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Easy Gideon Suture VS CERVICO-ISTHMIC Suture with Bilateral Uterine Artery Compression Suture in Management of PPH in A Tertiary Care Hospital of Bihar

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ABSTRACT
OBJECTIVE: *Postpartum haemorrhage (PPH) is a life threatening condition. Compression sutures has been considered as an invasive, effective treatment option to control uterine bleeding. In our study , we aimed to evaluate and compare the clinical efficacy of two types of compression sutures, namely easy Gideon suture and cervico-isthmic suture with bilateral uterine artery compression suture as a life saving intervention in post-partum haemorrhage (PPH).*
METHODS: *This was a prospective randomized controlled trial conducted on 60 women having PPH which was refractory to first-line management and who were treated with either of the two compression sutures applied during caesarean section and outcome studied in terms of time to apply, expertise required, complications in terms of intrauterine adhesions and necrosis.*
RESULTS: *In our study, most of the women were belonging to age group 25-35, unbooked , with mean parity 3. There was intrauterine adhesions in two, uterine wall necrosis in two in the cervico-isthmic suture with bilateral uterine artery compression suture group whereas no such complications in second group. 2 out of 30 in easy Gideon group required hysterectomy to stop bleeding while 3 out of 30 in cervico-isthmic suture with bilateral uterine artery compression suture required hysterectomy.*
CONCLUSION: *Easy Gideon suture and cervico-isthmic suture with bilateral uterine artery compression suture both are invasive, feasible and efficacious for control of PPH, but easy Gideon suture does not pass through uterine cavity, so, no complications occur as in other compression sutures. Both uterine artery as well as anterior and posterior walls are compressed simultaneously which leads to rapid cessation of bleeding.*
KEYWORDS: Compression suture, Easy Gideon suture , cervico-isthmic suture with bilateral uterine artery compression suture , post partum haemorrhage.

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I. INTRODUCTION

World wide, major cause of maternal morbidity and mortality is Obstetrical haemorrhage. World Health Organization, states that obstetrical hemorrhage contributes of 127,000 deaths annually worldwide . PPH is one of the major causes of maternal mortality around the world with a reported incidence of 2-11%. Its reported incidence in India is 2 to 4% after vaginal delivery and 6% after caesarean section . Further more latest figures suggest PPH as the contributory cause of 19.9% of maternal mortality in India.

It is mainly due to retained placental tissues, uterine rupture, coagulopathy, lower genital tract trauma etc. Postpartum haemorrhage is defined as >500 ml approximate blood loss after vaginal delivery or >1000 ml after caesarean section (CS). Diagnosis is to be considered as atonic PPH after excluding uterine and cervical trauma, deficient coagulation or retained placental tissue.

Majority of PPH is due to uterine atony; up to 80% of the cases result from suboptimal contraction of the myometrium following placental separation. The initial treatments for PPH are to administer uterotonic agents, uterine fundal massage, or bi-manual uterine compression . Intrauterine gauze tamponade or an intrauterine balloon catheter may be employed in some cases .When these relatively noninvasive treatments fail to achieve hemostasis, the next step is the use of more invasive treatments requiring laparotomy, including devascularization, iliac artery ligation or, finally, hysterectomy . Transarterial embolization has also become a good alternative.

In 1997, B-Lynch et al. introduced the B-Lynch uterine compression suture. Since then, various uterine compression sutures have been described such as Hayman , Cho , Pereira , Ouahba , or Hackethal suture. These compression sutures require laparotomy but are considered not as invasive as the surgical procedures mentioned above.

Bilateral uterine artery compression technique (Gideon Suture) may be particularly useful because of its simplicity of application. Both sided, uterine artery compression is done and simultaneously anterior and posterior uterine wall compression is done to obliterate uterine cavity there by controlling bleeding during caesarean section if there is PPH. It is life saving, potential relative safety and its capacity for preserving the uterus and thus fertility. In our study , we aimed to evaluate and compare the clinical efficacy of two types of compression sutures, namely easy Gideon suture and cervico-isthmic suture with bilateral uterine artery compression suture as a life saving intervention in post-partum haemorrhage (PPH).

II. METHODS

This was a prospective study conducted during period of june 2020 to 2021 in the department of obstetrics and gynecology at Patna Medical College and Hospital, Patna. The study recruited 60 patients having postpartum haemorrhage after excluding uterine and cervical trauma, deficient coagulation . After obtaining informed consent and satisfying inclusion and exclusion criteria, any of the two compression sutures were applied. In thirty women easy Gideon suture was applied and in rest thirty women, cervico-isthmic suture with bilateral uterine artery compression suture was given and statistical analysis done.

Suture applied in these indicated cases :

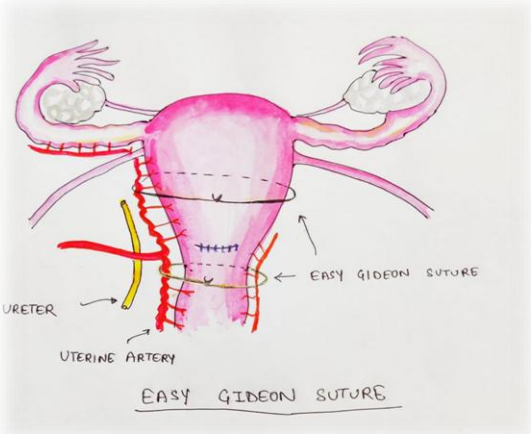
1. Atonic PPH.
2. Placenta Previa.
3. uterine rupture
4. After Suturing of lower uterine segment incision if incision line bleeds.
5. When uterine incision extended laterally and bleeds.
6. In prolonged labour, NPOL, Preeclampsia and Eclampsia, Over distended uterus (large baby or polyhydraminos), multiple pregnancies, multi gravida and obstructed labour as prophylactic method.

This compression suture were applied only in caesarean section not in PPH followed by normal delivery.

EASY GIDEON SUTURE

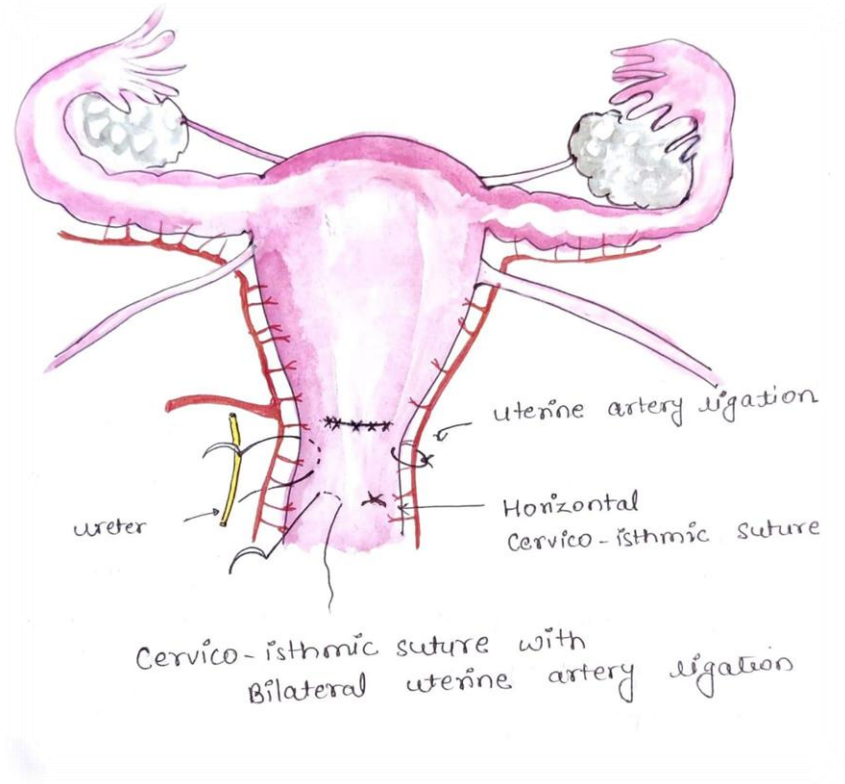
- Uterus was exteriorised.
- Using (vicryl no. 1) absorbable suture needle inserted first on left side at LUS incision, anterior to posterior medial to round ligement and laterally to lateral border of uterus through transparent area (Avascular area of broad ligament).
- Going posteriorly, encircling posterior wall of uterus taking care that omentum or loops of intestine not coming on the way or below suture.
- Then needle is inserted on right side from posterior to anterior side through avascular area, between round ligament and lateral wall of uterus and then a double knot tied in the centre below incision line as tightly as possible.
- Such one or two more sutures can be placed above incision if uterus is atonic.

It can be placed upto the level of fallopian tube insertion (cornual end). The success of the procedure is immediately visible because blood flow through the uterus is stopped and confirmed by perspeculum examination after procedure. Because both sided uterine arteries are compressed tightly as well as both anterior and posterior walls are brought together, obliterating uterine cavity. Haemorrhage is checked immediately. Uterus gives hard feeling.



CERVICO-ISTHMIC SUTURE WITH BILATERAL UTERINE ARTERY COMPRESSION SUTURE

- The uterus was taken out of the abdomen.
- The bladder was pushed down to prevent injury to it and to the ureters.
- Number 2 chromic catgut suture on a straight needle was passed through the uterus above the reflection of the bladder, about 3 cm below the lower edge of uterine incision and 2 cm medial to the lateral edge of lower segment, from anterior wall through posterior wall and brought back from posterior wall through anterior wall about 1 cm medial to entry of the suture and tied anteriorly .
- A pair of closed artery forceps was introduced in the cervical canal through the uterine incision to prevent accidental closure of cervical canal.
- Similar suture was placed on the other side of midline.
- The uterus is grasped and tilted to expose the vessels running through the broad ligament immediately adjacent to the uterus.
- Ideally, place the stitch 2 cm below the level of a transverse lower uterine incision site.
- A large atraumatic (round) needle is used with a heavy absorbable suture. Include almost the full thickness of the myometrium to anchor the stitch and to ensure that the uterine artery and veins are completely included.
- The needle is then passed through an avascular portion of the broad ligament and tied anteriorly.



STATISTICAL ANALYSIS

Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 20 software and presented in figures and tables. Chi-square test was used for comparisons with statistical significance as p value of less than or equal to 0.05.

III. RESULT

Table 1 : sociodemographic and suture statistics

	Easy Gideon suture (N=30)	**Cervico isthmic suture & bilateral uterine artery ligation (N=30)**	**P value**
Age (years)	28.95+-4.91	29.76+-5.02	>0.05
Gravida	3.76+-1.02	3.81+-1.52	>0.05
Gestation (weeks)	37.8+-3.65	36.71+-2.23	>0.05
Elective caesarean section	9	11	>0.05

Emergency caesrean section	21	19	>0.05
Estimated blood loss(L)	2.23+-0.9	2.12+-0.83	>0.05
Predelivery haemoglobin(g/dl)	10.33+-2.72	9.83+-1.82	>0.05
Postdelivery haemoglobin(g/dl)	8.54+-1.72	8.16+-1.62	>0.05
Total blood transfusion (units)	2+-0.6	2+-0.4	>0.05
Time to apply(secs)	45.32+-12.72	223.17+-62.64	<0.05
Fail to stop bleeding	2	3	>0.05
Intrauterine adhesions	0	2	0.013
Uterine wall necrosis	0	2	0.029

S.No.	Easy Gideon suture	Cervico isthmic suture &blateral uterine artery ligation
1.	It compresses uterine artery bilaterally which are travelling upwards on lateral wall of uterus as well as opposes both ant and post walls of uterus resulting in obliteration of uterine cavity.	First uterine artery ligation is done then cervio isthmic sutures are applied.
2.	Very easy, takes 30 to 40 seconds approximately to apply.	Takes lots of time in finding uterine artery first on one side and then on other side. There are chances of ureter ligation also
3.	No need of going through uterine cavity.	One has to pass through uterine cavity from ant to post walls or upto fundus.
4.	Easily learn by any obstetrician because simple technique at CHC level with less facilities performed there are no chances of PPH.	Needs trainings to do these compression sutures because difficult to do.
5.	No penetration through cavity so no chances of complications like Pyometra, Asherman's Syndrome, Haematometra	As there is penetration of cavity so more chances of late complications like Haematometra, Pyometra, Asherman's Syndrome
6.	No uterine wall partial thickness necrosis.	It may be linked to the square dead space in the uterine cavity where endometrial necrosis may occur. Uterine wall partial necrosis can occur. Occluding the cervical lumen is a potential complication.

The descriptive statistics of sociodemographic and suture statistics are described in **Table 1.** Both groups are comparable and showing no significant differences(P>0.05) in terms of age groups among easy Gideon suture were 28.95+-4.91 and cervico-isthmic suture with bilateral uterine artery compression suture were 29.76+-5.02 (p>0.05). Mean gravida among easy Gideon suture was 3.76+-1.02 whereas 3.81+-1.52 among cervico-isthmic suture with bilateral uterine artery compression suture group and belonging to mean gestation of 36-38 weeks which was statistically insignificant (P>0.05). 9 elective caesaren section and 21 emergency caesarean section was in easy Gideon suture group while 11 elective caesaren section and 19 emergency caesarean section in cervico-isthmic suture with bilateral uterine artery compression suture group. Mean estimated blood loss was 2.23+-0.9 l l in easy Gideon suture group while 2.12+-0.83 l in cervico-isthmic suture with bilateral uterine artery compression suture group.

Mean predelivery haemoglobin was 10.33+-2.72 g/dl in easy Gideon suture group while 9.83+-1.82 g/dl in cervico-isthmic suture with bilateral uterine artery compression suture group which was almost equal in both groups. Mean postdelivery haemoglobin was 8.54+-1.72 g/dl in easy Gideon suture while 8.16+-1.62 g/dl in cervico-isthmic suture with bilateral uterine artery compression suture group which was almost equal in both groups. Mean time to apply was 45.32+-12.72 secs in easy Gideon suture group while 223.17+-62.64 secs in cervico-isthmic suture with bilateral uterine artery compression suture group which was statistically significant (P<0.05). Mean blood transfused was 2 and mean hospital stay was 4-5 days in both groups. 2 out of 30 in easy Gideon group required hysterectomy to stop bleeding while 3 out of 30 in cervico-isthmic suture with bilateral uterine artery compression suture required hysterectomy. Out of 30 cases in cervico-isthmic suture with bilateral uterine artery compression suture group, 2 developed intrauterine adhesion complicating to hematometra and 2 developed uterine wall necrosis while none in easy Gideon group developed such type of complications.

IV. DISSCUSSION

Several methods have been described for the treatment of PPH secondary to uterine atony including mechanical and pharmacological methods. If bleeding persists despite these measures, surgical interventions such as uterine artery ligation, hypogastric or internal artery ligation, and finally hysterectomy may be performed.

In 1997, B-Lynch et al described a highly effective surgical technique for the control of postpartum bleeding in five women with PPH: compressing the uterus with two longitudinal sutures along its long axis and preventing the uterus from relaxing and filling with blood. Other techniques for uterine compression sutures have been reported in small case series. Hayman et al described placement of two to four vertical compression sutures from the anterior uterine wall to the posterior uterine wall without hysterotomy. A transverse

cervicoisthmic suture can also be placed if needed to control bleeding from the lower uterine segment. Pereira et al described a technique in which a series of transverse and longitudinal stitches of a delayed absorbable multifilament suture are placed around the uterus via a series of bites into the subserosal myometrium, without entering the uterine cavity. Two or three rows of these sutures are placed in each direction to completely envelope and compress the uterus. Cho et al described another technique, where multiple square sutures using a straight number 7 or 8 needle and number 1 chromic catgut is used to approximate the anterior and posterior uterine walls. The U-type suture was described by Hackethal et al, where the needle was inserted at the ventral uterine wall, led through the posterior wall, and then passed back to the ventral wall where the thread was joined with a flat double knot.

Mukhopadhyay and Arulkumaran modified B-Lynch suture technic to a simpler form. They also advocated isthmiccervical apposition suture in case of persistent bleeding from the lower segment during cesarean section due to placenta previa . This method was also practiced subsequentely by a few workers . Kafali et al effectively employed hemostatic compression cervical sutures approximating anterior and posterior cervical lips in three cases of intractable postpartum hemorrhage originating from the cervical canal. Bilateral uterine artery compression technique (Gideon Suture) may be particularly useful because of its simplicity of application. Both sided, uterine artery compression is done and simultaneously anterior and posterior uterine wall compression is done to obliterate uterine cavity there by controlling bleeding during caesarean section if there is PPH. It is life saving, potential relative safety and its capacity for preserving the uterus and thus fertility. Easy Gideon suture technic is very simple, effective, less time consuming, and if applied properly, has no side effect. Obviously it is a better alternative to major vessel surgery and radical measures like hysterectomy. In our series it was effective in most cases. Hysterectomy was necessary in 2 out of 30cases. On follow up, no complication like cervical stenosis leading to hematometra was seen in any of the cases. This suture technic is a new but effective method to arrest hemorrhage due to placenta previa. However, it requires large trials for acceptance.

V. CONCLUSION

Easy Gideon Suture is very effective, simple to apply, easy to learn for PPH management in caesarean section. As it does not passes through uterine cavity, so no complications occur as seen in other compression sutures. Both uterine artery as well as anterior and posterior walls are compressed simultaneously leading to rapid cessation of bleeding. It can be helpful where less staff and less facilities are there, if this suture is placed we can save the mother due to PPH which is the leading cause of maternal mortality.

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