ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 05 | May - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

THE ASHOK ANAND STITCH: A SAVIOUR IN MORBIDLY ADHERENT CENTRAL PLACENTA PREVIA

Obstetrics & Gynaecology

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ABSTRACT

Background: The Ashok Anand (AA) stitch is a simple technique to reduce the intraoperative blood loss from the lower uterine segment in cases of central placenta previa and morbidly adherent placenta previa, by obliterating the vast collateral supply, thereby reducing the need of blood transfusion and obstetric hysterectomy. **Methods:** A descriptive case-control study conducted in the department of Obstetrics and Gynecology at a tertiary care hospital in Mumbai for a period of three years from January 2019 to December 2021. A total of 35 patients of complete placenta previa including those with morbidly adherent placenta previa in whom the AA stitch was used were compared to 35 patients of placenta previa who were managed without the AA stitch. Case records were critically analyzed for blood loss, requirement of blood transfusion and need for obstetric hysterectomy and maternal mortality. **Result:** 35 patients of central placenta previa, including those with morbidly adherent placenta in whom the AA stitch was applied were studied. Average blood loss was 320 mL and 23% of the patients required blood transfusion. None of them required obstetric hysterectomy and there was no maternal mortality. **Conclusion:** AA stitch is a simple, less invasive, effective technique which bilaterally obliterates the collaterals and end arteries supplying the lower segment of uterus. This stitch thereby controls the lower segment bleeding in cases of complete placenta previa and morbidly adherent placenta previa during caesarian section. AA stitch thus avoids the need of blood transfusion, obstetric hysterectomy and also decreases maternal morbidity and mortality.

KEYWORDS

Placenta previa, AA stitch, post-partum hemorrhage, obstetric hysterectomy.

INTRODUCTION

Obstetrics is a bloody business. Being a challenge to every obstetrician, obstetric hemorrhage is a catastrophic event and a leading cause for maternal death, responsible for 25% of maternal mortalities.[1] In cases of central placenta previa, especially when the placenta is morbidly adherent, massive pelvic hemorrhage is inevitable and life threatening, owing to the highly vascular and friable nature of the lower uterine segment. The lower uterine segment is taken up in the last trimester and during labor, the uterine contractions result in placental separation, often resulting in a large amount of blood loss. In addition to this, the vessels at the placental bed have no muscular layer because of their remodeling by the trophoblast cells in order to make it a low-pressure system. Myometrial fibers of the lower uterine segment inherently fail to contract, and thereby fail to constrict the torn blood vessels resulting in significant obstetric postpartum hemorrhage, which is difficult to control by oxytocics and by other routine measures taken for PPH. This type of bleeding complicates 3 - 5 out of 1000 pregnancies and is a leading cause of perinatal and maternal mortality worldwide. Placenta previa is frequently associated with the placenta being morbidly adherent, characterized by abnormally implanted, invasive or adhered placenta with partial or total absence of the decidua basalis and imperfect development of the fibrinoid or Nitabuch's layer, making it a serious complication[2].

The incidence of placenta previa and morbidly adherent placenta is gradually increasing owing to the increase in the incidence of cesarean section. The incidence of Cesarean section has increased from 7% in 1990 to 21% in 2021 and are projected to continue increasing in the current decade. The rates of placenta previa and accreta increases with increase in the maternal age, parity, and with use of assisted reproductive technology (ART). The rate increases linearly with the number of previous caesarean deliveries or following uterine curettage. Rates are 40% higher among twin pregnancies[3]. Placenta previa has also been linked to maternal complications like massive hemorrhage- ante, intra and post- partum hemorrhage, hypovolemic shock, need for multiple blood and blood product transfusions, urogenital injuries, emergency obstetric hysterectomies, sepsis, disseminated intravascular coagulation, admission to intensive care unit (ICU) and prolonged hospital stay[4].

Over time, with the need to control hemorrhage in cases of placenta previa and morbidly adherent placenta, a number of techniques that are subject to timely modifications have been introduced throughout the world with varying efficacy to control obstetric hemorrhage, mainly by devascularizing the lower uterine segment. Taking hemostatic sutures in the placental bed could cause cut-through of the placental bed tissue, leading to further blood loss. Bilateral uterine artery ligation to devascularize the lower segment is helpful[5], but only to some extent. Other methods such as bilateral internal iliac artery ligation, uterine artery catheterization, ballooning and embolization have been routinely practiced[6], with a success rate of only about 70%, but with the disadvantage of being time-consuming, expensive, requiring skilled surgeons with surgical and technical expertise and interventional radiologists, sophisticated equipment and intensive care. This, most often is not feasible in the lower socio-economic strata and in Government hospitals. Management of placenta previa especially morbidly adherent placenta previa is indeed a challenging task and despite the advent of various alternative options, surgery remains the mainstay of treatment and is still every obstetrician's worst nightmare.

The Ashok Anand's life-saving stitch, incepted in 2007, and put into practice in over 250 cases since then, is an easy, simple, inexpensive, less invasive and a rapidly effective technique in controlling lower segment bleeding in cases of placenta previa and accreta during cesarean section, thus efficiently decreasing blood loss and avoiding the need for blood transfusions and obstetric hysterectomy, thus decreasing the possible risk of increased maternal morbidity and mortality.

MATERIALS AND METHOD

A descriptive case-control study conducted in the department of Obstetrics and Gynecology at a tertiary care hospital in Mumbai for a period of three years from January 2019 to December 2021. A total of 35 patients of complete placenta previa including those with morbidly adherent placenta in whom the AA stitch was used were compared to 35 patients of placenta previa who were managed without the AA stitch. Case records were critically analyzed for blood loss, requirement of blood transfusion and need for obstetric hysterectomy and maternal mortality.

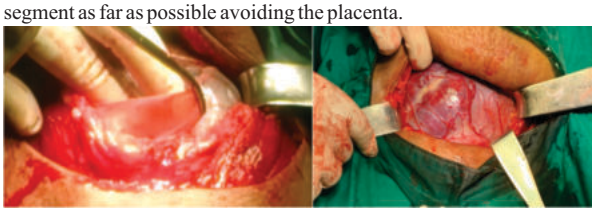
Requirement

1. A straight needle (No.18 triangular straight needle) or a long-curved needle is required to negotiate the lower uterine segment which is usually ballooned out when the placenta is previa.
2. Polyglactin 910 Number 1 suture

Technique

1. The patient is operated in supine position under spinal or general

anesthesia.
2. Once the abdomen is opened, the bladder is pushed down well below the cervix, and then the uterine incision is taken in the lower uterine segment as far as possible avoiding the placenta.



[**Figure 1-**Pushing the bladder below the cervix]

3. After the delivery of the baby, the umbilical cord is clamped and cut and the uterus is exteriorized and the placenta is kept in-situ by applying pressure on it with sterile mops.

[**Figure 2-** Exterioring the uterus after delivery of the baby keeping the placenta in-situ]

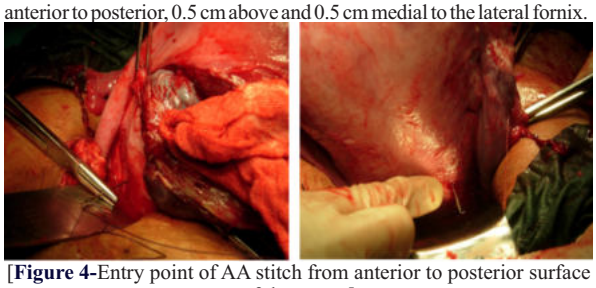
4. Bilateral uterine arteries (descending cervical branch) are ligated with braided coated Polyglactin 910 number 1 on round body needle (40 mm ½ circle)

[**Figure 3-** Bilateral Uterine artery ligation]

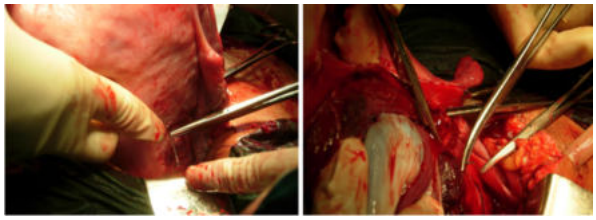
5. The assistant holds the uterus in a central upright position. A spade or any other retractor can be used to guard the intestines behind the uterus to avoid any injury.

6. **The Ashok Anand (AA) Stitch**: Polyglactin 910 Number 1 suture material is mounted on a straight needle (No.18 triangular straight needle or of surgeons preference).

The mounted needle is inserted into the cervical musculature, from anterior to posterior, 0.5 cm above and 0.5 cm medial to the lateral fornix.



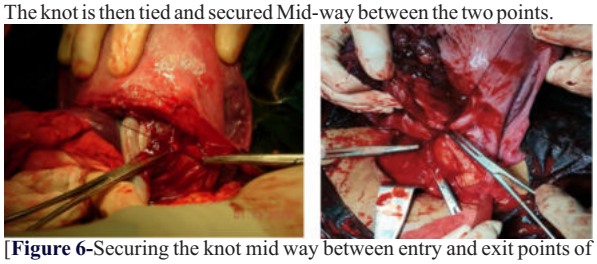
[**Figure 4-**Entry point of AA stitch from anterior to posterior surface of the uterus]



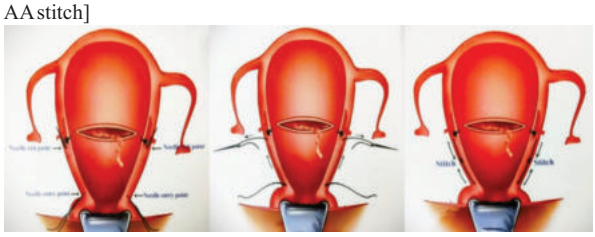
[**Figure 5-** Exit point of AA stitch from posterior to anterior surface of the uterus]

The same needle with suture material is re-inserted from posterior to anterior about 0.5 cm below the lower edge of the uterine incision on the same side.

The knot is then tied and secured Mid-way between the two points.



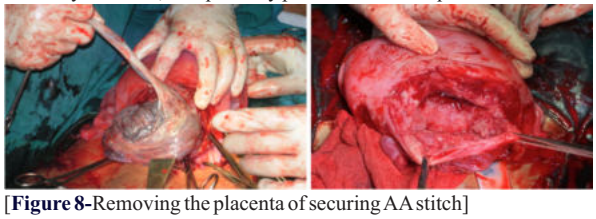
[**Figure 6-**Securing the knot mid way between entry and exit points of AA stitch]



[**Figure 7-**Schematic representation of AA stitch]

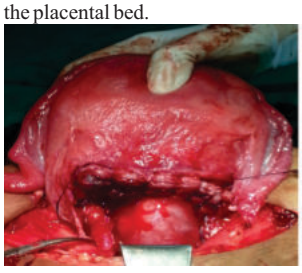
7. Similar steps are repeated on the other side.

8. Once the sutures are taken, the lower uterine segment is de-vascularized, after which the placenta can be removed even when it is morbidly adherent, if required by piece-meal technique.



[**Figure 8-**Removing the placenta of securing AA stitch]

9. The uterine incision is then closed after confirming hemostasis from the placental bed.



[**Figure 9-**Closure of uterine incision]

[**Figure 10-**Blood loss during the surgery]

RESULTS

In this comparison study, 35 cases of placenta previa including those with morbidly adherent placenta previa in whom the AA stitch was taken is compared to 35 cases of placenta previa in whom the AA stitch was not taken.

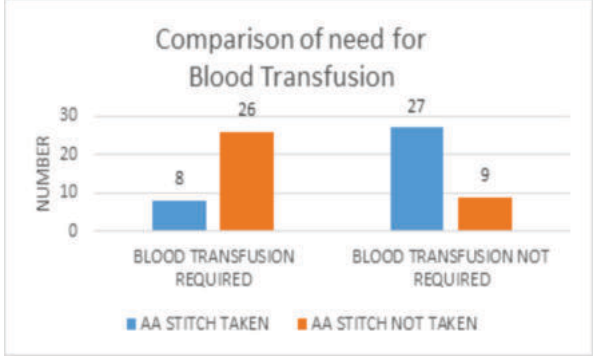


Chart 1-Analysis and comparison of requirement of blood transfusion

Table 1-Analysis And Comparison Of Blood Loss With AA Stitch And Without AA Stitch

Blood loss	Minimum (mL)	Maximum (mL)	Average (mL)
With AA stitch	150	1200	321
Without AA stitch	450	3800	1015

In the study group, with AA stitch taken, the minimum blood loss was 150 mL and maximum blood loss of 1200 mL and the average blood loss was found to be 321 mL. In comparison, in the control group without taking AA Stitch, the minimum blood loss was 450 mL and maximum was 3800 mL. The average blood loss in management without the AA stitch was 1015 mL.

In the management of placenta previa with AA stitch, 23% of cases required blood transfusion (for non-placental bleeding), in comparison, 74% of cases required blood transfusion when AA Stitch was not taken.

Table 2- Analysis And Comparison Of Need For Obstetric Hysterectomy

Obstetric Hysterectomy	Required	Not required
With AA stitch	0	35
Without AA stitch	8	27

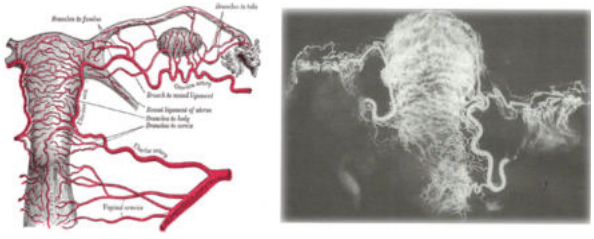
In cases where AA stitch was taken, none of them required obstetric hysterectomy, whereas obstetric hysterectomy was performed in 8 out of the 35 cases when AA Stitch was not taken, corresponding to 22.8%.

4. Analysis Of Maternal Mortality

In the control group, one maternal mortality was encountered wherein the patient had morbidly adherent placenta previa, with intra-operative blood loss of 3800 mL, and was incidentally, also suffering from Covid 19 Pneumonia. However, in cases where AA stitch was taken, there was no maternal mortality.

DISCUSSION

The Ashok Anand stitch is based on the blood supply to the lower uterine segment. The blood supply to the uterus is primarily from the Uterine and Ovarian Vessels. The lower uterine segment and the cervix is supplied by the descending cervical branch and smaller cervical circumflex arteries[5]. When the placenta is praevia, the majority (75%) of the blood supply to the lower segment is primarily through the collaterals.



[**Figure 11-** Schematic and MRI picture showing blood supply to uterus and cervix]

The Ashok Anand Stitch completely obliterates these collaterals and end arteries prior to the placental separation, thereby devascularizing the lower segment. This stitch hence, controls the lower segment bleeding in cases of placenta previa and morbidly adherent placenta previa during caesarian section, which usually leads to severe antepartum and postpartum hemorrhage, thereby leading to hemorrhagic shock. Blood loss is managed by replacing the volume by blood and blood product. Amount of blood loss also depends on the type of placenta previa. When the stitch is taken little medially, there will occur a swelling, due to bleeding in the dead space, thus proving the basis of the stitch on table. Sometimes, the stitch may have to be repeated when it gets loosened after placenta is removed.

Our study showed that the average amount of blood loss with the AA stitch was about 300mL, in comparison to 100mL in those whom the AA stitch was not taken. In the management of cases of placenta previa without any intervention, the range of blood loss was found to be 500-2000 mL.[7]

8 out of 35 patients required obstetric hysterectomy when AA stitch was not taken, whereas none of the cases required obstetric hysterectomy when AA stitch was taken. A retrospective analysis of cases of placenta accreta in Turkey[8], revealed that the need for an obstetric hysterectomy in cases of placenta accreta ranged from 15 to 94% with bilateral internal iliac ligation and without any intervention respectively, 1.4 % cases of placenta previa and 68% of placenta accreta required obstetric hysterectomy.

Our study shows significant reduction in blood loss, need for blood transfusion and obstetric hysterectomy when the AA stitch was implemented, thereby reducing maternal morbidity and mortality, often saving the life of a mother and her uterus for future fertility.

CONCLUSION

The stitch was incepted by Dr. Ashok R. Anand on November 19, 2007 on a staff-nurse with placenta previa with previous LSCS and pre-eclampsia with intractable bleeding on-table. With pure scientific basis of devascularizing the lower segment by bilaterally occluding the collaterals that supply it, this stitch proved to be efficient in life-saving ways. It has been implemented in over 250 cases of placenta previa, amongst which around 50 cases had a morbidly adherent placenta. The average blood loss in amounts to ~150mL in uncomplicated placenta previa to ~350 mL in morbidly adherent placenta previa. There hasn't been a single case of simple placenta previa that required hysterectomy and in the 15 years of its use, only 5 cases of morbidly adherent placenta previa required a hysterectomy, because the placenta could not be separated, but with controlled bleeding. Owing to the promising results of the stitch, it was patented on 1st March, 2013 in Dr. Ashok Anand's name.

It is a simple and easy technique, requiring only about 10 minutes, without the need for any sophisticated instruments and can be done in any set-up with only minimal surgical skills and expertise. It is indeed, a saviour stitch, especially in settings where only limited resources are available. AA stitch avoids the need for multiple blood transfusions, obstetric hysterectomy and maternal death due to postpartum hemorrhage. More interestingly, the stitch does not affect the future fertility, and till date has shown no complications and nor is any expected.

Declarations

Funding: None

Conflict of interest: None

Ethical approval: not required

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