



Caesarean Scar Pregnancies

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DOI: 10.31080/ASWH.2022.04.0360

Received: February 24, 2022

Published: April 18, 2022

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Abstract

Majority cases of Caesarean Scar Pregnancies (CSP) reported till date involves singleton pregnancy. This case series discusses two Caesarean Scar Pregnancies. Initial presentations, diagnosis and management of a rare case of advanced heterotopic pregnancy in which CSP coexisted with intrauterine pregnancy and another case of grade 4 CSP are discussed here in detail. Both patients discussed here underwent laparotomy followed by hysterectomy because of continued severe hemorrhage and recovered well during postoperative follow up visits.

A brief review of published literatures regarding diagnostic modalities and management options for CSP was performed and discussed here.

Keywords: Heterotopic Pregnancy; Caesarean Scar Pregnancy; Laparotomy; Hysterectomy; Maternal Morbidity

Abbreviations

CSP: Caesarean Scar Pregnancy; UAE: Uterine Artery Embolization; CS: Caesarean Section; D&C: Dilatation and Curettage; D&E: Dilatation and Evacuation; STIs: Sexually Transmitted Infections; TCR: Trans Cervical Resection; RCC: Red Cell Concentrate; FFP: Fresh Frozen Plasma; MTX: Methotrexate; GS: Gestational Sac

Introduction

An ectopic pregnancy may occur in variety of anatomic sites including the fallopian tubes, cervix, ovary, abdomen, myometrium, and previous caesarean scar. The most common location for an ectopic pregnancy is in the ampulla of the fallopian tube.

Caesarean-scar ectopic pregnancy is one of the rarest ectopic pregnancies with a prevalence of one in 2000 pregnancies and account for 6% of ectopic pregnancies, although their incidence is increasing [1].

The increasing prevalence of caesarean scar pregnancy (CSP) is due to increasing rates of caesarean deliveries. The first case of CSP was reported in 1978, when CSP was misdiagnosed as incomplete abortion and that caused severe hemorrhage [2].

Recently, CSPs have been classified into two types: In the first type, the implanted gestational sac grows towards the cervico-isthmic space or the uterine cavity with the potential of proceeding to a viable fetus but with a high risk of abnormally invasive placenta and massive postpartum hemorrhage. In the second type, the deeply implanted gestational sac grows towards the serosal surface of the uterine wall. This type carries the risk of rupture and hemorrhage during first trimester of pregnancy [3].

Women with CSPs usually presents with vaginal bleeding and abdominal pain, although many are asymptomatic. Early and accurate diagnosis is crucial as undiagnosed cases are associated with high morbidity and mortality. Serious consequences are severe hemorrhage, uterine rupture ultimately requiring hysterectomy [2].

Owing to the rarity of this condition, there has been no consensus on the preferred mode of treatment or follow up. Various treatment modalities have been used so far, with different reported success rates [4].

Here, we report two cases of CSPs. One with advanced heterotopic twin pregnancy with grade 3 CSP and another with grade 4 CSP.

Case Presentation

Case 1: Second trimester heterotopic pregnancy: unusual caesarean scar pregnancy

A 33 year woman, (Gravida4, Para1, Abortion2) presented to labor room with 20 weeks 6 days of amenorrhea and painless vaginal bleeding.

At the outside facility, she had had a transabdominal ultrasound on 21-06-2021 that showed heterotopic twin pregnancy with one alive intrauterine and other early embryonic demise of scar ectopic pregnancy. Gestational ages of Intrauterine and scar ectopic pregnancies were 18 weeks 4 days and 9 weeks respectively. A large 94*61*60 mm sized subchorionic hemorrhage was noted along with profuse vascularity in serosa of previous caesarean scar and bladder – uterine interface.

Although patient was informed about the serious consequences of continuation of pregnancy, she denied treatment until 4 weeks later when she presented to our hospital on 9-7-2021 with heavy vaginal bleeding.

Her obstetric history was significant for one live birth by emergency lower segment caesarean delivery in view of fetal distress 6 years ago and 2 spontaneous miscarriages which were not followed by D&E. Her last pregnancy was 2 years ago. She had no other significant medical history; her menstrual cycles were regular and had no history of STIs. She denied usage of any contraceptive methods.

On examination, her temperature was 36.6 °C, heart rate 100 beats/min, blood pressure 100/70 mmHg, and O2 saturation 98%. Per abdominal examination revealed uterus of 20 weeks size, and on per speculum examination, bleeding through os was noted.

An urgent transabdominal and transvaginal scan was performed. Intrauterine alive twin B of 21 weeks gestation seen. And twin A of small G sac (9 weeks 2 days) was located anteriorly in the previous

caesarean scar. The sac traversed the full width of the anterior myometrium (Grade 3 CSP).

A written informed consent taken for emergency laparotomy and hysterectomy if need arises. Abdomen opened through midline vertical incision. Uterus was 20 weeks size; lower uterine segment was bulged out and discolored. A transverse incision was made over upper uterine segment to deliver alive twin B (Figure 1). It weighed 300 grams and could not be revived. Twin A implanted over the previous scar, was delivered through same incision. A wedge of thinned out myometrium excised. However, there was active bleeding from the site of implantation. In view of this, decision was made to proceed for hysterectomy. Total hysterectomy performed without difficulty (Figure 2). A drain was kept in POD and abdomen closed in layers. She received 2 units of RCC and 2 units of FFP intraoperatively. Her postoperative recovery was uneventful.



Figure 1

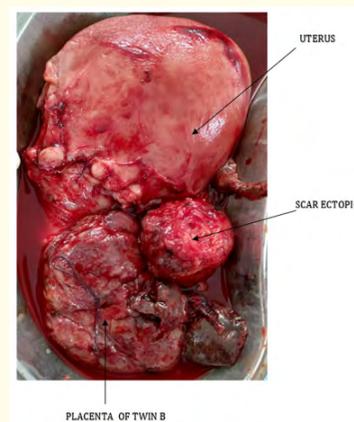


Figure 2

Case: Grade 4 caesarean scar pregnancy

A 28 year women (Gravida4, Para 2, Abortion1) was referred to our hospital on 06/07/2021 for management of scar ectopic pregnancy. She complained of intermenstrual bleeding in the last 3 months and menorrhagia for 1 month.

She has had one vaginal delivery 6 years ago, followed by a spontaneous abortion. In her last pregnancy, she underwent emergency LSCS for nuchal cord six months ago. She had lactational amenorrhoea for 3 months after which she experienced intermenstrual bleeding every 10-15 days. Urinary pregnancy test was positive and Beta HCG levels were 608.32 mIU/ml.

There was no significant past medical or family history. She had regular menstrual cycles in the past, with no history of any STIs or contraception usage. On examination, she was conscious and alert. Heart rate 116/min and blood pressure 100/70 mmHg. Her abdomen was soft, with a well healed Pfannenstiel scar. On per vaginal examination, uterus was found to be 12 weeks size with a soft bulge in the anterior vaginal wall.

Transvaginal ultrasound examination revealed an irregular G sac of 4.51 x 2.68 x 2.2 cm on the previous caesarean scar site without any embryo or yolk sac with internal septation. It was surrounded by dilated venous channels and thinned out overlying myometrium. CT scan revealed a 6.6 x 5.6 x 5.5 cm sized peripherally enhancing lesion in the anterior myometrium of lower uterine segment possibly in the region of previous LSCS scar. There was loss of fat plane with posterior wall of bladder at places, indicating Grade 4 Caesarean Scar Ectopic pregnancy.

Patient and her relatives were informed of the dangers and complications arising from continuation of scar ectopic pregnancy and written informed consent obtained for exploratory laparotomy. Abdomen opened through the previous Pfannenstiel incision and muscle splitting was done. Uterus eventrated as it was about 12 weeks size with a prominent bulge of bluish discoloration in the region of lower uterine segment. Thinned out myometrium and advanced bladder noted. In view of these findings, decision was taken to proceed for hysterectomy. After transfixing cardinal ligaments, anterior myometrium overlying the ectopic gave way and hence uterus was transected just above the level of cervix and vault was closed. Bladder integrity ensured and course of

the ureters were traced. Haemostasis was ensured and abdomen closed in layers (Figure 3 and 4). She received 4 units of RCC and 2 units of FFP transfusion intraoperatively along with 2 units RCC postoperatively. Her postoperative recovery was unremarkable.

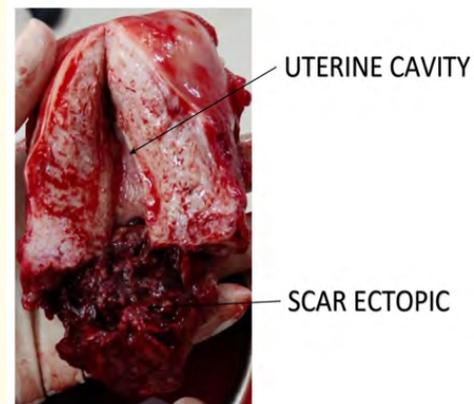


Figure 3

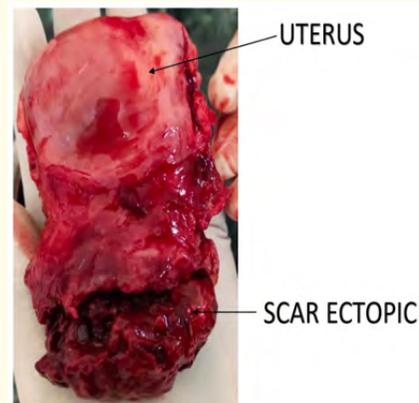


Figure 4

Discussion

Increase in CS rates are associated with increased complications, including hemorrhage, blood transfusions, abnormal placentation, bowel and bladder injury, ICU admissions, uterine rupture and recently with increased incidence of CSP [5].

There are several hypotheses for scar ectopic pregnancy although its exact pathogenesis is unclear. It has been postulated that the blastocyst invades into the myometrium through a

microscopic uterine dehiscence tract which is related to previous uterine procedures (e.g., CS, myomectomy, D&C and iatrogenic uterine perforation). But this hypothesis fails to explain development of scar ectopic pregnancy in the absence of previous uterine surgeries [5,6].

It is hypothesized that scar pregnancy may occur due to a trauma to the endometrium during manual removal of placenta or during assisted reproduction techniques. As surrounding myometrium is deficient in CSP, untreated patients can have adverse outcomes such as uterine rupture with severe maternal hemorrhage and death. However, the risk of CSP appears to be unrelated to the number of previous caesarean deliveries [4,7].

Our patients had history of previous caesarean delivery which predisposed them for scar ectopic pregnancy.

The initial investigation of choice is transvaginal ultrasound in first trimester, along with transabdominal scan in advanced gestation and for better panoramic view. Magnetic resonance imaging (MRI) will confirm the diagnosis in equivocal cases [7].

The proposed diagnostic criteria for scar ectopic pregnancy based on ultrasound evaluation include the following:

- Presence of gestational sac in the anterior part of the lower uterine segment.
- An empty uterus and cervical canal.
- Absence of myometrium between the bladder wall and the gestational sac. This is essential to differentiate scar pregnancy from cervical pregnancy [8,9].

Lin SY, *et al.* (2018) in their cohort study categorized women with CSP into four grades based on the ultrasound presentation.

- **Grade I CSP:** Gestational Sac [GS] embedded in less than one-half thickness of the lower anterior corpus.
- **Grade II CSP:** GS extended to more than one-half thickness of overlying myometrium.
- **Grade III CSP:** GS bulged out of the caesarean scar;
- **Grade IV CSP:** GS became an amorphous tumor with rich vascularity at the caesarean scar.

They concluded that more invasive surgery (e.g., hysterectomy) tended to be associated with more advanced ultrasound grading ($p < 0.0001$) [6]. Based on this classification of CSP, our first case with heterotopic pregnancy had grade 3 CSP (Case 1, figure 5) and Case 2 had Grade 4 CSP (Figure 6).



Figure 5

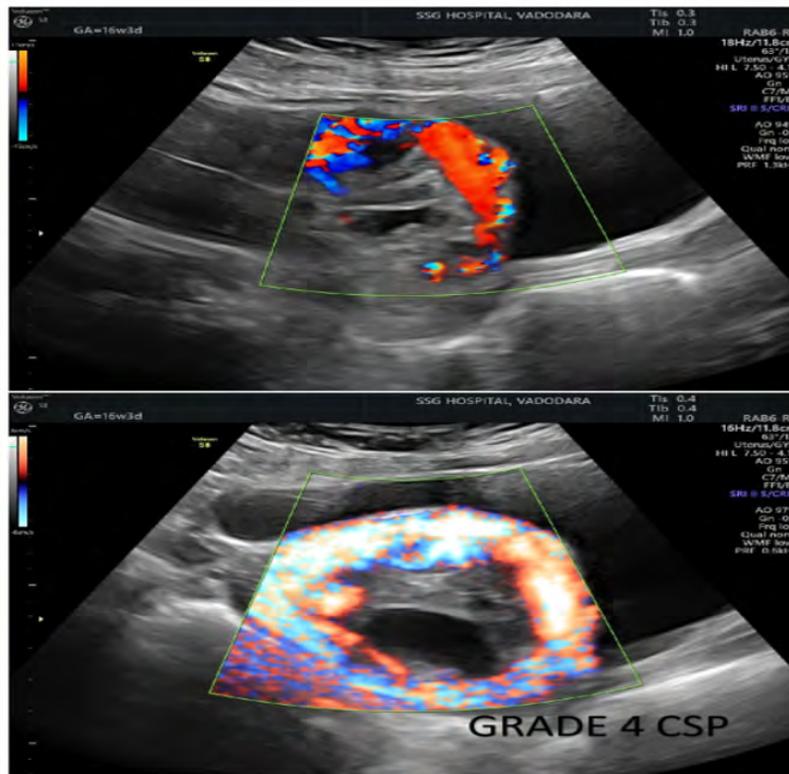


Figure 6

Management options for CSP include expectant management, medical management with local injection of potassium chloride and local or systemic Methotrexate (MTX) administration, surgery or uterine artery embolization (UAE). These options depend upon the gestational age, embryo viability, evidence of myometrial deficiency and clinical symptoms at presentation. Generally, termination of a pregnancy in the first trimester is strongly recommended [6,11].

The expectant, conservative and the surgical management of CSP have a success rate of up to 41.5%, 75.2% and 97.1% respectively [2].

In one systematic review 63% of women managed expectantly required hysterectomy for the management of life-threatening hemorrhage following spontaneous uterine rupture or abnormally adherent placenta. The high morbidity and risk of death do not justify expectant management of a viable scar pregnancy [10].

Another meta-analysis concluded that, expectant management in viable CSPs were associated with a high risk of maternal

morbidity, whereas it may be a reasonable option in CSPs with no cardiac activity. Conservative treatment with local or systemically administered MTX carries a risk of heavy bleeding [2].

Surgical management includes evacuation of the pregnancy by D&C, hysteroscopic transcervical resection [TCR], excision of the pregnancy via laparotomy/laparoscopy/transvaginally and recently, placement of a double-balloon catheter. Since D&C is associated with severe complications, it is not recommended as treatment of CSP [2,6].

A hysteroscopic approach is rarely used alone due to the increased need for further interventions. It is effective in cases of CSPs growing inwards [type 1], whereas laparoscopy may be used in cases of CSPs that are growing towards the serosal uterine surface [type 2] [2].

However, hemodynamic status of patient should be considered before choosing route of surgery. And laparotomy is preferred in hemodynamically compromised patients as it gives better access and control of hemorrhage.

Liu SY, *et al.* conducted a cohort study on 109 women with CSPs. They opined that TCR is generally adequate for grade I CSP, since grade II CSP lesions bulge out of the uterine surface and show rich vascularity, laparotomic resection might be safer than laparoscopic resection while hysterotomy or even hysterectomy is usually required for grades III and IV CSP [6].

Conclusion

The standard guidelines for treatment of CSP is yet to be defined. The plan of treatment should be individualized considering the patient's preference and desire for future fertility, the size of the gestational sac and the hemodynamic condition of the patient.

If CSP is left untreated, it may progress into an abnormally invasive placenta, which can result in uterine rupture and life-threatening hemorrhage. Hence, early recognition and timely management are essential for improved patient outcomes.

Conflict of Interest

The authors have no conflicts of interest to declare.

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