

Original Article

SUCCESS RATE OF B-LYNCH SUTURE IN THE TREATMENT OF POSTPARTUM HEMORRHAGE IN WOMEN UNDERGOING EMERGENCY CAESAREAN SECTION

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ABSTRACT

Background: Postpartum hemorrhage is one of the five main causes of maternal mortality with an estimated prevalence of 34% in Pakistan. Uterine atony has been described as the most common underlying cause. Application of B-Lynch suture to prevent atony has been shown to successfully control postpartum hemorrhage in the previous literature. However, all of the existing studies were conducted with a very small sample size and the results were conflicting. So the purpose of this study was to repeat this trial over a larger sample size to confirm the control of PPH with B-Lynch suture in women undergoing emergency cesarean section. The objective of the study was to calculate the frequency of successful control of PPH with B-Lynch sutures in women during emergency cesarean section.

Material and Methods: This cross-sectional study was conducted in Obstetrics and Gynecology Department, Sir Ganga Ram Hospital, Lahore from 25/11/2020 to 24/05/2021. This study involved 314 patients who underwent emergency cesarean section and developed PPH which was managed by B-Lynch suture. Informed consent was taken.

Results: The patient's mean age was 27.46±5.61 years. Most of the patients (n=125, 39.8%) were para 2, then para 3 (30.9%) and para 1 (24.2%) while only 5.1% patients were para 4. Following the application of the B-Lynch suture, PPH was successfully controlled in 301 (95.9%) patients while 13 (4.1%) patients didn't respond well and were managed by hysterectomy. When data was stratified for age groups, the frequency of successful control of PPH was 96.9% between 20-25 years, 96.0% between 26-30 years, 95.9% between 31-35 years, and 91.9% between 36-40 years of patients age, and it was a statistically insignificant difference (p=.617). When data was stratified for parity, the frequency of successful control of PPH was 94.7% among para 1, 96.0% among para 2, 96.9% among para 3 and 93.8% among para 4, however again the observed difference was statistically insignificant (p=.874).

Conclusion: B-Lynch suture was found to successfully control postpartum hemorrhage in 95.9% of patients undergoing emergency cesarean section.

Key Words: Postpartum Hemorrhage, Cesarean Section, Suture

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INTRODUCTION

Postpartum hemorrhage (PPH) is one out of the five crucial causes of maternal deaths throughout the world.^{1,2} About 25% of deaths in underdeveloped countries are because of PPH. Its prevalence in Pakistan is about 34%. Among the main causes, uterine atony is the commonest, in about 75-90% of patients. The

remaining include placental abruption, placenta previa, abnormally adherent placenta, lower genital tract injuries, coagulopathy, uterine inversion, and ruptured uterus.³⁻⁵ Following delivery, Loss of 500 ml or more blood in the 24 hours after delivery is physiologically normal, and the loss of more than that is considered PPH. Clinical deterioration does not occur usually till the blood loss is > 1000 - 1500 ml. "Massive" primary PPH occurs when there is an estimated blood loss of > 1500 ml, drop in hemoglobin concentration > 4 g/dl, or transfusion of 4 units of blood urgently required. In one of the tertiary care hospitals in Pakistan, 0.5% of cases had massive PPH out of a total of 4881 deliveries.^{6,7} The b-lynch suture is described during cesarean section to prevent atony of the uterus. It is a safe, simple, and effective method for the control of primary postpartum hemorrhage.^{8,9} This technique may particularly be useful because of its simple application, and life-saving potential. It is relatively safe, and preserves the uterus and hence fertility. So it should be applied as a first-line treatment, before proceeding to hysterectomy: The b-lynch technique was first invented in 1997 by Christopher B-Lynch.¹⁰ Smith JR et al. reported successful control of PPH with B-Lynch suture in 71.4% of the cases for primary postpartum hemorrhage.¹¹⁻¹³ Another recent trial⁴ showed it was successful in 97.33% of cases, while another study by Ayesha Khatoon and colleagues in Pakistan applied B-Lynch sutures in 15 patients, and 14 (93.3%) patients had effective c bleeding control. One patient (6.6%) failed to respond to suture application.¹⁴⁻¹⁶ The limitation of the above studies was that these studies had a smaller sample size and had some discrepancies with Smith JR and colleagues. However, this study was conducted to determine its efficacy in PPH in women during the emergency cesarean section on a larger sample size so that if this technique is found to be highly effective then this technique will be pursued in the future for the treatment of PPH.

OPERATIONAL DEFINITION

Postpartum Haemorrhage: Blood loss more than 1000ml after delivery during emergency cesarean section. Blood loss was measured as an observational method: Capacity of one kidney tray equals 500ml + Single sponge soaked with blood equal is 150 ml of blood + Measured in a suction jar Successful Control of PPH: It was established by blood loss decreased to <1000ml and contracted uterus within 15 minutes of application of B-Lynch Suture.

MATERIAL AND METHODS

It was a descriptive case series, conducted at the Department of Obstetrics and Gynecology, Sir Ganga Ram Hospital, Lahore 6 months period after the approval of the synopsis from 25/11/2020 to 24/05/2021. With a 5% margin of error and 95% confidence level, a sample size of 314 cases was calculated and an expected percentage of successful control of PPH to be 71.4% in patients managed with B-Lynch suture in emergency cesarean section.

Patients were selected by non-probability consecutive sampling. Inclusion criteria was age from 20 to 45 years, any parity, singleton pregnancy (assess on USG) and patients with PPH (as per operational definition).

Exclusion criteria was spontaneous vaginal delivery and patients who develop PPH due to coagulation disorders i-e prolonged PT >13sec and APTT >34sec and platelet count less than normal (i-e. <150,000 per microliter).

DATA COLLECTION PROCEDURE

A total of 314 patients fulfilling the inclusion/exclusion criteria admitted from the Labour Room of Sir Ganga Ram Hospital, Lahore were included in this study. Informed consent was taken to include their data in the study. In patients having findings of Postpartum Haemorrhage, a B-Lynch suture was applied under general anesthesia following departmental protocols. A 70 mm

round body needle on a No.2 chromic catgut suture was used to puncture the uterus. B-Lynch suture applied as per technique. Successful control of PPH was observed as per operational definition. In case of failure, the case was managed according to the standard protocol for hysterectomy. All information was collected on a designed Proforma by the researcher herself.

DATA ANALYSIS PROCEDURE

Data were entered into SPSS version 16. Numerical variables like age have been presented by mean ± SD. Categorical variables i-e successful control of PPH has been presented by frequency and percentage. Frequency has been calculated for parity. Data stratified for age and parity to control the effect modifiers. Post-stratification chi-square test has been applied to take p≤0.05 as significant.

RESULTS

This study included 314 patients who underwent emergency cesarean section and developed PPH which was managed by B-Lynch suture. The age ranged from 20-38 years with a mean of 27.46±5.61 years as shown in Table 1. Most patients (n=125, 39.8%) were of parity 2, followed by parity 3 (30.9%) and parity 1 (24.2%) while only 5.1% patients were para 4 as shown in Table 2. Following the application of B-Lynch suture, PPH was successfully controlled (as per operational definition) in 301 (95.9%) patients while 13 (4.1%) patients didn't respond well and were managed by hysterectomy as shown in Table 3. When the data were stratified for age groups, the frequency of successful control of PPH was 96.9% between 20-25 years, 96.0% between 26-30 years, 95.9% between 31-35 years and 91.9% between 36-40 years of patients age, however, the difference was statistically insignificant (p=.617) as shown in Table 4. When the data for parity was stratified, the frequency of successful control of PPH was 94.7% among para 1, 96.0% among para 2, 96.9% among para 3, and 93.8% among para 4, however, the observed difference was

insignificant statistically (p=0.874) as shown in Table 5.

Table-1. Descriptive Statistics for Age

Age	N	Minimum	Maximum	Mean	Std. Deviation
	314	20	38	27.46	5.610

Table-2. Frequency Table for Parity

Parity	Frequency	Percent	Valid percent	Cumulative percent
1	76	24.2	24.2	24.2
2	125	39.8	39.8	64.0
3	97	30.9	30.9	94.9
4	16	5.1	5.1	100.0
Total	314	100.0	100.0	

Table-3. Frequency Table for Successful Control of PPH

PPH controlled	Frequency	Percent	Valid percent	Cumulative percent
Yes	301	95.9	95.9	95.9
No	13	4.1	4.1	100.0
Total	314	100.0	100.0	

Table-4. Age Groups and Successful Control of PPH Crosstabulation

Age groups		Successful control of PPH		Total	p-value
		Yes	No		
20-25 years	Count	123	4	127	.617
	% with in age groups	96.9%	3.1%	100.0%	
26-30 years	Count	97	4	101	
	% with in age groups	96.0%	4.0%	100.0%	
31-35 years	Count	47	2	49	
	% with in age groups	95.9%	4.1%	100.0%	
36-40 years	Count	34	3	37	
	% with in age groups	91.9%	8.1%	100.0%	
Total		301	13	314	
		95.9%	4.1%	100.0%	

Table-5. Parity and Successful Control of PPH Crosstabulation

Parity		Successful control of PPH		Total	p-value
		Yes	No		
1	Count	72	4	76	.874
	% with in age groups	94.7%	5.3%	100.0%	
2	Count	120	5	125	
	% with in age groups	96.0%	4.0%	100.0%	
3	Count	94	3	97	
	% with in age groups	96.9%	3.1%	100.0%	
4	Count	15	1	16	
	% with in age groups	93.8%	6.3%	100.0%	
Total		301	13	314	
		95.9%	4.1%	100.0%	

DISCUSSION

Despite advanced management, postpartum hemorrhage is one of the major causes of maternal morbidity and mortality in developing countries and hospitals equipped with all modern medicine. Postpartum hemorrhage is the third major reason of maternal mortality next to pregnancy-induced hypertension (preeclampsia) and infection.^{8,17} Primary postpartum hemorrhage is the loss of blood in excess during the first 24 hours after the birth of the infant. Uterine atony is the most common underlying cause. Identifying its risk factors and anticipation, early diagnosis and prompt intervention are keys to success to minimize its impact.^{3,18,19} B-lynch suture applied during cesarean section to prevent atony of the uterus is an efficient, safe, and simple method for the control of primary postpartum hemorrhage.^{8,20,21} This technique may particularly be useful because of its simple technique, lifesaving method, relative safety, and capacity to save the uterus and hence fertility. Smith JR and colleagues recorded successful control of PPH in 71.4% of the cases with B-Lynch sutures for the

management of primary postpartum hemorrhage.^{11,22,23} Another recent trial 4 showed it to be successful in 97.33% of cases, while in another study Ayesha Khatoon and colleagues in Pakistan applied B-Lynch sutures in 15 patients, and 14 (93.3%) had effective bleeding control. One patient (6.6%) had failure of this technique.^{14,24,25} However, a very important limitation of all these studies was their limited sample size and there was a need to repeat this trial over a larger sample to confirm the frequency of successful control of PPH with B-lynch suture.^{26,27} This study involved 314 patients who underwent emergency cesarean section and developed PPH which was managed by B-Lynch suture. The mean age was 27.46 ± 5.61 years. Most of the patients (n=125, 39.8%) were para 2, then para 3 (30.9%) and para 1 (24.2%) while only 5.1% patients were para 4. Following the application of B-Lynch suture, PPH was successfully controlled in 301 (95.9%) patients while 13 (4.1%) patients didn't respond well and were managed by hysterectomy. Our results match those of Neelam and Kumar in 2010 (97.33%)⁸ and Khatoon et al. in 2011 (93.3%)¹¹ who also observed a similar success rate of B-Lynch Suture. When data was stratified for age groups, the frequency of successful control of PPH was 96.9% between 20-25 years, 96.0% between 26-30 years, 95.9% between 31-35 years and 91.9% between 36-40 years of patients age, the observed difference was insignificant (p=.617) statistically. When the data were stratified for parity, the frequency of successful control of PPH was 94.7% among para 1, 96.0% among para 2, 96.9% among para 3 and 93.8% among para 4, however again the observed difference was statistically insignificant (p=.874). Thus B-lynch suture is an effective treatment in the control of PPH in patients undergoing emergency cesarean section with a success rate of 95.9%. This efficacy of B-Lynch suture is not affected by age (p=.617) and parity (p=.874) of the patient, making it an ideal choice for PPH control at any age and parity. The strength of our study is that it is

the only study performed over such a large sample size of 314 patients which has never been done before. By carefully excluding the confounders and stratifying the results for age and parity, the element of bias was minimized. The results of this study are therefore reliable and advocate routine B-Lynch suture use in the PPH management in patients undergoing emergency cesarean section.

CONCLUSION

The B-Lynch suture was found to successfully control postpartum hemorrhage in 95.9% of patients undergoing emergency cesarean section.

AUTHOR'S CONTRIBUTION

FL: Analysis & interpretation of results

SQ: Data collection

SA: Literature review & discussion

MG: Data collection

RMH: Review of article

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