

B-Lynch Suture for the Management of Post Partum Hemorrhage – A Local Experience

N J FARUQI L JAVED F YOUSAF A SALICK A N ALAM S NAUSHEEN

Department of Obstetrics and Gynecology Unit I, Allama Iqbal Medical College/ Jinnah Hospital, Lahore.

Correspondence to Dr. Naheed Jamal Faruqi, Assistant Professor

Objectives: To assess the efficacy of B-Lynch suture in the management of postpartum hemorrhage **Study Design:** Case series report. **Study Setting:** Department of Obstetrics & Gynecology unit I, Jinnah Hospital, Lahore **Materials and Methods:** The data was collected retrospectively from hospital record during July 2003 to June 2004, of patients with PPH in whom B-lynch suture was applied to control hemorrhage. The study included 45 women who were admitted through emergency or out patient department during last one-year period who fulfilled the inclusion criteria. Data was collected according to a pre-set proforma which included age, parity, gestational age, cause of PPH, estimated blood loss, number of transfusions needed and duration of hospital stay and was reviewed and evaluated in terms of treatment outcome, potential side effects and the efficacy of B-Lynch suturing technique as treatment of postpartum hemorrhage. Ratio and proportions were calculated and Chi- square test was used for significant associations. **Results:** The age of the patients ranged from 20–35yrs and parity from 1–6. Gestational age was from 34–41wks. 36 {80%} women had PPH due to uterine atony, while 9 {20%} had PPH due to placental causes, and none of them had bleeding disorders. The estimated blood loss was 1000–1500cc in 15 patients {33.33%}, 1500–2000cc in {62.22%} and 2 patients {4.44%} had blood loss more than 2000cc. 15 {33.33%} patients required 3 transfusions, 28 {62.2%} required 4 transfusions and only 2 {4.44%} women required 5 transfusions. Suturing technique has been applied successfully in 44/45 patients with failure rate of 2.22%. **Conclusion:** The B-Lynch suture is a valuable addition to the surgical treatment of postpartum hemorrhage because of its simplicity of application, relative safety, life saving potential and its capacity for preserving the uterus and thus fertility. Satisfactory haemostasis can be assessed immediately after application.

Key Words: Postpartum hemorrhage, B-lynch Suture, Maternal Mortality

It has been estimated that worldwide, over 125,000 women die of postpartum hemorrhage each year. The traditional management of this condition includes the use of uterotonics, such as oxytocin, ergometrine, and prostaglandins, before proceeding to surgical procedures like ligation of the internal iliac arteries and even hysterectomy. The B-Lynch technique is a surgical procedure that may be used to arrest postpartum hemorrhage resulting from uterine atony¹.

Recent years have seen a marked improvement in obstetric care the world over. Yet postpartum hemorrhage still remains one of the leading causes of maternal death. Significant PPH is estimated to complicate 2–4 percent of vaginal and 6% of caesarean births¹. In United States, it accounts for about 10% of maternal deaths². While in developing countries, obstetric hemorrhage is an even more important cause of maternal death³. Analysis of record of 20yrs in India reveals that it was a contributory cause of maternal mortality in 19.9% of cases, the majority of deaths (65%) occurred within 24hrs of admission and in 47.5% there was severe anemia on admission. The largest category (17.5%) died due to atonic PPH followed by uterine rupture (15%), abruptio placenta (15%) and retained placenta 12.5%⁴.

Most maternal deaths are avoidable and are due to underestimation of blood loss, inadequate volume replacement and delay in operative intervention. Any delay in achieving haemostasis results in terminal coagulopathy due to prolonged shock. At this stage even surgery may be

too late⁵.

Numerous medical and surgical therapies have been used but none has been uniformly successful⁶. Knowledge, skill and appropriate use of such management strategies can save lives, may help to avoid major surgery and may at times be valuable to preserve the uterus and hence fertility. The obstetrician should initiate a sequence of non-operative and operative interventions for control of PPH and promptly assess the success or failure of each measure. Indecisiveness delays therapy and results in excessive hemorrhage, which eventually causes dilutional coagulopathy. This will make control of hemorrhage more difficult and increase the risk of hysterectomy, major morbidity from hemorrhagic shock and death.

Initial steps for control of uterine bleeding include fundal massage, intravenous administration of uterotonic drugs and infusion of large amounts of fluids to prevent hypo tension. Blood transfusion is necessary to prevent tissue hypoxia and coagulopathy. If these measures are not successful then adequate assistance, exposure and anesthesia are required to thoroughly evaluate the genital tract for lacerations and tears. Any retained products of conception are removed. Laparotomy may be required for intra-abdominal bleeding and uterine atony, which sometimes culminates in hysterectomy. In some cases, more sophisticated and advanced surgical techniques may be required. These include selective arterial embolization and internal iliac artery ligation.

Among the different modalities, B-lynch suture, a

comparatively simple surgical technique originally described by Christopher B-lynch in 1997 is a valuable addition to the surgical treatment of postpartum hemorrhage due to uterine atony, which immediately sustains correction of hemorrhage⁷. The mechanism behind the technique is that the mechanical compression of uterine vascular sinuses prevents further engorgement with blood and hemorrhage. The technique is very simple, effective, can be easily learnt and has the potential to save the fertility of the women.

Materials and Methods:

Study Design: This is a case series report of 45 patients evaluated to assess the efficacy of B-Lynch sutured applied for PPH. The test of potential efficacy was the control of hemorrhage, time taken to achieve homeostasis, loss of blood, need of transfusion and postoperative complications. Rate and ratio was calculated and Chi – square was applied to find out any significant association between variables. P value of < .05 was considered as statistical significance.

Inclusion Criteria: Patients in whom B-lynch suture was applied as primary treatment of Post Partum hemorrhage.

Exclusion Criteria:

- 1 Patient who were in state of irreversible shock
- 2 PPH due to causes like injuries of the birth canal and coagulopathies.
- 3 Great grand multiparas were also excluded from the study in which hysterectomy was performed as the first choice.

Methods: The use of B-Lynch sutures for postpartum hemorrhage was reviewed over a 12-month period (July 2003 June 2004) in a tertiary obstetric unit. The hospital record of patients who had PPH during the last one year was evaluated and data of the women in whom B-lynch suture was applied was collected according to inclusion and exclusion criteria. Haemostatic sutures along with B-lynch suture were applied to the patients who had bleeding from the placental bed. The study included 45 women who were admitted through emergency or out patient department in one-year period who were managed with B-Lynch sutures. Data was collected according to a pre-set proforma which included age, parity, gestational age, cause of PPH, estimated blood loss, number of transfusions needed and duration of hospital stay.

Technique: B-lynch suturing technique involves the use of a large mayo needle with #2 chromic catgut to enter and exit the uterus in the lateral lower anterior segment. The stitch is looped over the fundus and another stitch is taken across the posterior lower uterine segment. The stitch is then looped back over the fundus and anchored by entering the lateral lower anterior uterine segment opposite and parallel to the initial bite. The free ends are tied down securely to compress the uterus.

Results:

The age of the patients ranged from 20–35yrs (Table: 1) and parity from 1–6 (Table: 2). Gestational age was from 34–41wks (Table: 3). 36 {80%} women had PPH due to uterine atony, while 9 {20%} had PPH due to placental causes, and none of them had bleeding disorders (Figure I). The estimated blood loss was 1000-1500cc in {33.33%} 15 patients, 1500–2000cc in {62.22%} 28 patients and {4.44%} 2 patients had blood loss more than 2000cc (Figure: II). 15 {33.33%} patients required 3 transfusions, 28 {62.2%} 4 transfusions and only 2 {4.44%} women required 5 transfusions and there is significant association between B-Lynch procedure and blood transfusion (p<.05). In our study the technique proved to be highly successful. Hysterectomy was required in only one patient (failure rate 2.22%) (Figure III). The results showed that uterine atony is more common in patients with higher parity and increasing maternal age. Most of the patients (62.22%) had blood loss of around 2litres and they required four blood transfusions each. 88% of the patients were discharged in less than 10 days Chi-square 29.733 (P<. 05) while the rest required a longer stay (Figure IV). 95.5 % of the respondents achieved haemostatsis with in one hour (0-60 minutes) and is Chi-square 31.60 (P<. 05) statistically significant only 4.4 % of the respondent did not achieve Haemostasis where there was technique failure. The condition of all the patients was satisfactory on discharge.

Fig. I. Causes of PPH

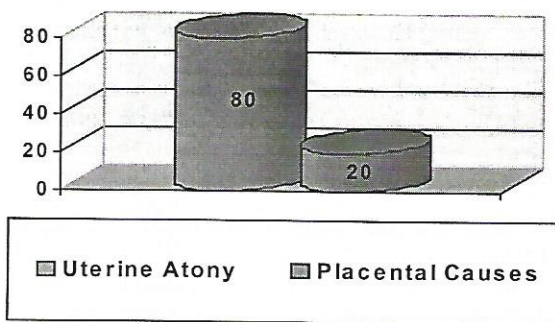


Fig. II. Blood loss

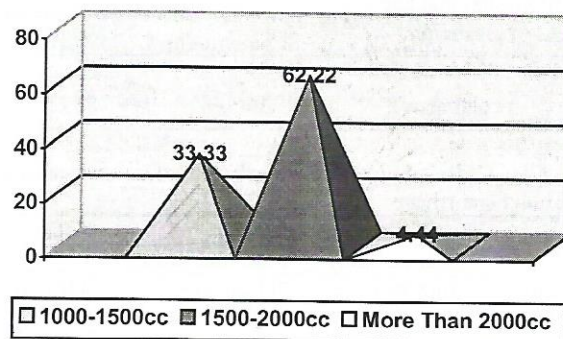


Fig. III Success rate

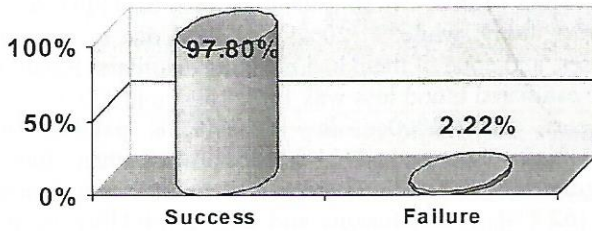


Fig IV Hospital Stay

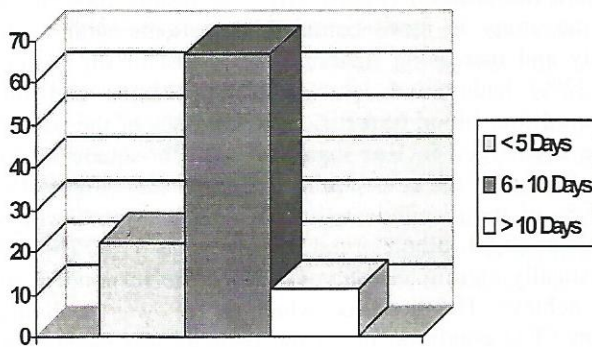


Table I Age distribution

Age	n=	%age
20 – 25	08	17.77
26 – 30	16	35.55
31 – 35	21	46.68

Table II Parity

Parity	n=	%age
Primi para	04	08.80
P ₂₋₄	15	33.33
P ₅ & above	26	57.77

Table III Gestational age

Weeks of Gestation	n=	%age
34 – 36wks	09	20
37 and above	36	80

Table 1.1: Cross tabulation B-Lynch procedure and causes of postpartum hemorrhage

	Causes of PPH		Total
	Uterine atony	Placental causes	
Applied successfully	36(80%)	7(15.6%)	43(95.6%)
Failure	0	2(4.4%)	2(4.4%)
Total	36(80%)	9(20%)	45(100%)

Table 1.2: Cross tabulation B-Lynch procedure and blood loss during procedure:

	Blood Loss during Procedure			Total
	1000-1500ml	1500ml-2000ml	>2000ml	
Applied successfully	15(33.3%)	28(62.2%)	0	43(95.6%)
Failure	0	0	2(4.4%)	2(4.4%)
Total	15(33.3%)	28(62.2%)	2(4.4%)	45(100%)

Table 1.3: Cross tabulation B-Lynch procedure and time for haemostasis:

	Time for Haemostasis			Total
	<30 min	30-60 min	Not achieved	
Applied successfully	32(71.1%)	11(24.4%)	0	43(95.6%)
Failure	0	0	2(4.4%)	2(4.4%)
Total	32(71.1%)	11(24.4%)	2(4.4%)	45(100%)

Discussion:

Any woman who gives birth can have postpartum hemorrhage that can threaten her life. It is one of the leading causes of maternal mortality and serious morbidity in the developing and developed world. We are at the threshold of major changes in its prevention and treatment. The implementation of these changes is an essential part of a wider commitment towards saving mothers from complications of childbirth⁸.

In cases of massive bleeding it is essential to establish mother's cardiovascular status, whether the placenta is delivered or not and look for source of bleeding. These steps should be taken swiftly. If the uterus fails to contract, make it contract manually and with the use of uterotonic agents. Currently there is increasing interest in the use of misoprostol to arrest postpartum hemorrhage⁹. Packing using gauze or inflatable tubes for example Sengstaken – Blake more accompanied by temporary external compression of the uterus has been recommended. It may be effective in some cases^{10, 11}.

Bilateral uterine artery ligation for control of PPH has now become the first line procedure but it is not effective in all the cases¹². If this alone doesn't succeed the vessels of utero-ovarian arcade are similarly ligated, which is reported to be successful in over 90% of cases¹³. Internal iliac artery ligation has been largely replaced by other simpler procedures because the technique is difficult especially with a large uterus, a small transverse incision, a pelvis full of blood and a surgeon who rarely operates in the pelvic retroperitoneal space¹⁴. There is also risk of injury to ureters and external iliac vessels.

Advanced surgical techniques like selective arterial embolization require the services of a radiologist trained in interventional procedures along with proper equipment. It is effective provided the patient is hemo-dynamically stable and in a state to be transferred to the radiology department, which is not possible in cases of massive PPH¹⁵.

One of the simpler surgical procedures, the brace suture is gaining popularity because of its simplicity of application, relative safety, life saving potential and its capacity for preserving the uterus hence fertility¹⁶. In our study out of forty-five women in whom brace suture was applied only one had to undergo hysterectomy. So the success rate was 97.8%. Another advantage of this technique is that it can be easily learnt and the success or failure of the procedure is evident straightaway.

Pakistan is a developing nation, so far has not succeeded in reducing maternal mortality, which still stands out at an alarming figure of {300/100,000 women}. Most women are delivered by traditional birth attendants (TBA) in villages and towns. They already have low hemoglobin levels because of teenage marriages, poor nutrition and lack of birth spacing. They do not have access to medical treatment especially in emergency situations. Delay at primary, secondary and tertiary level, non-availability of health personnel, blood and blood products results in loss of young women – a loss that has serious repercussions on the family. The problem needs to be addressed at both ends. Positive efforts of the government in the right direction and changing the attitudes of the masses so that they become more receptive and cooperate with the health personnel. There is a need to take expert services to the doorstep of the people if we want to reduce maternal mortality.

Conclusion:

Our review of 45 cases found that the B-Lynch compression suture is easy to apply and should be considered primary treatment and also in cases of severe atonic PPH when oxytocic agents fail, and before resorting to hysterectomy. This suturing technique has been successfully applied with no problems to date and no apparent complications.

The B-Lynch suture is a valuable addition to the surgical treatment of postpartum hemorrhage because of its simplicity of application, relative safety, life saving potential and its capacity for preserving the uterus and thus fertility. Satisfactory homeostasis can be assessed immediately after application. We suggest that the B-Lynch suture is a simple procedure and should be tried before more complex interventions are used.

There is clearly a need for larger trials to assess the effectiveness of various treatment options to allow an evidence – based approach to this most dangerous and terrifying obstetric complication.

References

1. Combs CA, Murphy EL, Laros RK Jr. Factors associated with postpartum hemorrhage with vaginal birth. *Obstet Gynaecol* 1991a; 77: 69.
2. Rochat RW, Koonin LM, Atrash HK, Jewett JF. Maternal mortality in United States: report for the maternal mortality collaborative. *Obstet Gynaecol* 1998; 72: 91.
3. Harrison KA. Maternal mortality in developing countries. *Br J Obstet Gynaecol* 1989; 96: 1.
4. Chhabra S, Sirohi R. Trends in maternal mortality due to hemorrhage: two decades of Indian rural observations. *J Obstet Gynaecol*. 2004 Jan; 24(1): 40-3.
5. Drife J. Management of primary postpartum hemorrhage. *Br J Obstet Gynaecol*. 1997; 104: 275–277.
6. Medline Abstract. B-Lynch Suture for postpartum hemorrhage. *Obstet Gynaecol* 2000 Jun; 95(6 pt 2): 1020-2.
7. Fergouson JE, Bourgeois FJ, Underwood PB. B-lynch suture for postpartum hemorrhage. *Obstet Gynaecol* 2000 Jun; 95: 1020–2.
8. El-Refaey H, Rodeck C. Postpartum hemorrhage: definitions, medical and surgical management. A time for change. *Br Med Bull*. 2003; 67: 205–17.
9. G. Justus Hofmyer. New developments in the management of postpartum hemorrhage. *Recent advances in Obstet Gynaecol*; Vol21: 55–66.
10. Druzin ML. Packing of lower uterine segment for control of post caesarean bleeding in instances of placenta praevia. *Surg gynaecol Obstet*. Dec 1989; 169(6): 543–545.
11. Bobrowski RA, Jones TB. A thrombogenic uterine pack for postpartum hemorrhage. *Obstet & Gynaecol* May 1995; 85(5 pt 2): 836–837.
12. O'leary, JL, O'Leary, JA. uterine artery ligation in the control of intractable postpartum hemorrhage. *Am J Obstet Gynaecol* 1996; 94: 920.
13. Abdrzboo, S.A. Stepwise devascularization: a novel technique for management of uncontrolled postpartum hemorrhage with preservation of the uterus. *Am J Obstet Gynaecol*. 1994; 171: 694.
14. Evans, S, McShene, P. The efficacy of internal iliac artery ligation in obstetric hemorrhage. *Surg Gynaecol Obstet*. 1985; 165: 250.
15. Brown, BJ, Heaston, DK, Poulson, AM, et al. uncontrollable postpartum bleeding. A new approach through angiographic arterial embolization. *obstet gynaecol* 1997; 54: 361.
16. B-lynch C; Coker A; Lawal AH; Abu J; Cowen MJ. The B-lynch surgical technique for the control of massive postpartum hemorrhage: an alternative to hysterectomy. *Br J Obstet Gynaecol*. 1997 March, 104; 3: 372–5.
17. Hayman RG, Arulkumaran S, Steer PJ. Uterine compression sutures: surgical management of postpartum hemorrhage. *Obstet Gynecol*. 2002 Mar; 99(3): 502-6.