# ECTOPIC PREGNANCY IN PREVIOUS CESAREA SCAR: A SERIES OF CASES

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**ABSTRACT**

Introduction: Ectopic pregnancy in cesarean section scar (CSEP) consists of implantation of a blastocyst in the myometrium of a scar from a previous cesarean section. The incidence of CSEP has been increasing in parallel with the increase in cesarean sections and currently ranges from 1:1800 to 1:2216 pregnancies. Objective: To report a series of cases and their outcomes, to know the sonographic characteristics that corroborate the diagnosis and to identify the associated major complications, to discuss the forms of treatment and to report the evolution after the resolution of the condition. Method: Case series. Discussion: The best therapeutic proposal in cases of CSEP is the interruption of pregnancy in the first trimester to prevent the fearful complications inherent to the myometrial implantation of the fetus (hemorrhage and uterine rupture). Expectant management is inadvisable and is associated with exceptionally high morbidity and mortality. The patient profiles of the cases fit the risk factors cited in the studies. All cases had a previous cesarean section and a diagnosis of ectopic pregnancy in a cesarean scar; mean age: 31.25 years (29-33 years); average parity (gesta): 3 (G5-G2). In this way, we meet what the literature cites as the main risk factors. In cases 1 and 3, patients were treated through ultrasound-guided uterine evacuation associated with drug treatment. Case 2 received drug treatment with methotrexate through an intramuscular dose and later, added to the intra-gestational sac injection of the drug. And in case 3, the patient received drug treatment and, after bleeding, underwent surgical treatment with a diagnosis of placenta accreta through hysteroscopy. In all cases, the patients were diagnosed early, amenable to conservative treatment and had their fertility preserved. Final considerations: A good approach to ectopic pregnancy in cesarean scar after early diagnosis with USG and Doppler performed by an experienced team has the power to change the patient's prognosis and reproductive future.

**KEYWORDS: PREGNANCY, ECTOPIC, CESAREAN SECTION, SCAR, METHOTREXATE**

## INTRODUCTION

Health education in Brazil about the occurrence of ectopic pregnancy in a cesarean scar is of paramount importance, since there is an exponential increase in the number of cesarean sections over time and, despite being a rare form, its incidence has been occurring on an increasing basis. It is observed that there is a scarcity of case reports and studies on the subject and deepening the knowledge of gynecologists and ultrasonographers regarding this rare form of ectopic pregnancy, enables the early detection and prevention of bleeding complications, as well as the reduction of incidence of urgent hysterectomies and even maternal death from this cause.

Ectopic pregnancy is the implantation of the blastocyst outside the lining of the uterine cavity, an implantation that can occur in the tubes, ovaries, cervix or uterine horns, abdominal cavity and in the scar of a previous cesarean section1. The implantation of a pregnancy in the cesarean scar is considered the rarest presentation of ectopic pregnancy with high morbidity and mortality [2].

The first report of cesarean section scar ectopic pregnancy (CSEP) was carried out in 1978 by Larsen and Solomon, being described as a post-abortion hemorrhage due to a saccule in the uterine scar of a previous cesarean section [3]. In recent decades, due to the increasing frequency of cesarean sections, there has been an increase in reports about this new complication [4].

Because it is a rare condition, there is no universal protocol for treatment nor an ideal approach in terms of safety and therapeutic efficacy. Most literature recommends termination of pregnancy during the first trimester. In this sense, the objective of the treatment should be to prevent the pregnancy before a possible uterine rupture, remove the entire gestational sac and preserve the fertility of these women whenever possible [4].

The present study aims to report a series of cases of CSEP, describing the sonographic diagnosis and the different therapeutic approach in each one.

## METHODS

The work will be of the Case series type, which is characterized as a descriptive study. Its valuation is based on the premise that problems can be solved and practices can be improved through the description and analysis of

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objective and direct observations. The techniques used to obtain information are quite diverse, with emphasis on medical records, laboratory and imaging tests and photos authorized by the patient.

As for the ethical aspects, it should be noted that the research will be based on Resolution n. 466/2012, thus ensuring the rights of those involved. This research will be approved by the Ethics Committee indicated by Plataforma Brasil and will only be developed with the patient's authorization with the signing of the Informed Consent Form.

The study will only contain the analysis of care protocols, medical records, diagnosis and indicated forms of treatment. The risks present here are in relation to the exposure of the history of care and patient data present in the medical records.

Benefits refer to understanding the diagnosis and treatment, generating knowledge for the medical profession.

## CASE REPORTS

CASE 1

Patient FGMC, 33 years old, G2P1c, without use of a contraceptive method (never adapted to the use of oral contraceptives) had irregular cycles, but started with symptoms of nausea, fatigue, symptoms similar to her previous pregnancy and suspected a new pregnancy, had an episode of discrete and painless vaginal bleeding lasting 1 day and opted for a positive pregnancy test, she had her first USG on 06/28/22 with a normally inserted gestational sac, irregular, measuring 26 x 15.8 x 17.7mm, yolk sac present and anomalous, embryo present with CRL 6.3mm, BCF 75bpm and presence of areas of retrotrophoblastic detachment in the bottom of the uterine cavity measuring 29.6 x 10.4 x 21mm, the ultrasound on that day showed topical pregnancy with 6 weeks and 4 days biometry (CRL 6.3mm) with uterine volume of 130.35 $cm^3$. BETA-HCG on 06/29/22 of 66,939 mIU/mL). She was instructed to use utrogestan, rest and follow-up with USG. From the beginning, there was already a suspicion of an unviable pregnancy due to the shape of the GS, fetal bradycardia. During follow-up the patient presented intermittent vaginal bleeding and mild colicky pain.

On 07/02/22, the patient, being a physician and radiologist, opted for a magnetic resonance imaging of the pelvis showing an elongated and irregular gestational sac on its lower margin where it projects into the anterior isthmic region, a probable site of isthmocele, covered by thin myometrium and subchorionic hematoma at the upper margin of the gestational sac with a volume of 14mL.

A new USG performed 1 week later, on 07/06/22, showed an irregular GS inserted in the uterine isthymic/cervical region, with projection of the trophoblast towards the previous cesarean scar and internal cervical os with hypervascularization in this region, an area of trophoblastic detachment of 3.1 x 2 x 2.4, exam compatible with missed abortion and anomalous insertion of the gestational sac, perception of bleeding like coffee ground after the exam (Figure 1).

**Figure 1. Endovaginal ultrasound image of ectopic pregnancy in the cesarean scar.**

She was referred to a specialist and a USG was performed, which showed an area of increased vascularization in the cesarean scar on Doppler, and she was instructed to perform a local injection of MTX into the gestational sac, performed on 07/07/22. She was discharged the next day with a prescription for oral contraceptives, she was instructed to perform weekly BETA-HCG and repeat USG after negative BETA-HCG. About 4 days after the procedure, the patient presented with moderate bleeding with amorphous material output and afterwards, she remained with slight bleeding for about 2 weeks.

The patient is still undergoing weekly laboratory/ultrasound follow-up. Denies vaginal bleeding or abdominal pain at the time and last BETA-HCG (day) was 77 mIU/mL.

CASE 2

Patient, EMJ, 29 years old, G3P1N1CA1, with a bicornuate uterus, history of two premature births, the first normal and breech, the second cesarean section, and the last ectopic pregnancy in the cesarean scar that was recently interrupted at 16 weeks. On 01/22/22, the patient presented the first symptoms, while cleaning her house, presenting abdominal pain followed by vaginal bleeding. A beta-hCG test was performed on 01/24 which was positive and she scheduled an appointment with a specialist. She had moderate and persistent abdominal pain, initially colicky and then more severe with moderate vaginal bleeding, which became mild during follow-up and lasted for several months. USG performed by a specialist on 02/02/22 with diagnosis of ectopic pregnancy in the cesarean scar with live embryo and CRL of 7mm. Conservative treatment with 1 intramuscular Methotrexate dose was indicated.

USG on 02/06/22, pregnancy continued to evolve with elevated beta-hCG of 50655 mUI/mL, therefore, a dose of intra-gestational sac Methotrexate was indicated. After the procedure, the imaging exam on 02/25 showed ectopic pregnancy in regression. Beta-hCG was evaluated once a week until negative and the patient was discharged with a contraceptive prescription for contraception (Figure 2).

**Figure 2. Endovaginal ultrasound image of ectopic pregnancy in the cesarean scar.**

CASE 3

Patient, WCGSL, 31 years old, G5P1C1NA2 in May 2020 began to experience nausea and brownish vaginal discharge, without abdominal pain. She had a positive beta-hCG test and, after performing a TVUS, an ectopic pregnancy in a cesarean scar was suspected, and was referred to a specialist. USG on 05/29/20 with a 4cm pregnancy in the cesarean scar, being prescribed intramuscular methotrexate single dose. One week after medication beta-hCG was 320 mIU/mL (060/4/20). In weekly follow-up with ultrasound and beta-hCG, on 06/12/20 the examination showed a mass of 5.5 cm with present vascular flow and beta-hCG in regression, on 06/18 of 36.3mUI/mL. After the beta-hCG drop to 18mUI/mL (06/25/20) USG-guided uterine curettage was indicated (four weeks after MTX), performed on 06/27/20 at Hospital Amparo without intercurrences. One month after the procedure, a new USG was performed, with no signs of ectopic pregnancy and negative beta-hCG. Patient was discharged with resolution of the condition. She has just discovered a new pregnancy of 16 weeks and 4 days in obstetric USG on 22/11/22.

CASE 4

HVB patient, now 34 years old, G2P1CA with a positive pregnancy test, started with mild abdominal pain, without vaginal bleeding and sought medical attention on 04/14/2020, underwent beta-hCG with a value of 31,708.4 mIU/mL being, therefore, being requested to perform the first TVUS on 04/20/2020 which showed an anembryonic gestation, gestational sac measuring 18 x 6 x 15 mm with low insertion in the region of the isthmus compatible with 5 weeks. On 04/22 after having a new USG evaluation carried out by a specialist, she received the written medical report: Patient HVB is a carrier of ectopic pregnancy and, due to being of high uterine risk, she needs ultrasound investigation and intervention. On 04/30, an intragestational sac injection of methotrexate was performed on the cesarean section scar pregnancy. USG on 05/07 after intrasac injection of MTX with a mass of 4.2 cm in the anterior uterine segment with hyperflow and low vascular resistance. Beta-hCG on the same day was 34.336 mIU/mL. A follow-up of beta-hCG was carried out, which began to fall, being 783 on 06/08, 463 on 6/16 and 368 on 06/25. On 06/30 a new ultrasound was performed, still visualizing a hypervascularized mass of 5.5 cm in the cesarean section scar. A single dose of MTX 50 mg IM was prescribed. Day 07/07 beta-hCG of 251 and 07/21 of 49. On 07/30 the patient presented increased vaginal bleeding and was submitted to a new USG showing an amorphous mass of 5 cm compatible with ectopic cesarean scar pregnancy, without metabolic activity on doppler. The pregnant woman was hemodynamically stable, normal laboratory tests (complete blood count, coagulogram, renal function) with hemoglobin of 15.2 g/dL and surgical hysteroscopy was indicated due to ectopic pregnancy with uterine hemorrhage. In the procedure carried out on 08/01 at the hospital, the presence of placenta accreta was found in the uterine segment and pathology revealed the specimen containing blood clots and permeate necrotic chorionic villi without signs of malignancy (Figure 3).

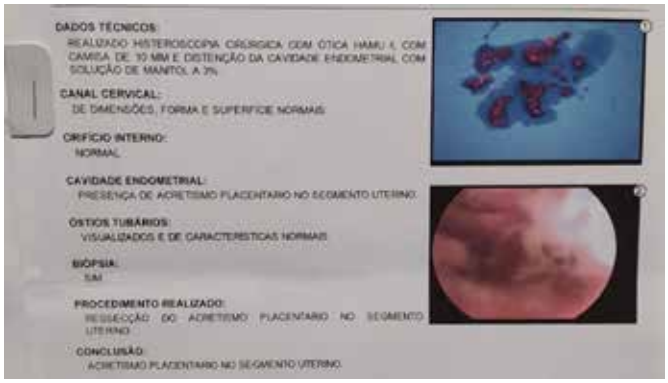


**Figure 3. Surgical Hysteroscopy Image.**

Eight months later, the patient presented a new pregnancy, performed by cesarean section at 37 weeks, without intercurrent pregnancy, interrupted due to initial labor.

## DISCUSSION

Although endovaginal ultrasonography is already well established in the case of ectopic pregnancy, the differential diagnosis between ongoing miscarriage, cervical pregnancy and pregnancy in the cesarean scar is not easy and requires experience from the examiner. As for case 1, the initial diagnosis was a topical pregnancy of 6 weeks and 4 days and only in subsequent exams was the correct diagnosis suspected.

Early ultrasound findings suggestive of a woman with previous uterine scarring include: Anterior gestational sac and low insertion (ultrasound marker for CSEP only at early gestational ages below 7 weeks), if the gestational sac is below the imaginary line taken at longitudinal direction of the uterus, it is a CSEP or cervical pregnancy. When applied before 7 weeks, it has reliable statistical performance, having a sensitivity of 93% and specificity of 98.9%. Other findings that may be found are similar to the ultrasound diagnosis of placenta accreta, such as the presence of low anterior placenta or placenta previa, thin myometrium (thickness <= 3 mm), or absence of myometrium between the placenta and the bladder, irregular bladder line, increased vascularity at the interface between the bladder and the placenta. With the exception of the position of the gestational sac, the other findings become increasingly evident at more advanced gestational ages (after seven weeks, until the end of the third trimester) [5].

Ultrasonography is the standard test for diagnosing ectopic pregnancy in the cesarean scar and should be performed by a specialist and experienced physician.

Magnetic resonance imaging, due to its excellent tissue resolution, is capable of locating the implantation in the cesarean scar, measuring the thickness of the anterior uterine wall and accurately evaluating the vesicouterine pouch[7]. However, to date, there is no evidence to support its routine use for the diagnosis of CSEP. In selected cases where the ultrasound image is indeterminate or the images are suboptimal, MRI can be used as an additional assessment [6].

Among the therapeutic options are watchful waiting, medical or surgical treatment. The choice is made based on gestational age, serum beta-hCG level, myometrial integrity, hemodynamic status of the patient in addition to parity and desire for future pregnancy [8].

There are few studies that report success in expectant management and, when chosen, strict surveillance is required due to the risk of needing urgent intervention. It is not advisable in cases of embryo with cardiac activity due to high maternal morbidity and mortality [8].

Treatment with methotrexate alone is more effective when beta-hCG levels are less than 5000, and should be limited to two doses of 1mg/kg each. Some authors suggest the use of methotrexate always associated with another technique to increase its therapeutic efficacy [9] .

Ultrasound-guided intragestational methotrexate injection is a very effective treatment. In a prospective study including 18 patients with pregnancy in the cesarean scar, local injection of 25 mg MTX was successful in five out of seven cases (71%) and only 2 out of seven cases (20%) required emergency surgery to control hemorrhage. A slow resolution of the condition is expected with negative beta-hCG occurring within 40 days on average (range 21 to 140 days) [5].

After administration of methotrexate, patients should always be evaluated for possible side effects, which include leukopenia, liver or kidney dysfunction, stomatitis, nausea and hemorrhage [2]. In the cases described here, none of the patients had the side effects described.

When opting for intrauterine evacuation, the procedure must always be guided by USG due to the risk of uterine perforation and the patient must always be informed of the possibility of hysterectomy in case of massive hemorrhage [2]. The cases of MVA described in the literature are in pregnancies of less than eight weeks, mean diameter of up to 13 mm of the gestational sac, without bulging of the uterine scar and without cardiac activity [9].

It is likely that pregnancy in the cesarean scar shares a common histology with the spectrum of placenta accreta and the two conditions may represent a continuum of the same disease, with CSEP diagnosed in the first trimester and accretism, with the evolution of pregnancy [6].

In one of the cases described in our study, the patient underwent drug treatment and, in the follow-up period, presented hemorrhage, being submitted to surgical hysteroscopy, with a diagnosis of placenta accreta. There was no need for transfusion, the patient remained hemodynamically stable and was successfully treated with resection of ovular remnants by hysteroscopy after treatment.

Early diagnosis is essential to avoid serious complications such as bleeding and the need for urgent hysterectomy. In the cases described in this work, thanks to early diagnosis and ultrasound performed by an experienced professional, it was possible to treat all patients conservatively with preservation of fertility. One of these patients became pregnant again after the resolution of the condition, had a smooth and uneventful pregnancy, one is currently pregnant and starting prenatal care, and the other two had the ectopic pregnancy recently and are using contraception.

## FINAL CONSIDERATIONS:

Ectopic pregnancy in a cesarean scar is a pathology that may be associated with serious complications with the risk of uterine rupture and massive hemorrhage requiring urgent hysterectomy, which may compromise the woman's reproductive future.

Early diagnosis is of fundamental importance in this pathology and is done through endovaginal ultrasonogra-

phy, obeying the ultrasonographic criteria and excluding differential diagnoses.

Conservative treatment is the appropriate treatment for patients who wish to preserve fertility and should be performed whenever possible.

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