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Research Article

Multistep approach for control of postpartum hemorrhage in placenta accreta: a novel scheme in a tertiary referral center

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ABSTRACT

Background: Placenta accreta is a major cause for massive postpartum hemorrhage and consequent obstetric hysterectomy. Incidence is rising secondary to increased rates of caesarian delivery worldwide.

Methods: From January 2014 to January 2016, 25 women with anterior low-lying placenta and previous caesarian section(s) were recruited at El-Shatby Maternity university hospital in Alexandria, Egypt. Cases had previous 1-4 lower segment caesarian deliveries. Cases were diagnosed as placenta accreta by ultrasonographic examination on admission to hospital. Elective surgery was done at 36-37 weeks. Mid line abdominal incision with upper segment uterine incision with plication of lowers uterine segment with transverse compression sutures.

Results: We present a clinical trial for conservative management of placenta accreta in 25 cases with 19 cases [76%] successfully managed without hysterectomy.

Conclusions: Conservative management of placenta accreta can be successfully performed in young age females desiring fertility.

Keywords: Placenta, Accreta, Hysterectomy, Ultrasound, Hemorrhage

INTRODUCTION

Postpartum haemorrhage (PPH) is a leading cause of maternal mortality worldwide and is responsible for approximately 25% of all maternal deaths. Placental abnormalities are a major contributor to obstetric haemorrhage. The most common placental abnormalities are placental abruption, placenta previa, and an adherent (accrete, increta, or percreta).¹ Placenta accreta is one of the most serious complications of anterior placenta previa with previous lower segment caesarian delivery. Invasion of the placental tissue into the myometrium occurs with varying degree, resulting in deficient contraction of lower uterine segment and haemostasis at the placental bed. It is associated with severe obstetric haemorrhage usually necessitating hysterectomy.²

Several methods were proposed for control of haemorrhage, with no gold standard method agreed upon yet in literature.

Aim of the study was to evaluate the efficacy of lower segment plication and compression sutures at the placental bed to control bleeding in cases of placenta accreta avoiding hysterectomy.

METHODS

From January 2014 to January 2016, 25 women with anterior low-lying placenta and previous caesarian section(s) were recruited at El-Shatby Maternity university hospital in Alexandria, Egypt. This hospital is a tertiary center for 3 governorates in Egypt with population exceeding 10 million and caesarian section rate approaching 40% of all deliveries. This study was approved by the Ethics Committee of the hospital and a written informed consent form was signed by the women and/or their nearest relatives before the operation. Cases had previous 1-4 lower segment caesarian deliveries. Cases were diagnosed as placenta accreta by ultrasonographic examination on admission to hospital. Criteria for ultrasonographic diagnosis were:³

1. Location of placenta: anterior placenta previa
2. Loss of retro placental clear space
3. Irregularity of uterine bladder interface: caused by abnormal bridging vasculature that is easily seen with Doppler ultrasound
4. Thinning of uterine bladder interface. The smallest myometrial thickness in sagittal plane <1 mm
5. Placenta lacunar spaces: spaces are graded according to Finberg and Williams as follows:
 - Grade 0: no lacunar spaces are seen
 - Grade 1: 1-3 lacunar spaces present and generally small
 - Grade 2: 4-6 lacunar spaces present and tending to be larger and more irregular
 - Grade 3: many lacunar spaces throughout the placenta and appearing large and bizarre.
6. Placental bulge: deviation of the uterine serosa away from the expected plane
7. Focal exophytic mass
8. Bridging vessels: Doppler colored mapping demonstrates abnormal vasculature that bridge from placental mass to uterine bladder interface
9. Utero-vesicle hyper vascularity
10. Sub-placental hyper vascularity
11. Placental lacunae feeder vessels.

Cases underwent elective caesarian delivery at 36-37 weeks gestation with the following steps (Figure 1-3):

- Right infraumbilical para median abdominal incision was done
- Dissection of the bladder flap down to cervical canal was done prior to uterine incision, to reduce time needed for lower segment plication after extraction of the placenta
- Longitudinal incision was used in the uterus to avoid cutting through the anterior low-lying placenta, and fetus was extracted
- Preventive measures were done to avoid upper segment atony; in the form of: warm towels, uterotonic agents (oxytocin, carbetocin, ergometrin and/or prostaglandin analogs)
- Bilateral uterine artery ligation prior to placental removal, to decrease the pulse pressure in placental bed and subsequent bleeding
- After removal of the placenta, Vicryl number 1 absorbable thread (Ethicon Inc., Somerville, NJ, USA) on a 70-mm round needle was used for plication of lower uterine segment.
- Multiple transverse compression sutures connecting anterior wall of lower uterine segment to the posterior one were applied, with preservation of a canal in the middle of the cavity for drainage of blood. A suture was started from anterior to posterior wall, just above the internal cervical os, then from the posterior to the anterior one was done.

- Repair of upper segment incision was then done with Vicryl 1 thread and 40 mm needle.
- Blood and fresh plasma transfusion was concurrently done, with plasma expanding crystalloids.

Cases that failed to achieve adequate hemostasis and progressed to life threatening hemorrhage proceeded to obstetric hysterectomy with ovarian preservation.

RESULTS

Of the studied 25 cases, 19 had successful conservative treatment, 6 had obstetric hysterectomy (Table 1).



Figure 1: Right para-midline incision revealing placenta invading the myometrium and reaching to the serosa.



Figure 2: Plication sutures taken in the lower uterine segment.



Figure 3: uterus after successful compression sutures, closure of upper segment incision and adequate haemostasis.

DISCUSSION

Placenta accreta is a serious cause for postpartum hemorrhage. Its incidence is increasing worldwide secondary to increase in rate of caesarian section

deliveries. Many authors have proposed different methods for control of hemorrhage in these cases. B-lynn and Hayman techniques are more successful in treatment of hemorrhage from upper uterine segment.^{4,5}

Rabbo A presented stepwise de-vascularization, it entails unilateral then bilateral uterine artery ligation, followed by unilateral ovarian artery ligation.⁶ It act locally by decreasing pulse pressure at the placental bed and allowing time for clotting factors to achieve hemostasis. Yildiz et al presented a case series with internal iliac artery ligation for control of postpartum hemorrhage, yet it holds the need for obstetricians with good experience of retroperitoneal dissection and entails the risk of iliac vein or external iliac artery injury.⁷ Winograd et al and Soro et al presented internal iliac artery catheterization and embolization for pelvic devascularization, yet it still holds the need for trained interventional radiologist, with the use of expensive machinery.^{8,9}

Estimated blood loss was roughly by weighing of laparotomy pads before and after soiling and amount in suction apparatus.

Table 1: Patient data.

Age (yr)	Number of previous cesarean sections	Gestational age at delivery	Estimated blood loss in ml	Operative time in minutes	Amount of transfused blood products	Management
26	2	37 w 1 d	1800	50	1 litre blood, 400 ml FFP	Conservative
31	3	36 w 4 d	2000	55	1.5 l blood, 400 ml FFP	Conservative
28	2	36 w 5 d	2200	50	1.5 litre, 400 ml FFP	Conservative
39	4	36 w 6 d	3500	75	2.5 l blood, 600 ml FFP	Hysterectomy
32	2	37 w 1 d	1800	55	1 litre blood, 400 ml FFP	Conservative
24	3	37w 4 d	3800	80	3 litre blood, 600 ml FFP	Hysterectomy
40	3	37w 2 d	3000	70	2 litre blood, 600 ml FFP	Hysterectomy
33	2	37 w 2 d	1600	60	1 litre, 400 ml FFP	Conservative
35	3	37 w 4 d	2500	55	1.5 litre blood, 400 ml FFP	Conservative
40	4	36 w 1 d	3000	75	2 litre blood, 600 ml FFP	Hysterectomy
26	1	36 w 3 d	1500	50	1 litre blood, 300 FFP	Conservative
29	2	36 w 4 d	2700	80	2 litre blood, 600 ml FFP	Conservative
31	2	37w 1 d	2000	55	1 litre blood, 400 ml FFP	Conservative
30	2	36 w 1 d	2000	55	1 litre blood, 400 ml FFP	Conservative
29	3	37 w 3 d	2400	55	2 litre blood, 600 ml FFP	Conservative
34	4	36 w 5 d	3400	80	2.5 litre blood, 600 ml FFP	Hysterectomy
33	2	36 w 2 d	2300	60	2 litre blood, 500 ml FFP	Conservative
31	2	37 w 4 d	2300	60	2 litre blood, 400 ml FFP	Conservative
34	2	36 w 4 d	2300	90	1 litre blood, 500 ml FFP	Conservative
31	2	37 w 1 d	1900	55	1.5 litre of blood, 400 ml FFP	Conservative
33	3	37 w 0 d	2500	60	2 litre of blood, 600 ml FFP	Conservative
39	3	36 w 5 d	3500	70	2.5 litre of blood, 600 ml FFP	Hysterectomy
30	1	37 w 2 d	1800	50	1 litre blood, 400 ml FFP	Conservative
38	2	37 w 4 d	2000	60	1.5 litre of blood, 500 ml FFP	Conservative
36	3	37 w 3 d	2200	80	1.5 litre of blood, 400 ml FFP	Conservative

The use of balloon compression, as Bakri Balloon, has also been proposed in cases of placenta accreta.¹⁰

This study presented a multistep approach for fertility preservation in cases with placenta accreta. We combined methods from different studies to achieve hemostasis. Right para median abdominal incision gives access to the upper uterine segment to avoid delivery of the fetus through torn placenta by a lower segment incision. Dissection of the urinary bladder downwards allowed access to lower uterine segment before fetal extraction. This reduced the time needed for lower segment plication after fetal extraction. Bilateral uterine artery ligation after fetal extraction and before placenta removal reduced the pulse pressure in the placenta bed, helping in reduction of blood loss and achieving hemostasis after placental removal. Plication of lower segment and compression sutures from the anterior to posterior walls achieved hemostasis in 19 out of 25 cases (76% success rate) without the need for hysterectomy. Three patients had urinary bladder injury, which necessitated insertion of Foley's catheter for one week post-operative. No mortalities occurred in our study. None of the cases reached the stage of massive blood transfusion (defined as 8 or more units of blood within 24 hours after delivery).¹¹ Compared to other case series where cases of placenta accreta had 100% caesarian hysterectomy, our study presents a fairly successful method for conservative treatment.¹¹ Iatrogenic bladder injury occurred in 30% of conservative cases that was repaired by the gynecologist using double layer closure with 3/0 vicryl suture.

Reduction in blood loss with our multistep approach resulted in significant reduction in blood loss, similar to that with the use of internal iliac balloon occlusion reported by Li et al, without the high cost and necessary skill for these arterial catheter insertion.¹² In a smaller series of seven patients, Shazly et al reported the use of compression sutures in cases with failed uterine artery ligation to achieve hemostasis.¹³

Chandrasekaran et al described the 'triple-P' procedure entailing delivery of the fetus via transverse uterine incision above the upper border of the placenta; pelvic de-vascularization; and placental non-separation with myometrial excision and reconstruction of the uterine wall.¹⁴ Kaplanoğlu described the 'uterine sandwich method' combining B-lynch sutures with intrauterine gauze tamponade for control of hemorrhage in cases with one case with placenta accreta.¹⁵ Mechsner et al applied B-lynch compression with uterine artery embolization and recombinant factor VII for the treatment of one case of placenta accreta.¹⁶

As mentioned by Cunningham et al, risk of recurrent placenta accreta is 20 % in subsequent pregnancies, so cases successfully managed conservatively were carefully counseled about that risk.¹⁷

CONCLUSION

Conservative management of placenta accreta can be successfully performed in young age females desiring fertility using plication of the lower uterine segment and multiple transverse compression sutures.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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