M E D I C A L
P R A C T I C E

# Conservative management of placenta praevia with accreta

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It has been advocated that placenta accreta/percreta should be managed conservatively to avoid massive pelvic bleeding and preserve fertility. Diagnosis of this condition with high-resolution imaging investigations performed during the antenatal period facilitates discussion of management plans with other clinical disciplines (eg interventional radiologists), the patient, and her family. Three cases of placenta praevia with accreta are presented. The three cases were managed by leaving the placenta in-utero after caesarean section, using uterine arterial embolisation to control postpartum haemorrhage only when needed. In all these cases, we succeeded in conserving the uterus without major complications. With improved imaging techniques, accurate antenatal diagnosis of placenta praevia with accreta is now possible. This new approach to conservative management can be considered in order to not only conserve the uterus but also to avoid uncontrolled pelvic haemorrhaging.

## Introduction

Placenta praevia represents a major cause of obstetric haemorrhage. The risk is higher when it is complicated by placenta praevia with accreta and percreta. The incidence of these conditions has been rising recently, probably as a result of the increasing number of surgical deliveries worldwide.[1,2] In the past, hysterectomy was often needed to control the bleeding and in cases of percreta, even hysterectomy might fail to control the bleeding. The maternal morbidity and mortality associated with these conditions are considerable. The availability of high-resolution grey-scale ultrasound with colour Doppler study techniques and the wider use of magnetic resonance imaging (MRI) scanning in obstetric practice has enabled accurate antenatal diagnosis of placenta accreta and percreta. Management involving performance of a classical caesarean section to avoid the placental site, leaving the morbidly adherent placenta in situ, followed by hysterectomy 2 to 6 weeks after delivery, has reportedly achieved a possible decrease in maternal morbidity and mortality.[3] It has also been proposed that prophylactic embolisation of the uterine arteries followed by hysterectomy may be a means of reducing bleeding morbidity. We successfully managed one case of placenta accreta detected during a lower segment caesarean section for placenta praevia by leaving the adherent placenta in utero, and found there was no need for a hysterectomy at a later stage. Following this success, the possibility of conservatively managing placenta praevia with accreta using a combination of leaving the placenta in-situ, transfemoral cannulation with or without pelvic arterial embolisation, and expectant management after delivery, was discussed in the department. Such an approach was used for the next two cases with antenatal diagnoses of placenta praevia with accreta. The uterus was preserved in all three patients. Recently, another centre reported a much larger series of patients with placenta accreta managed using a similar conservative approach. In this series there were fewer complications in the conservatively managed patients compared with historical controls where attempts were made to remove the placenta.[4] We report our three cases in detail to support these findings.

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## Cases

### Case 1

A 39-year-old Chinese housewife, with a history of two previous lower segment caesarean sections, was referred to our unit at 34 weeks gestation because of suspected placenta accreta. She reported no vaginal bleeding throughout the pregnancy along. A grey-scale ultrasound scan with colour Doppler study at 34 weeks of gestation showed deep myometrial invasion of the anterior uterine wall by placental tissue, with an intact uterine serosa. Managing this conservatively by leaving the placenta in utero was discussed with the family. While waiting for the MRI to confirm the diagnosis, the patient went into spontaneous labour at 36 weeks. An emergency lower segment caesarean section was performed. The baby was delivered in good condition. No plane of separation could be

# 前置胎盤合併胎盤植入的保守治療

使用保守療法醫治胎盤植入的做法一直得到認同，因能避免盆腔大量出血及保留病人的生育功能。產前用高分辨掃描成像診斷此病症可加快與其他臨床專科醫生（如介入放射學醫生）、病人，以及其家屬討論治療方案。本文討論前置胎盤合併胎盤植入的三個個案，均在剖腹生產後讓胎盤仍然留在子宮內，有需要時用子宮動脈栓塞術控制產後出血。所有個案均能成功保留病人子宮，也沒有併發症。隨著掃描成像術的進步，可在產前準確地診斷前置胎盤合併胎盤植入。這種新的保守療法不但能保留病人子宮，而且能避免盆腔不受控的出血。
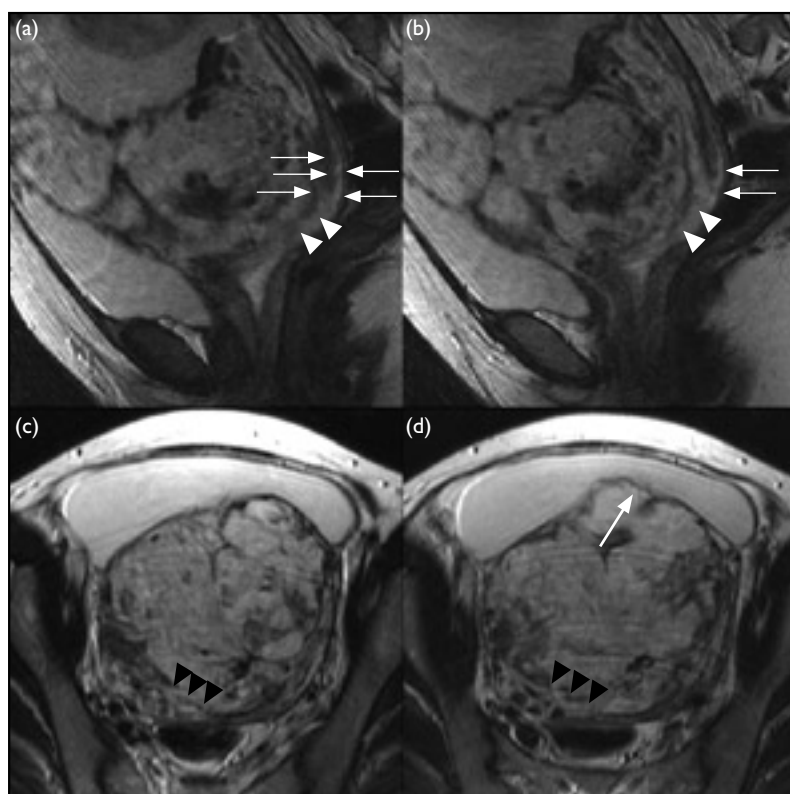


FIG 1. (a, b) Sagittal fast spin-echo T1 images showing placental tissue invading (white arrowheads) the myometrium (white arrows), thus splitting it into two layers. (c, d) Axial images revealed the site of penetration (black arrowheads). (d) The bladder wall invasion site, along with intact overlying bladder mucosa, is indicated by the white arrow

identified at the myometrial-placental junction and no signs of separation were seen after oxytocin was given. The placenta was left in-situ with the cord tied close to the placental insertion site. During the operation there was massive blood loss of about 2000 mL, mainly from the uterine incision. The patient was treated with amoxicillin clavulanate and metronidazole for 2 weeks. Her postoperative recovery was uneventful and her lochia remained scanty. On day 56 after surgery, a piece of greyish-white tissue was passed vaginally after a few days of vaginal bleeding. Her menses returned 5 months after delivery and she had regular monthly cycles afterwards. A follow-up ultrasound examination showed complete involution of the uterus with some echogenic foci in the lower anterior and posterior myometrium suggestive of calcified placental remnants.

## Case 2

A 34-year-old Chinese housewife presented to our unit at 32 weeks of gestation with an antepartum haemorrhage. She had a history of one previous lower segment caesarean section 4 years earlier. During the current pregnancy, she had been managed elsewhere from the first trimester. She reported recurrent painless vaginal bleeding from 6 weeks of gestation. An ultrasound examination revealed an anterior, low-lying placenta covering the cervical os. She was admitted to our unit at 32 weeks of gestation to manage the unprovoked vaginal bleeding. A grey-scale ultrasound scan and colour Doppler study showed a major placenta praevia with suspected invasion of the bladder wall. Magnetic resonance imaging scanning confirmed the diagnosis of placenta percreta invading close to the bladder mucosa, although the bladder mucosa appeared intact (Fig 1). The patient had no strong wish to conserve her uterus but a massive haemorrhage, potentially uncontrollable even with hysterectomy, was anticipated because of the possible bladder wall involvement. Conservative management involving leaving the placenta in-utero was offered to the patient after an extensive debate within the department. After discussion with the couple, a planned classical caesarean section was performed at 36 weeks to avoid cutting through the placenta. In addition, a transfemoral arterial catheter was placed in-situ by an interventional radiologist immediately before the operation to prepare for pelvic arterial embolisation, if required. A baby boy was delivered in good condition. The lower segment of the uterus was thin and vascular (Fig 2). There was no sign of separation of the placenta except at the upper edge. The bulk of the placenta was left in-situ. The umbilical cord was cut and ligated near the placenta. The operation was smooth and the intra-operative blood loss was 300 mL. The patient was treated with ampicillin and sulbactam, and metronidazole for 2 weeks and had an unremarkable postoperative recovery. Her lochia remained scanty. Follow-up MRI and ultrasound scans showed progressive shrinkage of the placental bulk. No placental tissue was passed. She regained regular monthly menses 6 months after the surgery and at the 1-year follow-up remained in good health.

## Case 3

A 36-year-old Nepalese waitress presented to our unit at 29 weeks of gestation with an antepartum haemorrhage. She had a history of two first trimester

surgical terminations of pregnancy and two lower segment caesarean sections. During the current pregnancy she had attended our unit for antenatal care from 14 weeks of gestation. A routine ultrasound scan performed at 18 weeks of gestation revealed an anterior, low-lying placenta covering the cervical os. At 29 weeks of gestation, she presented with unprovoked vaginal bleeding, which subsided spontaneously shortly after admission. A grey-scale ultrasound with Doppler study showed a major anterior placenta praevia accreta with bladder wall involvement. Magnetic resonance imaging scanning also indicated deep myometrial invasion by placental tissue but the bladder mucosa was intact (Fig 3). These findings were compatible with placenta percreta. It was planned that she underwent an elective classical caesarean section, leaving the entire placenta in utero, at 36 weeks of gestation but she developed vaginal bleeding with uterine contractions at 33 weeks. An emergency classical caesarean section was performed and a transfemoral arterial catheter was placed in situ before the operation. A baby boy was delivered with good Apgar scores, but he later developed respiratory distress syndrome requiring intensive neonatal care. No signs of placental separation were noted during the operation. The umbilical cord was cut short and ligated. The entire placenta was left in-situ. The intra-operative blood loss was 400 mL. A speculum examination performed immediately after the operation did not detect any bleeding from the cervical os. The patient was then transferred to the intensive care unit for observation because of the risk of massive bleeding. Three hours after surgery, she had sudden massive vaginal bleeding of 3000 mL. A pelvic angiogram was performed and revealed that the bleeding originated from the lower part of the placenta, near the cervical region. Both uterine arteries were embolised and the uterine bleeding was controlled (Fig 4). She remained in the intensive care unit for observation and no further bleeding occurred. After 2 days, she was transferred to the postnatal ward. Five days later, she noticed a segment of umbilical cord protruding from her vulva. It was ligated and cut short at the level of the external cervical os. Two days later, she experienced a slightly increased amount of vaginal bleeding and a pelvic examination showed protrusion of a small piece of the placental edge from the cervical os. The protruding placenta was trimmed at the level of the external os and minimal bleeding was noted during this procedure. No attempts were made to evacuate the uterus. Subsequent ultrasound examinations showed progressive shrinkage of the placental mass in the uterus (Fig 5). She was given prophylactic antibiotics (ampicillin and sulbactam, and metronidazole) for 2 weeks. She had sporadic scanty vaginal bleeding for 4 months after the operation, and was amenorrhoeic at the 8-month follow-up. She was still breastfeeding.



FIG 2. Thin and vascular lower uterine segment noted during caesarean section
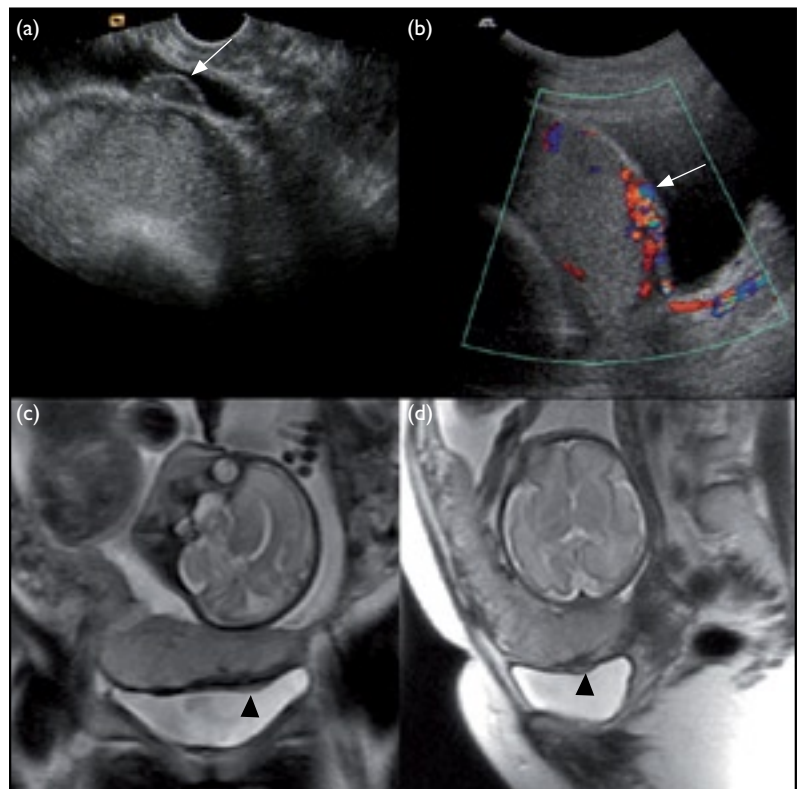


FIG 3. (a, b) Transvaginal sonographic images revealed no myometrial tissue between the lower uterine wall and the bladder. There is also an abnormal vessel running within the bladder wall (white arrows). Corresponding (c) coronal and (d) sagittal magnetic resonance images indicate a bulge at the bladder wall (black arrowheads)

## Discussion

Placenta praevia with accreta, a condition dreaded by obstetricians throughout the ages, presents new challenges in modern times. The incidence appears to be increasing due to an increase in the caesarean section rate. Over the last decade, its management has changed from the old interventionist dictum of never leaving any part of the placenta in utero,

FIG 4. (a) Selective angiography of the left internal iliac artery showed active extravasation of contrast medium (white arrows) at the lower uterine cavity, in keeping with active bleeding. (b) Less extravasation from right internal iliac artery was noted. (c, d) After transarterial embolisation of the bleeding vessels, there was significant reduction in uterine vasculature and bleeding



FIG 5. Transabdominal sonographic image of a longitudinal section of the uterus taken 6 months after a classical caesarean section and bilateral uterine arterial embolisation. Small placental bulk (white arrow) is seen inside the uterine cavity

been reported in the literature including localised resection of the placental bed, and the administration of methotrexate after leaving the placenta in-situ after delivery.[5-7] In most of these cases, surgical intervention, including delayed hysterectomy and manual removal of the placenta, was also employed.[6] Due to the paucity of cases, the patients were not managed on a standard evidence-based protocol but on a case-by-case basis. A recent study involving a larger series showed conservative management led to less blood transfusion and lower hysterectomy rates.[4] Our experience confirms that this is a promising approach.

All three of our patients had histories suggestive of possible placental accreta/percreta, with previous uterine scars and low-lying placentas. Placenta accreta was looked for and suspected on high-resolution grey-scale ultrasounds with Doppler studies in all three patients. In cases 2 and 3, the depth of the myometrial and bladder wall involvement was further delineated by MRI scans. This facilitated prior consultation with consultants from other relevant disciplines (eg interventional radiologists, anaesthesiologists, urologists, operating theatre staff) and also discussion with the patient and her family.

Grey-scale ultrasonography is now an established first-line investigation for suspected placental invasion of the myometrium and has clear diagnostic criteria.[8-10] The two most sensitive diagnostic features are: firstly, irregularly shaped placental lacunae within the placenta and turbulent flow through these lacunae during Doppler flow studies. This feature has a 79% sensitivity at 15 to 20 weeks of gestation, and a 93% sensitivity after 20 weeks. The positive predictive value is up to 92%. The second diagnostic feature is loss of retroplacental clear space. This feature has an 80% sensitivity. Other less-sensitive criteria include thinning or absence of the myometrium overlying the placenta, increased vascularity of the uterine serosa-bladder interface and protrusion of the placenta into the bladder.

The presence of at least two of these features has a positive predictive value of 86%. Doppler study findings are not diagnostic. While there is usually an increase in vascularisation of the placental-myometrial interface in placenta accreta, the absence of this feature has a 95% negative predictive value.

The false-positive and false-negative rates range from 2 to 25% using a transabdominal ultrasound approach. A transvaginal approach is usually superior, as it enables avoidance of the foetal head and higher resolution images.

Magnetic resonance imaging has been effectively used for the investigation of placental invasion. It achieves better images than ultrasonography in posteriorly sited placenta accreta and prior

to a more conservative approach. Various forms of conservative management of placenta accreta have

myomectomy because in the former the foetal head impedes the ultrasound beam and in the latter it is blocked by scar tissue. The limited experience with use of MRI to investigate this condition means that, as yet, the diagnostic features are not as well established as in ultrasonography.

In one study of 300 cases, topographic description rather than morphological assessment was used and this reported, with low false-positive and -negative rates, a 97.6% accuracy for predicting placenta accreta.[11]

Another study of 17 cases showed three statistically significant MRI features for the detection of placenta accreta. These are: abnormal uterine bulging of the normal pear-shaped gravid uterus, heterogeneity of the signal intensity of the placenta on T2-weighted images, and the presence of T2-weighted dark linear bands in intraplacental signal intensity, extending from the basilar plate to the placental surface.[12]

Other diagnostic features summarised from several case reports include: (1) loss of myometrial contour in the lower uterine segment and obliteration of the lower uterine segment[13]; (2) thinning or irregularity of the myometrium, transmural extension of signal abnormality through the myometrium, irregularity or disruption of the normal bladder wall architecture and invasion of local structures[14]; (3) attenuation and non-visualisation of the uterine wall, interruption of the uterine wall, interruption of the tissue plane between the myometrium and bladder wall by irregular masses and over invasion of the myometrium by the placenta.[15]

In some studies, the use of Gadolinium contrast showed an excellent contrast between myometrium and placenta but foetal safety has not been established. Gadolinium contrast is not recommended and not used in our patients.

Placenta accreta is known to be associated with massive haemorrhage, which was illustrated in case 1. For patients in cases 2 and 3, who both had placenta percreta, the risk of uncontrolled haemorrhage was higher due to possible involvement of the posterior bladder wall. Surgical interventions may include cystectomy or even pelvic clearance. These treatments are, however, associated with significant morbidity. Pelvic arterial embolisation was initially used for pelvic bleeding control[16] and its use in obstetric haemorrhage was first reported in 1996.[17] It is considered a safe and effective method for managing intractable postpartum haemorrhages.[18] Subsequent fertility has also been demonstrated.[18] The use of this approach in patients with placenta accreta/percreta has been reported before[19,20] but hysterectomy was still required afterwards, despite the significant reduction in blood loss. In our two patients with placenta percreta (cases 2 and 3), a transfemoral arterial catheter was inserted prior to caesarean section. This is desirable because this procedure may become difficult when there is massive bleeding leading to vascular collapse. In case 3, the patient developed massive uterine bleeding shortly after delivery that required therapeutic pelvic arterial embolisation; the bleeding was controlled effectively. On the other hand, the role of prophylactic embolisation is still unclear. Prophylactic pelvic arterial embolisation has been reported[3,21] but hysterectomy has been required in most reported cases. In those cases where the uterus could be preserved, the long-term outcome is unknown.[21] In case 2, pelvic arterial embolisation was not needed. We propose that prophylactic embolisation need not be done if there is no excessive bleeding.

Our three cases also illustrated that different uterine incisions may affect the clinical outcome. In case 1, a lower segment transverse uterine incision was used. Part of the placenta was therefore incised. This, together with the vascularity of the lower uterine segment, led to massive intra-operative blood loss. In cases 2 and 3, a classical caesarean section using a vertical upper segment incision was performed in order to avoid both the placenta and the vascular lower uterine segment. This approach was associated with much less intra-operative blood loss, though massive uterine bleeding still occurred after the operation in case 3 due to placental separation but the risks of complications in subsequent pregnancies (such as uterine rupture) will be increased.

Another possible reason for the failure of conservative management in previously reported cases may be attempts to remove the placenta. In case 1, with placenta accreta, part of the placenta left in-situ was expelled spontaneously 2 months after surgery. Manual removal of placental remnants was therefore not required. In case 2, no placental parts were expelled after the delivery, probably due to the extensive myometrial invasion preventing any placental separation. Placental removal was not attempted. In case 3, partial placental separation occurred and part of the placenta (include the umbilical cord) protruded from the uterine cavity. The retained part of the placenta was probably still morbidly adherent to the uterine wall. Any attempt to separate the retained part from the uterine wall might have resulted in torrential bleeding necessitating hysterectomy. Therefore, we continued conservative management even when part of the placenta protruded through the cervix. Neither manual removal of the placenta nor uterine evacuation was attempted; the protruding placental part was simply trimmed. The rationale for this was to minimise the communication between the vagina and the uterine cavity, and thus reduce the risk of intra-uterine infection. Further surgical intervention was not required.

We did not use methotrexate to manage any of these patients and we propose that it is probably not necessary. It was also omitted from the management of patients in the recent large series. Antibiotics were given to all patients for 10 to 14 days in both the large series and in our three cases. There is no evidence that prophylactic antibiotics had an impact on the outcome or any indication of the optimal duration for antibiotic coverage. We did not use prophylactic prostaglandins in any of the three patients.

By comparing our limited experience of three cases with the larger study, we can identify the essential component of successful conservative management: leaving the adherent placenta part of the placenta in utero, and making no attempt to remove the placenta at a later stage, even when part of the placenta is expelled. Prolonged prophylactic antibiotics were used, though there is little evidence supporting the superiority of this regimen over the single-dose prophylaxis commonly used in other elective or emergency caesarean deliveries.

Other components of the management (prostaglandins, pelvic arterial embolisation) can be used to control bleeding if needed. Prophylactic use of these might not be necessary. Methotrexate is probably not needed but our numbers are too small to yield a definite conclusion on this.

In patients at risk of developing placenta accreta or percreta (those with previous caesarean delivery, antepartum haemorrhage due to anterior placenta praevia, previous adherent placenta), detailed visualisation of the placenta, including its relationships with the uterine and bladder walls, during the antenatal period, using high-resolution grey-scale ultrasound with Doppler studies, and an MRI scan where needed, is useful. This enables planning for and discussion of the management approach with interventional radiologists, anaesthesiologists, and the patient and her family.

We are not aware of any case reports describing subsequent successful pregnancies following conservative management. We are not certain if this is due to under-reporting or to background factors like multiparity.

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