

CASE SERIES

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Ectopic pregnancy with implanted gestational sac in the cesarean scar

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ABSTRACT

Introduction: Implantation of a pregnancy in the cesarean scar is considered a rarest presentation of ectopic pregnancy with high morbidity and mortality. The use of imaging tests is capable of early diagnosing such cases and assisting in the management of pregnancy. The present article reports two cases of ectopic pregnancy in the cesarean scar, illustrating the main aspects in ultrasound tomography (UST) and magnetic resonance imaging (MRI) exams. In addition, a bibliographic search was carried out in a database that presented data about this clinical condition.

Case Series: Case 1: A 44-year-old patient, without comorbidities, G2P1cAO, with a pregnancy of 9w4d, admitted with bleeding for 03 days. Ultrasound tomography showed a single gestational sac with an embryo of anomalous morphology, with no heartbeat and in isthmic topography, in an exophytic position,

over the topography of a scar from a previous cesarean section. The initial diagnosis was placental accreta. After MRI of the pelvis, an ectopic pregnancy with a gestational sac implanted in the cesarean section scar (type II—exogenous), with signs of trophoblast/placental accreta. Case 2: A 30-year-old patient, without comorbidities, G2P1c, with a 7w3d pregnancy, with abdominal pain. Ultrasound tomography showed a single gestational sac with a gestational sac implanted in the cesarean section scar, transmural type I (endogenous), which was later confirmed by pelvic MRI.

Conclusion: It is necessary to highlight the importance of early diagnosis of ectopic pregnancy with implantation in a cesarean scar, given the possibility of making an appropriate therapeutic decision depending on the clinical context, aiming to reduce the possible complications of the condition.

Keywords: Cesarean section scar, Ectopic pregnancy, Magnetic resonance imaging, Transvaginal ultrasound

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INTRODUCTION

The implantation of a pregnancy in the cesarean scar is considered the rarest presentation of ectopic

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pregnancy and high morbidity and mortality. Little is known about the natural history of this condition, but allowing the pregnancy to progress carries the risk of rupture of the uterine scar, possibly requiring hysterectomy [1]. Of the various theories to explain this type of ectopic pregnancy, the most reasonable seems to be that the blastocyst enters the myometrium through a microscopic scar dehiscence, which may have been created by trauma from a previous segmental cesarean section or any other surgery.

Since the advent of transvaginal ultrasound (TUS) and magnetic resonance imaging (MRI), this type of ectopic pregnancy could be diagnosed early in pregnancy and treated conservatively, preserving fertility. This article reports two cases of ectopic pregnancy in the cesarean scar, illustrating the main aspects in TUS and MRI.

CASE SERIES

Case 1

A 44-year-old patient, without comorbidities, G2P1cAo. On 03/08/2016, with a pregnancy of 9w4d, she was admitted with a report of bleeding for 03 days. Transvaginal ultrasound showed a single gestational sac with an embryo of anomalous morphology, no heartbeats were identified (a miscarriage in progress), located in an isthmic topography, in an exophytic position, on the topography of a scar from a previous cesarean section, not being possible to identify the trophoblasto-myometrial interface properly. It is also evident an intense vascularization in the Doppler study, being the initial diagnosis of placental accreta. An MRI of the pelvis was performed, which showed an ectopic pregnancy with a gestational sac implanted in the cesarean section scar (type II—exogenous), with signs of trophoblast/placenta accreta (Figure 1). The patient underwent laparotomy, where the gestational sac was identified, mobilized and separated from the vesicouterine planes.

Case 2

A 30-year-old patient, without comorbidities, G2P1C, admitted on 06/10/2016, with a 7w3d pregnancy, with a report of abdominal pain. Transvaginal ultrasound showed a single gestational sac with a gestational sac implanted in the cesarean section scar, transmural type I (endogenous). An MRI of the pelvis was performed on 8/17/2016, demonstrating an ectopic pregnancy with the gestational sac implanted in the cesarean section scar, transmural, type I—endogenic (Figure 2). The patient was treated conservatively with methotrexate and had a good response, with no complications.

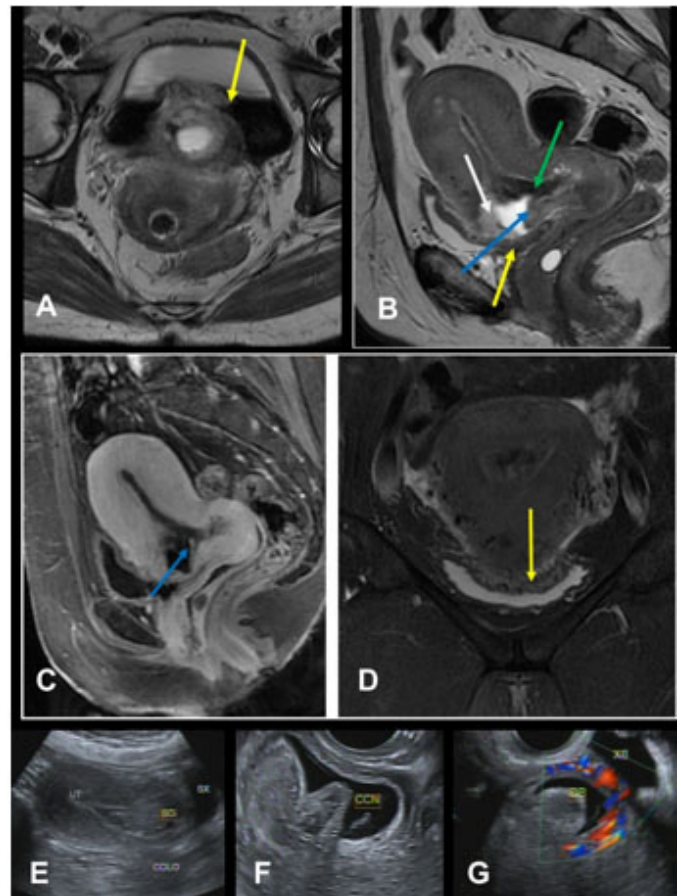


Figure 1: (A) Axial T2, (B) Sagittal T2, (C) Sagittal T1 FAT SAT—post-gadolinium, (D) Coronal T2 FAT SAT. Ectopic pregnancy in the type II cesarean scar (exogenic) with trophoblast/placenta percreta signs (yellow arrows). Anteverted uterus with gestational sac (blue arrows) transmurally located in the anterior isthmic region in the cesarean scar, with extension of the trophoblast/placenta (white arrow) in addition to the uterine serosa without cleavage plane with the posteroinferior wall of the bladder (yellow arrows). Gestational sac (blue arrows) with thickened semi-circumferential parietal tissue compatible with trophoblast/placenta showing contrast enhancement. Slight distention of the uterine and cervical cavities due to hypointense content on T2 consistent with recent bleeding (green arrow). (E and F) An ultrasound study of the patient showing an anteverted uterus, in a globose shape, containing a single gestational sac (GS), located in an isthmic topography, in an exophytic position, over the topography of a scar from a previous cesarean section. It was not possible to identify the trophoblasto-myometrial interface properly. (G) The presence of intense vascularization on the Doppler study in the trophoblast/placenta is also noted, which may correspond to placental accreta.

DISCUSSION

Ectopic pregnancy in cesarean scar (EPCS) is a relatively rare phenomenon and can occur not only due to cesarean section, but also related to any other type of trauma to the uterine wall, such as myomectomy, manual removal of placenta, dilation, and curettage and even in vitro fertilization [2, 3].

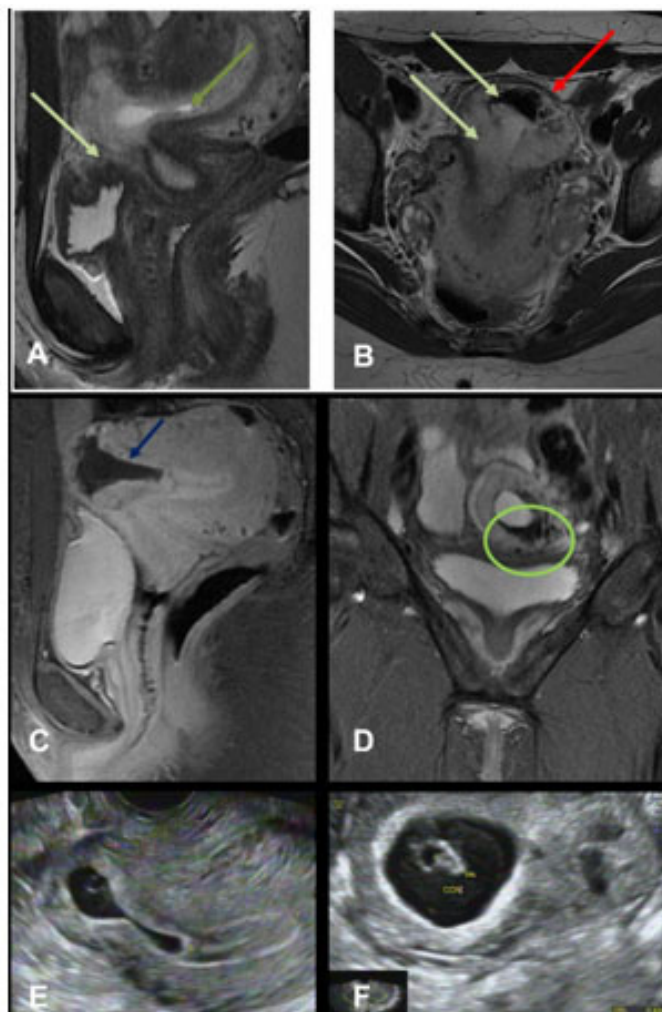


Figure 2: (A) Sagittal T2, (B) Axial T2, (C) T1 FATSAT—after use of intravenous contrast gasoline, (D) Coronal T2 FAT SAT. Retroverted uterus with increased dimensions, demonstrating ectopic pregnancy in the type I cesarean scar—endogenic (light green arrow), compromising the entire thickness of the uterine wall without extending beyond the serosa, with a gestational sac protruding into the uterine cavity (dark green arrow). Gestational sac with irregular contours with a marked hyposignal halo (bleeding) in the trophoblast, red arrow, transmural ectopic implantation in the anterior isthmic region in the cesarean section scar (dark blue arrow), without evidence of extra-serous uterine extension (light green circle). (E and F) Uterus in retroversion, globous format, regular contours, homogeneous texture, presenting a gestational sac in a previous hysterorrhaphy topography, measuring approximately 39 mm in average diameter, containing an embryo without detectable heartbeats.

Due to the increase in cesarean deliveries, EPCS has become increasingly common, occurring 1 in 500 pregnancies among women who have already undergone cesarean delivery and accounting for 4% of ectopic pregnancies [4].

The pathogenesis has not been well defined, but the most likely theory is impaired wound healing after

previous trauma with consequent myometrial defect where the blastocyst will implant. This impaired healing may be due to poor blood flow due to systemic diseases such as diabetes, collagen diseases, postoperative wound infection, short-term pregnancies, or inadequate suturing [2, 5].

They are caused by the migration of the blastocyst into the myometrium through a dehiscence in the cesarean scar [4, 6, 7]. This condition differs from intrauterine pregnancy with placenta accreta because the gestational sac is completely surrounded by the myometrium and fibrotic scar tissue, separate from the endometrial cavity or fallopian tube [3, 5].

Two types are described depending on the depth of implantation, with type I progressing toward the uterine cavity (endogenous) and type II progressing toward the bladder and abdominal wall (exogenic) [2, 4].

A quarter of women are asymptomatic at diagnosis; but the rest may present with vaginal bleeding or abdominal pain [2], making the differential diagnosis between miscarriage and cervico-isthmic pregnancy difficult [3, 5, 7].

Every patient with EPCS has a positive pregnancy test measured through β -hCG [2, 8]. If diagnosed early, the uterus can be preserved [3] and possible complications such as placenta accreta, uterine rupture, disseminated intravascular coagulopathy, hypovolemic shock, and even death can be avoided [2, 4].

Transvaginal ultrasound is the test of first choice and the findings are evaluated according to the criteria of Vial [6]: empty uterine cavity and cervical canal, gestational sac at the hysterostomy site, thinning or absence of myometrial tissue between the bladder and the gestational sac, a sign of negative “organ slippage” translated by the non-displacement of the gestational sac when applying pressure with the transducer [5] and a peritrophoblastic hypervascularization identified with the use of Doppler [2, 7, 8].

In cases of doubt or difficulty in transvaginal ultrasound, the magnetic resonance with images in the 3 orthogonal planes and T1 and T2-weighted sequences allows a more detailed assessment of the anatomy, such as the depth of invasion of the trophoblast into the myometrium, involvement of the serosa or bladder, the exact position, and volume of the gestational sac [6].

Outcomes of an ectopic pregnancy in cesarean section scar are variable. Its prognosis is related to gestational age and β -hCG levels, regardless of type I or II. The risk of rupture in ectopic pregnancy increases as gestational age and β -hCG levels increase. In cases of ruptured ectopic pregnancy, the patient may progress to bleeding, shock, and even death. Therefore, it is important that the diagnosis is made early, avoiding further complications [9, 10].

The treatment of ectopic pregnancy aims to prevent bleeding and other complications, in addition to seeking to preserve the patient's uterus. There are several proposals for interventions; however, there is no consensus on

the ideal approach in cicatricial ectopic pregnancy. The definition of the conduct depends on several factors, among them the gestational age, the levels of β -hCG, and the hemodynamic stability of the patient. Thus, there is no specific treatment for type I or type II [9].

Treatment should be individualized and consideration should be given to the gestational age, the desire for future pregnancies, the length of gestation, the therapeutic possibilities available, and the experience of the medical team [6, 8, 11].

Numerous treatment modalities have been recorded, including expectant management when the patient is hemodynamically stable and decides to wait for a spontaneous abortion; systemic or local drug treatment with direct application to the gestational sac, with methotrexate being the most commonly used substance; uterine artery embolization; surgical procedures such as hysteroscopy with resection of the gestational sac/curettage and hysterectomy or combination of medical and surgical treatments [2, 4].

If the option is drug treatment, surveillance of the drop in β -hCG value until it becomes negative, as well as ultrasound control until the gestational sac disappears [6, 12].

CONCLUSION

Ectopic pregnancy in a cesarean scar is a rare condition that can develop into a serious condition, leading to maternal death. The interest of an early diagnosis lies in the possibility of making an appropriate therapeutic decision based on the clinical context, imaging information, the patient's wishes and technical conditions; in order to reduce possible complications.

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Author Contributions

Mariana Couto de Moraes – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Renata Lopes Furletti Caldeira Diniz – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Laura Filgueiras Mourão Ramos – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Enzo Furletti Diniz – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are

appropriately investigated and resolved

Paulo Franco Taitson – Conception of the work, Design of the work, Acquisition of data, Analysis of data, Interpretation of data, Drafting the work, Revising the work critically for important intellectual content, Final approval of the version to be published, Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved

Guarantor of Submission

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Written informed consent was obtained from the patient for publication of this article.

Conflict of Interest

Authors declare no conflict of interest.

Data Availability

All relevant data are within the paper and its Supporting Information files.

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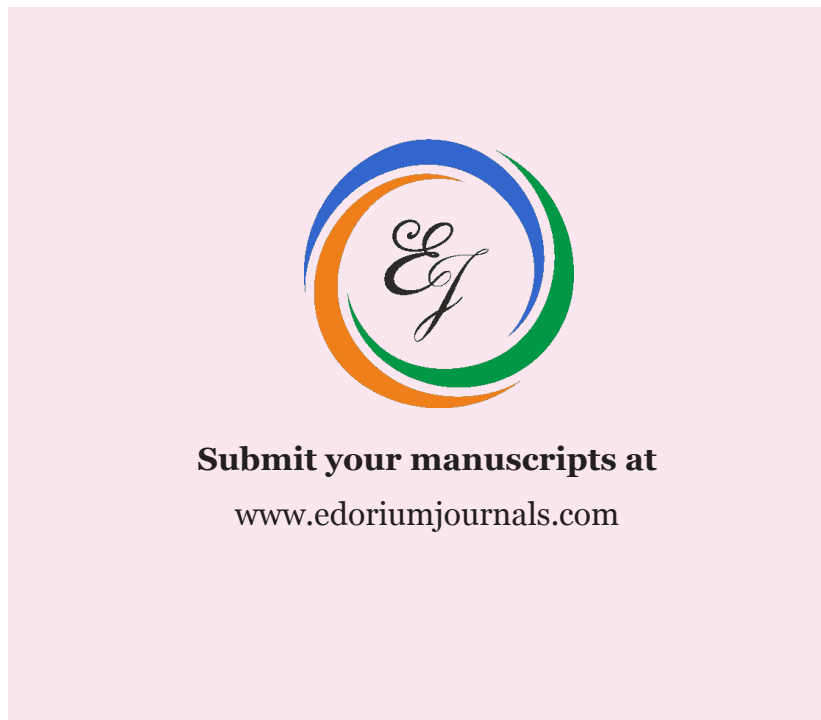
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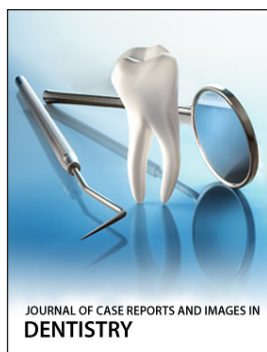
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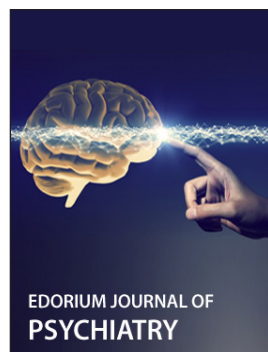
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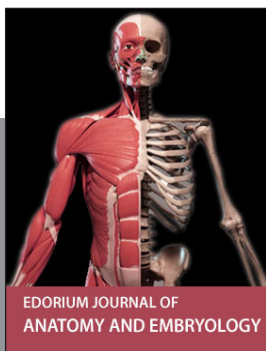
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