Original paper

Modified Uterine Incision To Decrease Mortality And Morbidity In Placenta Accreta: Cohort Study

Falah A. Muhi[1], Ali Khairi Toman*[2], Haitham F. Hamzha[3]

[1]Alhindiya Hospital/ Department of Obstetrics & Gynecology/ Alhindiya/ Kerbela/ Iraq.
[2]Alhindiya Hospital/ Department of Surgery/ Alhindiya/ Kerbala/ Iraq.
[3]Alhindiya Hospital/ Department of Radiology/ Alhindiya/ Kerbela/ Iraq.

Abstract

Background: Placenta accreta is an un common but potentially lethal complication of pregnancy. It occurs when the placenta is abnormally adherent to the uterine myometrium causing massive obstetric hemorrhage and still the leading cause of pregnancy related deaths. The risk factors are previous lower segment cesarean section, previous uterine surgery, endometrial defect like Sherman syndrome, presence of sub mucous fibroid, previous manual removal of placenta, vigorous and repeated curettage, previous myomectomy.
Objective: To find the best strategy for dealing with placenta accreta patients and to decrease the associated maternal mortality and morbidity.
Patients And Methods: 30 patients admitted in Alhindiya hospital between January 2008 and December 2013. Cohort study was conducted between 2 groups of patients with different management strategy. One group underwent the ordinary procedure of Caesarian section, while modification of uterine incision were done for the other group considering opening the uterus at a site distant from the placenta (high U shape incision), and delivering the baby without disturbing the placenta, then closure of the uterus in order to enable elective hysterectomy to be done. Analysis of data was done.
Results & discussion: Thirty cases of placenta accreta were identified between January 2008 and December 2013. Placenta accreta was diagnosed either with ultrasound or MRI examinations. The patients had been divided into two groups with different management strategy. Analysis of operative and post-operative complications was done, and we found that scheduled caesarean hysterectomy performed under controlled circumstances with modified high uterine incision without attempting to remove the placenta before hysterectomy was associated with significantly decreased maternal morbidity and mortality.
Conclusion: Scheduled caesarean hysterectomy performed under controlled circumstances with modified high uterine incision without attempting to remove the placenta before hysterectomy was associated with significantly decreased maternal morbidity and mortality.
Keywords: Placenta accrete, invasive placentation, caesarian hysterectomy

Introduction

Placenta accreta is an un common but potentially lethal complication of pregnancy. It occurs when the placenta is abnormally adherent to the uterine myometrium as a result of partial or complete absence of the decidua basalis and Nitabuch's layer. The depth of invasion determines the histologic classification: Placenta accreta indicates direct attachment of the placenta to the myometrium; placenta increta describes placental invasion into the myometrium; and placenta percreta indicates full-thickness compromise of the myometrial layer. Deeper invasion is associated with more serious complications. [1]

*For Correspondence: E-Mail aktooman73@yahoo.com

Incidence and pathophysiology: The incidence of placenta accreta has increased threefold over the past 20 years. Breen and colleagues reported a rate of 1 in 7,000 deliveries in 1977, [1] while a later review suggests an incidence closer to 1 in 2,500 deliveries for the period from January 1985 through December 1994. [2]

Placenta accreta can develop in any setting in which there is an abnormally thin or denuded decidual layer, allowing easy access to the underlying myometrium by the invading trophoblastic tissue. Risk factors include placenta previa, Asherman's syndrome, the existence of a prior hysterotomy scar, and advanced maternal age or parity. The major contributor to the rise in the incidence of placenta accreta appears to be a concurrent increase in the rate of cesarean section, which is associated with an increased risk for placenta previa. [3,4] When placenta accreta occurs in the setting of a prior hysterotomy, the placenta is implanted over the uterine scar, where the decidual layer is already thinned. Clark et al reported the association between placenta accreta and prior cesarean section in a retrospective review of over 97,000 deliveries. They discovered a 5% risk of clinically diagnosed placenta accrete with placenta previa alone, but found this risk increased to 24% with a single prior hysterotomy, to 47% with 2 prior Caesarian section, and to 67% with 3 or more (TABLE 1). [3] Miller and colleagues recently demonstrated that women with placenta previa have a 9.3% incidence of placenta accreta, compared with a 0.005% incidence in women with normally located placentae. [4]

Table 1. Incidence of placenta accreta in women with placenta previa and prior hysterotomy

Number of Caesarian sections	Incidence
0	5%
1	24%
2	47%
3 or more	67%

Diagnostic Approach: It is important to make the diagnosis of placenta accreta prenatally because this allows effective management planning to minimize morbidity. This diagnosis is usually made by ultrasonography or Doppler study or magnetic resonance imaging (MRI). Placenta accreta should be suspected in women who have both a placenta previa and a history of cesarean delivery or other uterine surgery. [5]

Ultrasonography: irregularly shaped placental lacunae (vascular spaces) within the placenta, thinning of the myometrium overlying the placenta, loss of the retro placental "clear space," protrusion of the placenta into the bladder, increased vascularity of the uterine serosa bladder interface, and, on Doppler ultrasonography, turbulent blood flow through the lacunae. [6]

Magnetic Resonance Imaging: Although most studies have suggested reasonable diagnostic accuracy of MRI for placenta accreta, it appears that MRI is no more sensitive than ultrasonography for diagnosing placenta accreta. [7]

Management: The procedure should take place in a hospital that not only has intensive care unit but has experience in dealing with complex intraoperative hemorrhagic complications. Ensure that clotting factors and intensive resuscitation measures are available. The decision should consider parity, future fertility desire and the clinical circumstances. [7]

When imagining strongly suggests the diagnosis one should plan for cesarean with hysterectomy with adequate preparations of blood, an experienced surgical and anesthetic team and intensive hemodynamic monitoring, these will reduce the incidence of maternal mortality and morbidity. [8]

Surgeons delivering the baby by caesarean section in the presence of a suspected

placenta previa accreta should consider opening the uterus at a site distant from the placenta, and delivering the baby without disturbing the placenta, in order to enable conservative management of the placenta or elective hysterectomy to be performed if the accreta is confirmed. Going straight through the placenta to achieve delivery is associated with more bleeding and a high chance of hysterectomy and should be avoided. Conservative management of placenta accreta when the woman is already bleeding is unlikely to be successful and risks wasting valuable time. (8)

The choice of skin and uterine incision needed to avoid the placenta will depend on the location of the placenta. A low transverse skin incision allows access to the lower half of the uterus and is reasonable if the upper margin of the anterior aspect of the placenta does not rise into the upper segment of the uterus. If, however, the placenta is anterior and extending towards the level of the umbilicus, a midline skin incision may be needed to allow for a high upper-segment longitudinal uterine incision. It is therefore useful for the surgeon to perform an ultrasound scan before surgery to plot out the extent of placenta before starting. This is surgical logic and not evidence based. (9)
Predelivery angiographic embolization of pelvic vessels is another technique recently described. The technique requires the availability of skilled radiologist angiographer & facility with experience. (10)

Patients and Methods

This cohort study conducted for 30 patients admitted in Alhindiya General Hospital between January 2008 and December 2013.
Half of the patients (15) (Group A) have been managed in the usual way of antenatal care and follow up until 37 weeks of gestation and delivered by either emergency or elective caesarian section with an attempt to remove the placenta. While the second (Group B, 15 patients) were prepared for elective caesarian hysterectomy at 35-36 weeks of gestation. During operation, modification of uterine incision were done considering opening the uterus at a site distant from the placenta (high U shape incision), and delivering the baby without disturbing the placenta, then closure of the uterus in order to enable elective hysterectomy to be done.

The analysis of Data in term of Morbidity and maternal mortality were done. The
Morbidity was defined as the occurrence of one or more of the following: maternal admission to the intensive care unit (ICU) for >24 hours, transfusion of ≥4 units of packed red blood cells, coagulopathy (platelets≤100 000/microliter, international normalized ratio ≥1.2, and/or fibrinogen ≤200 mg/dl), bladder or ureteral injury, or early re-operation, intra-abdominal infection (defined as persistent fever >38.3°C, leukocytosis, and abdominal pain), deep vein thrombosis, ileus more than 24 hours, ureteric or bladder injury, vesico-vaginal fistula, wound infection, hospital re-admission within 6 weeks, or delayed re-operation.

Results

Thirty cases of placenta accreta were identified between January 2008 and December 2013. Demographic and clinical characteristics of cases are shown in Table 2. Twenty seven women (90%) had identifiable risk factors for placenta accreta.
All women had at least one antenatal ultrasound performed. Twenty seven women were suspected of having an accreta antenatally and other were diagnosed either with the use of MRI examination or by per operative diagnosis.
Two approaches were adopted after explanation and taking the written consents of the patients; Group A(15

patients) contains patients who have been managed in the usual way of antenatal care and follow up until 37 weeks of gestation and delivered by either emergency or elective caesarian section with an attempt to remove the placenta. While the second Group B(15 patients) were prepared for elective caesarian hysterectomy at 35-36 weeks of gestation. During operation, modification of uterine incision were done considering opening the uterus at a site distant from the placenta (high U shape incision), and delivering the baby without disturbing the placenta, then closure of the uterus in order to enable elective hysterectomy to be done.

Table 2. Demographic and clinical characteristics.

	Group A	Group B
Maternal age at delivery, years	21–43	22-45
Gravidity	2–5	3-8
Parity	1–4	3-7
Gestational age, weeks	25.6–37	35-36
Prior uterine curettage		
0	7	8
1	4	5
≥2	3	3
Prior caesarean section		
0	0	0
1	2	2
2	7	8
≥3	5	6
Prior uterine surgery	3	4
Placental site		
Not praevia	2	1
Praevia	11	11
Anterior low-lying	2	3

Table 3. Types of intervention and gestational age.

	Group A	Group B
Elective Caesarian section (no.)	5	15
Emergency Caesarian section (no.)	10	0
Gestational age at elective C/S (weeks)	35-37	35-36
Gestational age at emergency C/S (weeks)	29.6-37	
Emergency hysterectomy	8	0

The mean gestational age for scheduled deliveries of live born infants among women with antenatally suspected placenta accreta in both groups was 35.4 weeks (range 33.6–37.9 weeks) and 50% of infants were admitted to the neonatal intensive care unit . The mean gestational age for emergency deliveries among those with antenatally suspected placenta accreta was 32.2 weeks (range 29.6–37 weeks) and 94% of these neonates required NICU admission.

The post-operative mortality and morbidity data were assessed for all the patients and summarized in table 4.

Discussion

Overall, the morbidity in our cohort of women with placenta accreta was high; 21 women (70%) experienced major morbidity. Eighteen patients received major blood transfusion ≥4 units and fourteen of women required admission to an ICU. These observations are consistent with the high morbidity reported in other series of placenta accreta. [11]

The most influential variable on maternal outcome was whether or not an attempt was made to remove the placenta. In cases of antenatally suspected placenta accreta, attempts at placental removal significantly increased early maternal morbidity.

Ten patients from group A underwent emergency caesarian section after they

were admitted for severe vaginal bleeding and preterm labor. The placenta was removed in 7 cases of group A with preservation of the uterus, the placenta was removed in fragments and hemostasis was achieved with over sewing of the placental bed.

Table 4. Post-operative complications.

Post-operative complications	Group A	Group B
Maternal mortality	1	0
Blood transfusion≥4 units	13	5
ICU admission for >24 hours	11	3
Coagulopathy	5	1
Intra-abdominal infection	3	0
Hospital re-admission within 6 weeks	8	1
Delayed re-operation	5	0
DVT	4	1
Ileus> 24 hour	15	4
Mean operative time(hour)	2	1
Bladder injury	6	2
Ureteric injury	2	0
Vesico-vaginal fistula	2	0
Renal failure	4	0
Wound infection	7	3
Mean hospital stay(day)	8	4

Although uterine preservation was achieved, the women had an estimated blood loss of 3.5 l resulting in coagulopathy, transfusion, and prolonged hospital stay. Thus, removing the placenta in the hope of avoiding hysterectomy rarely proved effective in our study cohort. Another retrospective study showed that placental removal before hysterectomy results in increased maternal morbidity. [12] A recent comprehensive review also advised against attempts at placental removal before hysterectomy. [13]

Maternal death was due to severe uncontrollable bleeding and hypovolemic shock.

In group B, the incision which was used in lower uterine segment had been modified to High U shape away from the placental vessels, other study used a vertical incision in the uterus, this also get away from placental vessels. 13 Then repair of wound of uterus in a single layer suture so that when we proceed for hysterectomy, the field of operation was clear and not filled with blood and destroyed uterus from wound of delivery of baby and adherent placenta.

Antenatal diagnosis allows for preoperative scheduled caesarean hysterectomy without attempts at placental removal, which appear to reduce maternal morbidity. Our findings emphasize the importance of antenatal diagnosis for placenta accreta and the need to maintain a high index of suspicion in women with any identified risk factors. Maternal morbidity was reduced among women with an antenatal suspicion of accreta who underwent a scheduled compared with unscheduled delivery. These findings are similar to those reported by Ramos *et al*. [14] who noted increased blood loss and need for transfusion of blood and fresh frozen plasma among women with accreta who had emergency, rather than scheduled hysterectomies.

Planned caesarean hysterectomy performed at an earlier gestation to avoid emergency delivery in women with suspected placenta accreta has the potential to reduce maternal morbidity. More than half of all emergency deliveries for vaginal bleeding In group A occurred at or beyond 35 weeks of gestation. If scheduled delivery had been performed at 35 week emergency deliveries could have been avoided. The potential maternal benefits of earlier scheduled delivery must be weighed against the consequences of

premature birth and the associated increased risk of neonatal morbidity. More data are required before recommendations can be made about the optimal timing of delivery in women with placenta accreta.

Ten cases of ureteric or bladder injury occurred within this cohort; eight were among women in group A and only two in group B while there was no ureteric injuries among the 17 women who underwent preoperative bilateral ureteric stent placement reported by AG Eller *et al*. [15]

In our cohort, there were no cases in which uterine artery embolization or prophylactic internal iliac artery balloon occlusion was used. One retrospective case–control study of women with placenta accreta has shown no benefit to prophylactic internal iliac occlusion. [16] There are several case reports and small case series advocating embolization in cases of accreta. [17] In contrast, others reported no benefit from uterine artery embolization. [13]

Hysterectomy has traditionally been advised in the management of placenta accreta but there has been a recent movement towards conservative management for preservation of fertility. Several small case series suggest that conservative management with uterine preservation is a safe and reasonable option resulting in lower rates of disseminated intravascular coagulation and blood transfusion but higher rates of maternal sepsis. [18-22] Strategies include leaving the placenta after caesarean delivery with surgical uterine devascularisation, embolization of the uterine vessels, uterine compression sutures and/or over sewing of the placental vascular bed. [17-23] Some authors also have advocated the use of methotrexate to inhibit trophoblastic growth and hasten postpartum involution of placenta. [24-26] It is unclear whether this treatment is useful since most trophoblastic cells are not actively dividing in the third trimester. Finally, there is concern for risk of recurrent placenta accreta in women who undergo conservative management. [27]

Conclusion

In summary, the maternal morbidity in women with placenta accreta is high. Scheduled caesarean hysterectomy performed under controlled circumstances with modified high uterine incision without attempting to remove the placenta before hysterectomy was associated with significantly decreased maternal morbidity and mortality. Further studies including multiple centers and uniform diagnostic criteria are needed to identify optimal management strategies for this increasingly common, morbid condition.

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