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ORIGINAL ARTICLE

B-Lynch suture is effective in controlling postpartum hemorrhage: a prospective observational study

Keriman Nabil Read Abdelhafeez[1], Haney A. Farouk,[1] and Mohamed S. Fahmy[1]

Obstetrics and Gynecology department, Aswan University hospital, Aswan, Egypt

ABSTRACT:

Introduction: Postpartum hemorrhage is the most common form of obstetric hemorrhage and is the leading cause of maternal morbidity and mortality in the world The commonest cause of postpartum hemorrhage is uterine atony. It is a serious obstetrical problem and contributes to 25-43% of all maternal deaths in the developing countries. This suture technique was described by Christopher B-Lynch in 1997 that envelope and compresses the uterus to control life-threatening postpartum hemorrhage. **Purpose:** To study the effectiveness of B-Lynch uterine compression sutures in the control of PPH. **Materials:** study includes 30 patients whom developed severe atonic PPH not responsive to pharmacological measures at department of Obstetrics and Gynecology at Aswan University hospital, in the period between March 2018 and December 2019. **Methods:** A prospective observational study, a total of 30 cases of B-Lynch was performed and results analyzed. **Results:** The procedure was successful in most of the studied cases (86.7%), as no hysterectomy had been done in these patients. On the other hand 13.3% of the studied women had hysterectomy The causative factors accounting for PPH were Placenta previa (43.1%), followed by Abruptio placenta (23.3%) and prolonged/obstructed labour (13.3%) seventy percent of the studied patients (70.0%) had blood loss in the range 1000-1500 ml, whereas 6.7% had a blood loss of more than 2500 ml Slightly more than one quarter of the studied patients (26.8%) did not need any blood transfusion, whereas one third of the patients (33.2%) required one unit and 20.0% of them needed ≥ 3units blood transfusion. **Conclusion:** The application of B lynch suture is was a very effective method to control primary postpartum hemorrhage. It is was a simple suture and technique of application could be learned by every doctor with little practice .The suture can be used to conserve uterus, with little cost of procedure.

Keywords:

Post-partum hemorrhage, Atony, B Lynch suture, Compression sutures

***Corresponding Author:**

Keriman Nabil Read Abdelhafeez1

Mobile: (+20) 01145976543

E-Mail: dr.keri111@gmail.com

INTRODUCTION

Postpartum hemorrhage is the most common form of obstetric hemorrhage and is the leading cause of maternal morbidity and mortality in the world . **[1]**

Postpartum hemorrhage (PPH) can result from uterine atony, retained placental tissue including that from abnormal placentation, maternal genital tract trauma and coagulopathies The commonest cause of postpartum hemorrhage is uterine atony. It is

a serious obstetrical problem and contributes to 25-43% of all maternal deaths in the developing countries. **[2]**

Uterine atony is the major cause of postpartum hemorrhage (PPH), accounting for up to 80% of PPH cases . **[3]**

The treatmentof PPH involves finding and ceasing the cause as soon as possible.

Management includes pharmacological options (oxytocin, ergot alkaloids, prostaglandins, tranexamic acid, etc.) and non-pharmacological options (manual massage, selective arterial embolization, arterial ligation, uterine tamponade, uterine compression sutures and hysterectomy **[4]**

The uterine compression sutures, for the control of PPH, are useful in cases in which bleeding secondary to uterine atony cannot be controlled, and there is the desire to preserve the reproductive capacity. **[5]**

The B-lynch suture is the most well-known uterine compression suture , and described over sewing of the uterus with a continuous suture to apply ongoing compression. Since then, the techniques have been adopted for control of bleeding in severe PPH due to uterine atony as well as placenta previa /accrete. **[6]**

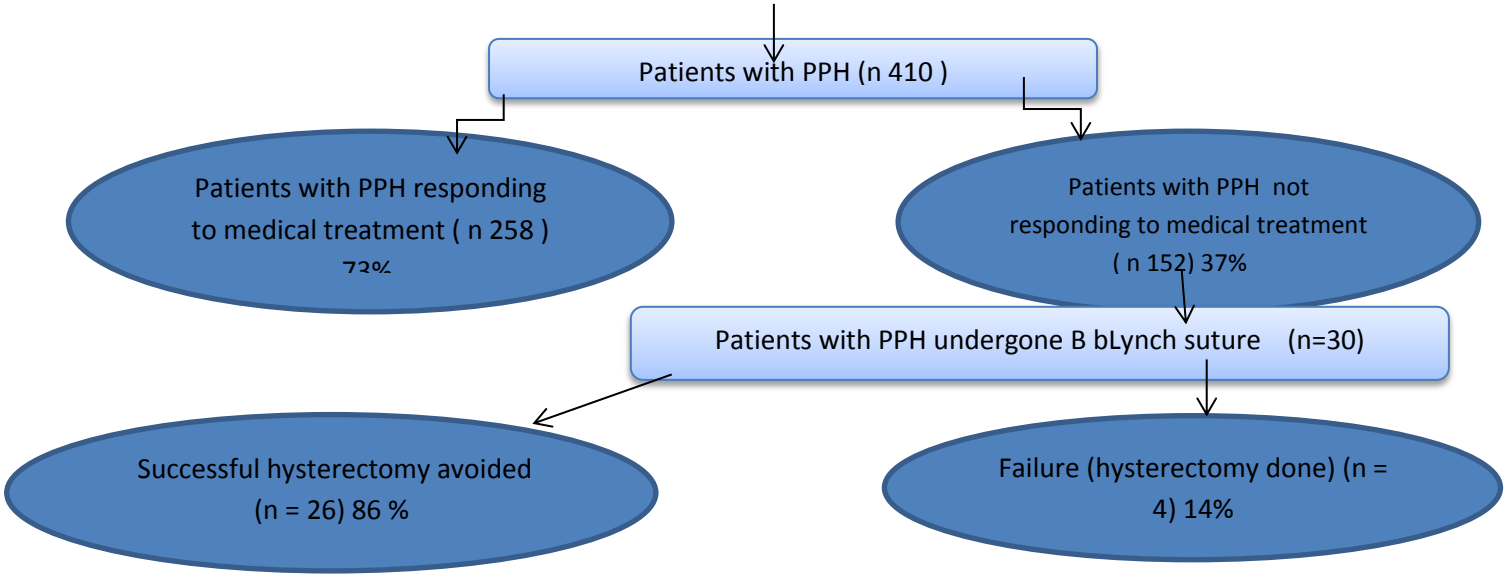
MATERIALS AND METHODS:

A prospective observational study conducted at department of obstetrics and gynecology, Aswan University Hospital () from March 2018 to December 2019 and undergone vaginal or abdominal delivery and had postpartum hemorrhage We used Polyglactin suture materiuan size No. 2 (Vicryle No 2)for B- Lynch Suture. Specialized proforma used to record the information from all these patients, results were calculated in percentages. Patients with other causes of PPH i.e., retained placenta, genital tract trauma, morbidly adherent placenta were excluded from study

After delivery of baby and placenta, oxytocin injected intramuscularly, uterine suture was done by double layer, If uterine atony was detected, oxytocin intravenous, methylergon-ovine maleate (Methergin®), and sulprostone (Nalador®) step by step If the contraction was not improved minutes of medical treatment B-Lynch was used ,exteriorization of the uterus from the abdominal cavity is performed, the suture first begins at 1–2 cm below right inferior edge and 3–4 cm from the lateral border of the cesarean incision without reopening of the uterine cavity ,the suture is then passed to the upper incision margin 1–2 cm above and ~3–4 cm from the left lateral border, not too deep to avoid puncture through the posterior wall ,this is then fed anteriorly and vertically over the fundus and then passed backto posteriorly and downward to enter the posterior wall of uterus at the same level as the upper anterior entry point ,the suture is placed horizontally at the midline of the uterus not too deep to avoid puncture through anterior wall,the suture is fed posteriorly and vertically over the fundus to lie anteriorly and vertically over the fundus on the left side as occurred on the right side. The needle is passed in the samefashion to the left side through the cesarean incision ,the uterus is held inante-flexion position by an assistant, then the suture is pulledundermode-rate tension to hold the uterus in the flexion position, and the suture is tied secure the uterus is placed back into the abdomen and closure of abdominal wall done anatomically

RESULTS

Graphical representation summarizing the study patients and the intervention done to them **Fig (1)**



Fig(1) of the study patients and the interventions given to control the PPH

Table (1): Basic profile of patients / Description of the studied sample

Variable	**No. (n= 30)**	**%**
Age: (years)		
Range	**19-39**	
< 20 year	2	**6.7**
20 to < 35 years	23	**76.7**
≥ 35 year	5	**16.7**
Mean ± SD	**28.8±5.5**	
Gravidity:		
Primi gravida	7	**23.3**
Second gravida	6	**20.0**
Third gravida	4	**13.3**
More than three gravida	13	**43.4**
Gestational age at delivery(weeks):		
Pre-term < 37 weeks	8	**26.7**
Term 37- 42 weeks	22	**73.3**
Post term > 42 weeks	0	**0.0**
Mean ± SD (Range)	**37.3±1.7 (33- 40)**	

Table 1 shows the sociodemographic characteristics and basic profile of the studied sample who underwent B-Lynch suturing. The mean age in this study group was 28.8±5.5 years and nearly three quarters (76.7%) were in the age group range of 20 to < 35 years.. Primigravida constituted 23.3% of the studied patients, while those with more than three gravida represent 43.4%. In this study group, 73.3% were term pregnancies whereas 26.7% were preterm pregnancies with a mean gestational age of 37.3±1.7 weeks.

The risk factors accounting for PPH were Placenta previa (43.1%), followed by Abruptio placenta (23.3%) and prolonged/obstructed labour (13.3%)

Variable	No. (n= 30)	%
Presenting diagnosis/ Causative factor of PPH: ◦		
Atonic postpartum haemorrhage in placenta praevia not accreta	13	**43.1**
Abruptio placenta	7	**23.3**
Prolonged Lab-/Obstructed lab	4	**13.3**
Preeclampsia	3	**10.0**
Gestational. HTN	2	**6.6**
Polyhydraminos	2	**6.6**
Multiple pregnancy	2	**6.6**
Macrosomia	**1**	**3.3**

Table (2) risk factors among the study patients

The procedure was successful in most of the studied cases (86.7%), as no hysterectomy had been done in these patients (table 3). On the other hand 13.3% of the studied women had hysterectomy

Variable	No. (n= 30)	%
Outcome:		
Successful (hysterectomy avoided)	26	**86.7**
Failure (hysterectomy done)	**4**	**13.3**

Table (10): Distribution of outcome

Time required for application of B-Lynch suture in 90 % of cases was in the range (7-20) and 10 % of cases required more than 20 minutes for procedure

Parameter	**Number (n=30)**	**Percentage** %
Time taken to apply the suture from the time of detecting the PPH		
<10 minutes	9	30.0
11 to 20 minutes	18	60.0
>20 minutes	3	10.0
Duration time of procedure (minutes) Mean ± SD (Range)	9 ±2 (7- 14 min)	

Table (4):Time required for application of B-Lynch suture

Discussion

PPH is a life threatening condition when surgical interventions are required , a procedure that is efficient and preserves

fertility is preferable. We report our experience with B-Lynch suture that was developed as uterine-salvaging procedures for the treatment of PPH..

In the present study A total of (30) women who underwent B-lynch suturing for control of PPH during cesarean section The mean age in this study group was 28.8±5.5 years and nearly three quarters (76.7%) were in the age group range of 20 to < 35 years.. This is close to the study done by El-Sokkary et al in (Cairo, Egypt) 2016 where they found that the mean age was 29.3 years.12 [7] This is comparable to the study done by Qadir M, Amir S study 2017 , Pakistan where they found thatthe mean mean age was 27.6 years and the most prevalent age group was 21- 30 years [8] Similarly, Nalini etal reported 28 years mean age.13 On the contrary,Koh et al reported 35 years as the mean age14 [9] ,which can be explained by elderly gravid uterus leading to atonic PPH.The results of our study regarding age were consistent with several other studies

Sixty percent of the studied patients (60.0%) were resided in rural areas. Forty percent of the study sample (40.2%) received secondary education. Primigravida constituted 23.3% of the studied patients, while those with more than three gravida represent 43.4%. This is comparable to the study done by Qadir M, Amir S study 2017 , Pakistan where they found that Majority of patients (57%) were multiparous (71.42%) with most of them induced and augmented at peripheral areas by untrained Dais and Lady Health Visitors These results were almost same as thosenoticed by Sheikh et al in their study where they observed that 51.4% of their study population was multiparous and 74.3% were cases hailing from rural areas.

In this study group, 73.3% were term pregnancies whereas 26.7% were preterm pregnancies with a mean gestational age of 37.3±1.7 weeks

Two thirds of the newborns (66.7%) had birth weight in the range of 2.5-4 kg, and those weighing less than 2.5 kg constituted 26.7% of the cases. The mean birth weight in this study group was 2.8± 1.3 kg This is comparable to the study done by Qadir M, Amir S study 2017 Mean birth weight in our study was 2.9 kg.

Kalkal N et al observed a mean birth weight of 2.7kg in their study with most of the babies weighing between 2-3 kg.18 52.94% of our babies belonged to this range of birth weight.[10]

In comparison average birth weights of 3.49 and 3.5 kg were reported by few authors. Our average birth weight might have got lessened due to the 2 twin deliveries where uterus got atonic and babies were of 2-3kg weight..

The causative factors accounting for atonic PPH were Placenta previa (43.1%), followed by Abruptio placenta (23.3%) and prolonged/obstructed labour (13.3%) Slightly more than one quarter of the studied patients (26.8%) did not need any blood transfusion, whereas one third of the patients (33.2%) required one unit and 20.0% of them needed ≥ 3units blood transfusion. The procedure was successful in most of the studied cases, our success rate was 87%, which is comparable to previous reports, with 4 cases requiring a hysterectomy. Though the evidence for the use of compression sutures is based on case series without proper control groups, it is apparent that uterine compression sutures are successful in- most of the cases and should be incorporated or even be the first line surgical treatment for PPH due to uterine causes. When PPH due to uterine atony appears during cesarean section and does not respond to medical treatment, it is reasonable to perform compression sutures before the patient's condition deteriorates and hemodynamic decompensation occurs..

In our study 4 (13%) cases ended into obstetrical hysterectomy which shows its failure rate. This is comparable with a study conducted in India where 6.67% cases B. Lynch were found to be ineffective in controlling PPH5. Another study conducted in King Edward Medical College. The failure rate was only 2.22% which shows high efficacy of B-Lynch suture. In our study failure cases were only 4 (13%)cases, which ultimately ended into obstetrical hysterectomy. One case was of placenta previa and we were unable to achieve compression, there was massive Hemorrhage

and less availability of Rh–ve blood decision of Obstetrical hysterectomy was done in interest of mother's life. One case was of previous 3 LSCS, lower segment was thinned out and compression didn't achieve to control PPH one case developed DIC and one case was Placenta Previa accrete

This success rate is high and comparable to the result of a case series conducted in Department of Obstetrics and Gynaecology in University of Toronto, Canada where success rate was 92%1 and a study showed 93.75% reduction in hysterectomy due to compression suture7. In another study by Shazia et al. in Civil Hospital Karachi ,Pakistan success rate was 83%4 [11]

This is comparable to the study done by Qadir M, Amir S study 2017 was 92.85%, where out of 14, only one patient ended in caesarean hysterectomy.

B-lynch suture has been declared highly successful in earlier studies where success rates of 100%. (Kalkal N, et al 2016) (Pal M,et al2013) [12] (Vachhani M, Virkud A 2007) [13] , 97.3% (Neelam N, Kumar SJ.2010)[14] 97.78% (. Faruqi NJ, et al 2004) [15] and 93.5% (Ghodake V,et al 2008) [16] has been reported The results are comparable to the study conducted by Vijayasree M at Mamata Medical College, India which also showed 100% improvement in controlling postpartum hemorrhage with B Lynch suture [17] .The results are also comparable to the study conducted by Ashraf M et al at Lady Willington Hospital, Lahore which showed 97% effectiveness of B Lynch suture.[18] The results are also comparable to the study conducted by Neelam N, Kumar SJ et al in 2010, which resulted in more than 97% control of postpartum hemorrhage

This shows that B Lynch suture is very effective and easy way to control postpartum hemorrhage. It is very easy to get expertise of applying B Lynch .All junior doctors can be made expert with little training and the benefit out of it is huge. This is observed in the study that application of B Lynch suture results in saving the uterus of patient which is necessary for future fertility. It also protects female`s life and avoid major surgery i.e., hysterectomy)

The success rate of B-Lynch suture has been reported to be 77 to 82% in several case series. Price and B-Lynch presented a detailed review of 15 published reports which included 46 cases with two failures. [19]

Faruqi et al performed B-Lynch suture on 45 women to control PPH. They applied this suturing technique successfully in 44/45 patients with failure rate of 2.22%.

Choudry Performed B-Lynch suture on 17 patients with refractory PPH of whom 12 were applied at cesarean section and five was a sequel to vaginal delivery. The procedure was successful in 14 patients. Failure of B-Lynch was more with placenta previa, previous CS and DIC. These conclusions were similar to our study [20]

Baskett described larger series of 28 cases, in which hysterectomy was avoided in 23 patients. [21] Wohlmuth et al described 22 cases: 11 cases obtained hemostasis with the B-Lynch suture alone and six cases with the suture and uterine and/or ovarian artery ligation.[22] They had a 77.3% success rate, similar to the 28 cases reported by Baskett, who had an 82.1% success rate..

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CONCLUSION

B-Lynch suture is a valuable addition to surgical management of PPH because of its ease of application, lifesaving potential and its capacity to preserve the uterus. Hysterectomy is associated with morbidity in a young woman in addition to loss of fertility, which can be avoided by application of B-Lynch suture

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