



## Save the Uterus

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**Abstract** With ever increasing rates of cesarean section, the incidence of placenta accreta has multiplied manifold and is bound to increase even further. Appropriate management of placenta accreta is multidisciplinary requiring planning beforehand and has backup strategies for any unanticipated complications. Suspecting and establishing the diagnosis of accreta changes the course of management from a major emergency operative endeavor to expectant therapy. Identifying placenta accreta in pregnancy raises a red flag for life-threatening complications at the time of delivery as diagnosing accreta in the third stage of labor can be catastrophic and might require multiple blood transfusions, ureteral injuries, cystotomy, and infectious complications with emergency cesarean hysterectomy. Expectant management with methotrexate helps in tiding over the life-threatening complications and preventing hysterectomy, thus, SAVING the uterus.

**Keywords** Placenta accreta · Multidisciplinary · Emergency hysterectomy · Conservative · Methotrexate

### Introduction

Placenta accreta is defined as an abnormal trophoblast invasion into the maternal myometrium, due to defective decidua basalis, leading to failure of placenta to separate from the uterus at the time of delivery. When the trophoblast invasion is only up to the myometrium, it is known as placenta increta, whereas placenta percreta denotes deeper invasion into the serosa or even the bladder [1]. When whole or part of the placenta fails to separate, it might lead to massive obstetric hemorrhage, threaten the development of disseminated intravascular coagulopathy, and necessitate hysterectomy with potential for surgical injury to the adjacent pelvic organs, adult respiratory syndrome, acute transfusion reaction, electrolyte imbalance, and renal failure. Average blood loss in clinical setting of placenta accreta is around 3000–5000 mL, while around 40 % of the cases might require more than 10 units of packed red blood cells [2].

With ever increasing rates of cesarean section globally, the incidence of placenta accreta has multiplied manifold. In a recent study, it has been reported to be as high as 1:533 pregnancies [3]. Abnormal placental insertions are responsible for 35–38 % of peripartum hysterectomies and high peri or postpartum morbidity [4], while maternal mortality may be as high as 7 % [5].

All pregnant women with prior myometrial damage (myomectomy or previous cesarean scar) with low-lying placenta or placenta previa are suspected for development of placenta accreta. Risk factor for abnormal placental myometrial invasion includes placenta previa per se without previous uterine surgery. It may be associated with placenta accreta in 1–5 % of cases. Besides advanced maternal age, multiparity, submucous leiomyomas, history of endometrial curettage [6], thermal ablation [7] or uterine

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artery embolization [8] may be associated with placenta accreta.

Diagnosis of placenta accreta in the third stage of labor can be catastrophic. In one case study, it was associated with multiple transfusions ( $\geq 4$  units of packed red blood cells) in 42 % of cases, ureteral injuries in 7 %, cystotomy in 29 % and infectious complications in 33 % of cases [9].

The American College of Obstetricians and Gynecologists (ACOG), recommends proceeding with planned preterm cesarean hysterectomy straightaway without attempting the removal of placenta, whenever the suspicion is strong [10]. Even if the woman is not desirous of further children, cesarean hysterectomy should still be avoided due to its associated high maternal morbidity, high transfusions, bladder, ureteral injury, postoperative infections, and permanent sterility which might not be desired by all parturients.

Appropriate management of placenta accreta is multidisciplinary, requires planning beforehand, and has backup strategies for any anticipated complication.

## Diagnosis

First and foremost imaging modality used for the diagnosis of placenta accreta, is antenatal ultrasound. Absence of hypoechoic zone between the placenta and myometrium with interruptions of echogenic area at the interface of serosa and bladder, and Swiss cheese or moth-eaten appearance in the intraplacental lacunae are suggestive of abnormal placental invasion [11]. Eventhough, the positive predictability of ultrasound for placenta accreta is only in the range 62–78 %, its advantage lies in the fact that the ultrasound markers for abnormal placental invasion appear early and have increased specificity with increased gestational age [12].

Another imaging modality that works like an adjuvant for the diagnosis of placenta accreta, is antenatal magnetic resonance imaging (MRI) which includes heterogeneity of signal intensity with dark intraplacental band in T2 imaging, improving the performance of the fetal Doppler [13].

## Report of Cases

Two cases of multiparous women with placenta accreta are presented. The first case was managed conservatively with adjuvant methotrexate and preserving the uterus. In the second case, failure to manage placenta accreta appropriately led to cesarean hysterectomy.

### Case I

A second gravida woman was diagnosed to have an open neural tube defect (NTD) at 19 weeks (Fig. 1) with placenta previa and a previous cesarean scar. Ultrasonographic findings were suspicious of placenta accreta (Fig. 2). The patient was counseled regarding an unfavorable fetal prognosis due to the anomaly, with a complication which might put the health of the pregnant mother at risk. Suspicious ultrasound findings of the placenta accreta were confirmed on fetal MRI (Fig. 3).

With informed consent, fetal reduction was done by instilling potassium chloride in the fetal heart. After reducing the fetus, methotrexate was given for rapid involution of the placenta. With expectant management, the functional placental volume and fetoplacental circulation decreased and eventually the fetus delivered vaginally with en mass of placental tissue.

### Case II

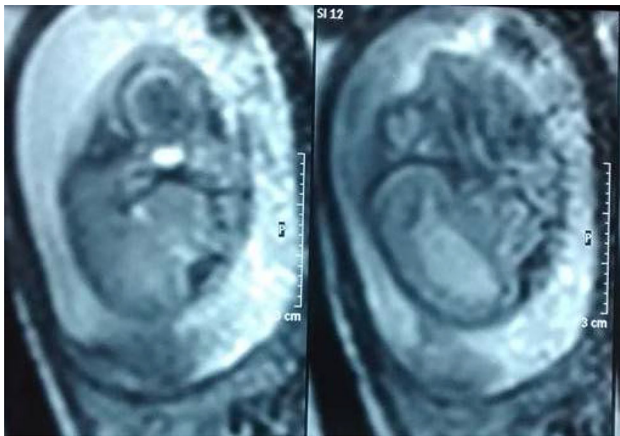
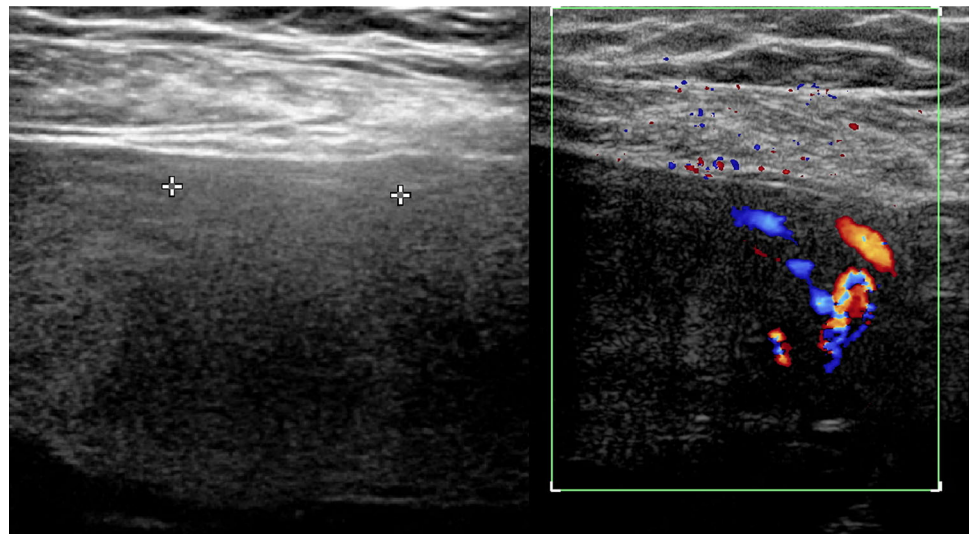
A second gravida woman with previous lower (uterine) segment cesarean section (LSCS) was diagnosed to have placenta accreta, at the time of anomaly scan at 19 weeks of gestation (Fig. 4). Patient was counseled regarding the possibility of adherent placenta and the likelihood of postpartum complications at the time of delivery. The patient was lost to follow-up.

On enquiry, it was learnt that the patient had a repeat cesarean section and an emergency cesarean hysterectomy



**Fig. 1** Case I: Antenatal ultrasound showing lemon sign (inward bowing of frontal bones) and banana sign (effacement of cisterna magna) with sacral meningocele suggestive of neural tube defect

**Fig. 2** *Case I*: Linear transducer showing absence of hypoechoic zone between placenta and myometrium with hypervascularity suggestive of abnormal trophoblast invasion into myometrium



**Fig. 3** *Case I*: Suspicion of placenta accreta on ultrasound confirmed by fetal MRI showing dark intraplacental band on T2 imaging further improving the performance of fetal Doppler and confirming the diagnosis

following a major postpartum bleeding, after the placenta failed to separate from the uterus.

## Discussion

The modalities of treatment are discussed as follows:

### (i) *Methotrexate*

It is an antimetabolite but is used as an adjuvant for conservative management of placenta accreta; induces placental necrosis and expedite rapid involution [14]. Etiology of placental resorption is not fully known and takes a variable period of time. There is lack of consensus regarding the optimal dosing, frequency, and route of administration. Single dose of 50 mg/sq meter

of the body surface area was used. The objective is to prevent secondary hemorrhage and to accelerate the placental necrosis and involution.

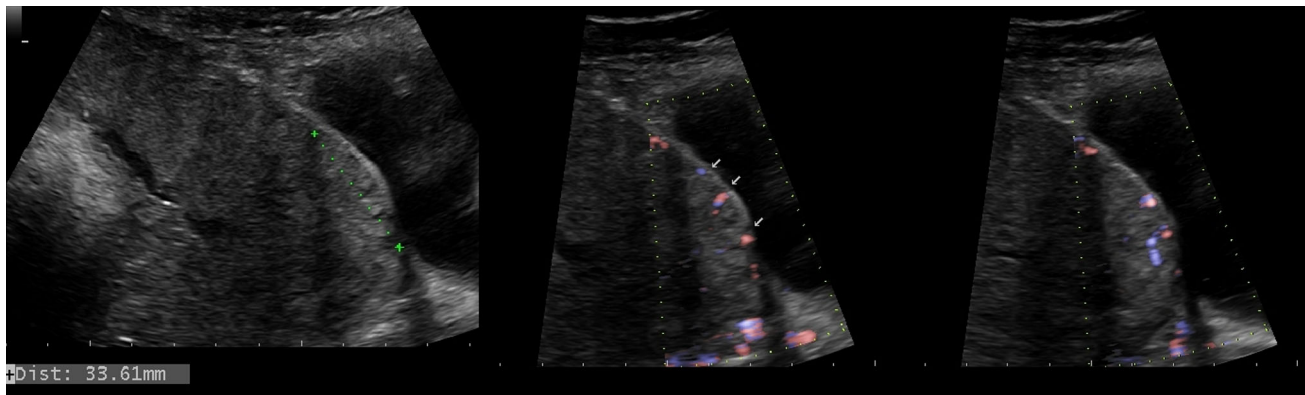
Slow rate of placental tissue renewal at term suggests that methotrexate might be less effective than in its traditional use in ectopic pregnancy [15].  $\beta$ -hCG decreases with half life of 5.2 days [16] to 5.8 days [17] in cases of retained placenta managed with methotrexate. Correlation and prognostic implication of decreasing  $\beta$ -hCG is better described in the setting of ectopic pregnancy. For placenta accreta, it is conflicting whether the decreasing trend of  $\beta$ -hCG correlates with the rate of involution of placental tissue.

### (ii) *Surgical Approach*

Choice of uterine incision is based on the type of previous incision and the patient's body habitus with the aim of reducing blood loss. Mid-line vertical or transfundal classical uterine incision is the ideal incision as it gives sufficient and maximum exposure, avoids injury to the placenta, and allows easy delivery of the fetus.

*Timing of delivery* should be individualized and discussed in great detail; the need for emergency hysterectomy should be discussed and documented along with risk of profuse bleeding and possible maternal death. The guiding principle for management is to achieve a planned delivery, as close to term as possible, vis-a-vis with a preterm delivery as recommended by ACOG [10].

It is reasonable to wait for the spontaneous separation and expulsion of the placenta as the positive predictive value for antenatal ultrasound is only 65–93% [12, 18]. Manual removal of the placenta should be avoided as it might open up the vascular channels leading to torrential bleeding. If hysterectomy



**Fig. 4** Case II: Abnormal trophoblast invasion with absence of hypoechoic zone and moth-eaten appearance in the intraplacental lacunae on Doppler suggestive of placenta accreta

becomes necessary, the placenta should be left in situ with ‘whip stitch’. The uterine incision is to be closed and hysterectomy to be carried out.

Although harnessing the advantages of interventional radiology by using either balloon catheter occlusion or embolization seems good in theory, the available data is unclear regarding its efficacy in emergent conditions.

(iii) *Proposed Strategy*

Based on the antenatal risk factors and antenatal imaging, the possibility of placenta accreta should be suspected. Encountering placenta accreta at the third stage of labor, when the placenta fails to deliver, with absence of plane of cleavage between uterus and placenta, can be catastrophic. If the hemodynamic status of the patient is stable, she can be managed conservatively, with subsequent follow-up for resorption of placenta weekly. The anticipated complications are irregular bleeding and infection. Both of these are not life threatening and can be managed conservatively.

## Conclusions

When the placenta is overlying the uterine scar, trophoblast might invade deep into the myometrium. It can be diagnosed on ultrasound studies with some pathognomonic features, but is usually confirmed on MRI. With no plane of cleavage between the placenta and the endometrium following failure of placenta to separate spontaneously, manual attempts to separate it might open the venous sinuses leading to profuse bleeding, which might necessitate life-saving hysterectomy.

Anticipated placenta accreta should be managed conservatively by ligating the umbilical cord as close to the placental insertion as possible, while resisting the temptation to

try separating it. Under antibiotic coverage with adjuvant antimetabolic methotrexate, the patient may be managed expectantly for aseptic autolysis of the placental tissue with piecemeal expulsion.

Either suspicion or subsequent confirmation of placenta accreta in pregnancy helps in raising the red flag for life-threatening anticipated complications at the time of delivery and changes the course of management from a major emergency operative procedure to an expectant one. It helps in tiding over the crisis by SAVING the uterus instead of sacrificing it. Proper antenatal planning with multidisciplinary approach with conservative management which has a success rate of 80 % [10] should be given priority before undertaking a major surgical endeavor.

This proposed strategy of conservative management has produced the desired result in two cases of placental chorioangioma with retained placentas. After vaginal delivery of the fetus and the main placental tissue, methotrexate helped in getting aseptic autolysis of the adherent residual placental tissue and its expulsion.

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