

EFFICACY OF B-LYNCH COMPRESSION SUTURE FOR CONTROL OF PRIMARY POST-PARTUM HEMORRHAGE

Hina Niaz¹, Asaf Alam Khan²

How to cite this article

Niaz H, Khan AA. Efficacy of B-Lynch Compression Suture for Control of Primary Post-Partum Hemorrhage. J Gandhara Med Dent Sci. 2024;11(4):24-27

Date of Submission: 21-03-2024

Date Revised: 28-05-2024

Date Acceptance: 10-09-2024

²Trainee Registrar, Department of Cardiology, Khyber Teaching Hospital, Peshawar

Correspondence

¹Hina Niaz, Experiential Registrar, Department of Gynae A, Khyber Teaching Hospital, Peshawar

☎: +92-332-9265356

✉: drhinaniaz11@yahoo.com

ABSTRACT

OBJECTIVES

This study aimed to evaluate the efficiency of the B-Lynch compression suture for primary post-partum hemorrhage control.

METHODOLOGY

It is a prospective cross-sectional study performed for two years, i.e., 1 November 2021 to 31 October 2023, at the Department of Obstetrics and Gynaecology in a tertiary care hospital. This study included 65 study cases out of 23,964 with primary post-partum hemorrhage (PPH) due to uterine atony during cesarean delivery not responding to pharmacological treatment and was managed by applying B-Lynch compression sutures. The amount of blood loss, demographic characteristics, birth weight of babies, causative factors, and other related complications were studied in such selected cases.

RESULTS

B-Lynch compression suture presented a success rate of 97% in the present study. 52% had blood loss of 1000-1500ml, 29% had loss between 1501-2000ml and 18% had 2001-2500ml blood loss. 6% had wound gaping, 10.7% had a fever, and 8% had more than seven days stay in hospital, and wound infections were noted.

CONCLUSION

Our study concluded that the B-Lynch compression suture had a success rate of 97% in the management of primary post-partum hemorrhage, with few post-operative complications. The current research demonstrates the efficacy of B-Lynch as a lifesaving, easy, effectual technique that avoids hysterectomy and thus avoids heavy blood loss.

KEYWORDS: Post-Partum Hemorrhage, B-Lynch Compression Suture, Atony, Cesarean Section, Blood Loss

INTRODUCTION

One of the main reasons for maternal death & morbidity, particularly in low resources nations like Pakistan, is post-partum hemorrhage (PPH), which is defined as "any blood loss >500 ml following vaginal delivery and >1000 ml after cesarean delivery".¹ The World Health Organization defines post-partum hemorrhage as blood loss that results in hypovolemia, a 10% decrease in hematocrit, or the need for blood product transfusion (regardless of delivery method). The prevalence of death from post-partum hemorrhage in Pakistan is of huge concern.^{2,3,4} Every year, over 500,000 mothers worldwide pass away during pregnancy, and up to 25% of these deaths are caused by hemorrhage.⁵ Blood loss from vaginal delivery above 500 ml and blood loss via a C-section during the first 24 hours of delivery exceeding 1500 ml are considered primary PPH.⁶ Its incidence is 5% of all the deliveries. Excessive vaginal blood loss that starts 24 hours after the third stage of labor ends is known as secondary PPH.⁷ Numerous studies have demonstrated that adherent and retained placentas, vaginal hematomas,

genital tract tears, and uterine atony are the leading causes of post-partum hemorrhage (PPH).^{8,9,10} Serious complications include hypovolemic shock, DIC, acute respiratory distress syndrome, and kidney failure can result from massive PPH.^{10,11,12} When pharmaceutical treatment is ineffective for atonic PPH, uterine balloon tamponade may be tried.^{9,13} Other surgical methods to lessen blood loss were also discussed; however, these methods require experience, which the on-call obstetrician and specific consultants lack. These methods include ligating the uterine and internal iliac arteries.¹⁴ Being more advanced, Embolization also needs technical expertise that couldn't be found in many hospitals. Uterine compression sutures, being highly effective in controlling life-threatening post-partum hemorrhage, were introduced by Balogun Lynch Christopher (in 1997) B-Lynch et al.,^{15,16,17} These can be used instead of more involved surgical treatments, such as hysterectomy, because they are easy to conduct. As a result, the uterine vascular sinuses are mechanically compressed. Though little literature exists regarding this technique's application, a survey based on its efficacy in Khyber Pakhtoon Khwa, Pakistan

region, has not been reported. Thus, our research aimed to determine the effectiveness of the B-Lynch brace suture as a conservative surgical technique in managing primary PPH in cesarean section cases.

METHODOLOGY

This prospective cross-sectional study was conducted in the Obstetrics and Gynae 'A' unit of the Medical Teaching Institute in a tertiary care hospital for two years from 1 November 2021 to 31 October 2023. 23,964 admissions were recorded, and 4067 of total lower segment cesarean sections were performed during this study period. Since the duration of the study was short, we considered 65 cases of post-partum hemorrhage. All patients who had undergone Lower segment cesarean section (LSCS) with atonic post-partum hemorrhage not responding to pharmacological management were inclusion criteria. Patients with PPH after vaginal delivery, disseminated intravascular conglutination (DIC), bleeding diathesis, retained products of the placenta, or patients with uterine anomalies were the exclusion criteria. Data was collected after obtaining permission from the Hospital Ethical Committee and receiving informed consent from patients. After admission, provide a detailed history of gravidity and parity, especially medical history, for any contraindication to pharmacological management and the gestation period. Pre-operative investigations essential for cesarean section (CS) were sent. The pharmacological treatment for atonic PPH included Oxytocin, injection of methyl ergometrine, Injection of Prostaglandin F2 alpha, and Prostaglandin E1 tablets. Despite using all these drugs repeatedly, if the uterus remained atonic, then a B-Lynch compression suture was applied using Vicryl 1 after exteriorizing the uterus. Blood loss estimated based on mop count (1 small 10*10cm fully soaked mop: around 60ml blood loss; 40*40cm fully saturated mop: 350ml of blood loss). 1 gram clot equal to 3mL of blood. Blood loss was also calculated by blood collected in the suction bottle after delivery of the placenta, and vaginal blood was collected in a separate kidney tray which was then measured. Blood loss in total was estimated by adding all these values and subtracting the amount of liquor after the rupture of membranes. Post-operatively patient's vitals, along with urine output, uterine tone and per vaginal bleeding, wound gaping, fever, etc., were recorded. Blood investigations were repeated after 24 hours. The patients were discharged after seven days only after the suture was removed. Fetomaternal parameters were recorded. The data was collected, compiled, and analyzed using a Microsoft Excel worksheet and SPSS. Qualitative variables were presented in terms of percentage.

RESULTS

We included 65 cases of PPH who underwent a B-Lynch compression suture in our current research and analyzed them for two years.

Table 1: Demographic Parameters of the Study Cases (n=65)

Demographics	Frequency	%age
Age Group (in Years)		
<20	09	13.8
21 – 25	15	23
26 – 30	28	43
31 to 35	08	12.3
>35	05	7.6
Gravida		
Primi	39	44.60
Multi	36	55.38
Gestational Age		
<32	05	8.00
33-36	12	18.00
37-40	42	65.00
≥41	06	9.00

Demographic characteristics, as shown in percentage, determine that many cases were found in the age group of 26-30 years (43%), were multipara (55.38%), and the period of gestation range was 37 to 40 weeks (65%).

Table 2: Mode of Cesarean Delivery Studied in 65 Cases

Type	Number (n=65)	%age
Elective LSCS	14	21.53
Emergency LSCS	51	78.46

B-Lynch suture was predominantly applied in emergency cesarean sections (78.46 %) compared to elective cesareans (21.53%).

Table 3: Birth Weight of Babies Concerning B-Lynch Compression Suture

Weight in kg	Number (n=65)	%age
Up to 2	05	7.69
2.1–3.0	32	49.23
3.1–4.0	19	29.23
>4	09	13.84

From statistical observation, maximum cases regarding babies birth weight, concerned with B-Lynch-compression, found that the baby has a weight range of 2.1-3.0 kg in 49.23% of cases, with a mean baby weight of 2.8 kg Table 3.

Table 4: Causative Factor for PPH among 97 Patients

Weight in kg	Number (n=65)	%age
Severe pre-eclampsia	22	22.68
Eclampsia	08	8.24
Abruption	09	9.27
Placenta previa	14	14.43
Prolonged labor	12	12.37
Big baby	08	8.24
Prolonged PROM	07	7.21
Multiple pregnancies	17	17.52

The risk factors causing uterine atonic PPH. The percentage values calculated suggest that most cases were of severe pre-eclampsia. Some patients had a combination of 2 or more causative factors, and about 52% of patients suffered blood loss in the 1000 -1500 ml range.

Table 5: Distribution of the Cases Based on the Pre-Operative Haemoglobin

Hemoglobin	Frequency	%age
Severe	15	23.00
Moderate	36	55.00
Mild	11	17.00
Normal	03	5.00
Total	65	100.00
Mean	7.34	
SD	2.88	
Range	6.5 to 12.00	

Patient distribution on a pre-operative hemoglobin basis. From the calculated percentage values, it was found that most cases had moderate anemia (55%) followed by severe anemia (23%) according to W.H.O guidelines during the pregnancy. The mean hemoglobin pre-operative was 7.34 \pm 2.88mg/dl, with 6.5 as the minimum and 12 as the maximum in current research. Whereas, in immediate complications, about 6.1% of patients had wound gapping, 7 had fever, and 8% each had wound infection and a hospital stay of >7 days.

DISCUSSION

PPH, the life-threatening complication, can be anticipated, if not managed in time, can lead to disastrous maternal morbidities and mortalities also. Although managed conservatively first by bimanual massage and uterotonic agents as first-line medical treatment in primary atonic PPH, surgical techniques play a pivotal role in saving maternal life. Here, we conducted simple, fruitful techniques such as a B-Lynch compression suture, a lifesaving procedure when first-line medical management fails, fewer transfusions, and less expertise required. The different variables have been compared and contrasted with other necessary studies. The mean age in our study was 26.8 years Table 1. This is similar to the previous studies, which showed that the mean age of the patients was 26.6 years. Our study's average age of 26.8 years is because of cultural customs of marriage in our country's twenties. Atonic post-partum hemorrhage was seen almost equally distributed in both the primigravida (44.6%) and multigravida (55.38%) in the current study Table 1. The same findings were revealed in another study.¹⁸ Most cases studied were term patients (65%) in the present research, and the mean gestational age was 38 weeks Table 1. The gestational age range at presentation in our research ranged between 31.4 and

41.6 weeks. In our study, 21.53% of the patients had elective LSCS, whereas 78.46% had emergency LSCS Table 2. This is comparable with a study showing that 72% of the study cases had emergency LSCS, and 14% had elective LSCS.¹⁹ This proposed that atonic PPH is more commonly experienced in emergency cases due to many other contributing factors. The current study's average birth weight was 2.8 kg (range 1.9-4.2) Table 3. Good size babies would lead to uterine distension & ultimately, atonic uterus. The average birth weight in our study was less, most probably because of patients coming from poor socio-economic status and the bulk of cases being with severe pre-eclampsia that leads to intrauterine growth restriction. Severe pre-eclampsia was our research's primary cause of atonic PPH Table 4, which showed the most dominating factor contributing to atonic PPH. Moreover, the average blood loss observed was 1450 mL, ranging between 1000 and 2500 mL. Most patients (52.23%) had a blood loss in the 1000-1500 mL range. We can compare this with a study by Dixit et al.¹⁸ The lower blood loss in the current research shows the timely decision to halt the pharmacological treatment and go for compression suture application. This decision plays a pivotal role in the amount of blood loss and blood transfused to the patients. Our study showed a 97% success rate in the conservation of the uterus, mainly by the B-Lynch technique only and, in a few cases, by additional uterine devascularization techniques. In many studies, on average, the success rate varied between 82% and 95%. The difference in the success rate in various studies may be due to patient selection criteria and short study duration variations. In our study, out of the 65 patients, 7 cases developed post-operative fever, and 4 had wound gape. All cases were managed in our research. Major complications like deep venous thrombosis (DVT) vesicovaginal fistula (VVF) were not seen in any of the research mentioned above. However, the literature does show few isolated cases.

LIMITATIONS

The study involved a relatively small sample size and study period, which may limit the generalizability of the findings. A more extended study period might provide more comprehensive insights into the effectiveness and safety of the B-Lynch technique and other management strategies, i.e., comparing the B-Lynch compression suture with different methods or treatments.

CONCLUSIONS

The success rate of B-Lynch was 97% in our current study, with few post-complications. However, it is lifesaving and easy, avoids hysterectomies, and saves

future fertility by resuming a regular menstrual cycle safely and rapidly, using an effective hemostatic technique, thus preventing excessive blood loss. This procedure can be combined with other procedures like uterine artery ligation and internal iliac ligation. Post-graduate residents & registrars in Obstetrics & Gynaecology should be trained enough to apply B-Lynch sutures in emergency independently.

CONFLICT OF INTEREST: None

FUNDING SOURCES: None

REFERENCES

- Zheng F, Wen H, Shi L, Wen C, Wang Q, Yao S. Incidence of post-partum hemorrhage based on the improved combined method in evaluating blood loss: A retrospective cohort study. *PLoS one*. 2023;18:e0289271–e0289271.
- Riaz M. Comparison of mean Triglyceride levels in third trimester of Pregnancy in a Patients with and without Pre-Eclampsia. *Isra Medical Journal*. 2023;14:95–98.
- Anwar J, Torvaldsen S, Morrell S, Taylor R. Maternal Mortality in a Rural District of Pakistan and Contributing Factors. *Maternal and Child Health Journal*. 2023;27:902–915.
- Qadir M. Trends in Maternal Mortality in a Tertiary Care Hospital of Khyber Pakhtunkhwa. *Pakistan Journal of Medical and Health Sciences*. 2024;18:44–46.
- Zegeye AM, Bazezew Y, Adare A, Jaleta P, Kumlachew W, Liben SW, Tarik YD, Kebede GD, Dagnaw Y, Zeleke FT, et al. Determinants of fetomaternal outcomes of antepartum hemorrhage among women who gave birth in Awi zone public hospitals, Ethiopia. A case-control study. *PLoS one*. 2024;19:e0297700–e0297700.
- Niu B, Duffett L, El-Chaar D, Timmouth A, Wang T-F, Khalife R. Bleeding disorders and post-partum hemorrhage by mode of delivery: a retrospective cohort study. *Research and practice in thrombosis and haemostasis*. 2023;7:100166-100166.
- Taylor N, Brazel N. Management challenges in primary and secondary post-partum haemorrhage. *Obstetrics, Gynaecology & Reproductive Medicine*. 2023;33:243-254.
- Shah K, Katke RD, Radiowala SY. Post-partum Hemorrhage [Internet]. *Labour and Delivery*. Springer Nature Singapore; 2023. p. 227-257.
- Laganà AS, Casarin J, Lembo A, Ervas E, Cromi A. Post-partum Hemorrhage: Conservative Treatments [Internet]. *Practical Guide to Simulation in Delivery Room Emergencies*. Springer International Publishing; 2023. p. 539-555.
- Mohamed Aboul Fotouh A, Abdelfattah A, Nosser W, Mohammed A. Post-partum Hemorrhage in Pregnant Women with Previous Uterine Surgeries. *Zagazig University Medical Journal*. 2023;0:0–0.
- Makwe CC, Okunade KS. Conservative approaches to post-partum haemorrhage. *Best Practice & Research Clinical Obstetrics & Gynaecology*. 2024;95:102516.
- Liu LY, Nathan L, Sheen J-J, Goffman D. Review of Current Insights and Therapeutic Approaches for the Treatment of Refractory Post-partum Hemorrhage. *International journal of women's health*. 2023;15:905–926.
- Sadiku OD, Aina SA, Odoemene CC, Ogunmoyin TE, Adedara VO, Olasimbo O, Ashir FA, Adili SC, Kuteyi AO, Fakayode OO, et al. Approaches to the Prevention and Treatment of Post-partum Hemorrhage: A Systematic Review of Past Advances, Recent Developments, and Best Practices. *Cureus*. 2024;16:e65096-e65096.
- Kostov S, Kornovski Y, Watrowski R, Slavchev S, Ivanova Y, Yordanov A. Internal Iliac Artery Ligation in Obstetrics and Gynecology: Surgical Anatomy and Surgical Considerations. *Clinics and practice*. 2023;14:32–51.
- Makino S, Takeda S. Uterine Compression Sutures for Atonic Bleeding [Internet]. *Compression Sutures for Critical Hemorrhage During Cesarean Section*. Springer Singapore; 2019. p. 11–16.
- Bayo AI, Babarinsa I, Jido TA, Al Obaidly S, Shahata MAM. Peripartum Hemorrhage: Recent Updates in Management [Internet]. *Updates in Intensive Care of OBGY Patients*. Springer Nature Singapore; 2024. p. 73–105.
- Stafford IA, Fox KA, Belfort MA, Dildy GA. Etiology and Management of Hemorrhage (Includes Accreta) [Internet]. *Critical Care Obstetrics*. Wiley; 2024. p. 627-663.
- Makino S, Takeda S. Uterine Compression Sutures for Atonic Bleeding [Internet]. *Compression Sutures for Critical Hemorrhage During Cesarean Section*. Springer Singapore; 2019. p. 11–16.
- Dwivedi N, Mahajan M, Gupta A, Vij A. Management of non-tubal ectopic pregnancies: rural tertiary care centre experience. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology*. 2023;12:3171-3176.

CONTRIBUTORS

- Hina Niaz** - Concept & Design; Data Acquisition; Data Analysis/Interpretation; Drafting Manuscript; Critical Revision; Supervision; Final Approval
- Asaf Alam Khan** - Concept & Design



LICENSE: JGMDS publishes its articles under a Creative Commons Attribution Non-Commercial Share-Alike license (CC-BY-NC-SA 4.0).
 COPYRIGHTS: Authors retain the rights without any restrictions to freely download, print, share and disseminate the article for any lawful purpose.
 It includes scholarly networks such as Research Gate, Google Scholar, LinkedIn, Academia.edu, Twitter, and other academic or professional networking sites.