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Original Research Article

Comparative Study of Efficacy of Ashok Anand Stitch with Internal Iliac Ligation in Cases of Placenta Previa

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ABSTRACT

Introduction: Massive pelvic hemorrhage is a feared complication during cases of central placenta previa and morbidly adherent placenta. It can be life threatening.
Background: To avoid the need for blood transfusions, obstetric hysterectomy and possible risk to mothers' life in cases of placenta previa during cesarean section delivery, a new simple innovative technique developed by Dr ASHOK ANAND known as Ashok Anand's stitch.
Methods: In this study we analysed 35 cases of placenta previa (including cases of morbidly adherent placenta) where ASHOK ANAND STITCH was taken, in terms of blood loss, blood transfusion requirement and cesarean hysterectomy. The results were compared with that of other studies where internal iliac ligation was done in cases of placenta previa.
Results: The results were compared on the basis of blood loss, need for blood transfusions and the need for obstetric hysterectomy with the modalities practiced.
Discussion: This stitch is based on the reasoning that taking the stitch bilaterally occludes the collaterals supplying the lower segment. As these are end arteries, their occlusion causes hemostasis in the lower segment.
Conclusions: Ashok Anand's stitch is a simple and effective technique in controlling lower segment bleeding in cases of placenta previa during cesarean section thus avoiding the need for blood transfusions for operative blood loss and obstetric hysterectomy. The technique is easy to apply, less invasive and does not require any special instruments. It can be life-saving.
Keywords: Ashok Anand Stitch, Internal Iliac Blood Loss

INTRODUCTION

Haemorrhage, hypertension and sepsis are 3 main horsemen of pregnant and labouring women. Haemorrhage is one of the most important cause of maternal mortality. Obstetrics is a bloody business and central placenta previa and more so if the placenta is morbidly adherent, is a nightmare of an obstetrician and can be life threatening. One of the effective and time tested method of controlling sever pelvic hemorrhage is ligation of both internal iliac arteries ligation (IIAL) as these are the major source of blood supply to the pelvic viscera. But it requires expertise and experience.

Bleeding from the placental bed in cases of placenta previa is a commonly faced, less discussed issue till date. The highly vascular and friable lower segment which forms the placental bed is slow to retract and the greater the time it takes, more severe is the blood loss. Taking hemostatic sutures in the placental bed is difficult and most often placental bed tissue cut through leading to further blood loss. When the placenta is previa majority of blood supply comes from the collaterals which are developed and therefore descending cervical artery ligation usually fails.

In this study we are comparing the efficacy of ASHOK ANAND STITCH [1] (an effective method discovered, practiced with successful results) with studies where internal iliac ligation in cases of placenta previa was done and others where no intervention was done.

The accompanying figures illustrate this technique (Figure 1-5).

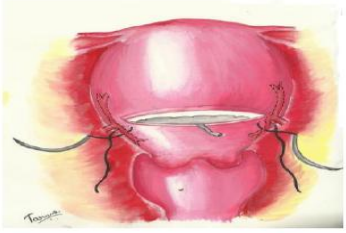

Figure 1: Uterine artery ligation; Bilateral uterine arteries (descending cervical branch) are ligated with braided coated Polyglactin 910 on number 1 round body needle (40mm, ½ circle).

Figure 2: Ashok Anand's stitch- Anterior view; Polyglactin 910 number 1 is mounted on a straight needle (18 no triangular straight). Needle is inserted into the cervix, from anterior to posterior, 1cm above the level of lateral fornix and 0.5cm medially from lateral cervical musculature. The same needle and suture is reinserted from posterior to anterior 0.5cm below the lower edge of the uterine incision on the same side.

Figure 3: Ashok Anand's Stitch- Posterior View; Posterior view of uterus showing the stitch. The needle exits posteriorly, 1cm above the level of lateral fornix on the same side and reenters the uterus from posterior to anterior 0.5 cm below the level of lower edge of uterine incision.

Figure 4: Ashok Anand's stitch- final view; Anterior view of the uterus showing the suture tied midway between the entry and exit points.

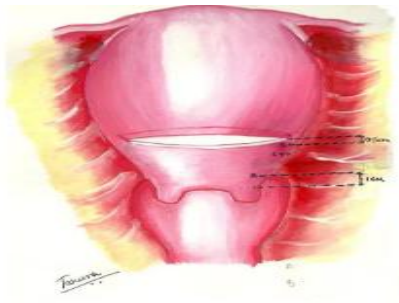

Figure 5: Schematic diagram showing the entry and exit points in Ashok Anand's stitch; A- Point of insertion of needle from anterior to posterior (1cm above the level of lateral fornix, 0.5cm medially to lateral border of cervix), B-Point of reinsertion of needle from posterior to anterior (0.5cm below the lower margin of uterine incision, 2 cm medial to the lateral uterine margin), C-Point midway between A and B anteriorly where the knot is tied.

Background

Ashok Anand's Stitch (AA Stitch) [1]

It is a simple, least invasive, cost effective, time saving and rapidly effective method to control lower uterine segment blood loss in such cases. It was discovered on the operating table on 19 Nov, 2007 by Dr. Ashok Anand, Professor in Obstetrics and Gynaecology, Grant Medical College and Sir JJ Group of Hospitals, Mumbai, in an attempt to control postpartum hemorrhage in a case of previous cesarean

delivery with central morbidly adherent placenta previa. This technique has been successfully applied to several cases of placenta previa operated in the last 7 years at JJ Hospital with no apparent complications till date, negligible requirement of blood transfusion for operative blood loss and no obstetric hysterectomies. The results were spontaneously seen once the stitch is taken. Future fertility is not affected.

Technique

The technique can be described as follows:

1. The patient is kept in a supine position under spinal/general anesthesia.
2. After delivery of the baby by lower segment cesarean section, umbilical cord is clamped and cut and uterus is exteriorized with placenta in situ.
3. Both uterine angles are secured with braided coated Polyglactin 910 number 1 on round body needle (40mm ½ circle).
4. Bilateral uterine arteries (descending cervical branch) are ligated with the same suture. Bladder is pushed down further.
5. The assistant holds the uterus in central upright position. A spade or any other retractor can be used to retract the intestines behind the uterus to avoid injury.
6. Polyglactin 910 number 1 is mounted on a straight needle (18 no triangular straight) or surgeons preference and inserted into the cervix, from anterior to posterior, 1cm above the level of lateral fornix and 0.5cm medially from lateral cervical musculature.
7. The same needle and suture is reinserted from posterior to anterior 0.5cm below the lower edge of the uterine incision on the same side.
8. The knot is then tied and secured midway between the two points.
9. Similar steps are repeated on the other side.
10. As soon as the sutures are taken, the lower segment is devascularized and then the placenta can be easily removed even if it is morbidly adherent.
11. The placental bed is found to be dry with no active bleeding.
12. The uterine incision is then closed.

Internal Iliac Ligation

Ligation of the internal iliac artery can be performed either via an open approach. A midline incision is made. Viscera are packed away to the contralateral side of pelvis. The bifurcation of the iliac artery is identified via two landmarks, the sacral promontory and an imaginary line through both antero superior iliac spines. The peritoneum can be incised longitudinally directly over the iliac bifurcation and extended proximally and distally for a few centimeters. The medial peritoneal flap and medial pelvic contents are retracted medially and the lateral flap retracted laterally. Blunt dissection is then performed around the vessels opening the areola tissue. Once the bifurcation is exposed, the hypogastric artery is confirmed as the branch coming off at right angles and coursing medially and inferiorly. The external iliac artery is visually confirmed as traversing laterally and superiorly over the psoas muscles to form the common femoral artery beneath the inguinal ligament. Careful and meticulous dissection is performed to separate the internal iliac artery from the veins. A right-angled forceps is used to separate the plane between artery and vein and to isolate and control the artery with a silastic loop. The internal iliac artery is then ligated.

MATERIALS AND METHODS

In this study we analysed 35 cases of placenta previa (including cases of morbidly adherent placenta) where ASHOK ANAND STITCH was taken, in terms of blood loss, blood transfusion requirement and cesarean hysterectomy. The results were compared with that of other studies where internal iliac ligation was done in cases of placenta previa.

RESULTS

In 35 cases in which Ashok Anand stitch was taken, by using standardized visual estimation of blood loss using fixed mop and container, it was found that in 33 cases blood loss was between 100 to 200 ml and in 2 cases it was more than 1000ml (which were cases of morbidly adherent central placenta with prior blood loss)

In comparison, study of Yavuz SIMSEK et al in 2012 [2] studied the efficacy of internal iliac ligation in cases of post partum haemorrhage. Total 13 cases were subjected to BIAL, out of which 7 were done for cases of placenta previa (including 1 case of increta and percreta each). The mean blood loss was 1423 ml. Nighat Sultana et l in 2011 [3] studied 32 cases of MAP. BIAL was done in 17 patients, blood loss estimation 1500-2800 ml. Walker M.G. et al in 2013 [4] studied 33 women with placenta previa and increta-percreta (diagnosed by ultrasound and/or magnetic resonance imaging). Interventional radiology consultation and preoperative placement of balloon catheters in the anterior divisions of the internal iliac arteries in 26/33 patients, 24/33 patients required blood transfusions.

In comparison, study of Evsen MS et al in 2012 [5] for 41 cases of placenta accreta, estimated blood loss was >2 liters. Sumigama S et al in 2007 [6] retrospectively studied 408 cases of placenta previa. Mean intraoperation blood loss was (increta) and 12,140 +/- 8343 g (percreta). Ojha N [7] in 2007 analysed 70 patients undergoing LSCS for placenta previa. 1/3 rd patients (31.4%) had blood loss more than 500ml. 4 cases had blood loss more than 1000ml and 2 cases had blood loss more than 2000ml. Iwata A et al in 2010 evaluated the effect of internal iliac ligation as a bleeding control during cesarean hysterectomy for placenta accreta. Among 23 cases, the mean blood loss during the operation and the length of hospitalization after the operation, with or without internal iliac artery ligation (IIAL) were not significantly different. There was no significant difference between the mean blood loss and the pathological findings of cases managed with IIAL. In cases of placenta previa accreta, ligation of the internal iliac artery did not significantly contribute to hemostasis during cesarean hysterectomy.

TABLE NO.1 – Comparison of blood loss in various Studies.

Study	Intervention	Blood	Loss	Estimation
AA STITCH (35 cases of placenta previa)	AA STITCH	100-200 ml (33/35 cases)	>1000 ml (2/35 cases, morbidly adherent central placenta)	Blood loss was measured after taking the stitch. The maximum blood loss was 2000ml and minimum was 10ml, with mean of 260ml.
Yavuz SIMSEK et al (7 cases of BIAL for placenta previa/13 total cases of BIAL	BIAL	1423 ml		
Nighat Sultana et al (17 cases subjected to BIAL out of 32 cases of MAP)	BIAL	1500 – 2800 ml		
Walker MG et al (26 cases subjected to BIAL out of 33 cases of Placenta previa including MAP)	BIA Balloon Catheters	2000 ml		
Evsen MS et al (41 cases of placenta accreta)	None	Approx. >2000 ml		
Sumigama S et al (431 cases of placenta previa)	None	3630 +/- 2216 g (placenta increta)	12,140 +/- 8343 g (placenta percreta)	
Ojha N (70 cases of placenta previa)	None	>500 ml (1/3rd cases)	>1000ml (4 cases)	>2000ml (2 cases)

In 35 cases in which Ashok Anand stitch was taken, blood transfusion was required in 4 cases.

TABLE NO.2 - Comparison of blood transfusion requirement in various Studies

Study	Intervention	Blood transfusion requirement
AA STITCH (35 cases)	AA Stitch	11.4 % cases
Yavuz SIMSEK et al (7 cases of BIAL for placenta previa/13 total cases of BIAL	BIAL	100% cases
Nighat Sultana et al (17 cases subjected to BIAL out of 32 cases of MAP)	BIAL	100% cases
Leena Wadhwa et al (2 cases subjected to BIAL out of 12 cases of MAP)	BIAL	100% cases
Walker MG et al (26 cases subjected to BIAL out of 33 cases of Placenta previa including MAP)	BIA Balloon Catheters	73% cases
Fouzia Parveen et al (4 cases of BIAL for placenta previa/8 total cases of BIAL)	BIAL	100% cases
Evsen MS et al (41 cases of placenta accreta)	NONE	100% cases
Ojha N (70 cases)	NONE	14.3% cases

In comparison, study of Fouzia Perveen et al in 2011 [8] of eight patients who underwent BIAL in their department (3 had placenta previa and 1 had placenta increta), all patients required multiple blood and blood product transfusions. In comparison study of Yavuz SIMSEK et al in 2012[2] studied the efficacy of internal iliac ligation in cases of post partum haemorrhage. Total 13 cases were subjected to BIAL, out of which 7 were done for cases of placenta previa (including 1 cases of increta and percreta each). 100% cases required blood transfusions. Nighat Sultana et al in 2011 [3] studied 32 cases of MAP. BIAL was done in 17 patients, 100% cases required blood transfusions. Walker M.G. et al in 2013 [4] studied 33 women with placenta previa and increta-percreta (diagnosed by ultrasound and/or magnetic resonance imaging). Interventional radiology consultation and preoperative placement of balloon catheters in the anterior divisions of the internal iliac arteries in 26/33 patients, 24/33 (73%) patients required blood transfusions. The blood loss was approximately 2000 ml.

In the study of Evsen MS et al in 2012 [5] (in 41 cases of placenta accreta) all patients required blood products transfusion. In the study of Ojha N in 2007 [7] (70 patients undergoing LSCS for placenta previa), 10 patients (14.3%) required blood transfusion and 1 patient (91.4%) required OH.

None of the cases in which the stitch was taken, required an obstetric hysterectomy (including 10 cases of morbidly adherent placenta).

In comparison, study of Joshi V et al in 2007 [9] where 88 women underwent therapeutic IAL, 25 had placenta previa , 21 had IAL as an emergency procedure, 3 (14.3 %) required OH, salvage rate was 85.7% , 4 had prophylactic IAL , no OH was required , salvage rate was 100%. In the study of Fouzia Perveen et al in 2011 [8] (of eight patients who underwent BIAL in their department, 3 had placenta previa and 1 had placenta increta), 2 (50%) patients required OH. In comparison study of Yavuz SIMSEK et al in 2012, [2] studied the efficacy of internal iliac ligation in cases of post partum haemorrhage. Total 13 cases were subjected to BIAL, out of which 7 were done for cases of placenta previa (including 1 cases of increta and percreta each). 15% cases required OH. Nighat Sultana et l in 2011 [3] studied 32 cases of MAP. BIAL was done in 17 patients, 12(70.5%) cases required OH. Walker M.G. et al in 2013 [4] studied 33 women with placenta previa and increta-percreta (diagnosed by ultrasound and/or magnetic resonance imaging). Interventional radiology consultation and preoperative placement of balloon catheters in the anterior divisions of the internal iliac arteries

in 26/33 patients, 31/33 (94%) cases required OH. Leena Wadhwa in 2013 [10] analyses the data of 12 patients with clinical diagnosis of morbidly adherent placenta was reviewed. BIAL was done in 2 patients. 2/12 (16.6%) cases with BIAL and 9/12 (75%) cases without BIAL required OH.

TABLE NO.3 - Comparison of need for obstetric hysterectomy in various Studies

Study	Intervention	Need for obstetric Hysterectomy
AA Stitch (35 cases, including 10 cases of morbidly adherent placenta)	AA STITCH	0 , salvage rate 100%
Joshi V et al (88 women underwent therapeutic IAL, 25 had placenta previa , 21 had IAL as an emergency procedure)	BIAL	3 (14.3%) required OH, salvage rate was 85.7% , 4 had prophylactic IAL , no OH was required , salvage rate was 100%
Fouzia Perveen et al in (eight patients who underwent BIAL in their department, 3 had placenta previa and 1 had placenta increta)	BIAL	2 (50%)
Yavuz SIMSEK et al (7 cases of BIAL for placenta previa/13 total cases of BIAL)	BIAL	1 (15%)
Nighat Sultana et al (17 cases subjected to BIAL out of 32 cases of MAP)	BIAL	12 (70.5%)
Leena Wadhwa et al (2 cases subjected to BIAL out of 12 cases of MAP)	BIAL	2/12 (16.6%) with BIAL and 9/12 (75%) without BIAL
Walker MG et al (26 cases subjected to BIAL out of 33 cases of Placenta previa including MAP)	BIA Balloon Catheters	31 (94%)
Evsen MS et al (41 cases of placenta accreta)	NONE	28 (68.3%)
Ishii T et al (37 cases who underwent caesarian section due to placenta previa/low-lying placenta)	NONE	4 (11%)
Ojha N (70 cases undergoing LSCS for placenta previa	NONE	1 (1.4%)

In the study of Evsen MS et al in 2012 [5] (in 41 cases of placenta accreta), OH was required in 28 (68.3%) of 41 women with placenta accreta and uterine preservation was achieved in 13 (31.7%) of them. In the study of Ishii T et al in 2012 (analysis of 37 patients who underwent caesarian section due to placenta previa/low-lying placenta), 4 (11%) underwent OH due to placenta accreta and 33 (89%) were treated conservatively. In the study of Ojha N in 2007 [7] (analysis of 70 patients undergoing LSCS for placenta previa), 1 patient (1.4%) required OH. Iwata A et al in 2010 [11] evaluated the effect of internal iliac ligation as a bleeding control during cesarean hysterectomy for placenta accreta. Among 23 cases, the mean blood loss during the operation and the length of hospitalization after the operation, with or without internal iliac artery ligation (IIAL) were not significantly different. There was no significant difference between the mean blood loss and the pathological findings of cases managed with IIAL. In cases of placenta previa accreta, ligation of the internal iliac artery did not significantly contribute to hemostasis during cesarean hysterectomy.

DISCUSSION

In all the cases of placenta previa in which Ashok Anand stitch was taken and blood transfusion was required, it was mainly because of either anemia in women or due to departmental protocol of arranging blood prophylactically. In placenta previa, blood loss is mainly after the separation of the placenta and that too from the lower segment because lower segment is not able to contract. When the placenta is previa the major blood supply along with uterine

arteries are the collaterals, hence uterine artery ligation alone does not help. Ashok Anand stitch is based on the reasoning that taking the stitch bilaterally occludes the collaterals supplying the lower segment. As these are end arteries, their occlusion causes hemostasis in the lower segment.

In developed countries and at well-equipped centers where facilities of blood and blood products, intensive care and skilled surgeons are available, such complications can be managed with help of uterine artery catheterization, ballooning and embolization. This also requires specialized, expensive equipments and technical expertise. In underdeveloped and developing countries with scant resources and sometimes even in developed countries with resources, it can become a nightmare for everyone.

This stitch has a very low learning curve, does not require any special instruments or suture material. It can be performed easily and safely and has life saving efficacy. The results are instantaneous and no complications are expected as the stitch goes through the myometrium. In remote rural areas where thousands of mortalities occur due to placenta previa and also in tertiary care centres like medical colleges which receive a lot of referred cases is a life saving modality. In this study we compared the efficacy of ASHOK ANAND STITCH with other studies where internal iliac ligation was done in cases of placenta previa in terms of blood loss, blood transfusion requirement and requirement of caesarean hysterectomy and other studies where no intervention is used. Clearly ASHOK ANAND STITCH is a far better and life saving modality for managing cases of placenta previa as compared to internal iliac ligation done for the same.

CONCLUSION

Decreasing the maternal mortality rate is the first and most important goal in obstetric care. Appropriate and expert surgical intervention is the solution when hemorrhage does not stop, despite aggressive medical treatment. In earlier times peripartum hysterectomy was the only hope for cases of severe postpartum haemorrhage. Obstetricians found of newer surgical modalities when uterus preservation and fertility was questioned.

Internal iliac ligation is one of them. It is a time-tested method used by obstetricians since many years. Though it has proved to be quite effective in cases of massive haemorrhage, it is known that it had failed many a times and finally a hysterectomy was needed. At the same time it is not a simple procedure which can be practiced by all obstetricians especially juniors (who deal with maximum obstetric cases, more so in remote areas of India), and can lead to disastrous iatrogenic injuries.

Ashok Anand's stitch can thus be used in cases of placenta previa during cesarean delivery as a simple and effective method for controlling postpartum hemorrhage. Ashok Anand stich is very effective as it devascularises lower segment even before the placental sinuses are open. The basic science behind the success of this stitch is the fact that it completely devascularises the vessels causing the problem (the COLLATERALS in cases of placenta previa).

It is easy to take & does not require expertise; it is not time consuming, does not require any special material or instrument & does not affect the future fertility. It can be of major help to the surgeons, mainly in developing countries and in the setting of limited resources for avoiding blood transfusions and modalities like obstetric hysterectomy.

Conflicts of Interest: Nil
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