

## COMPRESSION UTERINE SUTURES TRIUMPH OVER EMERGENCY PERIPARTUM HYSTERECTOMY IN INTRACTABLE ATONIC PPH

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### ABSTRACT

#### OBJECTIVE

To study the efficacy and morbidity of uterine compression sutures in the management of intractable severe postpartum haemorrhage.

#### METHOD

A prospective study was done at Muzaffarnagar Medical College, Muzaffarnagar from Jan 2012 to June 2015. There were total 6149 deliveries and 1803 (29.4%) caesarean deliveries and 4346 (70.7%) were vaginal deliveries. Uterine compression sutures B-Lynch and modified B-Lynch (Hayman) sutures were applied in eight patients. A Vicryl No. 1 or catgut No. 2 sutures were used in straight round body needle. Patient was placed in modified lithotomy position to assess the compression effect of uterine compression suture.

#### RESULT

There were eight uterine compression sutures applied in 6149 deliveries (1:800). Five (62.5%) were applied at the time of caesarean and three (37.5%) were applied after vaginal or assisted vaginal deliveries. Hysterectomy was avoided in seven patients and one patient (12.5%) required hysterectomy for intractable bleeding due to DIC. Blood transfusions were given in all patients. Postoperative period was uneventful and there was no maternal death.

#### CONCLUSION

Uterine compression sutures should be considered in case of intractable postpartum haemorrhage (atonic) and it may obviate the need of hysterectomy and other procedures like hypogastric artery ligation, uterine artery/ovarian artery ligation.

#### KEYWORDS

Intractable Postpartum Haemorrhage, Uterine Compression Sutures (B-Lynch, Hayman), Atonic Uterus.

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**INTRODUCTION:** Postpartum haemorrhage is a biggest nightmare for an obstetrician which is sudden, unexpected and frequently catastrophic. For a lone obstetrician working in a small setup geared for simple obstetrics, the sudden onset of postpartum haemorrhage transforms the labour ward into a battlefield calling for a fight between life and death. The clinical picture changes rapidly and before one realises that it is getting out of hand, the patient might have easily gone to a point of no return. If at all there is a situation where complacency has no place, it is the event of postpartum haemorrhage.

Primary postpartum haemorrhage is a major cause of maternal morbidity and mortality in the developing world. India has the highest estimated number of maternal deaths and obstetrical haemorrhage is responsible for a large number of these deaths.

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2-5% of deliveries may lead to PPH with a blood loss of more than 1000 mL within first 24 hours<sup>1</sup>. While the life threatening haemorrhage occurs in 1 in 1000 deliveries<sup>2</sup>, the commonest cause of postpartum haemorrhage is atonic uterus.

Christopher B-lynch et al reported in 1997<sup>3</sup> on B-lynch Brace suture technique for the control of life threatening PPH and in 2002 Hayman RG<sup>4</sup> et al reported on modified B-lynch suture in the management of postpartum haemorrhage with success rate of 100% for intractable bleeding from atony and placenta praevia. We adopted these procedures in our hospital and all cases of intractable PPH treated with above techniques that is B-lynch and Hayman technique sutures (2012-2015).

**MATERIAL METHODS:** A prospective study was done between Jan 2012 to Jun 2015, eight women with intractable postpartum haemorrhage underwent uterine compression sutures at Muzaffarnagar Medical College, Muzaffarnagar where there were 6149 deliveries during this period. The relevant clinical and per operative characteristics of those patients are shown in various tables below.

All women were initially managed by conservative means including administration of oxytocin, Methergine PGF2, misoprostol, manual removal of placenta and tissue and bimanual uterine compression, fluid resuscitation. The uterine compression sutures were applied in those patients with atonic PPH where all medical methods could not control the blood loss.

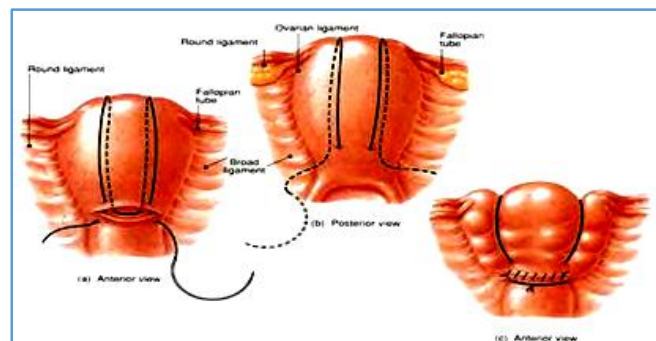
B-lynch compression sutures were applied when atonic PPH occurred during caesarean delivery while Hayman suture (modified B-lynch) were applied where atonic haemorrhage occurred after spontaneous vaginal delivery or assisted vaginal delivery.

Prior to applying uterine compression sutures under general/regional anaesthesia, catheterisation was done and patient was placed in modified lithotomy position to assess the control of bleeding objectively by intermittent swabbing of vagina by an assistant to determine the presence or extent of bleeding.

Abdomen was opened by a Pfannenstiel incision in patients who developed postpartum haemorrhage after vaginal delivery. Bimanual compression was first tried to assess the potential chances of success of the uterine compression sutures.

The technique of B-lynch suture and Hayman suture is shown in Figure-1.

The suture material used was No. 2 chromic catgut or No. 1 Vicryl.



**Figure 1**

Additional sutures were applied, when in the judgement of the obstetrician, there were area of the uterus that were not compressed by above sutures.

| Case No.  | Age (Yrs) | Parity | Maturity (weeks) | Mode of Delivery                        | Aetiology        | Treatment    | Type of sutures                 | Success Y / N | Transfusion (Unit) |
|---|-----------|--------|------------------|---|------------------|--------------|---------------------------------|---------------|--------------------|
| 1.  | 32        | P2     | 36+4             | LSCS/Two Previous LSCS Placenta praevia | Atony Pl Praevia | Conservative | B- Lynch                        | Yes           | 03                 |
| 2.  | 21        | P0     | 40+2             | Vacuum Delivery                         | Atony            | Conservative | Haymann                         | Yes           | 05                 |
| 3.  | 24        | P1     | 38+4             | LSCS/Twin Both breech                   | Atony            | Conservative | B- Lynch                        | Yes           | 03                 |
| 4.  | 25        | P2     | 36+0             | Vaginal Delivery                        | Atony            | Conservative | Hayman Uterine Packing          | Yes           | 06                 |
| 5.  | 27        | P0     | 37+5             | LSCS/prolonged 2 <sup>nd</sup> stage    | Atony            | Conservative | B- Lynch                        | Yes           | 04                 |
| 6.  | 28        | P2     | 39+3             | IOL/Vacuum Delivery                     | Atony            | Conservative | Haymann f/b uterine A. ligation | No            | 10                 |
| 7.  | 25        | P0     | 38+1             | IOL/ Dysfunctiol Labour/LSCS            | Atony            | Conservative | B- Lynch                        | Yes           | 04                 |
| 8.  | 29        | P2     | 39+2             | Abruptio Placenta LSCS                  | Atony            | conservative | B-Lynch                         | Yes           | 03                 |
| <b>Clinical Characteristics of Eight Patients Who Underwent Uterine Compression Sutures</b> |           |        |                  |   |                  |              |                                 |               |                    |

| Sl. No                         | Age in years | Number     |
|--------------------------------|--------------|------------|
| 1                              | 21-25        | 05 (62.5%) |
| 2                              | 26-35        | 03 (37.5%) |
| <b>Demographic Profile-N-8</b> |              |            |

|               |            |
|---------------|------------|
| P0            | 03 (37.5%) |
| P1A1          | 01 (12.5%) |
| P2            | 04 (50%)   |
| <b>Parity</b> |            |

|                         |                |           |
|-------------------------|----------------|-----------|
| 1                       | Spontaneous    | 01(12.5%) |
| 2                       | Vacuum         | 02(25%)   |
| 3                       | Emergency LSCS | 03(37.5%) |
| 4                       | Elective LSCS  | 02(25%)   |
| <b>Mode of Delivery</b> |                |           |

|               |                           |           |
|---------------|---------------------------|-----------|
| 1             | Spontaneous               | 01(12.5%) |
| 2             | Induction of labour       | 02(25%)   |
| 3             | Dysfunctional labour/NPOL | 01(12.5%) |
| <b>Labour</b> |                           |           |

**Indication of LSCS:**

|                             |                              |           |
|-----------------------------|------------------------------|-----------|
| 1                           | Post LSCS (Two) Pregnancy    | 01(12.5%) |
| 2                           | Twin pregnancy (Both Breech) | 01(12.5%) |
| <b><i>Elective LSCS</i></b> |                              |           |

|                              |                           |           |
|------------------------------|---------------------------|-----------|
| 1                            | Dysfunctional labour/NPOL | 01(12.5%) |
| 2                            | Prolonged second stage    | 01(12.5%) |
| 3                            | Abruptio Placenta         | 01(12.5%) |
| <b><i>Emergency LSCS</i></b> |                           |           |

|                              |                 |           |
|------------------------------|-----------------|-----------|
| 1                            | B-Lynch suture  | 05(62.5%) |
| 2                            | Hayman's suture | 03(37.5%) |
| <b><i>Suture Applied</i></b> |                 |           |

|                           |          |         |
|---------------------------|----------|---------|
| 1                         | Regional | 04(50%) |
| 2                         | GA       | 04(50%) |
| <b><i>Anaesthesia</i></b> |          |         |

|                       |           |
|-----------------------|-----------|
| Successful            | 07(87.5%) |
| Hysterectomy(DIC)     | 01(12.5%) |
| <b><i>Outcome</i></b> |           |

**RESULTS:** Eight B-Lynch and modified B-Lynch (Hayman suture) were applied during the period between Jan 2012 to Jun 2015 where total deliveries were 6149 (1:800). There were 1803 LSCS and 4346 vaginal deliveries. Five uterine compression sutures were applied at the time of caesarean delivery and three were done after spontaneous vaginal or assisted vaginal delivery.

Indication of suture was atonic PPH in seven patients and one had placenta praevia with atonic uterus. Hysterectomy was avoided in seven out of eight patients (87.5%). Uterine compression suture failed in one case (12.5%) in which patient detected atonic PPH after vacuum delivery. Type of suture used in failed case was Hayman uterine compression suture. Hysterectomy was done in this patient due to DIC.

Blood transfusion was given in all patients. Postoperative period was uneventful in all patients. There was no maternal death.

The following data were collected from the medical documents:

- Patient's Age.
- Parity.
- Induction of labour yes/no/spontaneous labour.
- Duration of second stage in the case of vaginal delivery.

Or

- Indication of caesarean delivery.
- Use of uterotonic drugs.

- Blood transfusion.
- Method of anaesthesia.
- Additional surgical procedures.
- Preoperative and postoperative Hb and haematocrit changes.
- Need for intensive care.
- Postpartum complications.
- Postpartum stay.

**DISCUSSION:** Aim of the conservative surgical procedure is not only to control PPH with the lowest morbidity but also to preserve a theoretical functional uterus that will not compromise the patient's subsequent fertility and obstetrical outcome.

Saego and associates<sup>5</sup> have reported if emergency postpartum hysterectomy is being contemplated it increases the blood loss, operative time, increased morbidity and transfusion rates in addition to future loss of fertility. A variety of surgical techniques have been proposed to avoid hysterectomy, each is associated with identifiable benefits and risks.

Stepwise devascularisation of uterus i.e. ligation of ovarian, uterine or internal iliac arteries is recommended in most cases of massive haemorrhage.<sup>6</sup> Bilateral uterine vessel ligation/ovarian vessel ligation helpful in 95% of the cases but need experienced surgeon and skill and still can lead to broad ligament haematoma in few cases and this technique failed in cases of placenta praevia and placenta accreta.

Hypogastric artery ligation has been found to be considerably less successful than previously thought. Hypogastric artery ligation is successful in avoiding hysterectomy in 50% of cases. However, delay in carrying out the procedure leads to poor prognosis. It also has a number of recognised potential complications including ligation of external iliac artery, damage to internal/external iliac vein, ureteral injury, and retroperitoneal haematoma.

Uterine packing is another attractive alternative, but there is a significant risk of continued haemorrhage and infection.

Easiest and less morbid surgical conservative procedure should be preferred in cases of failed medical treatment to control PPH.

Uterine compression sutures have now been second line surgical treatment in our algorithm management for PPH. Hypogastric artery ligation being considered before peripartum hysterectomy only by obstetricians with expertise in the technique.

Uterine compression sutures are very useful as an alternative to hysterectomy and other surgical interventions for control of massive postpartum haemorrhage and success is likely even in the cases of placenta praevia and accreta. The net effect of suture is to compress the uterus (As in bimanual compression). The suture material (Chromic catgut and Vicryl) is readily available. Moreover, the technique is simple and safe enough for the residents to learn and apply as identification of specific blood vessels is not required. Conservation of uterus and reproductive capacity as

achieved by uterine compression sutures is its greatest advantage.

More recently, Smith KL and Baskett TF<sup>7</sup> have assessed the use of B-Lynch suture as an alternative to hysterectomy for severe postpartum haemorrhage. In severe cases of uterine atony at the time of caesarean section, which were unresponsive to all oxytocic agents a B-Lynch compression suture was used before resorting to hysterectomy. They were successful in 86% cases in avoiding hysterectomy. In our series, success rate was 87.5%. Smith KL and Baskett TF concluded that the B-Lynch compression suture is easy to apply and should be considered in severe cases of severe atonic uterus when oxytocic agent fails, and before resorting to hysterectomy. Weryeland H, Alag KL, and Lokvik B<sup>8</sup>, have also concluded that stepwise devascularisation and hysterectomy are technically difficult and time consuming while B-Lynch if performed early, is less mutilating to women and can arrest serious postpartum haemorrhage. They showed 100% results in their study. Hence, B-Lynch suturing technique has been successfully applied with no problems to date and no apparent complications. Faruqi et al<sup>9</sup> performed B-Lynch suture on 45 women to control PPH. They applied this suture technique successfully in 44/45 patients with failure rate of 2.22%, though in our series failure rate was 12.5%.

There are no important structures such as great vessels or ureter in the surrounding, so the procedure can be done by residents who lack experience or skill in emergency conditions. There are no complications and patients recover with normal uterine cavities and menstrual flow after surgery. If it is used in early in postpartum bleeding it can prevent more serious blood loss. Because of the short operation time, it is possible to conduct uterine/ovarian and hypogastric artery ligation or stepwise devascularisation after uterine compression sutures fail to control bleeding.

**CONCLUSION:** Obstetric B-Lynch compression suture, therefore, represent a valuable and simple technique and should be tried before more complex and risky surgical interventions when dealing with severe atonic PPH.

The compression B-lynch suture proves to be a successful, safe, inexpensive and simple method for the treatment of intractable atonic PPH which reduces the incidence of mutilating urgent peripartum hysterectomy and preserve subsequent patient fertility. Thus, all obstetric institutions should include this method in their armamentarium of persistent postpartum haemorrhage treatment prior to deciding on hysterectomy.

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