Optimizing care in caesarean scar pregnancy: Lesson from five cases with different management modalities

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SUMMARY

Caesarean scar pregnancy (CSP) is a rare from of ectopic pregnancy that has been increasingly reported in recent years in parallel with the rising rate of caesarean section deliveries worldwide. CSP poses serious risks including uterine rupture, hemorrhage, hypovolemia, and even death 1 if not properly diagnosed and managed.This report highlights the importance of early detection and appropriate treatment based on individual clinical presentation. We report five cases managed between November 2023 and April 2024, utilizing various approaches: systemic methotrexate, intragestational potassium chloride with multi-dose methotrexate, and surgical intervention. Despite one complication from a misdiagnosed CSP, all patients recovered without severe outcomes.

INTRODUCTION

Caesarean Scar Pregnancy (CSP) is characterized by the implantation of trophoblastic tissue in the niche of a previous caesarean section site.[2-3] If untreated, CSP can progress to an abnormally invasive placenta.[4] The incidence of CSP ranges from 1 in 1,800 to 1 in 2,226 [1] pregnancies and correlates with the increasing rate of caesarean sections.[5] The estimation cases diagnosed as CSP at our center is around 10 cases per year since 2022. Diagnosis typically involves ultrasound or magnetic resonance imaging. Optimal management of CSP should be conducted at tertiary centers with appropriate facilities and experienced professionals. Treatment options include local or systemic methotrexate (MTX) [6] administration or surgical interventions such as laparoscopy, hysterotomy, or hysterectomy.[7-8] This case series reviews five CSP cases managed at our hospital, detailing their clinical presentations, diagnostic processes, management strategies, and outcomes.

CASE PRESENTATION

Case Report 1:

A 32-year-old woman, gravida 4 para 3, with an uncertain conception date, presented to the Early Pregnancy Assessment Unit with a complaint of two months of amenorrhea and intermittent vaginal bleeding for the past week. Her obstetric history includes a caesarean delivery at 27 weeks' gestation four years ago due to bleeding from a low-lying placenta, which was complicated by hypovolemic shock. She also has a history of type 2 diabetes mellitus, diagnosed in 2020.

On examination, her abdomen was soft and non-tender with a well-healed Pfannenstiel scar, and her vital signs were stable. Ultrasound revealed a gestational sac measuring 35 x 21 mm, with no visible fetal pole, located at the cervico-isthmic junction at the anterior scar site. Color Doppler showed hypervascularity, and the anterior myometrium measured 3.4 mm in thickness. The diagnosis of Caesarean Scar Pregnancy (Type 1) was established, and the patient was counseled accordingly.

Conservative management with methotrexate (MTX) was chosen. Baseline blood investigations, including a full blood count, renal function tests, and liver function tests, were within normal limits. The patient's beta-human chorionic gonadotropin (hCG) level at admission was 21 mIU/mL. She received a single 50 mg dose of intravenous methotrexate. Follow-up included serial beta-hCG measurements and transvaginal scans. Her beta-hCG levels decreased to 15 mIU/mL, 8 mIU/mL, 8 mIU/mL, and 4 mIU/mL over 50 days post-treatment. A subsequent transvaginal scan showed no remaining gestational sac in the lower uterine segment. The patient remained well throughout the follow-up period.

Case Report 2:

A 31-year-old female, gravida 3 para 1, with a history of miscarriage in 2020, presented with intermittent brownish vaginal spotting over the past month. Her obstetric history includes a caesarean delivery in 2020, followed by evacuation of retained products of conception later that year due to miscarriage. She also has a history of perimembranous ventricular septal defect (VSD) diagnosed in childhood, surgically repaired in 1994, and is currently under cardiology follow-up.

Upon admission, the patient's vital signs were stable, and her abdomen was non-tender. The cervical os was closed, with no active vaginal bleeding observed. Her beta-human chorionic gonadotropin (hCG) level was 52,530 mIU/mL, and other blood investigations were normal.

Ultrasound examination revealed a gestational sac positioned above the internal os in the lower uterus, bulging anteriorly, with the anterior myometrium measuring 3.8 mm in thickness. Doppler examination showed increased vascularity around the gestational sac and anterior myometrium. A live embryo with a crown-rump length (CRL) of 3.56 cm, corresponding to ten weeks and three days of gestation, was noted. Given these findings and the patient's

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history of prior caesarean delivery, a diagnosis of Caeserean Scar Pregnancy (CSP) was strongly suspected.

Management included a transvaginal injection of potassium chloride (KCl) for fetal reduction, followed by a multi-dose systemic methotrexate (MTX) regimen of 1 mg/kg on days 1, 3, 5, and 7, with tetrahydrofolate 0.1 mg/kg on days 2, 4, 6, and 8. Serial beta-hCG levels decreased as follows: 1,087 mIU/mL, 690.1 mIU/mL, 166.3 mIU/mL, 230.1 mIU/mL, 56.5 mIU/mL, and <2.3 mIU/mL over three months. Follow-up ultrasound showed a regressing gestational sac. The patient remained well throughout the follow-up, with no complications reported.

Case Report 3:
A 38-year-old woman, gravida 4 para 3, at 6 weeks' gestation, presented with intermittent vaginal spotting over the past week. Her history includes three previous caesarean deliveries, with the most recent in 2021, which was uncomplicated. Initial assessment at 6 weeks' gestation showed an empty, regular gestational sac with a subchorionic hematoma measuring 2 x 1.8 cm, and she was managed conservatively.

The patient subsequently visited the emergency department twice at 7 and 8 weeks' gestation with increased vaginal bleeding. A transvaginal ultrasound at 7 weeks revealed a live embryo with a crown-rump length (CRL) of 9.8 mm, consistent with 7 weeks' gestation. She was diagnosed with a threatened miscarriage and continued conservative management.

At 10 weeks' gestation, the patient developed abdominal pain and increased vaginal bleeding. Ultrasound showed the placenta located anteriorly at the caesarean scar site, with indistinct separation between the myometrium and placental bed. Doppler ultrasound revealed multiple lacunae and significant hypervascularization. The subchorionic hematoma had increased in size from 2 x 2 cm to 5 x 6 cm. A singleton pregnancy with a CRL corresponding to 10 weeks' gestation and fetal heart activity was observed.

Following discussions with the couple, a decision was made to proceed with surgical intervention due to the risk of uterine rupture. The patient underwent an uncomplicated total hysterectomy with bilateral salpingectomy via laparotomy. Intraoperative findings included a gravid uterus approximately 16 weeks in size, with the gestational sac implanted in the niche area, and clots from the posterior part of the sac occupying the uterine cavity up to the fundus (Figure 1).

The patient was discharged in good condition on the third postoperative day but developed a surgical site infection on the 11th postoperative day, which was managed conservatively with antibiotics and wound care. Histopathological examination confirmed the diagnosis of caesarean scar pregnancy with focal features of placenta accreta.

Case Report 4:
A 37-year-old woman, gravida 4 para 2, with a history of complete miscarriage in 2014, presented to our Early Pregnancy Assessment Unit with intermittent vaginal bleeding since early pregnancy. At 11 weeks' gestation, she was diagnosed with a missed miscarriage and managed conservatively. Her obstetric history includes two previous caesarean deliveries in 2014 and 2017, both due to acute fetal distress. Additionally, she was diagnosed with overt diabetes mellitus and essential hypertension early in this pregnancy.

At 14 weeks' gestation, a follow-up assessment raised suspicion of Caeserean Scar Pregnancy (CSP) when ultrasound revealed an irregular gestational sac measuring 6 x 4 cm, containing a fetal pole but no fetal heart activity. The sac was located in the lower part of the uterus and bulging anteriorly, with myometrial thickness measuring 5.3 mm. Doppler ultrasound indicated increased vascularity surrounding the sac. The patient's vital signs were stable, and no abdominal tenderness was noted. Her initial serum beta-human chorionic gonadotropin (hCG) level was 272 mIU/mL, with other blood parameters within normal limits.

After discussing management options, including systemic methotrexate (MTX) and surgical intervention, the patient and her husband opted for surgical management due to the patient's completed family and her inability to commit to regular follow-up. The patient underwent an uncomplicated total hysterectomy with bilateral salpingectomy via laparotomy (Figure 2).

Intraoperative findings revealed the gestational sac implanted in a niche area, embedded in the serosal layer of the uterus. The patient was discharged in good condition on the third postoperative day but later developed a surgical site infection, which required secondary suturing after antibiotic treatment. Histopathological examination confirmed caesarean scar pregnancy with early placenta accreta spectrum (increta).

Case report 5:
A 31-year-old woman, gravida 4 para 1+2, was referred to our center with a diagnosis of missed miscarriage at 11 weeks' gestation. She presented with three days of vaginal spotting. On physical examination, her vital signs were stable, and no abdominal tenderness was noted. Ultrasound revealed an anembryonic sac measuring 4.8 cm, confirming the diagnosis of missed miscarriage. The patient underwent evacuation of retained products of conception (ERPOC).

During the procedure, the patient experienced hypovolemic shock due to massive bleeding, likely secondary to a caesarean scar pregnancy. Intraoperative ultrasound showed a mixed echogenic collection in the lower uterus, likely blood clots, with thinning of the anterior myometrium over the scar site. The endometrial thickness was 8 mm. Despite uterotonic drugs, including oxytocin and carboprost, bleeding continued. A Foley balloon catheter was placed under ultrasound guidance for tamponade, inflated with 20 mL of sterile water, and removed 24 hours later.

The patient's estimated blood loss was 1300 mL, and she was transfused with two units of packed red blood cells. Following the removal of the Foley balloon, no further excessive vaginal

Table I: Summary of clinical history, management and outcomes of the patients with Caeserean Scar Pregnancies

Clinical history	Patient 1	Patient 2	Patient 3	Patient 4	Patient 5
Age	32	31	38	37	31
Gravidity/parity	G4P3	G3P1+1	G4P3	G4P2+1	G4P1+2
Obstetric history	1 previous LSCS	1 previous LSCS and 1 ERPOC	3 previous LSCS	2 previous LSCS	1 previous LSCS and 1 ERPOC
Gestational age at presentation	Unsure of date	13 week	10week	14week	11week
CRL (mm)	-	68mm	42mm	16.1mm	-
Fetal heart activity	-	Present	Present	-	-
Pre treatment Bhcg	21mIU/ml	52530mIU/ml	-	272mIU/ml	36mIU/ml
Size of gestational sac (mm)	35x21mm	-	-	60x40mm	48x20mm
Management	Intravenous single dose methotraxate injection	Transvaginal pottasium chloride for fetal reduction followed by systemic methotraxate injection (day 1,3,5,7)	Total abdominal hysterectomy bilateral salphingectomy	Total abdominal hysterectomy and bilateral salphingectomy	ERPOC-undiagnosed caeserean scar pregnancy, followed by single dose of intravenous
Outcome	No complication	Bhcg normalized after 3 month	Surgical site infection	Surgical site infection	Complicated with massive bleeding required ballon tamponade and blood transfusion
HPE	-	-	Consistent with caeserean scar pregnancy with features of focal placenta accreta	Consistent with caeserean scar pregnancy with early placenta accreta spectrum (increta)	Consistent with product of conception

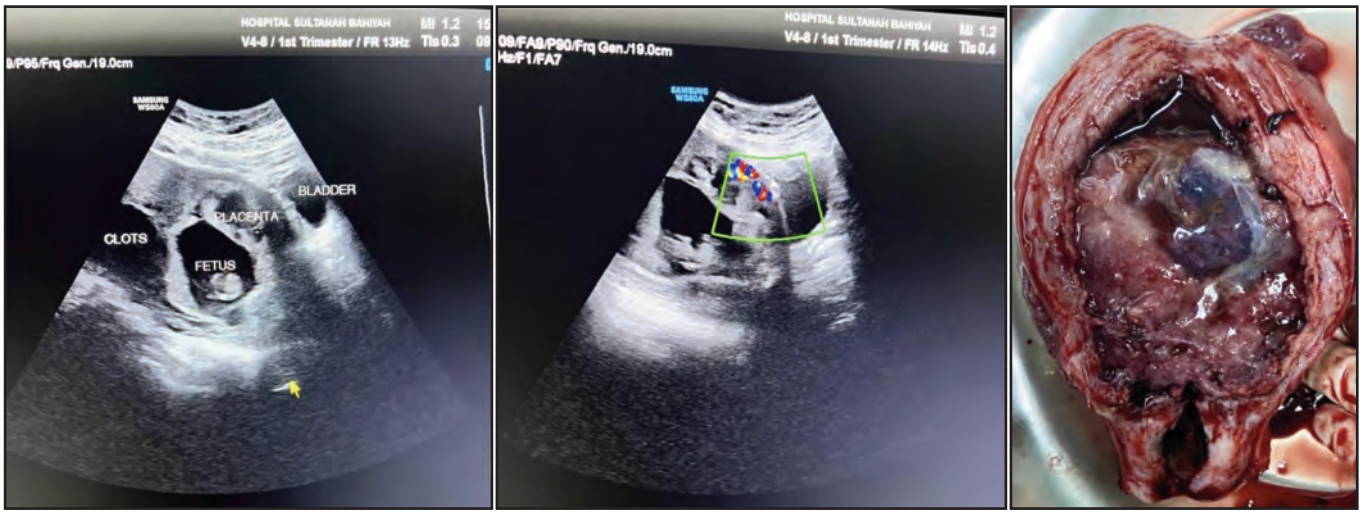

Fig. 1: Ultrasound findings showed placenta located anteriorly at the caesarean scar site with indistinct separation between placenta and myometrium. Doppler ultrasound showed hypervascularization with presence of lacunae. Gross specimen revealed gestational sac implanted in the niche area with clots from posterior part of gestational sac occupying the uterine cavity

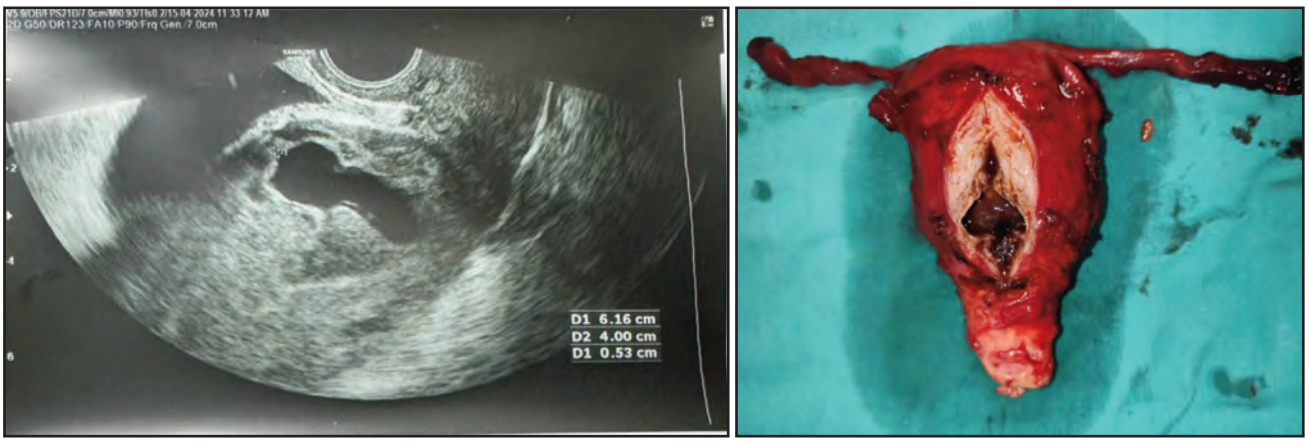

Fig. 2: Ultrasound findings noted irregular gestational sac located in the lower part of the uterus and bulging anteriorly with myometrial thickness of 5.3mm. Gross specimen showed gestational sac implanted in the niche area embedded in the serial layer of uterus

bleeding was observed. The patient received a single dose of methotrexate (50 mg) prior to discharge and was treated with broad-spectrum antibiotics. She was discharged in good condition on postoperative day 7. Follow-up showed normalization of beta-hCG levels and no additional complications with no significant abnormalities on ultrasound.

DISCUSSION

The diagnosis of Caesarean Scar Pregnancy (CSP) presents significant challenges, and its outcomes are highly dependent on both accurate diagnosis and appropriate management. CSP symptoms, are usually not specific[2] and often overlap with those of normal pregnancy or other gynecological conditions, contribute to the complexity of diagnosis. Common clinical findings is vaginal bleeding, low abdominal pain alone or combined with vaginal bleeding and however approximately one third of cases are asymptomatic.[2] Therefore, early detection and prompt intervention are critical to managing this condition effectively.

Imaging modalities, particularly ultrasound and magnetic resonance imaging (MRI), are indispensable in diagnosing CSP. First trimester transvaginal ultrasound plays an essential role in early diagnosis of CSP.[8] It is an optimal modality for evaluation of suspected CSP as its provides the highest image resolution.[9] The diagnostic ultrasound features of CSP include an empty uterine cavity and cervix with a normal endometrium and endocervical canal, alongside a gestational sac possibly containing an embryo or yolk sac positioned in the anterior part of the lower uterine segment at the site of the caesarean scar. A key characteristic is the presence of a thin or absent myometrial layer between the bladder wall and the gestational sac.

The primary management goals in CSP are to prevent life-threatening complications while preserving fertility whenever possible. However, the absence of standardized guidelines and limited evidence-based recommendations make treatment selection challenging. The management of CSP requires a personalized approach, considering factors such as clinical presentation, gestational age, grading of CSP, fetal viability, and the patient's preferences.[9]

For stable, young patients wishing to preserve fertility, medical management with methotrexate (MTX) is often the preferred option. It can be given intramuscularly, intravenously, orally or locally under image guidance.[8] It is crucial to inform patients about all available alternatives, including their potential benefits, risks, and failure rates. Unlike established protocols for tubal pregnancies, there are no definitive guidelines for MTX use in CSP.[10] MTX may be administered as a single dose of 50 mg/m² body surface area (BSA) or through a multidose regimen—MTX 1 mg/kg on days 1, 3, 5, and 7, with tetrahydrofolate 0.1 mg/kg on days 2, 4, 6, and 8. Follow-up typically involves weekly serum beta-hCG measurements for three consecutive weeks, followed by bimonthly monitoring until levels are undetectable. In cases where medical treatment fails, surgical intervention becomes necessary.

Surgical treatment is the only choice when life threatening complication arise [8] and options include hysteroscopic resection, CSP excision with scar reconstruction, hysterotomy via laparoscopy or laparotomy, and hysterectomy. The choice of surgical method should be based on the surgeon's expertise and the patient's preferences.

In our case series, patients 1 and 2, both younger and stable, opted for medical management to preserve their fertility. MTX has been shown to be effective at a dose of 50mg/m2 when beta-hCG level is less than 5000mIU/ml.[8] Single dose of MTX showed to be effective in a case no 1 as the pre treatment beta hCG was 21mIU/ml with no fetal cardiac activity. In a case with presence of fetal cardiac activity treatment with multi dose MTX therapy with intramniotic or intrafetal injection of potassium chloride have been propose by Gonzalez et al.[8] For a case 3, who presented with persistent symptoms such as abdominal pain and vaginal bleeding, required surgical management. Patient 4 also chose surgical intervention due to her inability to comply with the stringent follow-up required for medical therapy. Notably, patient 5, misdiagnosed with CSP and subsequently undergoing dilation and curettage, experienced severe hemorrhage, necessitating an additional procedure involving a Foley balloon catheter to control the bleeding. This case underscores the critical importance of accurate CSP diagnosis in determining appropriate management strategies and anticipating potential complications.

The conclusions drawn from this report are limited by the small number of cases. Larger, multi center studies are therefore warranted to better evaluate management strategies and outcomes, which may facilitate the development of national practice guidelines and standardized clinical algorithms for the management of caesarean scar pregnancies.

CONCLUSION

Caesarean Scar Pregnancy (CSP) is a potentially life-threatening condition if left untreated. Early termination of pregnancy during the first trimester is generally recommended to mitigate risks. Our case series underscores the importance of early CSP detection and highlights the need for individualized treatment strategies based on the specific clinical circumstances of each patient. Accurate diagnosis and tailored management are essential to improving outcomes and minimizing complications in CSP cases.

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DECLARATION

The authors declare no conflicts of interest.

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