

## Cesarean Scar Pregnancy: A Case Report

Md. Ouakka Fatiha<sup>1\*</sup>, S. Lamsyah<sup>1</sup>, K. Saoud<sup>1</sup>, N. Mamouni<sup>1</sup>, S. Errarhay<sup>1</sup>, C. Bouchikhi<sup>1</sup>, A. Banani<sup>1</sup>, G. El Mounssefe<sup>1</sup>

Obstetrics Gynecology I Department of the CHU HASSAN II, Faculty of Medicine, Sidi Mohamed Ben Abdellah University, FES, Morocco

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\*Corresponding author: Md. Ouakka Fatiha

Obstetrics Gynecology I Department of the CHU HASSAN II, Faculty of Medicine, Sidi Mohamed Ben Abdellah University, FES, Morocco

### Abstract

**Introduction:** A relatively new type of ectopic pregnancy is cesarean scar pregnancy (CSP). This is related to the increasing number of cesarean deliveries and to the advances in imaging. There are 2 types of CSP; CSP with progression to cervicoisthmic space or uterine cavity (type I, endogenic type) or with deep invasion of scar defect with progression towards bladder and abdominal cavity (type II, exogenic type). The endogenic type of CSP could result in a viable pregnancy; yet with a high risk of bleeding at the placental site. The exogenic type could be complicated with uterine rupture and bleeding early in pregnancy. As early diagnosis and treatment is important for the best outcome, every pregnant woman with history of cesarean delivery should be screened early in the first trimester of pregnancy. Diagnosis can be achieved with ultrasound and Doppler imaging. To date there have been only 5 randomized studies on CSP and evidence based management remains unclear. Until then, treatment should be individualized according to many factors including clinical presentation,  $\beta$ -hCG levels, imaging features, and the surgeon's skill. We report a case of cesarean scar pregnancy successfully managed in our university hospital center.

**Keywords:** Cesarean scar, Amenorrhea, bleeding,  $\beta$ -hCG, ultrasound and Doppler, scar pregnancy.

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## INTRODUCTION

The Implantation of a pregnancy into a caesarean scar is the rarest form of ectopic pregnancy with an estimated incidence of 1/1800 pregnancies [1]. This type of pregnancy has a major risk of massive bleeding that requires active management as soon as it is diagnosed. It is a pregnancy at major risk of massive hemorrhage and requires active management from the moment of diagnosis. The first publication on the subject dates back to 1978 [2]: the outcome of the first cases described was very often hysterectomy for hemorrhage caused by the first curettage treatment or spontaneous metrorrhagia without etiological diagnosis.

We present here the case of a patient received at the FEZ University Hospital in 2022 whose outcome was favorable. We will then discuss in the light of recent literature the diagnostic and therapeutic methods available for the optimal management of cesarean scar pregnancy (CSP).

## CASE REPORT

We report the case of a 32 year old patient, G2P1, one child delivered by caesarean section and an early spontaneous miscarriage, received for the management of persistent metrorrhagia for 20 days on an amenorrhea of 6 weeks, in whom the examination found the patient to be haemodynamically and respiratory stable, the abdominal examination was without abnormality, and then at the gynecological examination presence of a minimal blackish bleeding with no tenderness or a later-uterine mass.

The BHCG level was high at 2000UI/L, the pelvic ultrasound showed an anteverted uterus, thin endometrium at 4mm, with the presence of a well-limited echogenic heterogeneous isthmic image located opposite the caesarean uterine scar, measuring 4\*2.5cm, with the presence of an isthmocele, aspect evoking either an image of retention of a pregnancy on a scar or of a myoma. A pelvic MRI was performed revealing a moderately enhanced T2 hyposignal anterior isthmic lesion after injection of contrast medium measuring

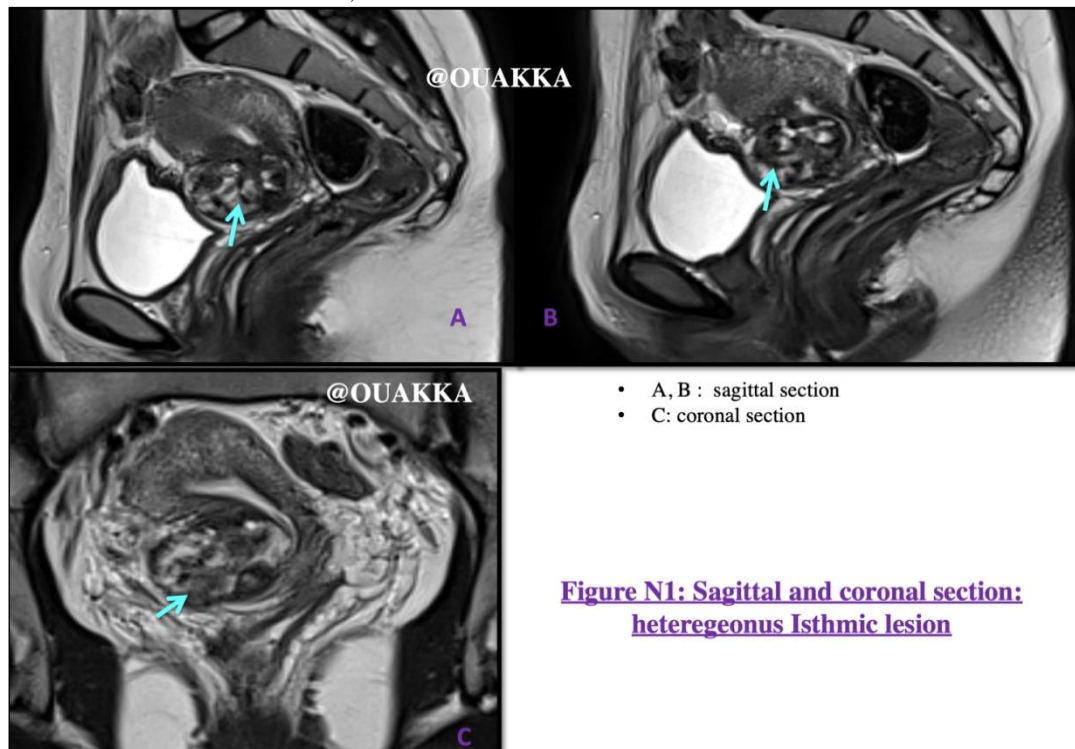
40\*42\*33mm, aspect evoking an adenomyoma or a retention image given the context.

We decided to perform a laparoscopy because of the suspicion of a pregnancy on a caesarean scar. The laparoscopic exploration found a normal size uterus, with a bluish bulging mass of about 04 cm at the isthmic level under the serosa, visualized by transparency, an incision was made opposite the mass, with removal of the trophoblastic material, and in the second stage the hysteroscope was introduced, with visualization of a hole in the isthmic level, lateral to the

left, in relation to the isthmocele, which was sutured and its watertightness checked.

The postoperative follow-up was simple, with injection of a dose of methotrexate-based monochemotherapy with biological monitoring of BHCg kinetics, which was favorable.

The anatomopathological study of the removed product was in favor of a pregnancy with signs of retention.



**Figure N1: Sagittal and coronal section: heterogeneous Isthmic lesion**

We are thus faced with a picture illustrating a rare situation in obstetrics gynecology, which is the ectopic pregnancy on a caesarean scar complicated by an isthmocele which was well managed.

## DISCUSSION

Cesarean scar pregnancy (CSP) is a potentially dangerous consequence of a previous cesarean delivery (CD). If unrecognized and inadequately managed, it can lead to untoward complications throughout all three trimesters of the pregnancy. Its rate of occurrence parallels the mounting rate of cesarean sections.

The true incidence of CSP is unknown. Almost all articles and related articles quote the only available estimates that the range is from 1/1800 to 1/2500 of all CD performed. One can expect an increase of the reported incidence caused by increased awareness and the more accurate diagnosis of this entity [3].

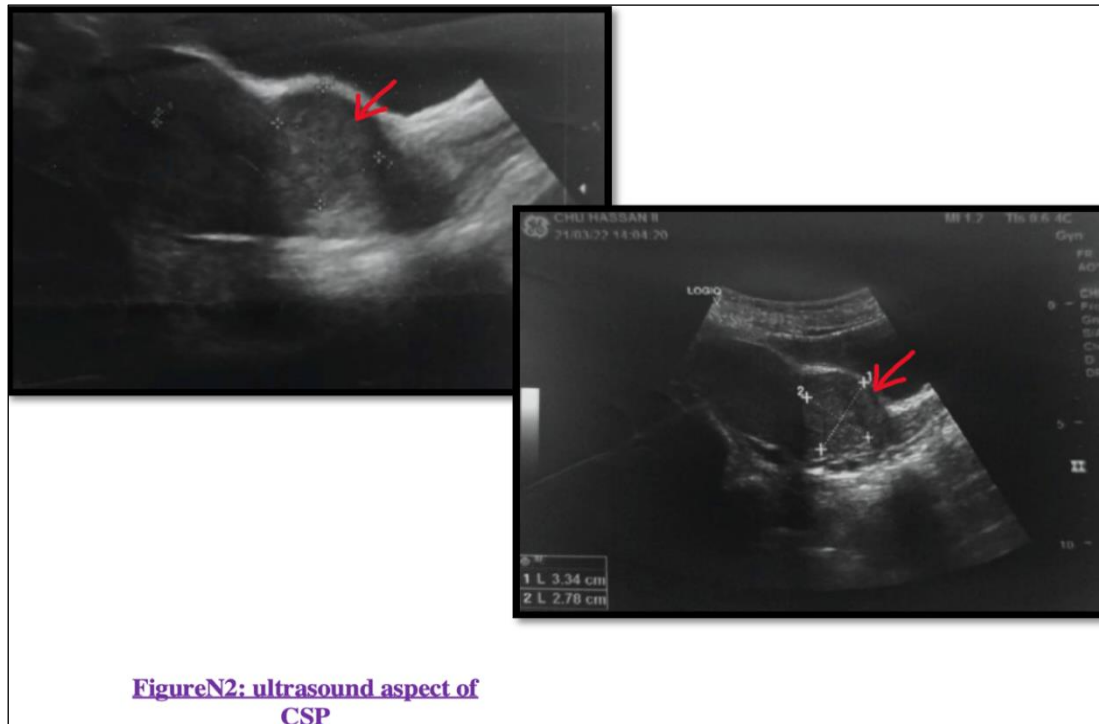
In order to understand the relationship between uterine wound healing and its consequences, Roeder *et*

*al.*, [4] evaluated the histopathology of uterine wound healing and found different thickness of myometrium along the scar with disordered muscular fibers and elastosis. Although, its mechanism is still unclear, it appears that impaired healing of the cesarean incision predisposes to the development of CSP. Factors predisposing to poor wound healing include inadequate closure of the uterine incision, postoperative infections, and impaired health conditions such as diabetes or collagen disturbances [5]. In addition, decreased blood flow to the affected tissue predisposes incomplete or delayed healing. Clinically, short interval between the cesarean pregnancy and subsequent pregnancy increases the probability of having CSP and placenta accreta. The definition of short interval in this context is unclear [5].

Two types of CSP have been proposed [1]. CSP with progression to cervicoisthmic space or uterine cavity (type I, endogenic type) and CSP with deep invasion of scar defect progression towards bladder and abdominal cavity (type II, exogenic type). The

endogenic type of CSP could result in a viable pregnancy; yet with a high risk of bleeding at the placental site. The exogenic type could be complicated

with uterine rupture and bleeding early in pregnancy [6].



**FigureN2: ultrasound aspect of CSP**

Due the serious consequences of CSP, early diagnosis and management is paramount. Symptoms of CSP are usually not specific [5]. In a review, 107 of 751 cases of CSP were missed and probably a similar number of cases remained undiagnosed [7]. The most common clinical finding is vaginal bleeding [5]. In a series of 57 patients, low abdominal pain alone or combined with vaginal bleeding was found in 24.6% of cases [8]. However, approximately one third of incidentally diagnosed cesarean pregnancies are asymptomatic. Gestational age at the time of diagnosis ranged from 5 to 16 weeks with a mean of  $7\pm 2.5$  weeks.

All women with a positive pregnancy test and prior cesarean delivery should undergo an early transvaginal sonographic (TVS) assessment during the first trimester. Indeed, the most utilized technique to detect CSP is TVS. The differential diagnosis includes cervical pregnancy and an aborting intrauterine pregnancy [6]. The US criteria [9] of CSP are:

- Absence of intrauterine gestation and empty cervical canal with clearly visible endometrium.
- A gestational sac located in the anterior isthmus, surrounded by the cesarean scar tissue, separated from the uterine cavity, and in presence or not of a thin myometrial layer between the bladder and the gestation sac.
- Gestational sac with or without fetal pole in presence or absence of cardiac activity.

On Doppler imaging, the gestational sac embedded in a scar defect is surrounded by vascular flows characterized by high velocity and low impedance blood flow. On the other hand, an aborting intrauterine pregnancy has no vascular flow bordering. In addition, a positive “sliding sac sign” suggests the latter where the sac slides with a slight pressure of the endovaginal probe to the cervix suggesting no intimate attachment between the sac and the uterus [6].

Magnetic resonance imaging (MRI) could be helpful when transvaginal ultrasound combined with power Doppler sonography is inconclusive [10] but equally accurate in the diagnosis of CSP compared to TVS, but better for evaluation of scar implantation [11]. MRI T2-weighted sagittal section is best to identify cesarean scar defect, trophoblastic layer, and myometrium separately. However, MRI does not detect placental invasion to cesarean scar and its extension.

Because of the limited number of reports with a large number of cases, there has been no consensus for treatment and management of CSP. Treatments vary from expectant management, medical management, local treatment and surgical approach. In any event, early treatment will provide the best results, and most are combined treatments. The objectives are to preserve fertility and to prevent life-threatening complications such as massive hemorrhage and uterine rupture.

➤ **Expectant Management:** Although expectant management has been reported [20], successful

outcome with no complications is unlikely. There are risks of placenta accrêta, uterine rupture, and massive hemorrhage, usually resulting in hysterectomy.

- **Systemic Methotrexate:** Most authors used systemic MTX in a single dose approach and a second dose a week later if needed. Experience with multidose treatment similar to that for treatment of molar pregnancy is lacking. In a review, systemic methotrexate treatment for CSP was found to be effective when the serum  $\beta$ -hCG levels was <12,000 mIU/ml, negative embryonic cardiac activity and gestational age below 8 weeks [13]. Yet, a quarter of patient's required additional treatment due to persistent fetal cardiac activity and/or increasing  $\beta$ -HCG levels, and 13% had serious complications [13]. This could be due to the short half-life of MTX. Exposure of MTX to the trophoblast is also limited by the presence of fibrous tissue surrounding the gestational sac [5]. Accordingly, local MTX treatment has been advocated as the first line treatment of CSP [15]. In 95 patients treated with single or multiple MTX local injections, 11.5% required additional treatment [15].
- **Local Methotrexate:** Peng *et al.*, conducted a randomized trial comparing local and systemic administration of MTX (single and a second dose a week later if needed) among 104 patients with CSP [16]. The cure rates were comparable (69.2% versus 67.3% for local and systemic treatment respectively). Yet, systemic MTX was associated with reduced time for hCG remission and cesarean scar mass disappearance. They suggested that success with MTX treatment can be achieved in women with  $\beta$ -hCG levels <20,000mIU/mL and uterine mass below 3cm in diameter [5].
- **Hysteroscopy:** Hysteroscopy could be done as a primary treatment especially for type I CSP as well as for follow up [17]. It allows good visualization of the gestational sac, the surrounding vessels, and the uterine wall. It is done using a resectoscope with glycine 1.5% as a distending medium. Using a loop electrode without electricity, the products of conception is separated from the uterine wall. Bleeding can be controlled by electrocoagulation or intrauterine Foley balloon if needed. Hysteroscopic removal of CSP is associated with fast recovery, short follow-up, rapid decline of  $\beta$ -hCG to normal values and normal morphology of uterine cavity [18]. However, hysteroscopic removal of a CSP should be performed by a skilled hysteroscopist [5]. Follow-up is mandatory with repeated measurements of  $\beta$ -hCG levels. [18]
- **Laparoscopy:** There have been only a few case-reports of laparoscopic treatment of CSP published. Laparoscopic removal of CSP is applicable when the ectopic gestation is growing towards the bladder and abdominal cavity (type II CSP) [5]. The patient should be hemodynamically stabilized,

and the procedure should be performed by an experienced surgeon in an adequate facility. The procedure is performed by first separating the bladder from the low uterine segment. In order to minimize bleeding, dilute solution of vasopressin is infiltrated into the myometrium overlying the gestation [19]. The gestation is removed by excising the uterine wall (wedge resection). The incision is then repaired [20]. If needed, bilateral uterine artery occlusion can be done. Laparoscopic excision of CSP up to 11 weeks gestation has been reported. The main advantage of laparoscopic approach is complete removal of the products of conception at the time of the surgery reducing the follow up time.

Our therapeutic approach in the light of the reported case was to combine three therapeutic modalities, hysteroscopy, laparoscopy with resection of the product of conception and repair of the defect of the uterine scar, followed by adjuvant treatment with single-dose of methotrexate with monitoring of B-HCG kinetics which was favorable.

Regarding obstetrical prognosis, a few pregnancies have been described after any type of conservative treatment, and the risk of recurrence is estimated at 5% [21]. Some teams recommend a delay of 12 to 24 months between pregnancy on a caesarean scar and a future pregnancy [21]. An evaluation of the caesarean scar is recommended by some authors before considering another pregnancy. Some teams use hysterosonography to assess the caesarean scar [21] to look for a defect. Some teams use hysterosonography to assess the caesarean scar to look for a scar defect, while others use ultrasound with a sensitivity of 87% and a specificity of 100% to diagnose this uterine defect during pregnancy [21]. The authors recommend early ultrasound in a subsequent pregnancy to verify the intrauterine location of the gestational sac [21].

## CONCLUSION

The occurrence of a pregnancy on a caesarean scar is no longer an exceptional an exceptional event. It is now an integral part of the long-term complications of caesarean section. It can be classified at the same level of severity as placenta accrêta. The interest of an early diagnosis lies in the possibility of choosing an adapted treatment according to the clinical context, the radiological data, the technical platform and the patient's desire. This could limit the serious hemorrhagic complications which very often go hand in hand with total hysterectomy, thus compromising the patient's subsequent fertility when maternal death has been avoided.

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