand multigravida	9	10.84%	8	1	88.89%
Mode of Delivery	NVD	72	86.75%	69	3	95.83%
	IVD	9	10.84%	7	2	77.78%
	C/S	2	2.41%	2	0	100.00%
Gestational age	> 37 weeks	73	87.95%	70	3	95.89%
	< 37 weeks	10	12.05%	8	2	80.00%
Booking status	Booked	30	36.14%	30	0	100.00%
	Un-booked	46	55.42%	43	3	93.48%
	Referrals	7	8.43%	5	2	71.43%

**Table-II. Success rate of balloon tamponade with respect to Demographic and obstetric characteristics**

## DISCUSSION

Active postpartum haemorrhage management should be the main goal in present-day obstetrics as it persists to be the chief cause of maternal deaths worldwide and especially in low income countries.<sup>1</sup> Even with suitable management, about 3% of vaginal deliveries will result in severe PPH.<sup>13</sup>

Management of PPH entail a stepwise approach starting with uterotonic drugs to more invasive ones like internal iliac ligation, arterial embolization, uterine compression sutures and hysterectomy as a last option.<sup>8</sup> Uterine balloon tamponade is a non-invasive option, next to medical treatment, for the management of PPH due to uterine atony in women and in use from past few decades, Goldrath being the first to report it in 1983.<sup>14</sup> Acknowledging the success of temponade balloon, WHO and FIGO updated their guidelines in 2012 and recommended the use of intrauterine balloon tamponade to avoid potential surgery and allow safe transfer of the patient to a higher-level facility.<sup>1</sup>

Uterine tamponade balloons are emerging as

a lifesaving option in the management of PPH with ability to preserve fertility. Even if it fails to completely stop hemorrhage, it may provide temporary respite by reducing the rate of bleeding such that resuscitative efforts can be effective while arranging more definitive management.<sup>15</sup>

A variety of tamponade balloons like Blakemore probe, Rusch balloon, the Bakri balloon and Foley catheters are available for use by the clinicians with intrinsic advantages and disadvantages. Efficacy of all these devices seems to be comparable.<sup>14</sup> In a recent study, a condom-loaded Foley catheter and Bakri balloon have been reported equally effective in terms of success rates in treating atonic PPH however Bakri balloon attained homeostasis in a considerably shorter time.<sup>16</sup>

In this study Foley's catheter was used as uterine tamponade balloon to manage PPH for the uterine atony in cases where the medical treatment failed and balloon tamponade was effective in controlling PPH in 78 (93.98%) cases. Only 5 (6.02%) patients needed further surgical intervention. Our success rate is similar to the findings of other studies<sup>1,14</sup> who reported a

success rates of 90.4% and 96.2% respectively. A recent study<sup>17</sup> reported a 100% success rate using intrauterine Foley's catheter ballooning tamponade to treat postpartum hemorrhage resulting from uterine atony after vaginal delivery as well as after cesarean delivery. Goldrath was the first to report successful use of Foley's catheter as a tamponade for arresting PPH in 1983 and 17 out of 20 (85%) patients of his patients recovered safely from PPH.<sup>18</sup>

The outcome of our study is consistent with overall success rate of Foley's catheter balloon tamponade reported in different studies.

## CONCLUSION

This study concludes that Foley's catheter can effectively be used for controlling PPH to save lives and morbidity. In our society with limited access to health care facilities, lack of skilled medical attendance and local custom of preferring delivery at home, basic health workers can be trained to the use of Foley's catheter as tamponade, thanks to its simplicity in use, to control PPH before referring the patient to a tertiary care hospitals which will minimize blood loss and avert irrevocable shock and mortality. Being a retrospective study with no control group and lack of information on the blood loss are the limitations of our study.

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### AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Rubina Akhtar	Conceived the study design, Collected the data Reviewed and case notes and contributed to the manuscript writing, Final review & approval of manuscript.	
2	Irum Afzal	Did the statistical analysis, critical review and editing of manuscript.	