



## Caesarean Scar Pregnancies: Case Report

**Bedjaoui Hind\*, Aboubekr Fadlallah, Senouci Oum Elkheir Soltana, Kerras Meriem Elbatoul, Tachema Ikram and Messaoud Mimouna**

*Department of Gynecology and Obstetrics, Mother and Child Hospital of Sidi Bel Abbes, Taleb Morad Faculty of Medicine – Djillali Liabes University, Algeria*

**\*Corresponding Author:** Bedjaoui Hind, Department of Gynecology and Obstetrics, Mother and Child Hospital of Sidi Bel Abbes, Taleb Morad Faculty of Medicine – Djillali Liabes University, Algeria.

**DOI:** 10.31080/ASCR.2024.05.0600

**Received:** October 28, 2024

**Published:** November 18, 2024

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### Abstract

Our case study focuses on the diagnosis and management of caesarean scar pregnancies. Scar pregnancies are on the rise, given the increased number of cesarean deliveries. Ultrasound plays an indispensable role in the diagnosis of this form of ectopic pregnancy, which can lead to life-threatening and obstetric complications. We report seven cases of scar pregnancy, and through their observation and review of the literature, we discuss the diagnostic criteria and therapeutics that will enable adequate management.

**Keywords:** Caesarean Scar Pregnancy; Endovaginal Ultrasound; Diagnosis; Scar Pregnancy Classification

### Introduction

Caesarean section is one of the most common surgical procedures performed on women of childbearing age, and the significant increase in caesarean section rates in recent decades has led to a significant rise in short- and long-term complications such as uterine rupture, placenta accreta [1] and scar pregnancies.

According to the 2020 recommendations of the European Society of Reproduction (ESHRE) [2] Scar pregnancy is a variant of ectopic pregnancy defined by total or partial implantation of the gestational sac at the caesarean section scar, and is associated with maternal mortality, morbidity and infertility.

The incidence of caesarean scar pregnancy is 1 in 2000 pregnancies and represents 6% of ectopic pregnancies in women with a history of caesarean delivery [3].

Early detection of this type of pregnancy is therefore essential for better management, and to prevent maternal complications [4] given the possible risk of precarization of this pregnancy.

Scar pregnancy may be misdiagnosed as threatened abortion, incomplete abortion or cervical pregnancy [5].

Ultrasound plays an important role in the diagnosis of scar pregnancies, which is why early ultrasound scans in the first trimester are recommended in women with a scarred uterus. Ultrasound reveals an enlarged hysterotomy scar with an integrated mass, which may protrude beyond the anterior contour of the uterus [6,7].

Management consists of evacuation of the pregnancy by injection of methotrexate in situ or systemically, curettage and aspiration, laparotomy or operative hysteroscopy [8-10].

In this case report we will share our experience at the EHS mother-child of Sidi Bel Abbes on the diagnosis and treatment of 7 patients with pregnancies implanted in the caesarean scar over a six-month period from November 2023 to March 2024.

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### Case Report

From November 2023 to March 2024, we received seven patients who presented with cesarean scar pregnancies, which were diagnosed and treated at our facility.

The age range varied between 30 and 40 years.

The medical histories of the 7 patients were unremarkable.

Four had a tri-scar uterus, one a quadri-scar uterus and two a scar uterus. The inter-uterine space was respected in all patients (Beyond one year).

All patients had undergone a segmental transversal caesarean section in the past, and the postoperative follow-up were unremarkable.

The reason for consultation was bleeding in stopped pregnancies ranging from 7 weeks of amenorrhea to 9 weeks of amenorrhea, none of whom had a pre-established diagnosis of scar pregnancy. This was confirmed in our hospital, with the use of an endovaginal ultrasound scan – table 1-, which revealed an empty uterine cavity, a gestational sac in the anterior portion of the lower segment of the uterus at the location of the Caesarean section scar – figure 1-, and measurement of the thickness of the myometrium

between the gestational sac and the bladder, which enabled us to decide on the choice of operation (Table 2).

Six of the seven patients received a systemic injection of MTX 1mg/kg.

Six patients were scheduled for laparotomy because the residual myometrium was less than 2mm; of the six, four showed scar dehiscence ranging from 2 to 4 cm on exploration; the surgical procedure was to perform wedge-shaped excision with resection of the sac and repair of the hysterotomy with simple extra-mucosal stitches – figure 2, 3, 4-, Only one patient underwent a total interadnexal hysterectomy, given the trophoblastic invasion extending into the uterine artery lumen, which was responsible for severe bleeding and life-threatening hemodynamic instability.

Only one patient was scheduled for hysteroscopic surgery, as the thickness of the myometrial wall was over 3 mm, and resection was performed using a mini-resector.

Post-operative follow-up was correct, with a post-operative hospital stay ranging from 48 to 72 hours.

All patients were monitored by weekly hCG levels and endovaginal ultrasound.

Empty uterine cavity	7
Empty cervical canal	7
Gestational sac at caesarean scar location	7
Gestational sac with an embryo with negative cardiac activity	3
Empty gestational sac	4

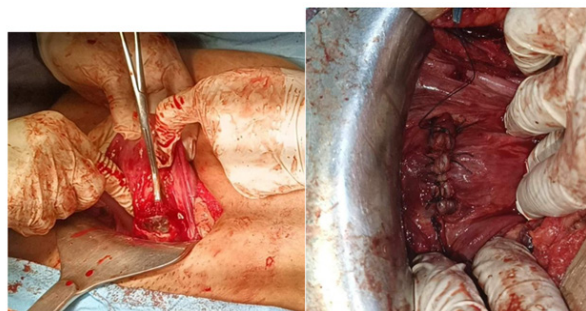
**Table 1:** Ultrasound findings of 7 patients.

Patients	Age	No. of caesareans	Gestational age (weeks of amenorrhea)	Nature of management	Complications
1	32	4	8	Injection of MTX and laparotomy	/
2	39	3	9	Injection of MTX and laparotomy	Intraoperative bleeding and transfusion of 2 packed red blood cells
3	37	3	7	Injection of MTX and laparotomy	/
4	40	3	9	Injection of MTX laparotomy	Total hysterectomy Inter adnexal Intraoperative bleeding and transfusion of 3 packed red blood cells and 5 FFP
5	36	1	9	Injection of MTX and laparotomy	/
6	30	3	8	Operative hysteroscopy	/
7	32	1	8	Injection of MTX and Laparotomy	/

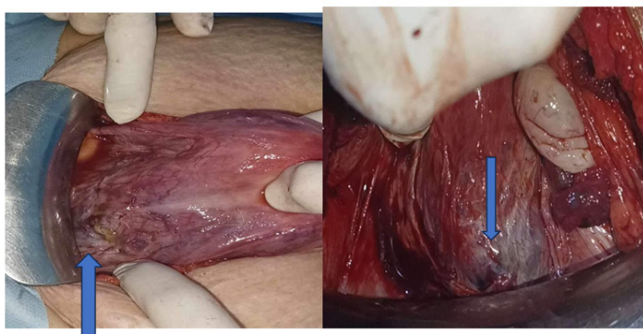
**Table 2:** Clinical data, types of surgery and postoperative follow-up.



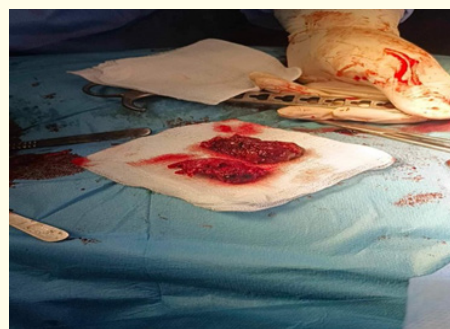
**Figure 1:** Transvaginal images demonstrating an obvious gestation sac developing in the anterior uterine wall.



**Figure 3:** Appearance after complete resection of the product of conception (a) and repair of the hysterotomy with simple extramucosal stitches (b) (intraoperative image).



**Figure 2:** Ectopic pregnancy on the cesarean scar is visible through the serosa (intraoperative image).



**Figure 4:** Gestational sac and embryo (intraoperative image).

### Discussion

Implantation and development of the gestational sac in the caesarean scar is rare, although the incidence ranges from 1/1800 to 1/2226 pregnancies [11,12]. The mechanism responsible for this scar pregnancy has yet to be elucidated, but it is thought to involve blastocytic invasion into the myometrium via a channel between the caesarean scar and the endometrium, with the gestational sac being surrounded by fibrous scar tissue and myometrium [13].

Diagnosis is made during the first-trimester ultrasound, and around 30% of women may have no symptoms at all [14]. Pain and bleeding, as in our case, are the most common signs. Early detection of scar pregnancy is essential, as any delay can lead to hemorrhage, placenta accreta, uterine rupture or hysterectomy with subsequent loss of fertility.

Ultrasound examination should be performed using an endovaginal probe, with inspection of the lower anterior uterine wall and identification of the scar.

Ultrasound criteria when evaluating cases of scar pregnancy should include the following [15]:

- Empty uterine cavity
- Empty cervical canal
- Development of the sac in the anterior isthmic segment
- Circumferential flow using color Doppler
- Myometrial thickness absent or reduced between sac and bladder

In our series, all our patients presented with an empty uterine cavity and empty cervical canal, with a gestational sac implanted in the scar. These were pregnancies with 4 cases of empty gestational sac and 3 cases of embryo with negative cardiac activity.

A new system has been created to classify caesarean scar ectopic pregnancies into five types, with a recommended surgical treatment strategy for each type. This classification system uses accurate quantitative indicators of anterior myometrial thickness and gestational sac diameter to determine the approach to first-line surgical treatment [16] figure 5.

Practical Clinical Classification	Anterior Myometrium Thickness (mm)	Average Diameter of the Gestational Sac or Mass (mm)	Surgical Treatment Strategy Recommended
Type I	Greater than 3		Suction curettage with or without hysteroscopy* under ultrasound guidance
Type II	1-3	IIa: 30 mm or less	Suction curettage with hysteroscopy* under ultrasound guidance
		IIb: greater than 30 mm	Hysteroscopy with laparoscopic monitoring or excision† or transvaginal excision
Type III	1 or less	IIIa: 50 mm or less	Laparoscopic excision or transvaginal excision
		IIIb: greater than 50 mm or with UAVF	Laparoscopic excision after UAE or laparotomy

UAVF, uterine arteriovenous fistula; UAE, uterine artery embolization.  
 \* Hysteroscopy is used to evaluate whether products of conception have been removed completely, with hysteroscopic resection of residual products when indicated.  
 † During laparoscopy, if the products of conception could not be removed completely by hysteroscopy, hemorrhage occurred, or myometrial layer bulge or thin-appearing myometrium was found, laparoscopic excision with scar defect repair was performed.

**Figure 5:** Clinical classification of caesarean scar ectopic pregnancy and recommended individual surgical treatment strategy.

Type I is defined as implantation of a gestational sac in the caesarean scar, with an anterior myometrial thickness of more than 3 mm, whatever the size of the gestational sac.

Type IIa is defined as an anterior myometrial thickness of between 1 and 3 mm and an average gestational sac or mass diameter of 30 mm or less.

Type IIb is defined as an anterior myometrial thickness of between 1 and 3 mm and an average diameter of the gestational sac or mass greater than 30 mm.

Type IIIa, the gestational sac protrudes below the caesarean scar, with a thickness of the anterior myometrium of 1 mm or less and an average diameter of the gestational sac or mass of 50 mm or less.

Type IIIb is defined as an anterior myometrial thickness of 1 mm or less and an average diameter of the gestational sac or mass greater than 50 mm [16].

MRI can provide further confirmation of the ultrasound results and specify the depth of trophoblastic invasion of the myometrium and potential involvement of the serosa or bladder [17].

Patients	Anterior myometrium thickness (mm)	Clinical classification	Development of the sac in the anterior isthmic segment
1	1	IIIa	Yes
2	1,2	I Ib	Yes
3	2	I Ib	Yes
4	1	IIIb	Yes
5	1,3	I Ib	Yes
6	3,2	I	Yes
7	1	IIIb	Yes

**Table 3:** The type of implantation of all 7 cases.

At present, there are no formal recommendations concerning treatment modalities, so it should be noted that treatment decisions must be made on the basis of the patient's clinical condition and the resources available in the hospital. Treatment, whether medical or surgical, must be conservative.

Treatment can range from MTX injections to aspiration and curettage, hysteroscopy or even laparotomy.

If treatment is delayed, scar pregnancy may develop into placental insertion anomaly or uterine rupture.

Local or systemic methotrexate injections can be effective in treating premature pregnancy, although regression can take a long time and there is always a risk of uterine rupture. Systemic MTX is a common treatment for ectopic pregnancy, with a 90% success rate.

However, this success rate is lower for pregnancy on Caesarean section scar [18], due to the fibrous tissue surrounding the gestational sac, which reduces pregnancy abortion and the efficacy of MTX, although it allows minimization of intraoperative blood loss (hysteroscopy, laparotomy).

MTX was used in six patients classified between I Ib and IIIb, table 3; and no complications or side effects occurred in this group of patients.

Surgical treatment includes either uterine curettage with uterine embolization, which is not the treatment of choice but rather used in cases of hemorrhage [19].

Either laparoscopic resection of the gestational sac and scar tissue, or laparotomy.

In our series, the management of type 1- table 3-, which involved a single patient, consisted of operative hysteroscopy. This procedure, described for the first time in 2005 by Wang [20], has the advantage of providing good visualization of the pregnancy and enabling selective coagulation of the vessels at the implantation site, thus preventing intra- and post-operative hemorrhagic complications. Fertility is also preserved.

The remaining six were classified between type I Ib and IIIb, representing the highest risk of intraoperative hemorrhage, and the laparotomy approach was therefore recommended. This allows complete resection of the scar and trophoblastic tissue, and repair of the hysterotomy with simple extra-mucosal stitches.

It has been shown that the operative technique and incision closure technique used during caesarean section was a factor influencing the pathogenesis of scar pregnancy [21].

A retrospective cohort study revealed that a new surgical technique, involving exclusion of the endometrium during uterine closure, was associated with fewer placental anomalies in subsequent pregnancies and a reduction in life-threatening maternal morbidity in future pregnancies [22].

As for obstetrical prognosis, there is a risk of recurrence of up to 5% [23]. Some teams advise a delay of between 12 and 24 months for a future pregnancy [24]. Some teams use hysterosonography to evaluate the Caesarean scar [24] in search of a scar defect.

We evaluated the scar by hysteroscopy eight weeks after the operation, which demonstrated good healing and absence of defect.

At the time of publishing this article, all six patients are still on contraception.

## Conclusion

The appearance of a pregnancy on a caesarean section scar is no longer an atypical event, and is now an integral part of caesarean section complications. Its frequency is constantly increasing, given the rise in Caesarean section rates.

The advantage of early diagnosis in the first trimester using an endovaginal ultrasound probe in all patients with a scarred uterus is to choose an appropriate treatment based on the clinical situation and the technical resources available, thus avoiding emergency interventions, minimizing maternal complications and preserving future fertility.

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