

Successful Management of Postpartum Hemorrhage Using B-Lynch Suture

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ABSTRACT

Background: Postpartum haemorrhage (PPH) is a life threatening obstetric emergency. In Pakistan 25% of maternal deaths are due to PPH and majority is due to uterine atony. B-Lynch suture is a simple and effective method for control of PPH due to uterine atony as an alternative to more complicated surgery including hysterectomy with loss of fertility and associated psychological morbidity.

Objective: To demonstrate the effectiveness of B-Lynch compression suture in patients with massive postpartum haemorrhage due to uterine atony refractory to medical treatment.

Methods: Prospective observational study conducted at Sobhraj Maternity Hospital, Karachi, from January 1, 2012 to December 31, 2012. Data was collected during the 12 month period for all women who had massive primary postpartum haemorrhage ($\geq 1500\text{ml}$) due to uterine atony refractory to uterotonic agents in whom surgical haemostasis was initiated by applying B-Lynch suture. Patients were followed up at 6 weeks, 6 months and 12 months. The main outcomes evaluated were reduction or cessation of bleeding, whether hysterectomy was needed to control haemorrhage and whether minor or major complications of the procedure arose.

Results: During the 12 months study period 3.1% (152/4782) women had primary postpartum haemorrhage, while massive postpartum haemorrhage occurred in 0.62% (30/4782) cases. Majority of these cases were due to uterine atony (20/30). B-Lynch suture was applied to 16 women who had massive primary postpartum haemorrhage due to uterine atony refractory to uterotonic agents. Effective haemostasis was achieved in all cases. None of the women required hysterectomy. All women later resumed normal menstrual flow without any abnormality. One patient had spontaneous pregnancy after eleven months of her delivery.

Conclusion: B-Lynch suture is effective in the control of massive postpartum haemorrhage as an alternative to hysterectomy, a lifesaving procedure preserving the uterus and thus fertility.

KEY WORDS: *Massive Postpartum Haemorrhage, B-Lynch Suture, Uterine Atony.*

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INTRODUCTION

Postpartum haemorrhage (PPH) is a major cause of worldwide maternal mortality and still associated with significant morbidity despite advances in medical and surgical therapies. PPH complicates up to 18% of all deliveries and accounts for 25-30% of all maternal deaths.^{1,2} In addition 64.7% of severe maternal morbidity is the result of obstetric haemorrhage.³ It is estimated that more than 125000 women worldwide die every year because of obstetric haemorrhage, and 75-90% of casualties are the result of uterine atony.⁴

Conservative methods such as bimanual compression, various uterotonic treatments such as oxytocin, ergometrine, misoprostol and uterine tamponade will control the majority of PPH due to atony. However these methods fail to work in 1% of women.⁵ In these surgical and radiological methods will be required to control the bleeding. Fertility is preserved in 46% of these women by successful arterial embolisation without hysterectomy but is restricted to specialized centres.⁶ Surgical ligation of uterine, internal iliac artery requires skill which may not be normally possessed by the registrar faced with such problem in the middle of the night. Probably some consultants have never done such procedures because of the relative rarity of this emergency obstetric problem.⁷ Uterine compression sutures are successful in avoiding hysterectomy in 82% of women.⁸

B-Lynch suture is a simple and effective uterine compression suture reported with successful outcome for control of life threatening haemorrhage as an alternative to more complicated surgery including hysterectomy with loss of fertility and associated psychological morbidity.⁷ Being simple and easy, it requires lesser skilled personnel, no specialized equipment and is cost effective. In this study we assessed the efficacy of B-Lynch compression suture technique to control PPH refractory to uterotonics in a public sector hospital with limited resources.

METHODOLOGY

During the study period i.e from January 1, 2012 to December 31,2012 all women delivering vaginally or by caesarean section at Sobhraj

Maternity Hospital having massive postpartum haemorrhage (blood loss \geq 1500 ml) refractory to conventional uterotonic agents such as oxytocin, ergometrine, misoprostol,PGF2 alpha, surgical haemostasis was initiated by applying B-Lynch suture originally described by C. B. Lynch in a series of five patients with intractable severe PPH. The procedure is carried out under general anaesthesia with an indwelling urinary catheter. The abdomen is opened by Pfannensteil incision, and a lower segment uterine incision is made or if PPH follows a caesarean section the same incision is used. The uterine cavity is inspected for retained products of conception and evacuated. The uterus is then exteriorised and rechecked to identify any bleeding point. If the bleeding is diffuse and no obvious bleeding point is identified bimanual compression is applied to the uterus to assess the potential chance of success of B-Lynch compression suture. If bleeding is controlled B-Lynch suture is applied using Vicryl No 1 on round body needle. The needle punctures the uterus 3 cm from the right lower edge of the uterine incision and 3 cm from the right lateral border. The suture is then threaded through the uterine cavity to emerge at the upper incision margin 3cm above and approximately 4 cm from the right lateral border. The suture is now passed over the anterior surface of the uterus 3-4 cm medial to the right cornual border and taken downwards along the posterior surface entering the uterine cavity from the posterior wall of the uterus corresponding to a point of the uterine incision on the anterior uterine wall. The suture is then pulled under moderate tension, helped by the manual compression by the assistant and is passed laterally and horizontally to the left side within the uterine cavity, the needle is used to exit via the posterior uterine wall in the lower uterine segment. The suture is then taken upwards along the posterior uterine wall over the fundus, 3-4 cm medial to the left uterine cornua and brought down over the anterior uterine wall, entering the uterine cavity 4 cm from the lateral border and 3cm above the uterine incision. After traversing the uterine cavity, the suture emerges 3cm below the uterine incision and 3 cm medial to the lateral border of the uterine wall. Finally the right and the left side of the sutures are tied anteriorly while the assistant compresses the anterior and posterior uterine walls. The uterine incision is closed and after ensuring normal vaginal bleeding is achieved abdominal wall is closed in layers. The main outcomes evaluated

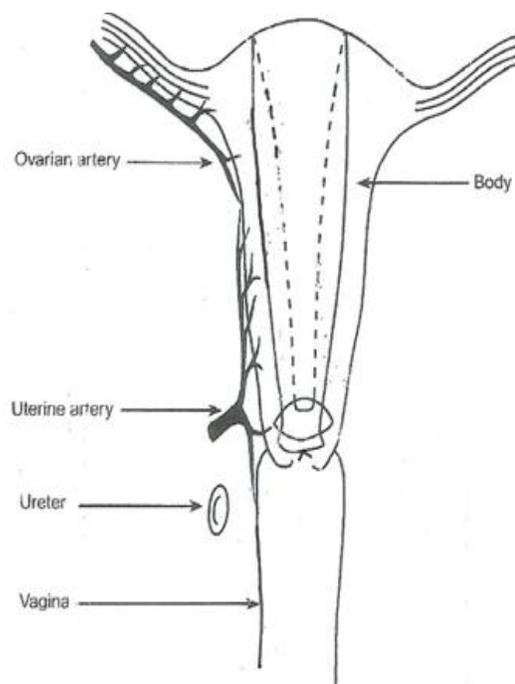
were reduction or cessation of bleeding, whether re-laparotomy or hysterectomy was needed to control haemorrhage and whether minor or major complications of the procedure arose.

All the patients were followed up at 6 weeks, 6 months and 12 months.

RESULTS

During the study period total number of deliveries were 4782. 3.1% (152/4782) of women had PPH (blood loss > 500ml) while massive postpartum haemorrhage (≥ 1500 ml) was encountered in 0.62% cases (30/4782 women). Uterine atony was the cause in 20 cases, B-Lynch suture was applied in 16 cases. Successful haemostasis was achieved in all cases, none of the women required hysterectomy. All the women were followed up for 12 months. There was no ischaemic complication, all women had normal lochia and there was no delay in resumption of normal menstruation. One patient conceived spontaneously after 11 months. Table 1. shows clinical data and outcomes of the 16 cases.

Figure 1. The B-Lynch suture



- suture anterior to the uterus -- suture posterior to the uterus

Table 1: Clinical data and outcome of women managed with B-Lynch suture

Case No	Maternal Age	Parity	Gestational Age	Mode of Delivery	Concomitant Conditions	Estimated Blood Loss (ml)	Blood Transfusions (units)	Outcome
1	25	1	37	Caesarean	Abruption	3000	9 6FFP	Resumed periods
2	28	2	38	Caesarean	Twins	2000	6 4FFP	Resumed periods
3	24	1	38	Caesarean	Prolonged labour	1500	3	Resumed periods
4	21	1	39	Caesarean	Twins	1600	3	Resumed periods
5	23	1	40	Vaginal	Prolonged labour	2000	6 4FFP	Resumed periods
6	22	2	38	Vaginal	Twins	2500	8 4FFP	Resumed periods
7	26	1	38	Caesarean	GDM	2000	6 4FFP	Resumed periods
8	25	0	38	Vaginal	Pre-eclampsia	1800	4 4FFP	Currently Pregnant
9	22	1	38	Vaginal	Abruption	2000	6 6FFP	Resumed periods
10	23	0	39	Vaginal	PIH	2000	6 6FFP	Resumed periods
11	30	0	38	Caesarean	PIH & GDM	2400	8 6FFP	Resumed periods
12	25	1	35	Caesarean	Twins	2000	6 6FFP	Resumed periods
13	27	0	41	Vaginal	--	2000	8 6FFP	Resumed periods
14	20	0	36	Caesarean	Abruption	2300	9 6FFP	Resumed periods

15	22	2	38	Vaginal	Poly-hydramnios	1500	4 4FFP	Resumed periods
16	24	2	37	Caesarean	PIH	2000	6 6FFP	Resumed periods

DISCUSSION

Postpartum haemorrhage is a major cause of worldwide maternal mortality from 13% in developed countries to 34% in developing countries.⁹ In Pakistan, PPH accounts for 25% maternal deaths.¹⁰ 5-17% of deliveries are complicated by PPH.¹¹ In this study we encountered PPH in 3.1% of deliveries. Massive postpartum haemorrhage occurred in 0.62% cases. It is lower compared to population based studies where incidence of massive PPH is reported to be 1.1%.¹² Uterine atony accounted for majority of the cases of PPH in this study which correlates well with other studies.^{13, 14} PPH occurs unpredictably and no woman is exempt from the risk of PPH. The improvement for the conservative management of this life-threatening condition in the past decade includes the invention of B-Lynch suture and its modifications.^{7, 15, 16, 17, 18, 19}

In the study B-Lynch compression suture was effective in controlling haemorrhage in all the cases of PPH due to uterine atony refractory to medical treatment thus avoiding obstetric hysterectomy with loss of fertility and considerable psychological trauma. Similar encouraging results have been reported with uterine compression sutures by B-Lynch, Cho et al, Hayman and El-Hamamy et al.^{7, 15, 16, 20} Overall uterine compression sutures are technically easy and fast to perform with low morbidity and mortality. The rationale is based on haemodynamic studies which showed that uterine compression sutures reduced pelvic blood flow and pulse pressure resulting in venous pressures in the arterial circuit and so promote haemostasis, and the fact that uterine compression suture rapidly reduce the surface

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of the uterine wall from which the placenta was detached.²¹

Other fertility preserving methods include internal iliac artery ligation which needs significant expertise and skill which may not be easily available in emergency situation, similarly arterial embolization requires equipment and skills available only at specialized centres.

In the series there were no complications of ischaemia, haematometra/pyometra and all the patients resumed normal menstruation. However reported complications of uterine compression sutures include pyometra, uterine synechiae, uterine necrosis and in a few cases hysterectomy was not everted because the sutures slid off the uterine fundus.^{22, 23, 24, 25} One of the patients in this series conceived spontaneously. There are other reports of successful pregnancies with uneventful deliveries following compression sutures.

The current study adds to growing body of evidence, showing the effectiveness of uterine compression suture in controlling postpartum haemorrhage and preserving the fertility.^{7, 15, 16, 18, 20}

Data from the study is limited and long term follow-up is lacking. Further large scale studies including larger number of women are required to confirm the potential advantage and safety of this procedure.

CONCLUSION

B-Lynch compression suture appears to be effective in controlling massive haemorrhage due to uterine atony. It is a simple, quick procedure potentially lifesaving, preserving fertility and should be tried before more complex measures are undertaken.

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