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Pregnancy on Cesarean Scar: A Case Report and Review of the Literature

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Pregnancy on a cesarean scar is a complication that occurs in the context of a previous cesarean section. It refers to the implantation of the gestational sac in the cesarean scar or dehiscence of a prior cesarean section, with increased risks for both the mother and fetus, including uterine rupture, placenta accreta, and postpartum hemorrhage. This article presents a clinical case of pregnancy on a cesarean scar, and through a review of recent literature, we highlight the diagnostic and therapeutic features, which, when well understood by practitioners, can improve the prognosis of this condition.

A 33-year-old patient, GIIIIP, with a history of stillbirth at term in 2020 due to gestational hypertension, a living child born vaginally in 2021, and a child delivered via cesarean section in 2022 in the context of diabetes (on insulin, later switched to oral antidiabetic drugs), with 15 days off medication and a pregnancy termination at 7 weeks gestational age by aspiration a year ago, consulted due to a delay in her menstruation. A BHCG test was performed, showing values of 1259, then 2514 after 24 hours, and 7040 after 48 hours. An ultrasound revealed a 6-week ongoing pregnancy located on the uterine scar **(Figures 1 and 2)**. Recent literature suggests that pregnancy on a cesarean scar is more common than previously thought. The first reported case of pregnancy in a cesarean scar was documented in 1978 **[1]**. By 1999, only 19 cases had been recorded. Since then, the incidence has continued to rise, particularly with the increasing frequency of cesarean sections and the use of assisted reproductive technologies (IVF). Its incidence is estimated between 1 in 1800 and 1 in 2216 pregnancies, and it accounts for 6.1% of all ectopic pregnancies in women with a history of at least one cesarean delivery. Risk factors are similar to those for placenta accreta, including the number of prior cesareans and intrauterine procedures (such as curettage and manual uterine revision), as well as the use of IVF with embryo transfer **[2]**. From a pathophysiological perspective, a microdefect in the cesarean scar may allow the blastocyst to invade the uterine muscle; the lower uterine segment, being less engaged and mature, does not promote optimal healing and thus favors ectopic implantation. Most cases reported in the literature are diagnosed in the first trimester. The risk of uterine rupture, maternal-fetal hemorrhage, hysterectomy for hemostasis, and bladder invasion by a percreta placenta increases if the pregnancy continues beyond the first trimester **[3]**. A case of pregnancy on a cesarean scar progressing to 35 weeks gestational age was described in 1995 by Herman et al., complicated by hemorrhage and treated with hysterectomy for hemostasis **[4]**. In most cases, the diagnosis can be made at 5-6 weeks gestational age. Clinical manifestations include abdominal pain and bleeding, which

can range from spotting to life-threatening hemorrhage **[5]**. However, the clinical presentation can sometimes be asymptomatic; indeed, a series study found that up to 40% of patients showed neither pain nor vaginal bleeding, highlighting the importance of considering the patient's history. Delayed diagnosis can lead to uterine rupture, and diagnostic errors leading to mismanagement as a miscarriage, followed by immediate curettage, could result in massive hemorrhage. This underscores the critical importance of rapid and accurate diagnosis **[6]**, which improves both vital and functional prognosis.

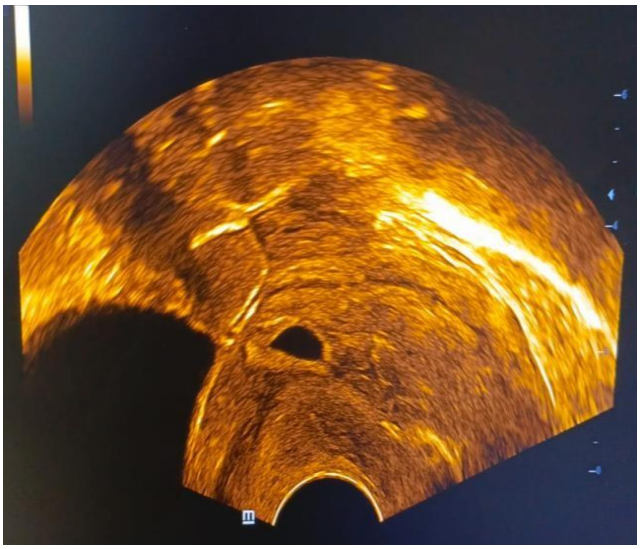
The diagnosis of pregnancy on a cesarean scar is made through ultrasound, performed via the vaginal route. This is a sensitive (84.6%) and easily accessible examination that allows for early and precise diagnosis **[7]**. It is based on the criteria established by Vial in 2000 **[8]**: uterine emptiness without contac with the gestational sac; a cervical canal free of contact with the gestational sac; and, in sagittal section, implantation of the gestational sac on the anterior uterine wall. Indirect ultrasound signs include the absence of an adnexal mass and no effusion in the Douglas pouch, unless the pregnancy is complicated by uterine rupture.

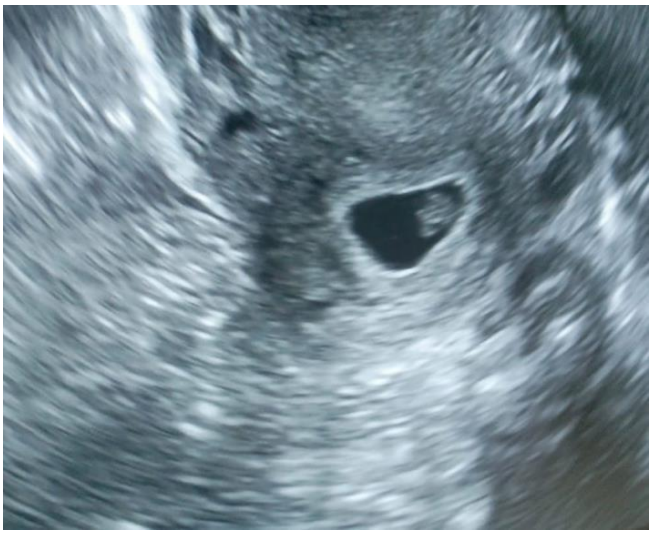
There are also indirect ultrasound signs such as the thinning of the myometrium between the gestational sac and the bladder, reflecting the depth of implantation, and hypervascularization of the trophoblast, observed by color or power Doppler **[9]**. In our case, the ultrasound identified the condition, and other imaging exams such as MRI can be used to assess the anatomical relationships, determine the depth of trophoblastic invasion into the myometrium, and identify potential involvement of the serosa or bladder, as well as the exact position of the gestational sac. T1 and T2 weighted sagittal and transverse images clearly show the gestational sac located in the anterior uterine wall **[10]**. This helps assess the volume of the lesion and guides therapeutic choices. Given the rarity of this condition, there are no formal recommendations currently regarding therapeutic management **[11]**. Treatment for pregnancy on a cesarean scar should be early and active due to the major risk of hemorrhage or uterine rupture, which can endanger both maternal and uterine function. The treatment plan takes into account gestational age, available therapeutic options, the patient's future fertility desires, the experience of the medical team, and the potential complications of first-line therapies **[12]**.

Currently, both medical and surgical treatments remain conservative, except in cases of therapeutic failure or when fertility preservation is not desired **[13]**. Medical treatment is feasible for many teams in hemodynamically stable patients. It involves the administration of methotrexate, which acts on tissues with active proliferation, such as fetal cells. This inhibits trophoblast growth. Methotrexate can be administered either locally or systemically **[14]**. Surgical techniques are generally proposed as first-line treatment for patients who no longer desire children, who are hemodynamically unstable, or in cases of medical treatment failure **[15]**. Aspiration-curettage carries a high risk of hemorrhage and uterine rupture. As the gestational sac is not in the uterine cavity, the trophoblastic tissue located in the cesarean scar is difficult to access, making this procedure potentially dangerous and ineffective. However, it remains acceptable under ultrasound guidance in cases where the gestational sac is extending toward the cavity and for pregnancies less than 7 weeks with a healthy anterior myometrium greater than 3.5 mm **[15]**. Hysteroscopic resection is a recently described method; it has the advantage of allowing clear visualization of the pregnancy and selective coagulation of blood vessels at the implantation site, thus preventing per and postoperative hemorrhagic complications. Fertility is preserved in this approach **[14]**. Laparoscopy and laparotomy are less commonly used now, due to the effectiveness of conservative techniques; however, they may allow complete resection of the scar and trophoblastic tissue.

Pregnancy on a cesarean scar is no longer an exceptional event. The increase in reported cases in the last decade reflects an increased vigilance among obstetricians and gynecologists regarding diagnosis and management options. It is now considered a part of the long-term complications of cesarean sections. The importance of early diagnosis lies in the ability to choose an appropriate therapeutic approach based on clinical context, radiological findings, available facilities, and patient preferences. The presence of a low-lying gestational sac in a patient with a cesarean scar history

should raise suspicion for pregnancy on a cesarean scar, which, if undiagnosed, can lead to early and severe hemorrhagic complications.





Figures 1 and 2

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