

IJMA



INTERNATIONAL JOURNAL OF MEDICAL ARTS

Volume 7, Issue 9 (September 2025)



<http://ijma.journals.ekb.eg/>

P-ISSN: 2636-4174

E-ISSN: 2682-3780



Available online at Journal Website
<https://ijma.journals.ekb.eg>
 Main Subject [Obstetrics and Gynecology]



Original Article

Role of Vaginal Packing in Prevention of Atonic Postpartum Hemorrhage

Reham Mohamed Ibrahim Hassan^{*1}; Ehab Elhelw²; Ahmed Mahmoud Elshorbagy²

¹ Department of Obstetrics and Gynecology, Al-Manzala General Hospital, Ministry of Health, Egypt.

² Department of Obstetrics and Gynecology, Damietta Faculty of Medicine, Al-Azhar University, Damietta, Egypt.

Abstract

Article information

Received: 21-04-2025

Accepted: 25-06-2025

DOI: [10.21608/ijma.2025.377519.2172](https://doi.org/10.21608/ijma.2025.377519.2172)

*Corresponding author

Email: m.reham159@gmail.com

Citation: Hassan RMI, Elhelw E, Elshorbagy AM. Role of Vaginal Packing in Prevention of Atonic Postpartum Hemorrhage. IJMA 2025 Sept; 7 [9]: 6060-6064. doi: [10.21608/ijma.2025.377519.2172](https://doi.org/10.21608/ijma.2025.377519.2172).

Background: Different treatment approaches were available for postpartum hemorrhage [PPH] [for example, medical uterotonic agents and interventional methods are in use]. However, the ideal option is not yet determined.

Aim of the work: This study aimed to determine the effectiveness of vaginal packing in prevention and management of the primary atonic PPH.

Patients and methods: The current study included 98 females with high risk for atonic PPH after delivery. They were divided into two groups: group [A] included 49 females, received medical treatment only [[Oxytocin] 10 IU in 500 ml of saline infused at a rate of 250 mL per hour after delivery]. The other group [B] included 49 females, received the same medical treatment as in group A, plus aseptic vaginal packing. All women were evaluated in standard manner. Then intrapartum and postpartum blood loss was estimated, and hemoglobin change was recorded.

Results: Both groups were comparable regarding patient demographics and clinical data. Anemia was commonest risk factor in groups A and B [71.5% and 59.2%, respectively]. The postoperative bleeding, 4 hours after delivery was mainly minimal [73.4% and 87.8%, respectively]. Marked bleeding, however, was reported in 26.5% and 12.2% in groups A and B respectively. Packing was associated significantly with reduced postpartum blood loss, hemoglobin loss and shorter duration of hospital stay. For instance, the postpartum blood loss was significantly lower in B than A groups [248.5±88.6 vs 347.5±108.6 ml, respectively]. In addition, the change of hemoglobin was significantly lower in B than A groups [0.68±0.54 vs 0.93±0.69, respectively]. Furthermore, the duration of hospital stay was significantly shorter in B than A groups [17.14±6.0 vs 21.6±8.8 hours, respectively].

Conclusion: The vaginal packing is considered a safe and effective method for prevention of postpartum hemorrhage. It is a cheap and easy applicable procedure.

Keywords: Postpartum hemorrhage; Oxytocin; Utero-vaginal Packing; Uterine Tamponade.



This is an open-access article registered under the Creative Commons, ShareAlike 4.0 International license [CC BY-SA 4.0] [<https://creativecommons.org/licenses/by-sa/4.0/legalcode>].

INTRODUCTION

Postpartum hemorrhage [PPH] defined formally as a blood loss greater than 1000 ml. It **remains** one of the principle causes of maternal morbidity and mortality all over the world [in either developed or developing countries. Many factors are responsible for PPH. However, the uterine atony is the commonest cause [it responsible for about 80% of PPH] ^[1].

In addition to uterine atony, other causes of PPH include trauma of the genital tract [13%], retained products [5%], and coagulation disorders. The sociodemographic and clinical factors also played a role in development of PPH. For example, patient age, ethnicity, pregnancy associated medical diseases [e.g., hypertension, anemia] and multiple pregnancy could play a role in the PPH development ^[2].

In this regard, the PPH varies widely with age [it is more common in 20-30 years age group], higher at low socioeconomic status. The reasonable estimate was reported to be 1 to 5 % of deliveries. Between 1994 and 2006 the incidence ranged between 2 and 3%, which changed to 3% in 2012 and 2013 in the United States National Inpatient Sample, population-based study ^[3].

PPH is responsible for 25% of maternal deaths; the majority of deaths occur within 24 hours after delivery. This highlights that the primary PPH is still the main cause of maternal mortality ^[2].

Different treatment options are available. First, the medical uterotonic drugs are used and if failed, the management plan proceeded to the interventional methods. The interventional approach depends on the parity, and PPH severity ^[4].

The treatment of intractable PPH [not responding to medical treatment] [uterotonic] needs prompt action to prevent maternal death. Recently, obstetric practice focused on the reduction of maternal morbidity and mortality due to hemorrhage, with the aim to reduce the need for laparotomy and increased uterine preservation. Uterine packing [tamponade] may represent a reasonable alternative to surgical intervention in patients with intractable primary PPH. It should be tried before proceeding to major surgery after failure of conventional treatment ^[5].

As time is of essence, all obstetricians should know how to insert a uterine pack, especially in primary PPH ^[2].

This study aimed to evaluate the effectiveness of vaginal packing in the prevention and management of primary atonic PPH.

PATIENTS AND METHODS

This was a randomized comparative study. It was performed in the Obstetrics and Gynecology department, Al-Azhar University, Hospital [New Damietta]. It included

pregnant females [primi- or multi-para, aged 18 to 38] at term, who were admitted for delivery with the high risk for atonic PPH [e.g., multiple pregnancy, macrosomia, polyhydramnios, anemia, etc..] after vaginal or cesarean section delivery. On the other side, the exclusion criteria were 1] genital tract injuries [except episiotomy], 2] retained placental tissues need evacuation and curettage], 3] uterine rupture or perforation with the need for laparotomy or CS hysterectomy, and 4] coagulation disorders.

Sample size calculation:

Based on the percentage of PPH after medical treatment of **Gonzalez et al.** ^[6] which was 2.5%, and percentage of PPH after uterovaginal packing of **Kishwar & Rauf** ^[5] which was 5% and with alpha error of .05, 95% confidence level, and power of 80%, a sample size was calculated, and it should be at least 49 patients for each group.

Methods:

All eligible women were clinically evaluated by full history taking, physical clinical examination, laboratory investigations and pelvi-abdominal ultrasound examination. Patients were divided into two groups. **Group [A]** received medical treatment only, in the form of [Oxytocin] 10 IU in 500 ml of saline infused at a rate of 250 mL per hour after delivery. The other **group [B]** received medical treatment as in group A, in addition to aseptic vaginal packing with a medium sized towel measured 20x20 cm – using Sims speculum for better visualization - in upper vagina compressing cervix and lower uterine segment, after exclusion of any cervical or vaginal tears.

The uterine massage was done to all cases every 15 minutes for 2 hours. Packing was removed after 2 hours and patients were observed for the following 2 hours and followed up for the next 6 hours. Procedure was considered effective if bleeding stopped after packing and patient was stable and was considered safe if there were no complications. Antibiotics were given intravenously for 5 – 7 days.

In addition, immediately after labor, an abdominal examination [fundal height, uterine tone, bladder assessment] was performed. This was followed by pelvic examination [inspection of external genitalia, assessment of vaginal lacerations and cervical examination]. The cervix was inspected for lacerations and retained productions. Then vaginal bleeding was inspected for and quantified.

Vaginal packing:

The vaginal pack was inspected for correct placing and security to maintain compression effect on the lower uterine segment and elevation of the uterine fundus [figure 1]. The patient was assessed for any discomfort which may indicate improper pack placement or the need to adjustment. After removal of the pack, the patient was reassessed generally for

hemodynamics, and locally to address the effectiveness of the packing procedure [If successful, the uterus should reduce in size and appear more **contracted** with less intrauterine fluid]. Any complications [e.g., hematoma formation] were documented.

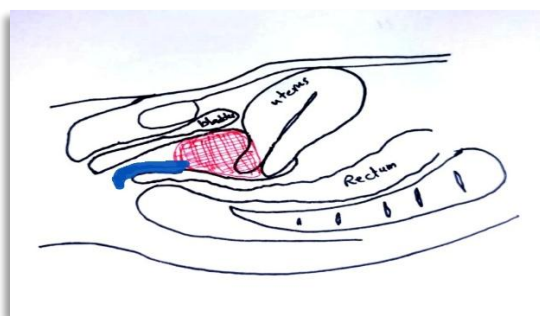


Figure [1]: Vaginal packing [red in color] compressing lower uterine segment and elevating uterine fundus.

Outcomes assessment: Assessment of bleeding monitored by hemoglobin level, no need for massive blood transfusion or further surgical intervention.

Ethical Considerations: The Local Ethics Committee of Scientific Research, Faculty of Medicine, Al -Azhar University, approved the study protocol. Informed consent was obtained from each patient before data collection, aim and methodology of this study was explained to the selected subjects, all data obtained from the present study, is in private consideration and for scientific purposes only.

Data Analysis: Statistical analysis was performed with SPSS statistical software, version 25 [IBM, Chicago, Illinois, USA]. The normality of the data was tested by the Kolmogrov-Smirnov test. Qualitative data was presented as numbers and percentages and was analyzed by the Chi-square test, while quantitative data was presented as mean and

standard deviations and was analyzed by the independent t-test. As a result, the p-value was considered significant at the level of <0.0

RESULTS

In the current work, the included females were mainly in their third decade of life, multigravida and multipara, with no significant differences between groups A and B. the mode of delivery was normal vaginal delivery [NVD] in 38.7% and 53.1% in groups A and B, respectively, with no significant differences between groups. The commonest risk factor in groups A and B was anemia [71.5% and 59.2%, respectively]. Others include low lying placenta, polyhydramnios, antepartum hemorrhage, macrosomia, diabetes mellitus and precipitated labor [The details are presented in table 1].

The mean intrapartum blood loss was 572.3 ± 158.2 and 553.9 ± 158.3 ml, in groups A and B, respectively. The postoperative bleeding, 4 hours after delivery was mainly minimal [73.4% and 87.8%, respectively]. Marked bleeding, however, was reported in 26.5% and 12.2% in groups A and B respectively. However, the difference between both groups did not reach statistical significance. Similarly, the need for ecboic, Prepartum hemoglobin, and need for blood transfusion did not differ significantly between groups. On the other side, packing was associated significantly associated with reduced postpartum blood loss, hemoglobin loss and shorter duration of hospital stay. For instance, the postpartum blood loss was significantly lower in B than A groups [248.5 ± 88.6 vs 347.5 ± 108.6 ml, respectively]. In addition, the change of hemoglobin was significantly lower in B than A groups [0.68 ± 0.54 vs 0.93 ± 0.69 , respectively]. Furthermore, the duration of hospital stay was significantly shorter in B than A groups [17.14 ± 6.0 vs 21.6 ± 8.8 hours, respectively] [Table 2].

Table [1]: Demographic distribution between studied groups.

Parameters		Group A N=49	Group B N=49	P-value
Age [years]		28.5 $\pm$ 5.43	27.6 $\pm$ 4.96	0.39
Gravidity		3.57 $\pm$ 1.22	3.59 $\pm$ 1.3	0.93
Parity		2.3 $\pm$ 1.1	2.34 $\pm$ 1.18	0.86
Mode of delivery [n,%]	NVD	19[38.7%]	26[53.1%]	0.15
	CS	30[61.3%]	23[46.9%]	
Potential risk factors [n,%]	Anemia	35[71.5%]	29 [59.2%]	0.88
	Low Lying Placenta	3[6.1%]	4[8.2%]	
	Anemia, history of postpartum hemorrhage	3[6.1%]	3[6.1%]	
	Prolonged Labor	1[2%]	3[6.1%]	
	Polyhydramnios	3[6.1%]	3[6.1%]	
	Antepartum hemorrhage	2[4.2%]	2[4.2%]	
	Macrocosmic Baby	1[2%]	1[2%]	
	DM and macrocosmic baby	1[2%]	3[6.1%]	
	Precipitated labor	0[0%]	1[2%]	

Table [2]: Comparison between groups regarding outcome data

Parameters		Group A N=49	Group B N=49	P-value
Intrapartum Blood loss [ml]		572.3 ± 158.2	553.9 ± 158.3	0.5
Bleeding 4 hours' after delivery [n,%]	Minimal	36[73.4%]	43[87.8%]	0.074
	Marked	13[26.5%]	6[12.2%]	
PP blood loss		347.5 ± 108.6	248.5 ± 88.6	<0.001*
Ecbotic [Carbetocin]		6[12.2%]	2[4.1%]	0.268
Hemoglobin	Prepartum	9.95±0.86	10.05±1.04	0.60
	Postpartum	9.02 ± 0.58	9.37 ± 0.78	0.012*
	Change	0.93 ± 0.69	0.68 ± 0.54	0.047*
Hospital stays [hours]		21.6 ± 8.8	17.14 ± 6.0	0.005*
Need for transfusion		4[8.2%]	1[2%]	0.362

DISCUSSION

PPH is a major health complication associated with maternal morbidity and mortality. It usually occurs 4 hours after delivery, denoting that, primary PPH is a consequence of the third stage of labor [7]. Thus, active management to the third stage of labor is a must to reduce PPH. Oxytocin administration after delivery of the anterior shoulder is the corner stay of the active management [8]. Risk factors for postpartum hemorrhage include a prolonged third stage of labor, multiple delivery, episiotomy, fetal macrosomia, and history of PPH. However, postpartum hemorrhage also occurs in women with no risk factors, so physicians must be prepared to manage this condition at every delivery. In addition to active management of the third stage of labor, it is essential to recognize and correct anemia before delivery, correct mother's beliefs about blood transfusions and reduce or prevent routine episiotomy. Examination of vital signs before and after delivery is crucial to recognize slow steady bleeding [9].

The treatment of lower uterine segment PPH includes different methods. For example, bimanual uterine compression [10], sustained traction of the cervix using ovum forceps [11], intrauterine packing with balloon [12,13], cervical apex clamping [14], obstruction of the lower segment vasculature [15], uterine artery ligation or wave-form sutures [16], controlled by vacuum [17] and uterine artery embolization or laparotomy [18]. The local direct compression had been shown to be the most effective measure. More recently, a novel method of vaginal or uterine packing had been introduced Liu X et al. [19]

During daily clinical practice, we noticed that high vaginal packing [e.g., in control of cervical bleeding to minor tears] is associated with reduction of the atonic postpartum hemorrhage incidence, especially when it is associated with good uterine massage. This explained by compression and

stretch of the lower uterine segment and elevation of the uterine fundus. Thus, the current work was designed to examine the value of vaginal packing in the management of primary atonic PPH.

The main results of the current work showed that, vaginal packing significantly reduced postpartum blood loss than the non-packing [248.5±88.6 vs 347.5±108.6 ml respectively]. This was confirmed by significant reduction of hemoglobin change [before-after] with packing [0.68±0.54 vs 0.93±0.69, respectively]. This was reflected on the duration of hospital stay after delivery, which was significantly shorter in packing than non-packing groups [17.14±6.0 vs 21.6±8.8 hours, respectively]. This could be translated into reduction of the overall healthcare cost.

These results are in line with Kishwar & Rauf [5]. They aimed to determine the effectiveness of uterovaginal packing in control of primary postpartum hemorrhage. They included 85 cases with PPH [due to uterine atony, coagulation disorders, placental site bleeding], after vaginal or cesarean deliveries. They were selected from the emergency and outpatient departments. Their results showed that, 62.35% of included women had normal vaginal deliveries. In addition, uterine atony was the commonest cause of PPH [47.1%]. The uterovaginal packing success rate was 95.3%. Other demographic data are also comparable to the current work.

In addition, Liu X et al. [19] aimed to examine the efficacy of pulling cervix down and vaginal pack in the fornix for PPH related to lower uterine segment. They included 124 women treated conservatively for PPH by routine management [group A] or routine treatment with packing [group B]. They reported that the treatment efficacy for conventional treatment was 44%, that increased to 100% when combined with vaginal packing. In addition, they found that there was no statistically significant differences regarding maternal age, gestational age, neonatal data. However, the

total blood loss in packing group was significantly lower than the other group [657.27 ± 131.61 ml vs 847.13 ± 250.37 ml, respectively].

The same authors reported that the intrauterine or vaginal packing with gauze for PPH is simple, cheap and can provide time for maternal recovery and transportation. Thus, it can be widely used in primary hospitals.

The success rate of vaginal or uterine packing in treatment or prevention of PPH was reported in previous studies. For example, **Haq and Tayyab**^[20] reported a success rate of 85%, while **Hsu et al.**^[21] reported a success rate of 88.9%. This success was associated with lower morbidity rate.

Conclusion:

Vaginal packing can be considered as a safe and effective method to reduce blood loss after delivery. It seems to be cheap, quick method with fewer complications to prevent primary PPH. However, due to limitation of small sample size and single center nature of the study, the results must be treated cautiously. In addition, it is recommended to carry out future large-scale studies are recommended.

Financial and Non-Financial Relationships and Activities of interest: None.

REFERENCES

1. D'Alton M, Rood K, Simhan H, Goffman D. Profile of the Jada® System: the vacuum-induced hemorrhage control device for treating abnormal postpartum uterine bleeding and postpartum hemorrhage. *Expert Rev Med Devices*. 2021 Sep;18[9]:849-853. doi: 10.1080/17434440.2021.1962288.
2. Tirunch B, Fooladi E, McLelland G, Plummer V. Incidence, mortality, and factors associated with primary postpartum haemorrhage following in-hospital births in northwest Ethiopia. *PLoS One*. 2022 Apr 6;17[4]:e0266345. doi: 10.1371/journal.pone.0266345.
3. Blaha J, Bartosova T. Epidemiology and definition of PPH worldwide. *Best Pract Res Clin Anaesthesiol*. 2022 Dec;36[3-4]:325-339. doi: 10.1016/j.bpa.2022.11.001.
4. Makwe CC, Okunade KS. Conservative approaches to postpartum haemorrhage. *Best Pract Res Clin Obstet Gynaecol*. 2024 Jul;95:102516. doi: 10.1016/j.bpobgyn.2024.102516.
5. Kishwar N, Rauf B. Effectiveness of uterovaginal packing in control of primary postpartum hemorrhage. *J Postgrad Med Instit* 2022; 36[2]: 97–103. doi: 10.54079/jpmi.36.2.2964.
6. Gonzalez SC, Budge J, Butler PD, Higgs M, Whiting J, Lutgendorf MA. An evidence-based oxytocin protocol for the third stage of labor to improve hemorrhage outcomes. *Int J Qual Health Care*. 2021 Feb 20;33[1]:mzab005. doi: 10.1093/intqhc/mzab005.
7. Liu C, Gao J, Liu J, Wang X, He J, Sun J, Liu X, Liao S. Predictors of Failed Intrauterine Balloon Tamponade in the Management of Severe Postpartum Hemorrhage. *Front Med [Lausanne]*. 2021 Jul 15;8:656422. doi: 10.3389/fmed.2021.656422.
8. Angarita AM, Berghella V. Evidence-based labor management: third stage of labor [part 5]. *Am J Obstet Gynecol MFM*. 2022 Sep;4[5]:100661. doi: 10.1016/j.ajogmf.2022.100661.
9. Sembada RH. On Going Losses After Hysterectomy Et Causa Uterine Atony: Case report. *J Pharmaceut Negative Results* 2022; 13[2]: 119-121. Available at: <https://www.pnrjournal.com/index.php/home/article/view/213/214>.
10. Chantrapitak W, Srijuntuek K, Wattanalungarun R. The efficacy of lower uterine segment compression for prevention of early postpartum hemorrhage after vaginal delivery. *J Med Assoc Thai*. 2011 Jun;94[6]:649-56. PMID: 21696071.
11. Hamdy A. A New Maneuver for Prevention of Postpartum Haemorrhage. *J Obstet Gynaecol India*. 2015 Jul;65[4]:241-5. doi: 10.1007/s13224-014-0592-6.
12. Dueckelmann AM, Hinkson L, Nonnenmacher A, Siedentopf JP, Schoenborn I, Weizsaecker K, Kaufner L, Henrich W, Braun T. Uterine packing with chitosan-covered gauze compared to balloon tamponade for managing postpartum hemorrhage. *Eur J Obstet Gynecol Reprod Biol*. 2019 Sep;240:151-155. doi: 10.1016/j.ejogrb.2019.06.003.
13. Feduniw S, Warzecha D, Szymusik I, Wielgos M. Epidemiology, prevention and management of early postpartum hemorrhage - a systematic review. *Ginekol Pol*. 2020;91[1]:38-44. doi: 10.5603/GP.2020.0009.
14. Jiang L. Bilateral cervix apex clamping procedure can be used as a new noninvasive second line therapy for postpartum hemorrhage. *Eur J Obstet Gynecol Reprod Biol*. 2019 Oct;241:66-70. doi: 10.1016/j.ejogrb.2019.08.005.
15. Yüksel H. A novel approach to primary lower uterine segment atony. *Taiwan J Obstet Gynecol*. 2015 Aug;54[4]:452-4. doi: 10.1016/j.tjog.2014.05.010.
16. Habek D. Transvaginal perpendicular cervical wafeform sutures in the treatment of early postpartum hemorrhage caused by lower uterine segment atony. *Taiwan J Obstet Gynecol*. 2021 May;60[3]:577-578. doi: 10.1016/j.tjog.2021.03.037.
17. Haslinger C, Weber K, Zimmermann R. Vacuum-Induced Tamponade for Treatment of Postpartum Hemorrhage. *Obstet Gynecol*. 2021 Sep 1;138[3]:361-365. doi: 10.1097/AOG.0000000000004510.
18. Miller CM, Cohn S, Akdagli S, Carvalho B, Blumenfeld YJ, Butwick AJ. Postpartum hemorrhage following vaginal delivery: risk factors and maternal outcomes. *J Perinatol*. 2017 Mar;37[3]:243-248. doi: 10.1038/jp.2016.225.
19. Liu X, Kang Y, Cao N, Sun X, Gu Y, Wang X, Wang H. Early identification and conservative treatment of postpartum hemorrhage in the lower uterine segment after vaginal delivery. *J Matern Fetal Neonatal Med*. 2024 Dec;37[1]:2386081. doi: 10.1080/14767058.2024.2386081.
20. Haq G, Tayyab S. Control of postpartum and post abortal haemorrhage with uterine packing. *J Pak Med Assoc*. 2005;55[9]:369-71.
21. Hsu S, Rodgers B, Lele A, Yeh J. Use of packing in obstetric hemorrhage of uterine origin. *Obstet Gynecol Surv*. 2003;58[8]:515-6. DOI: 10.1097/01.ogx.0000079644.05271.30

IJMA



INTERNATIONAL JOURNAL OF MEDICAL ARTS

Volume 7, Issue 9 (September 2025)



<http://ijma.journals.ekb.eg/>

P-ISSN: 2636-4174

E-ISSN: 2682-3780