ORIGINAL ARTICLE

# OUTCOME OF B-LYNCH APPLICATION IN PATIENTS WITH POST-PARTUM HEMORRHAGE FOLLOWING CESAREAN SECTION

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**Background**: The most common cause of post partum hemorrhage after a cesarean section is uterine atony. **Aims & Objective**: The main aim of this study was to examine the outcomes of the B-Lynch procedure in patients who experienced primary PPH after cesarean section. **Methods**: This study spanned one year, from August 2020 to August 2021, at Ayub Teaching Hospital. Patients who developed post-partum hemorrhage after a cesarean section were enrolled in this study and a thorough review of their records was conducted to identify those who received B-Lynch sutures and assess the resulting outcomes. **Results**: Out of the 87 patients who experienced PPH, 24 (27.6%) patients received the B-Lynch procedure. Among these 24 patients, only two (8.3%) needed hysterectomy, while the remaining 22 successfully recovered after receiving the B-Lynch procedure. **Conclusion**: The B-Lynch technique proves to be a safe, effective, and easily applicable method for stopping hemorrhage in patients who experienced significant initial postpartum hemorrhage due to uterine atony.

**Keywords**: B.lynch, Primary PPH, B.lynch during C-section

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## INTRODUCTION

According to the World Health Organization (WHO), maternal mortality (MM) is a serious global problem that affects about 300,000 women every year. Most of these deaths (94%) occur in low-income or developing countries and could have been avoided.[1] The rates of MM have decreased globally, but there are still large differences among countries. By following strategies to reduce MM, we have learned more about the socio-economic factors that influence this problem. These include education level, income inequality, and place of birth.[2]

Post-partum haemorrhage (PPH) is a major cause of death and disability among mothers worldwide. It happens when the uterus does not contract properly after giving birth. This condition, called uterine atony, accounts for 25-30% of all MM cases and 75-90% of PPH cases.[3,4] PPH can lead to serious complications such as cesarean hysterectomy, which can negatively affect fertility and the desire to continue a family. An overwhelming majority (>80%) of cases of primary post-partum hemorrhage have uterine atony as the underlying cause. The risk of PPH is around 4% for vaginal deliveries and 6% for cesarean deliveries.[5,6]

A recently introduced surgical technique for the management of PPH due to uterine atony is the B-Lynch suture application. It compresses both sides of the uterus without changing its anatomy. This can stop PPH and avoid the need for more invasive surgery that can harm fertility.[7] The technique has a success rate of 86.4% in preventing hysterectomy and is increasingly recommended for PPH management.[8] However, there is not enough published research on this topic

## MATERIAL AND METHODS

This descriptive cross-sectional study was conducted in the Obstetrics and Gynaecology Department of MTI, Ayub Teaching Hospital, Abbottabad from August 2020 to August 2021. The Institutional Review Committee approved the study ethically before it started. The study's participants were all patients who had postpartum hemorrhage (PPH) after a cesarean section during the research period. However, the study excluded patients with complete placenta accreta/previa, traumatic PPH, bleeding disorders, congenital malformations, retained placenta, and disseminated intravascular coagulation (DIC). The study used convenience sampling for selection of study sample. The formula: $n = z^2 * p * (1 - p) / e^2$ calculated the sample size (n) for this study which was 87 as per following calculation:

Where: z = 1.96 for a confidence level (α) of 95%, p = proportion (expressed as a decimal) 6% for pph following a c-section, e = margin of error.

z = 1.96, p = 0.06, e = 0.05

n = 1.962* 0.06 * (1 - 0.06) / 0.052

n = 0.2167 / 0.0025 = 86.666

n ≈ 87

The third stage of labor was actively managed in every case, using methods such as controlled cord traction, uterine massage, and oxytocin administration. A B-Lynch brace suture was used when uterotonics did not stop atonic postpartum hemorrhage (PPH), and the patient had uncontrollable bleeding. This research included patients who needed a B-Lynch suture due to uncontrolled hemorrhage after having primary PPH and not responding to uterotonics.

The data for this study came from the admission register of the labor room and the cesarean section record book. The data collection template covered factors such as parity, cesarean delivery indications, the need for blood transfusion, the requirement of further surgeries, and the necessity for admission to the Intensive Care Unit (ICU) for stabilization/recovery. In cases where atonic PPH was treated with medical drugs, a B-Lynch suture was applied using size 2 chromic catgut suture. The effectiveness of this procedure was measured by the cessation of bleeding after the application of the B-Lynch suture. Any complications that occurred within the first week after surgery were recorded from the patient file. These included subsequent treatments in case of re-bleeding, Disseminated Intravascular Coagulation (DIC), fever after the surgery, hysterectomy, the need for admission to the ICU, and maternal mortality. The data was entered into and analysed using using the SPSS v25.

## RESULTS

In this study involving 87 post-partum hemorrhage patients, B-Lynch suture management was needed for 24 patients, accounting for 27.6% of the total. Within this subset, two women (8.3%) experienced a non-responsive, flaccid uterus during cesarean section due to short spacing. Despite the initial reduction in bleeding post B-Lynch suture application, these patients later suffered from uncontrollable hemorrhage, necessitating a cesarean hysterectomy to preserve their lives.

Out of the 24 patients who received B-Lynch sutures, three (13.6%) developed wound infections, while 19 (86.4%) were discharged without any complications. No subsequent hospital visits were reported due to complications. The average age of these patients was 26.4±4.96 years, with an age range of 18-34 yr.

The mean±SD weight of the newborns was 3.12±0.35 kg, with 11 infants (45.83%) weighing more than 3 kg at birth. More than half of the patients (54.16%) were first-time mothers, and the majority (42.10%) were younger than 30 years. Emergency cesarean delivery was performed on 17 women (70.83%). The most common reason for cesarean section was fetal distress, observed in 7 cases (29.16%), followed by a history of previous cesarean section in 5 cases (20.83%).

## DISCUSSION

Obstetricians face the challenge of preventing and managing postpartum hemorrhage (PPH), which can cause maternal death and legal issues. The B-Lynch suture which is an effective, easy to perform technique for management of execessive post-operative bleeding is also compatible with other interventions if needed. It has additional benefits of being quick, simple and a handy procedure in management of emergencies where both life and fertility are important. The World Health Organization (WHO) recommends compression sutures, such as the B-Lynch suture, as an option after conservative management fails, and before attempting ligation of blood vessels.[9] The B-lynch suture has been reported to be the sole intervention required for management of PPH, without vessel ligation, and with positive pregnancy outcomes in some cases.[10] Uterine compressive sutures have proven to be an effective treatment for hemorrhage in atonic postpartum hemorrhage cases, when other medical and nonmedical treatments have not worked.[11] The use of absorbable sutures, which can remain in place, usually does not affect future pregnancies.[12] In our study, we used B-lynch suture for 27.6% of patients with post-partum hemorrhage after a cesarean section. The success rate for this method was 91.7%. Studies conducted in Pakistan have shown an 83% efficacy rate of the B-Lynch suture for postpartum hemorrhage (PPH) management, while another study reported a 91% success rate for PPH control.[13,14] Although some studies suggested that the B-Lynch suture was 100% effective for managing atonic PPH[15-17], a systematic review reported that this suture technique resulted in successful control of PPH in 91.7% cases.[18-21] Most of these studies reported an effectiveness range of 82-95%.[21,22]

There are multiple elements that can potentially impact the efficacy of the B-Lynch suture, including but not limited to the precise moment of its application, the implemented methodology, the criteria for patient selection, and the incidence of disseminated intravascular coagulation within the patient population. The B-Lynch brace suture possesses the benefit of a straightforward and quick implementation. To maximize its potential effectiveness, it is suggested that the suture be applied at the earliest opportunity, and it is recommended that its prophylactic usage be considered for patients categorized as high-risk.[23]

The B-Lynch suture can produce significant outcomes in PPH treatment and promptly stop bleeding when applied in a timely manner, given its high success rate. It is essential that postgraduate students, trainees, and registrars in obstetrics and

gynecology learn this procedure to ensure its effective use in emergency situations.[24]

The present study revealed an average patient age analogous to the findings from an Indian research (26.8 years)[24], although it diverges from a Singaporean research (35 years).[22] This variance could potentially be attributed to the higher incidence of early matrimony and childbearing practices in this region, a pattern similarly noted in another study conducted in India where the average patient age was reported as 26.6 years.[23] Factors such as religious customs, socioeconomic status, and national context may influence these early marriages and childbearing patterns. The mean gestational age was recorded at 37.8 weeks (ranging from 32 to 41 weeks), a finding that agrees with several other studies.[22-26]

Atonic PPH was mainly observed in first-time mothers, a pattern slightly different from a Mumbai-based study where atonicity was equally distributed between first-time and multiparous mothers, although the difference in our study was not significant.[23] This contrasts with another Indian study where multigravida patients were the majority.[27] The observed discrepancies can be ascribed to the variety of contributing elements across demographic groups and the distinct reasons prompting cesarean sections among these females.

The average birth weight recorded in our research corresponds with the data derived from a study conducted in Scotland, demonstrating a birth weight of 3.5 kg.[26] The most commonly used delivery method in our research was emergency cesarean section, mirroring findings from an Indian study where a majority (76%) of the participants underwent emergency lower segment cesarean section (LSCS), with a minority (24%) opting for elective LSCS.[28] This points towards a likelihood of postpartum hemorrhage (PPH) predominantly occurring in emergency LSCS scenarios. A similar trend was found in another research from India, where 76% of the patients had an emergency CS and approximately 23.52% elected for a cesarean section.[24]

## CONCLUSION

The B-Lynch application is a safe and effective procedure for management of post-partum hemorrhage following a cesarean section. Obstetricians should be trained in spotting the post-partum hemorrhage at the earliest and shouldn't have any hesitation in application of B-lynch sutures to stop post-partum hemorrhage, thus avoiding the need for hysterectomy.

Limitations: This was a single-center based descriptive cross-sectional study with a small size is a type of observational study with some prominent limitation because of the study design such as: selection bias, which could not be avoided because the sample size was not representative of the general population and inability to reflect the true burden of the disease. Therefore, researchers and readers should be cautious in interpreting and generalizing the results of such studies and avoid claiming cause-effect relationships.

**RECOMMENDATIONS**

Good antenatal care, regular checkups and follow-up visits can identify patients in who an emergency lower ceserean section can be avoided, thereby reducing the incidence of uterine atony indirectly.

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