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We report on four cases of caesarean scar pregnancy with different modes of treatment—expectant, surgical, systemic medical, and local medical. We attempt to explore the indications, and pros and cons of the various management modalities for caesarean scar pregnancy.

## Introduction

Caesarean scar pregnancy is a rare entity. With the rising number of caesarean sections performed, it is perhaps not so rare nowadays. Four cases of caesarean scar pregnancies were seen within a period of 12 months in our hospital and were managed with different treatment modalities. There are currently no guidelines for the management of such pregnancies. With these four cases and a review of the literature, we explore the indications for the various treatment modalities for caesarean scar pregnancy.

## Case reports

### Case 1

In April 2005, a 38-year-old woman was admitted at 9 weeks of gestation complaining of mild lower abdominal pain and vaginal spotting. She had delivered a baby by lower segment caesarean section, done for cephalopelvic disproportion, 9 years previously. Pelvic ultrasonography revealed findings compatible with an intramyometrial pregnancy where a 1.03 x 1.17 cm gestational sac containing a secondary yolk sac was seen inside the myometrium of the anterior uterine wall at the level of isthmus (Fig 1). A diagnosis of caesarean scar pregnancy was made in view of the history of caesarean section and the location of the gestational sac. No fluid was found in the pelvic cavity. Clinically, the patient was stable. The human chorionic gonadotrophin (HCG) level was 1371 IU/L and gradually dropped to 4 IU/L on day 38. On day 42, no gestational sac was detected in the uterus and the ultrasonographic findings were normal. The patient remained asymptomatic all along.

### Case 2

In March 2006, a 35-year-old woman was admitted in a stable condition at 5 weeks of gestation, complaining of vaginal spotting for 1 week. She had delivered a baby by caesarean section, performed for cephalopelvic disproportion, 4 years previously. An ultrasonogram revealed a 0.59 x 0.34 cm gestational sac containing a secondary yolk sac without a foetus at the isthmic level inside the anterior myometrium, compatible with a caesarean scar pregnancy. On admission, her haemoglobin level was 120 g/L; HCG was 5014 IU/L and gradually rose to 6117 IU/L at a gestation of 6 weeks and 3 days. Therefore, one dose of 45 mg methotrexate was given with 4.5 mg leucovorin intramuscularly on that day and the combination was repeated 2 days later. Uterine artery embolisation (UAE) was performed at the 16th day after the last dose of methotrexate because of increased vaginal bleeding. The HCG gradually returned to normal 5 weeks afterwards. A pelvic ultrasonogram was normal.

### Case 3

In June 2005, a 32-year-old woman was admitted in stable clinical condition at a gestation of 6 weeks, complaining of vaginal bleeding. She had delivered a baby by lower segment caesarean section, done for foetal distress, 6 years previously. An ultrasound scan revealed a 2.85 x 1.47 cm gestational sac with a viable 0.45-cm foetus in the anterior myometrial wall at the level of isthmus. There was no fluid in the pelvic cavity. The diagnosis was caesarean scar pregnancy. Her haemoglobin level was 99 g/L and HCG was 157 690 IU/L. One dose of 75.5 mg methotrexate was given intramuscularly at 7 weeks' gestation. Two days later, the HCG had risen to 223 272 IU/L and foetal heart activity remained. So, another dose of methotrexate was given;

#### Key words

Cesarean section; Embolization, therapeutic; Laparoscopy; Methotrexate; Pregnancy; Uterus

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## 一年內四宗剖腹產疤內妊娠的個案

這報告是有關四宗剖腹產疤內妊娠的個案。文中敘述了四種不同的處理方法——包括觀察、手術切除、肌肉內藥物注射治療及羊膜內藥物注射治療。從這四宗個案，我們嘗試探討治療剖腹產疤內妊娠之各種方法的適應症、優點和缺點。

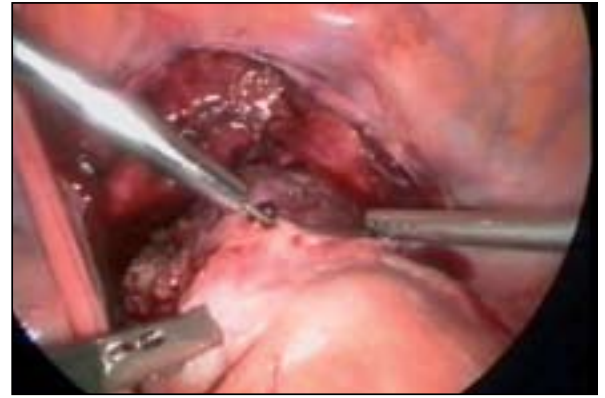


FIG 2. The site of the scar pregnancy at the isthmus region of the uterus

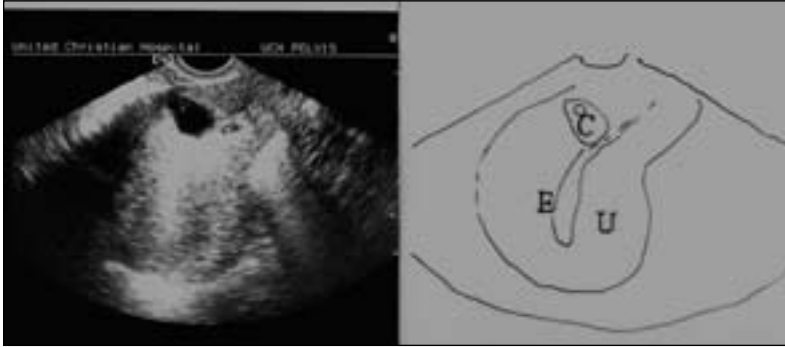


FIG 1. The gestational sac in the anterior myometrium at the isthmus level

C denotes caesarean scar pregnancy, E endometrium, and U uterus

ultrasonogram performed then showed a 5.7 x 4.0 cm heteroechoogenic mass at the isthmus level of the anterior myometrium, thought to be some scar tissues.

## Discussion

A caesarean scar pregnancy is a gestation completely surrounded by myometrium and the fibrous tissue of the caesarean section scar and separated from the endometrial cavity and endocervical canal. The four cases reported occurred within a period of 12 months during which a total of 65 cases of ectopic pregnancy were diagnosed in our hospital. More caesarean scar pregnancies are seen nowadays, probably because more and more deliveries are done by caesarean section. The diagnosis is usually made on ultrasonography revealing (1) an empty uterine cavity and an empty cervical canal, (2) a gestational sac in the anterior part of the uterine isthmus and (3) an absence of healthy myometrium between the bladder and sac.<sup>1</sup>

Expectant management of a viable scar pregnancy puts the mother at significant risk of an emergency hysterectomy if the pregnancy progresses beyond the first trimester.<sup>1</sup> Case 1 was a case of silent miscarriage in the caesarean scar and is one of the few cases of successful expectant management of a scar pregnancy. The reported results of expectant management are variable, with a few successful and a number of failed ones.<sup>1,2</sup> It has therefore been inferred by some that all scar pregnancies should be terminated once the diagnosis has been made. The main management options are still surgical and non-surgical treatments.

Non-surgical treatment mainly consists of methotrexate, administered either systematically, locally, or the two combined. There are also different regimens of medical treatment—single and multiple dosage. Due to the rarity of scar pregnancy, it is impossible to conclude whether systemic or local methotrexate administration is safer or more effective. Local administration of methotrexate avoids the systemic side-effects and may

UAE with gelfoam was performed on the same day. A second UAE was performed at a gestation of 9 weeks and 2 days for increased vaginal bleeding. At 11 weeks' gestation, our patient had heavy vaginal bleeding and lower abdominal pain again. An ultrasound scan showed a 3.64 x 3.46 cm heteroechoogenic mass in the anterior myometrium over the isthmus region, with vascularity in the periphery. After discussion, our patient opted for laparoscopic excision of the scar pregnancy instead of further conservative management. The operation was carried out smoothly (Fig 2). The postoperative course was uneventful and the HCG returned to normal 1 month after surgery.

### Case 4

In March 2006, a 32-year-old woman was admitted in stable condition at a gestation of 10 weeks, complaining of vaginal bleeding. She had three children, all of whom were delivered by caesarean section. The first caesarean section was performed for breech presentation and the subsequent ones were done electively. A pelvic ultrasonogram showed a 5.06 x 4.80 cm gestational sac containing a viable 4.05-cm foetus and a secondary yolk sac inside the anterior myometrium at the isthmus level, compatible with a caesarean scar pregnancy. The HCG was 103 874 IU/L. Two days later, UAE was performed before an intra-amniotic injection of 20 mg methotrexate was given under ultrasound guidance. An ultrasonogram 2 days later revealed a non-viable 2.2-cm foetus. She remained clinically stable and the HCG gradually dropped until it was normal 5 months later. An

be more effective if the initial HCG level is higher than 10 000 IU/L.<sup>3</sup> In case 2, the initial HCG was about 5000 IU/L and this scar pregnancy was successfully managed by intra-muscular methotrexate. Though an efficacy of 80% has been reported, the efficacy and safety of medical treatment is still unknown, and the HCG level takes up to 4 months to return to normal.<sup>4</sup> Despite a falling HCG, it is also known that bleeding and rupture may still occur in a scar pregnancy managed non-surgically.<sup>5</sup> It has also been suggested that bilateral UAE be employed to minimise the complication of massive bleeding.<sup>3</sup>

In case 3, our patient initially had non-surgical management with a combination of intramuscular methotrexate and UAE. The amount of bleeding caused by the failing scar pregnancy probably relates to the size of the gestational mass to be expelled or autolysed. It is not surprising that our patient had recurrent episodes of heavy vaginal bleeding while waiting for the HCG level to return to normal, considering the large gestational mass indicated by the initial HCG level. Perhaps, surgical treatment or local medical treatment in the form of an intra-amniotic methotrexate injection should have been employed right from the beginning, sparing our patient the ordeals of two UAEs and several episodes of heavy vaginal bleeding and blood transfusions, not to mention the long period of hospitalisation. This is the reason why intra-amniotic methotrexate and UAE, instead of intra-muscular methotrexate, was employed in case 4 where the initial HCG was more than 100 000 IU/L. Nonetheless, the HCG level in case 4 took 5 months to return to normal. Besides, some heteroechoicities were still observed at the site of previous caesarean scar pregnancy, raising some doubts about the integrity of the scar. With surgical excision of the gestational mass, HCG returns to normal much more quickly—within 1 to 2 weeks. Dehiscence was detected in some cases after successful medical treatment and a repeat scar pregnancy has been reported after local methotrexate treatment.<sup>6</sup> It is believed that excision of the old scar could reduce

the risk of dehiscence and recurrence. For patients desiring further pregnancies, it has been recommended that surgical repair of the scar should be offered either as the primary treatment or as a secondary operation after initial treatment.<sup>6</sup> However, apart from anaesthetic risks, surgical treatment involves operative risks, especially massive bleeding. Although surgical treatment offers the opportunity to remove the gestational mass and simultaneously repair the defect, no treatment modalities can guarantee uterine integrity.<sup>1</sup>

It is likely that more scar pregnancies will be seen in the future and therefore a set of criteria for the choice of various modes of management should be developed. In summary, both case 1 and some reports in the literature indicate that expectant management may be attempted for silent miscarriage in the scar.<sup>2</sup> Systemic administration of methotrexate may be used for an early scar pregnancy with an HCG of <10 000 IU/L.<sup>1,7</sup> In all other cases, and those where expectant or systemic methotrexate treatment fails, the choice should be surgery or ultrasound-guided local medical treatment with or without UAE, depending on local expertise and practice and experience. Most gynaecologists will agree that surgical treatment is necessary for clinically unstable patients and where there is large amount of fluid in the pelvic cavity on the ultrasound scan. Surgical intervention and repair of the myometrial defect is perhaps also worthy of serious consideration when patients desire further pregnancies. It is most important to look out for uterine rupture in any form of non-surgical management, be it expectant, systemic, local medical, or angiographic.

All scar pregnancies should be reported so that more data may be obtained to quantify the indications, contra-indications, the safety and efficacy of the various management modalities. At the moment, due to the relative rarity of scar pregnancy, it is still unclear which treatment is the most optimal. Selection of the mode of treatment decisions should be made by the patient, based on the information currently available in the literature.

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