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Case Series

The compression of myometrium and occlusion of uterine artery by COMOC-MG technique for the management of postpartum haemorrhage: clinical perspective from ten cases

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ABSTRACT

Compression of myometrium and occlusion of uterine artery by Dr. Mahesh Gupta (COMOC-MG) technique is an improved B-lynch stitch technique used to control postpartum hemorrhage (PPH). Objective was to study clinical perspective of the COMOC-MG technique on the effect of PPH in Indian women. Data of 10 patients with PPH who were managed by using the COMOC-MG technique in a tertiary care center in Gujarat from April 2022 to December 2022 were retrieved. Baseline characteristics, medical problems and history of women were recorded. Decision to perform COMOC-MG stitch was taken based on the indications such as PPH, per vaginal bleeding and degree of uterine contractility. Out of 10 women, four women had medical problems such as pregnancy-induced hypertension, dysfunctional uterine bleeding and using psychiatric medicines; two women had uterine surgery/ Laparotomy; four women were diagnosed with ailments such as pregnancy induced hypertension (PIH) and hypertension during the third trimester of pregnancy. Indications such as twins during a previous pregnancy, deflexed head, previous lower segment caesarean section (LSCS) with intrauterine growth restriction (IUGR), breech, prim parity, severe oligohydramnios, placental insufficiency and second baby were considered to carry out the CS delivery. Women were managed by COMOC-MG stitch followed by Misoprostol tablets; Carbetocin, Oxytocin, Methylergometrine and Carboprost injections to control PPH. Mean time between uterine closure to COMOC-MG was 10 min. COMOC-MG stitch resulted in good outcomes in seven patients except one patient had atonic PPH. Out of ten patients, one patient required a hysterectomy and three patients required blood transfusion. COMOC-MG stitch is an easy, simple method to control PPH.

Keywords: COMOC-MG, Postpartum hemorrhage, Polyglycolic acid suture, Modified B-lynch technique

INTRODUCTION

A severe blood loss during childbirth that makes the woman hemodynamically unstable is termed a postpartum hemorrhage (PPH). Maternal bleeding disorders, failure/inadequate uterine contraction, uterine rupture, genital tract trauma and retained placental tissue are major risk factors of PPH. Among these risk factors, uterine

atony (a weak uterus after childbirth) is the most common leading cause of PPH worldwide.¹ Evidence shows that if PPH is not treated on time, it can lead to death even in a healthy woman within two hours. The World Health Organization (WHO) statistics show that about 14 million women experience PPH resulting in about 70,000 maternal deaths per year globally.² In India, maternal mortality due to PPH accounts for 38%.³ However, the incidence of PPH

may vary in vaginal delivery (2-4%), caesarean section (CS) (6%) and uterine atony (about 50%) cases.¹

Maternal mortality can be controlled by a combination of good antenatal care, screening of risk factors, active management of the third stage of labor (AMTSL) and advanced obstetric infrastructure with trained medical personnel.¹ The use of medicine is considered the most important and easy component of the management of PPH. However, prolonged use or overdose may cause water intoxication and hypotension.⁴ The surgical method, B-lynch suturing technique (brace suture) is widely used for the management of PPH.⁵ However, there are major drawbacks such as reopening the C-section scars, sliding in and uterine folding.⁶

The compression of myometrium and occlusion of uterine artery by Dr. Mahesh Gupta (COMOC-MG) is an improved B-lynch technique, invented to overcome the drawbacks of medicines and the B-lynch technique. The technique is represented in Figure 1 and the suture used for this technique which is granted a US patent (United States Design Patent, Patent No: US D909,578 S, dated 2nd February 2021) is represented in Figure 2 at the end of this paragraph.

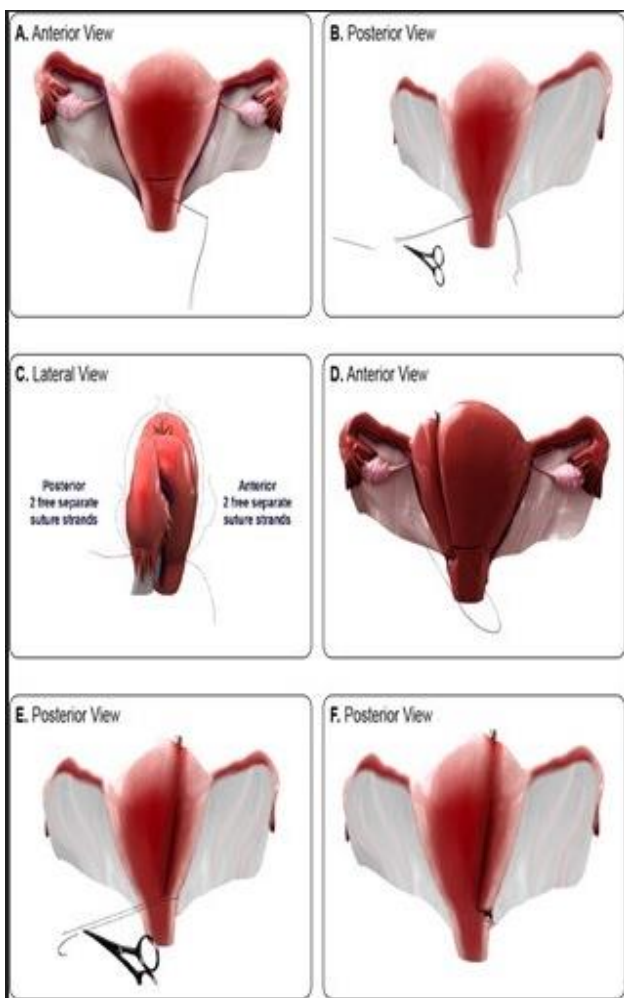


Figure 1: Representation of COMOG-MG technique.

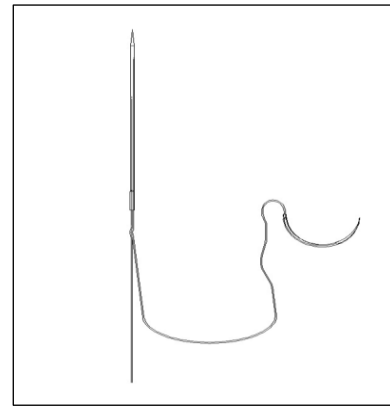


Figure 2: Suture used for COMOG-MG technique.

The main objective of this paper was to study the clinical perspective of the COMOC-MG stitch during CS delivery in the management of PPH.

CASE SERIES

The medical records of a total of ten women who had been managed by COMOC-MG stitch technique for the management of PPH in a tertiary care hospital in Gujarat, India from April 2022 to December 2022 were retrieved and reviewed. As the COMOC-MG stitch was carried out in an emergency situation therefore institutional ethics committee approval was not taken.

The age, gravida, parity, abortus, gestational age and other medical problems were reviewed. History and associated treatment of uterine surgery/laparotomy, infertility, pregnancy, ailments during pregnancy and fetal reduction were recorded. Also, antepartum hemorrhage, maturity at the time of delivery, mode of delivery (normal/CS) and birth weight was documented. The indication for CS, the trial of labor, time for trial, prior medications, placenta separation, indication for COMOC-MG, time between uterine closure to COMOC-MG, outcome, need for hysterectomy and blood transfusion were noted in CS delivery.

For women with poor uterine contraction were managed by uterine massage, bimanual compression and uterotonics in a stepwise manner for the management of PPH. The decision to perform COMOC-MG stitch was taken based on the amount of bleeding within 4 to 5 min after delivery and the degree of uterine contractility.

A total of 10 women received the low transverse CS after delivery. In the COMOC-MG technique, a 3.5-inch-long straight needle (Trugut®/ Truglyde®, Healthium Medtech Pvt. Ltd.) and chromic catgut or polyglycolic acid suture with a 40 mm round needle were used. The stepwise procedure of the COMOC-MG technique was already mentioned in the publication of Dr. Mahesh Gupta in 2020. In brief, exteriorization of the uterus was done and punctured the uterus about 3 cm below and medial to the uterine incision. The suture was taken out posteriorly from

the uterine wall. The loop was cut to obtain 2 free limbs. The anterior side of the uterus wall also has two limbs of the suture. Then one limb from the anterior and another limb from the posterior wall of the uterus from the same suture strand was tied at the top of the uterus. The round body needle using the uterine artery occluded. A similar procedure was used for the other side of the uterus. The uterus was compressed by an assistant and the surgeon used moderate tension, with a suture, to hold the uterus. Another assistant was asked to look for any vaginal bleeding. The abdominal wall was closed.⁷

Data were statistically described in terms of the median with minimum and maximum range, mean with standard deviation and numbers when appropriate. A total of 10 women were not responded to other conservative measures. Hence, COMOC-MG stitch was used to manage the PPH.

Demographic parameters of women include age, gravida, parity, living, gestational age at delivery, other medical problems and associated treatment are mentioned in Table 1.

Table 1: Demographic characteristics of women.

Characteristics	Median (min-max)
Age (years)	28 (21-34)
Gravida	1 (1-2)
Parity	0 (0-2)
Living	0 (0-1)
Gestation age (weeks)	40 (40-40.14)
Maturity at time of delivery (weeks)	36 (36-39)
Baby I weight (kg)	2.7 (1.4-2.9)
Baby II weight (kg)	2.225 (1.9-2.8)
Time for trial (min)	2 (2-30)

Total of four women were with other medical problems such as pregnancy-induced hypertension (PIH), hypertension, a history of dysfunctional uterine bleeding (DUB) before pregnancy and a history of using psychiatric medicines. Two women had a history of uterine surgery/laparotomy such as lower segment caesarean section (LSCS).

Seven women had a history of infertility. Out of which four women naturally conceived, five women conceived through assisted reproductive technology (ART) techniques such as ovarian stimulation followed by Intrauterine insemination (IUI) or *in vitro* fertilization (IVF).

Seven women delivered single baby and four women delivered twins. There was no history of fetal reduction and antepartum haemorrhage in ten women. Four women diagnosed with the ailments such as PIH and hypertension during third trimester of pregnancy. These ailments were managed by using Nifedipine (10 mg BD) or labetalol (100

mg BD). There were total nine cases of CS delivery and one women delivered twins one by vaginally and one by CS. No abortions were recorded in ten women.

The following indication such as, twins with a previous pregnancy (n=3), deflexed head (n=1), previous LSCS with IUGR (n=3), breech (n=1), prim parity, severe oligohydramnios, placental insufficiency (n=1) and second baby (n=1) were considered to carry out the CS delivery. Total of six women given prior- Misoprostol tablet. Carbetocin injection was given to 9 pts. Oxytocin injection was given to 9 pts. Methylergometrine injection was given to 7 pts. Carboprost injection was given to 8 pts. Manual and spontaneous placenta separation was done for two and eight patients, respectively. Following indications such as atonic PPH (n=6), per vaginal bleeding after CS (n=01), Prophylactic (n=01) and PPH (n=01) were considered to carry out the COMOG-MG stitch. The mean time between uterine closure to COMOC-MG was 10 min (range 5-20 min) was recorded.

The decision of COMOC-MG stitch resulted in good outcome in seven patients except one patient had atonic PPH. Out of ten patients, one patient required hysterectomy and three patients required the blood transfusion.

DISCUSSION

According to WHO, a blood loss of ≥ 500 ml within 24 hours after delivery is known as primary PPH.² PPH has been a major concern since centuries, it is a leading cause of maternal mortality worldwide. Around 600,000 maternal deaths were reported worldwide every year and 99% of these occur mainly in developing countries. Out of which 25% of deaths were reported due to PPH.⁸ Maternal mortality in developing countries contributes to a significant health problem. More than 50% of maternal deaths occurred in developing countries and where the lifetime risk of maternal death is 10 times higher than that in high-income countries.²

Antepartum hemorrhage, augmented labor, chorioamnionitis, fetal macrosomia, maternal anemia, maternal obesity, multifetal gestation, preeclampsia, prim parity and prolonged labor may lead to PPH. However, around 20% of PPH occurs with no risk factors in pregnant women. Hence, physicians must be prepared for action to manage PPH in every delivery.⁴

The strategic planning to prevent and decrease morbidity and mortality is the active management of PPH. The planning includes the choice of delivery in women at high risk of hemorrhage at hospitals with available medicinal, surgical, intensive care, and blood bank facilities. The stepwise approach includes the administration of oxytocin to the anterior shoulder soon after the delivery, controlled cord traction to deliver the placenta and uterine massage after delivery of the placenta.⁴ The use of medications such as Oxytocin is the first-line agent widely used for the

prevention and management of PPH. However, prolonged use and overdose may cause water intoxication and hypotension following caesarean delivery. The following second-line agents-carboprost, methylergonovine, misoprostol and tranexamic acid are also widely used for the prevention and management of PPH. However, carboprost cannot be used in patients with asthma, renal, cardiac and hepatic cardiac disease. Methylergonovine and misoprostol cannot be used in hypertensive patients. Tranexamic acid is also used with caution in patients with renal impairment.⁴

The surgical method, B-lynch suturing technique is simple to apply, safe, life-saving potential, capacity to preserve the uterus and fertility.⁴ However, there are four major drawbacks of B-lynch technique such as: B-lynch suture requires incision of the uterus or reopening the C-section scars and delays incision closure; the longitudinal sutures may migrate to the middle of the uterine fundus i.e. sliding in” and resulting in no compression at the periphery; a too tightly tied B-lynch suture may result in “uterine folding”; and a longitudinal suture may push the uterine fundus in a cephalad to caudal direction, possibly resulting in the uterine fundus being inverted.⁵

The COMOC-MG is a registered trademark (ID: 3175301). COMOC-MG has double action such as hemostatic compression and decreased uterine blood flow. The COMOC-MG stitch is simple, effective and harmless alternative option to B-lynch for the successful management of atonic PPH. COMOC-MG stitch technique has the potential to preserve fertility.⁷

The COMOC-MG stitch has great potential to manage PPH successfully during a caesarean section. COMOC-MG stitch can be used for the medical treatment of PPH. The double mechanism of COMOC-MG stitch decreased or stopped bleeding. Hence, the COMOC-MG stitch may aid in controlling PPH during the caesarean section.⁷

The COMOC-MG stitch uses only puncture to the uterus. It permits the free drainage of blood and associated material from the material uterine cavity and avoids reopening of uterine incision. The success rate of using COMOC-MG in PPH is in line with previously reported evidence of atonic PPH.⁹

COMOC-MG technique can be used for therapeutic and prophylactic management of PPH. The decision should be taken as early as possible to intensify the success of PPH. The simplicity, practicality, ease of application and safety make this technique very trustworthy. This technique also controls the undue pressure on the suture lines. Therefore, COMOC-MG will be a procedure of choice in uncontrolled PPH. The advantages of COMOC-MG can be enlisted as a simple, effective and safe alternative option to B-lynch for the successful management of PPH. COMOC-MG stitch technique has the potential to preserve fertility with fewer complications in the management of PPH. It's too early to draw a strong conclusion regarding

the effectiveness of the COMOC-MG technique due to limited evidences. Retrospective study of a small sample size are important limitations of this study. However, clinical data with large sample size is needed to confirm the potential advantages in PPH setting.

CONCLUSION

The COMOC-MG a simple technique requiring an only puncture on the uterus. It is safe and economical, with the potential to reduce transfusion requirements and hysterectomy rate for active management of PPH in women with a decreased degree of uterine contractility after delivery. The COMOC-MG stitch will be life-saving for women with PPH.

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