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Case Report

Pregnancy Implanted on a Caesarean Section Scar: Contribution of Ultrasound in Diagnosis and Management: A Case Report

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Abstract

Pregnancy implanted on a cesarean scar is a rare form of ectopic pregnancy that can be life-threatening and functionally threatening to the patient due to bleeding or early uterine rupture. The increased vigilance of obstetricians-gynecologists for diagnostic ultrasound, which remains the first-line examination, is evidenced by the increases in incidence and cases published over the last decade, reducing morbidity and mortality in this entity. and by providing opportunities for patients to benefit from therapeutic advances without there being a consensus on treatment. Through our illustrative observation and review of the literature, we will update our knowledge on the conditions associated with the incidence of this iatrogenic event, the difficulties of early diagnosis and the challenges of treatment.

Keywords: *Ectopic Pregnancy; Cesarean Section Scar; Obstetric Emergency*

Introduction

A pregnancy implanted on a cesarean scar is an ectopic pregnancy with localization and scarring of the isthmus of the cervix. The estimated incidence is between 1:1800 and 1:2216 [1]. Only case reports and limited series are found in the literature [2]. It carries the risk of massive and uncontrollable bleeding. Lack of knowledge or late diagnosis may be associated with serious complications such as uterine bleeding, uterine rupture [3] and irreversible obstetric sequelae. Hysterectomy is the standard treatment for major bleeding. A preliminary and precise diagnosis allows successful conservative treatment [4,5]. The diagnostic ultrasound features that we describe can help improve the management of scarred cesarean pregnancies.

Case Report

Patient history

Mrs. H.B aged 40, sixth gesture, third parity, mother of 3 children. In her obstetric history we find two spontaneous miscarriages and three deliveries by cesarean section (the first in 2016 for stagnation of dilation of the cervix at 4 cm, the second in 2018 for gestational diabetes and the third in 2020 for two previous Caesars). She consulted the gynecological emergency room for pelvic pain and minimal metrorrhagia lasting 3 days over amenorrhea of 08 weeks + 6 days according to a precise last menstrual period. At the initial clinical examination, the hemodynamic state was stable, abdominal palpation did not signal any red flags, speculum examination confirmed the

Endo uterine origin of the bleeding, and vaginal examination combined with abdominal palpation showed an enlarged uterus without palpable latero-uterine mass or signs of peritoneal irritation.

Diagnostic approach

A first ultrasound concluded that there was an isthmic gestational sac with embryonic ultrasound whose cranio-caudal length corresponded to 8 weeks with cardiac activity present. The gestational sac was visualized within the myometrium at the level of the scar 1 mm from the bladder (Figure 1).

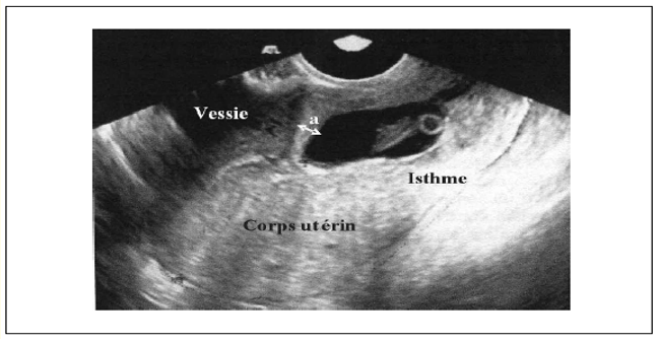

Figure 1

The pelvic MRI was in favor of a pregnancy at the level of the cesarean scar with myometrial thickening measured at 2 mm (Figure 2). On day +2 of her hospitalization, the patient presented a worsening of symptoms with an increase in the intensity of pelvic pain accompanied by moderate bleeding requiring laparotomy.

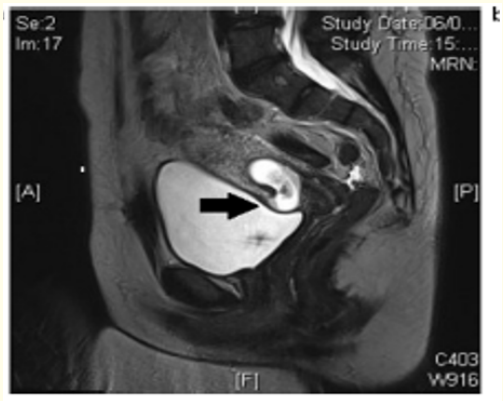

Figure 2

The quantitative dosage of BHCG returned to 3500 MIU. The preoperative assessment was without abnormalities and the patient underwent an exploratory laparotomy under general anesthesia. On exploration, we note the presence of a blue swelling of the left isthmus visible through the visceral peritoneum, and the incision after detachment and lowering of the bladder reveals the product of conception

(Figure 3). Thus, the wide excision of the scar removing the gestational sac and the subsequent repair of the uterine scar. was performed before performing the hysterorrhaphy. The postoperative period was unremarkable. The βHCG level returned negative after 2 weeks.

Figure 3

Discussion

Incidence, risk factors and pathophysiology

The incidence of pregnancies implanted on a cesarean section scar is 1:1800 pregnancies or 1:2216 pregnancies [1]. The risk of placenta previa increases with the number of previous cesarean sections; 4.5 for one scar, 7.4 for two scars, then 6.5 for three scars and 44.9 for at least four scars [6]. The first case was reported in 1978, and the number of reported cases has continued since: only 19 cases in 2001, 161 in 2007, and more than 1000 cases have been reported to date [7,8]. This is due in part to the increase in cesarean sections, the availability of ultrasound for early pregnancy assessment, and the fact that obstetricians do not misinterpret this entity. Various theories have been put forward to explain why the developing embryo implants in the cesarean scar. The most likely hypothesis is that the microdeficient early myometrium of the blastocyst invades the endometrium at the hysterotomy scar devoid of the decidua basalis, explaining the complete myometrium of the gestational sac surrounded by fibrous scar tissue independent of the endometrial cavity [9]. As the name suggests, history of cesarean delivery remains the main triggering factor, but no study has further formally criminalized exposure to the particular circumstances in which this phenomenon occurred [3,10]:

- There does not appear to be a correlation between the number of previous cesarean sections and the risk of pregnancy at the cesarean scar.
- Without direct link with the indications for cesarean section.
- The same surgical techniques used for previous cesarean sections will not be used.
- Or between the scar pregnancy by cesarean section and the last cesarean section. However, the coexistence of any of the above conditions forced us to pay special attention and consider problem pregnancies as dangerous situations requiring follow-up in tertiary centers. Placenta previa was the main risk factor for accreta (RR = 2065). Placenta accreta on cesarean scar presents a risk of accreta (RR = 4.5) [11]. Age over 35 years increases this risk by 30.3% if the placenta is attached anteriorly or centrally with a scar, compared to 14.6% if there is no scar [13]. These risk factors were found in our patient. Consider our patient who developed

her pregnancy on the third scar, which is likely to be of poor quality. The clinical presentation is very variable and said to be misleading, either more or less significant uterine bleeding, observed in premature pregnant women with at least one history of cesarean section, or cases could be accompanied by pelvic pain, which can be the main cause. and finally asymptomatic women with incidental discovery during a control pelvic ultrasound; while the most striking cases act on the hemodynamic state. In the event of medical instability, the combination of the 2 signs above. Our patient would have poor healing. Fibrosis and poor vascularization of the region would be responsible for insufficient and wider healing in a multi-scarred uterus [9]. Other risk factors described are: previous endouterine maneuvers, the number (> 2) and indication of cesarean sections [9], *in vitro* fertilization [11]. A quarter of cesarean section scars are defective and present a bayonet deformation at the level of the anterior uterine wall when examined in sagittal section by endovaginal ultrasound using a high-frequency probe or by hysterosonography [12].

Diagnostic

The clinical presentation may be asymptomatic. In one series, up to 40% of patients had no vaginal pain or bleeding [13]. Bleeding can range from simple spotting to life-threatening hemorrhage. It can be spontaneous or iatrogenic after curettage. Misdiagnosed as a dilation and curettage abortion early on, can result in massive bleeding [13,14]. Pelvic pain is the main symptom. Biological diagnosis is no longer necessary, the egg is clearly individualized on ultrasound with embryonic cardiac activity. The B-hcg test can be used for post-treatment monitoring. A definitive diagnosis was made due to the ultrasound findings first described by Vial [15]. Color Doppler flow revealed hypervascularization of the surrounding trophoblasts [12]. In the case of an intrauterine pregnancy, it is less common on the scar. This has been confirmed by other authors [12,13]. Thanks to pulsed Doppler, embryonic cardiac activity is objectified. Its absence leads to looking for a "negative sign of a sliding organ" [1]. In fact, it involves applying light pressure to the cervix using an intravaginal probe to see if the gestational sac has slipped between the anterior and posterior walls. The absence of displacement of the pocket would confirm the diagnostic hypothesis of a scar pregnancy. Other signs: bladder bloating on pelvic ultrasound (swelling of the lower uterine segment in the bladder cavity), in 3D, not detected on MRI. These tests are not systematically recommended [7]. Differential diagnosis to be evoked ultrasound on a scarred uterus are:

- Cervical pregnancy: Implantation in the cervical canal. The internal opening closes on the egg.
- Isthmic pregnancy: The trophoblasts are mainly not located next to the break in continuity of the anterior wall. Low insertion pregnancy. It can then migrate into the uterine cavity.
- Miscarriage in progress: "Negative sliding organ sign" negative in this case. No surrounding hyper vascularized trophoblasts. A previous ultrasound may have located the developing egg in the uterine cavity.

Treatment

Treatment takes into account gestational age, available treatments, the patient's desire for future fertility, the experience of the healthcare team and complications of first-line treatment. Indeed, during the treatment period, including termination of pregnancy by medical treatment (methotrexate) or surgical treatment (laparotomy or laparoscopy) (see combination of the two), several conditions must be guaranteed [17]:

- Serious, potentially life-threatening bleeding is expected.
- Complete a management plan to prevent and/or control bleeding to avoid hysterectomy.
- Availability of blood products.
- Patient informed consent form explaining the imminent need for a possible hysterectomy and the short- and long-term risks of each treatment.

- Availability of interventional radiology technological platforms Experienced in arteriography and pelvic artery embolization to control any bleeding as an alternative to hysterectomy [18]. When expected, uterine rupture may develop spontaneously [13]. Curettage can lead to severe hemorrhage requiring total salvage hysterectomy [16]. As for conservative surgical treatment, laparotomy allows the scar and trophoblastic tissue to be completely removed [12]. Hysteroscopic surgery resulted in rapid regression of ß-hcg within one month on average [2]. An ultrasound will confirm uterine emptiness during follow-up, without rupture or perforation of the uterus. From a distance, we can appreciate the quality of the scar. In case of subsequent pregnancy, early localization of the trophoblast implantation site will be useful. This development is beneficial for our patient. This success can be attributed to early accurate diagnosis and gestational age. As for the prognosis, the risk of recurrence is the main fear of any patient with a history of pregnancy following a cesarean section scar. Greshukhina has a 40% recurrence rate, but there is consensus that any pregnancy program after a scar pregnancy should be scheduled, including safety intervals from 3 months to 1 or 2 years. Early ultrasound throughout the pregnancy is recommended to ensure its position, while looking for any signs of placenta accreta, and labor must also be planned and most authors agree that repeat cesarean section is performed in these patients.

Conclusion

Scar pregnancy is a late complication of cesarean section. It can be classified as having the same severity as placenta accreta. The importance of early diagnosis is that appropriate treatment methods can be selected based on the technical platform and the wishes of the patient. This may limit the serious bleeding complications that often accompany total hysterectomy, compromising the patient's subsequent fertility where maternal death may be avoided. The current sonographer, in a clinical context, with a pregnancy on a scarred uterus, should actively search with the localization of the cervical isthmus, all conventional ultrasound landmarks plus color and pulsed Doppler modes and flow measurement, "A negative sliding organ sign" rejects the possible location of the cesarean scar. The interest is to adapt the management of this form of ectopia of pregnancy to the context by limiting the related morbidity and mortality.

Conflicts of Interest

The authors declare no conflict of interest.

Author Contributions

All authors contributed to the conduct of this work. All authors also declare that they have read and approved the final version of the manuscript.

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