

B Lynch Versus U Stitches for Postpartum Bleeding: Randomised Clinical Trial

M Othman¹ and Jumana H Hamwi²

¹Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine, Al-Baha University, KSA

²Senior Resident of Obstetrics and Gynecology, Madinah Maternity and Children Hospital, Madinah, KSA

***Corresponding Author:** M Othman, Assistant Professor of Obstetrics and Gynecology, Faculty of Medicine, Al-Baha University, KSA.

Received: April 24, 2019; **Published:** May 02, 2019

Abstract

Postpartum haemorrhage is one of the most important causes of women death. The aim of this research is to compare B lynch and U stitches as tamponade for control of uterine bleeding in postpartum haemorrhage. This is a prospective double centre, randomised controlled trial conducted in two major referral hospitals in Al-Baha area over 18 months between 1st December 2015 and 31st May 2017. Simple alternative patient randomisation used, where first patient will have B Lynch sutures while next will receive U stitches, and so on for the rest of patients.

Total number of women delivered is 11901. Lower segment cesarean section (LSCS) rate was 30.3% with total number of 3605. Total number of patient suffered PPH in both hospitals were 606 representing 5.1% of the total births, among them, 87 (14.4%) were post LSCS and 519 (83.6%) post vaginal delivery. Women who needed operative compression sutures were 103 (17%) of the women who suffered PPH.

As a conclusion, both methods, B lynch and U stitches, are equally effective in the management of PPH. With a small difference between the two methods to the benefit of B lynch side, which could be explained by the ease of performing this method and the shorter time to perform it. There was a difference between the two methods but did not reach significance and this could be explained by the small number of patients in each group, and so, caution should be noted while interpreting these results.

Keywords: Postpartum Haemorrhage; B Lynch; U Stitches; Clinical Trial; Cesarean Section; Tamponade Surgery

Introduction

Postpartum haemorrhage defined as bleeding of more than 500 ml of blood post vaginal delivery or more than 1000 ml of blood post cesarean delivery [1]. It is a serious live threatening condition that affects 1 - 5% of all deliveries. Incidence is higher in poor countries [1,2]. Postpartum haemorrhage is one of the leading cause of death in women, since the death rate in postpartum patients lies between 0.3 - 15 percent [1,3].

Causes of PPH is related to one of the following, Tone, Trauma, Tissue and Thrombin [4,7]. Atony may be predisposed by uterine over distension in cases of multiple pregnancy, fetal macrosomia and polyhydramnios [4,7]. Atony occurs if there is failure of progression of second stage of labor or prolonged third stage. It is also expected in a patient who had previous history of PPH and it represents 75 - 90% of cases [2,8,10].

Postpartum hemorrhage is the most common cause of maternal death. Worldwide, around 140,000 women died every year due to postpartum hemorrhage, postpartum hemorrhage represents 25 - 30% of maternal mortality [2,8,10]. Because of the seriousness of this condition, obstetricians worldwide struggle to find the best method to prevent and to treat such a condition [11,16]. Many methods

are used in the management of postpartum bleeding from medical to surgical methods [3,12,15,19]. One of the surgical methods used to treat the postpartum bleeding is to stitch the uterus to provide tamponade to compress the uterus against itself leading to decrease the bleeding. Many methods were described to provide this tamponade but two of these methods gain popularity [6,8,14,18,22].

The first method is B-lynch stitch, which was proposed by Dr Lynch in 1997 and immediately gained popularity because of its simplicity [3,5,19,21]. It is simply described in figure 1.

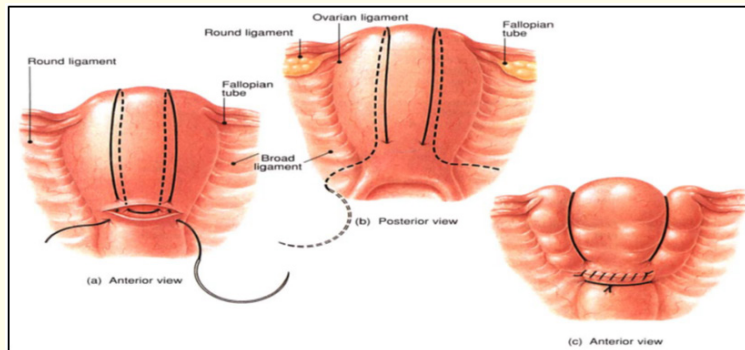


Figure 1: B-Lynch stitch.

Over the years, many doctors proposed many changes or modifications to B-Lynch technique but still the original technique is the most popular. In 2008, Hackethal introduced U-Stitches of the uterus and gained some popularity since, but never been studied before [6,8,10,12,13,22,23]. These U-stitches are simply rows of figure U stitches, usually 6-16 stitches compressing anterior wall of the uterus on the posterior wall as seen in figure 2.

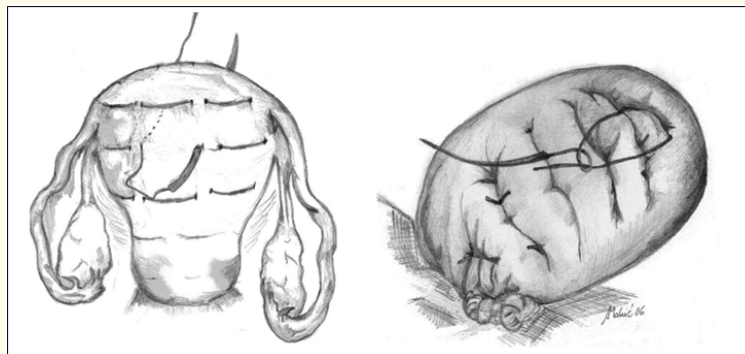


Figure 2: U-Stitches.

Whenever there is postpartum haemorrhage, this is one of the most urgent, acute and pressing Obstetric complication that keeps obstetricians on the edge of their seats. Medical team, including doctors, nurses, and laboratory technicians should be alerted. Most senior and expert consultant will take over. Manual methods will be used first with the exploration of any local lacerations, followed by medical treatments to control the bleeding [2,8,18,21,24]. However, if this failed or if the patient having a Cesarean section then exploration is mandatory [2,16,18,19,22]. Usually balloon tamponade is the next step and in a previous study, it showed a very high success rate in controlling the bleeding. Nevertheless, if the balloon tamponade failed or if it is not available, especially in peripheral hospitals, then uterine stitches are the solution [7,8,10,13,20,25].

Aim of the Study

The aim of this research is to compare these two methods of uterine stitches as tamponade for control of uterine bleeding in postpartum haemorrhage in peripheral hospitals.

Methods

This is a prospective double centre, randomised controlled trial conducted in two major referral hospitals in Al-Baha area over 18 months between 1st December 2015 and 31st May 2017. Two of the largest governmental referral hospitals in the area joined the study after Ministry of health in Saudi Arabia ethically approved it. First hospital is King Fahad Hospital (KFH) in Al-Baha and Prince Meshari Hospital (PMH) in Baljurashi. Both hospitals are secondary hospitals where medical care is given free of charge under the umbrella of Saudi Ministry of Health (MOH). Both hospitals have an average combined delivery rate of 9000 deliveries per annum, and caesarean section rate of 28.5%. Both hospitals serve Al-Baha area, which is located in the southwestern part of Saudi Arabia. It has an area of 9,921 km², with an elevation of 1,500 to 2,450 m (4,920 to 8,040 ft.) above sea level. Al-Baha area has a total multi ethnic population of 550,172.

Postpartum hemorrhage (PPH) is defined as loss of 500 ml or more of blood after vaginal delivery or more than 1000 ml after cesarean section. As per MOH protocol if a woman is diagnosed as PPH, she receives 20 international units of Oxytocin in 500 ml of normal saline IV with Methylergonovine (Methergine) 0.2 mg intramuscular. Woman to be observed for 20 minutes, if PPH continues she will receive Carboprost (Hemabate) 250 µg IM, which will be repeated again after 15 minutes if bleeding continues. If bleeding continues after that, Bakri balloon if available would be used to control the bleeding. In the other hand, if Bakri balloon is not available, exploration laparotomy is the next step since angiographic embolization is not available in the area. In the laparotomy, uterine compression sutures are the key operation, but if failed pelvic vessel ligation will be done, and if failed hysterectomy is the final step.

Women were randomised to the method of uterine compression suture using simple alternative patient randomisation, where first patient will have B Lynch sutures while next will receive U stitches, and so on for the rest of patients. All above-mentioned steps were explained in details for every patient had PPH and consent is taken from each patient and her husband.

Al-Baha University Medical College Ethical committee, King Fahad Hospital in Al-Baha Ethical committee and Prince Meshari Hospital Ethical committee, ethically approved this study. All participants operated by the first author and her specific consultant in the hospital she was operated.

There was blinding of patients but not for caregivers, as this is not possible. Baseline demographic, obstetric and medical histories, details of delivery and health care received until the time of discharge was recorded for all women. Outcomes included mode of delivery, maternal morbidity and mortality, the need for more management, blood loss, amount of blood transfused, recurrent pregnancy and mode of next delivery.

SPSS version 21 was used for the analysis. Categorical data was presented as frequencies and percentages and analysed using the Chi square test [26]. Continuous variables were presented as means with standard deviation or medians with ranges and analysed using Student's t-test and Mann-Whitney U test as appropriate for normally distributed and skewed data respectively. All tests are two-tailed with statistical significance defined as a probability value of < 0.05.

Results

Total number of women delivered is 11901. PMH deliveries were 6092 (51.2%) while, KFH 5809 (48.8%). There was 8296 vaginal delivery with 4298 vaginal delivery in PMH representing 51.8% of them and 3998 vaginal delivery in KFH representing 48.2% of them. Cesarean section (LSCS) rate was 30.3% with total number of 3605. LSCS rate of PMH was 29.5%, while KFH rate was 31.2%. Total number of patient suffered PPH in both hospitals were 606 representing 5.1% of the total births, among them, 87 (14.4%) were post LSCS and 519 (83.6%) post vaginal delivery. Women who needed operative compression sutures were 103 (17%) of the women who suffered PPH (Table 1).

	KFH	PMH	Total
All deliveries	5809 (48.8%)	6092 (51.2%)	11901
SVD	3998 (48.2%)	4298 (51.8%)	8296
LSCS	1811 (50.2%)	1794 (49.8%)	3605
PPH after SVD	187 (36%)	332 (64%)	519
PPH after LSCS	53 (60.9%)	34 (39.1%)	87
Operated PPH after SVD	29 (50.9%)	28 (49.1%)	57
Operated PPH after LSCS	28 (60.9%)	18 (39.1%)	46

Table 1: Details of all the deliveries.

Demographic characteristics of PPH patients and patients who needed operative compression sutures can be seen in table 2.

Characteristics	KFH	PMH	Total	Significance
PPH	240	366	606	0.025
Operated post PPH	57	46	103	0.025
Age	29	28.7		0.95
Education	12 th grade	12 th grade		0
Parity	4	4		0
Previous LSCS	1	0.8		1
Previous PPH	0	0		0

Table 2: Demographical characteristics of PPH women.

Of the 103 women needed operative compression sutures, 52 women had B Lynch sutures done and 51 women had U stitches done. Only 2 women in the B Lynch group needed further management were pelvic vessel ligation was done, while in the other arm 4 women in the U stitches group needed further management by pelvic vessel ligation and one of them ended by hysterectomy. No lives were lost for PPH in this trial (Table 3 and 4).

	KFH	PMH	Total	Significance
Operated after PPH	57 (55.3%)	46 (44.7%)	103	0.025
B lynch	29 (55.8%)	23 (44.2%)	52	0.54
U stitch	28 (54.9%)	23 (45.1%)	51	0.46
Pelvic vessels ligation	4 (66.7%)	2 (33.3%)	6	0.72
Hysterectomy	1 (100%)	0	1	0.5
Death	0	0	0	0

Table 3: Comparison between both hospitals for women operated after PPH.

	B lynch	U stitch	Total	Significance
Operated after PPH	52 (50.5%)	51(49.5%)	103	0.5
Pelvic vessels ligation	2 (33.3%)	4 (66.7%)	6	0.19
Hysterectomy	0	1 (100%)	1	0.5
death	0	0	0	0
Blood loss (liters)	1.2	1.6		0.4
Blood units transfused	4.2	6.6		0.2
Hospital stay (days)	7	7		0.48
Subsequent pregnancy	52 (51%)	50 (49%)	102	
Subsequent delivery	9 (45%)	11 (55%)	20	
Subsequent SVD	4 (36.4%)	7 (63.6%)	11	
Subsequent LSCS	5 (55.6%)	4 (44.4%)	9	
Subsequent PPH	0	0	0	

Table 4: Comparison between both methods.

Patients of the B Lynch group lost less blood and required transfusion of less blood units than U stitches group. All patients were discharged in the seventh day of admission in good condition and were advised not to get pregnant for a minimum of one year. All women in each group return (except patient who had hysterectomy done) within the next 6 - 18 months pregnant. Eleven women delivered vaginally and nine delivered by LSCS until the time of preparing this paper (Table 4).

Discussion

PPH is excessive bleeding following the birth of a baby [2,4,9]. One to 5 percent of women have postpartum hemorrhage worldwide. It is the leading cause of maternal mortality [14-16,19]. Although mortality from PPH decreased worldwide but, is still the leading cause of maternal death in some parts of the world. In most developed countries, PPH considered as one of the three leading causes of maternal death [1,2,15,18].

All evidence and guidelines, promote active management of the third stage of labor. This active management would prevent PPH and decrease its severity if it occur anyway [2,4,8,17]. Active management consists of three steps should be done as a combination. These steps are uterotonics administration immediately after delivery of the baby, early cord clamping and cutting and gentle cord traction with uterine counter traction when the uterus is well contracted [2,4,18].

The causes of PPH is related to Tone, Trauma, Tissue and Thrombin. Uterine atony is a failure of the uterine myometrial fibers to contract and retract. If the uterus does not contract strongly enough blood vessels, bleed freely and hemorrhage occurs. This is the most important cause of PPH and usually occurs immediately following delivery of the baby, up to 4 hours after the delivery. Trauma to the genital tract can lead to significant disruption of soft tissue and tearing of blood vessels. Retained placenta is a tissue that may cause postpartum hemorrhage. In the other hand, any reason causes coagulation abnormality lead to postpartum hemorrhage, including HELLP syndrome, intrauterine fetal demise for long time and placental abruption [2,8,16,17,19,20,22,23].

This prospective randomised clinical trial compared two methods of uterine tamponade sutures, B lynch versus U stitches. This trial was conducted in the two referral hospitals of Al-Baha area over 18 months. Total number of deliveries was 11901 with 8296 (69.7%) vaginal delivery and 3605 (30.3%) LSCS. Women suffered PPH were 606 representing 5.1% of all the deliveries. This outcome was consistent with the average incidence worldwide. What is not consistent with global incidence is that PPH was higher in vaginal deliveries than LSCS (6.3% V 2.4%). The low number of Obstetricians in the area facing the large number of deliveries especially vaginal deliveries that are handled most of the time by midwives and junior doctors can explain this.

Of the 606 PPH patients, only 103 (17%) needed surgical tamponade surgery representing 0.9% of all the deliveries. Of those patients, only 6 (5.8%) needed further management by vascular ligation representing 0.05% of all the deliveries. Of those patients, 4 (7.8%) of the U stitch group needed vascular ligation. On the other hand, 2 (3.9%) of the B lynch group needed vascular ligation. This difference did not reach significance (P 0.19). Only one woman needed further surgical intervention after U stitches and vascular ligation and she ended by total abdominal hysterectomy representing 0.97% of all tamponade surgery patients and 0.008% of all deliveries. On the other hand, this finding did not reach significance (P 0.5).

Regarding blood transfusion, the average number of units transfused in the B lynch group was less than that of the U stitches group (4.2 units V 6.6 units), but this difference was not significance (P 0.2). Both findings can be explained by the fact that doing U stitches take longer time on average than doing B lynch, which would affect the amount of bleeding and the need for further management.

Furthermore, all women in the two-tamponade groups in the next 18 months came back pregnant, except the only patient who had hysterectomy. To the date of preparing this paper, only 20 women of these delivered with no complications or PPH.

On revision of literature, no other study has compared these two methods in clinical trials.

Conclusions

The finding of this trial confirms that both methods, B lynch and U stitches, are equally effective in the management of PPH. There was a small difference between the two methods with the benefit in the B lynch side, which could be explained by the ease of performing this method and the shorter time to perform it. There was a difference between the two methods but did not reach significance and this could be explained by the small number of patients in each group, and so, caution should be noted while interpreting these results.

Training of new specialists and consultants on performing both methods are recommended depending on the results of this trial to save lives. Further training of residents, junior doctors and midwives is needed to decrease incidence of the PPH and to improve the outcomes for pregnant women.

Bibliography

1. American College of Obstetricians and Gynecologists. "Clinical management guidelines for obstetrician-gynecologists number 76". *American College of Obstetricians and Gynecologists* 108.4 (2006): 1039-1047.
2. Guideline GT. "Prevention and management of postpartum haemorrhage no 52". *BJOG: An International Journal of Obstetrics and Gynaecology* 124.5 (2017): e106-e149.
3. B-Lynch C., *et al.* "The B-Lynch surgical technique for the control of massive postpartum haemorrhage: an alternative to hysterectomy? five cases reported". *British Journal of Obstetrics and Gynaecology* 104.3 (1997): 372-375.
4. Cunningham F., *et al.* "Obstetrics". In *William Obstetrics* (2014): 780-828.
5. EL-Hamamy E., *et al.* "The B-Lynch suture technique for postpartum haemorrhage: A decade of experience and outcome". *Journal of Obstetrics and Gynaecology* 29.4 (2009): 278-283.
6. Hayman R., *et al.* "Uterine compression sutures: surgical management of postpartum hemorrhage". *Obstetrics and Gynecology* 99.3 (2002): 502-506.
7. Rath W. "Postpartum hemorrhage - update on problems of definitions and diagnosis". *Acta Obstetrica et Gynecologica Scandinavica* 90.5 (2011): 421-428.
8. Elsayed M. "New modified cross B- Lynch versus classic B Lynch in controlling postpartum hemorrhage". *International Journal of Science and Research* 4.5 (2015): 600-606.
9. Holtsema H., *et al.* "The B-Lynch technique for postpartum haemorrhage: an option for every gynaecologist". *European Journal of Obstetrics and Gynecology and Reproductive Biology* 115.1 (2004): 39-42.
10. Matsubara S., *et al.* "Uterine compression sutures for postpartum hemorrhage: an overview". *Acta Obstetrica et Gynecologica Scandinavica* 92.4 (2013): 378-385.
11. Baskett T. "Preparedness for postpartum hemorrhage: an obstetric hemorrhage equipment tray". *A Comprehensive Textbook of Postpartum Hemorrhage: An Essential Clinical Reference for Effective Management*, 2nd edition. London: Sapiens Publishing (2012): 314-317.
12. Hackethal A., *et al.* "Uterine compression U-sutures in primary postpartum hemorrhage after cesarean section: fertility preservation with a simple and effective technique". *Human Reproduction* 23.1 (2008): 74-79.

13. Rathat G, *et al.* "Synechia after uterine compression sutures". *Fertility and Sterility* 95.1 (2011): 405-409.
14. Roman A and A Rebarber. "Seven ways to control postpartum hemorrhage". *Contemporary OB/GYN* 48.3 (2003): 34-53.
15. Shields L. "Uterotonic agents fact sheet". California Maternal Quality Care Collaborative (2009): 74-75.
16. Shih J, *et al.* "'Nausicaa' compression suture: a simple and effective alternative to hysterectomy in placenta accreta spectrum and other causes of severe postpartum haemorrhage". *BJOG: An International Journal of Obstetrics and Gynaecology* 126.3 (2019): 412-417.
17. Barbieri L and E Chief. "A stitch in time: The B-Lynch, Hayman, and Pereira uterine compression sutures". *OBG Management* 24.12 (2012): 6-9.
18. WHO. "WHO recommendations for the prevention and treatment of postpartum haemorrhage" (2012): 41.
19. Wohlmuth C, *et al.* "B-Lynch suture: a case series". *International Journal of Fertility and Women's Medicine* 50.4 (2005): 164-173.
20. Begum J, *et al.* "B-Lynch: a technique for uterine conservation or deformation? a case report with literature review". *Journal of Clinical and Diagnostic Research* 8.4 (2014): OD01-OD03.
21. Cho J, *et al.* "Hemostatic suturing technique for uterine bleeding during cesarean delivery". *Obstetrics and Gynecology* 96.1 (2000): 129-131.
22. Qadir M and S Amir. "Atonic primary postpartum haemorrhage; the efficacy of B-lynch suture in management during cesarean section". *Professional Medical Journal* 24.10 (2017): 1584-1588.
23. Akoury H and C Sherman. "Uterine wall partial thickness necrosis following combined B-Lynch and Cho Square sutures for the treatment of primary postpartum hemorrhage". *Journal of Obstetrics and Gynaecology Canada* 30.5 (2008): 421-424.
24. Hall E, *et al.* "Modified B-Lynch suture technique for prevention of postpartum hemorrhage [16R]". *Obstetrics and Gynecology* 129.5 (2017): 187S.
25. Oyelese Y and C Ananth. "Postpartum hemorrhage: epidemiology, risk factors, and causes". *Clinical Obstetrics and Gynecology* 53.1 (2010): 147-156.
26. Corp., I., IBM SPSS Statistics for Windows, in SPSS. IBM: Armonk, NY IBM Corp (2012).

Volume 8 Issue 5 May 2019

©All rights reserved by M Othman and Jumana H Hamwi.