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Laparoscopic management of a 13 weeks viable ectopic cesarean section Scar pregnancy: a case report

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ABSTRACT

Background. Cesarean scar ectopic pregnancy is a rare type of life-threatening pregnancy whereby the embryo implants on a uterine scar, due to a previous cesarean section. It accounts for about 4.2% of total ectopic pregnancies. It is very rare that an ectopic scar pregnancy arrives undetected up to 13 weeks, but this is the case of some patients, not regularly scanned during the early pregnancy. The objective of our case report is to present a novel conservative laparoscopic approach in such cases.
Case presentation. A 28-year-old G3P2A0 patient, presented to our primary care for heavy vaginal bleeding. The ultrasound performed confirmed a viable 13-week embryo ectopic scar pregnancy. In this regard, the case was considered eligible for a conservative laparoscopic intervention treatment which was divided in the following steps: extensive dissection of the bladder; identification of the ectopic pregnancy at the level of the lower segment; extraction of the product of conception; suturing of the lower segment defect.
Conclusions. The success of this technique may help amplifying its usage in other similar scenarios. In particular, the failure of medical treatment may be the first indication in trespassing the laparoscopic surgery approach. Further investigations about minimally invasive technologies seems undeferrable.

INTRODUCTION

Cesarean Scar Pregnancy (CSP) is an obstetric condition defined by an altered embryo implantation localized in previous uterine scar after a cesarean section. Epidemiologically, it is estimated that 1 patient in 531 women with a cesarean scar will have a CSP and that CSP account for 4.2% of ectopic pregnancies [1]. Therefore, the trophoblast invasion finds a different "soil" from the correct endometrium characterized by fibrin and collagen, with a thinner myometrium. Moreover, with the growth of the uterus, the scar compounds do not grow congruently and are stressed and

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stretched until they may crack. Indeed, this type of pregnancy is prone for complications such as uterine rupture, massive, sometimes life-threatening hemorrhage leading to hypovolemic shock, disseminated intravascular coagulation, and even maternal death. For this reason, a SP can be extremely dangerous if not properly detected by ultrasound and leading to severe hemorrhage or shock. The cesarean scar pregnancy can be divided in two types:

- type I, endogenic type: CSP with growth progression to the isthmic space or uterine cavity;
- type II, exogenic type: CSP with deep invasion of scar route and progression across the bladder and abdominal cavity.

Between these two types, the endogenic type of CSP could allow the pregnancy to progress, since it grows forward the uterine cavity. On the contrary, the exogenic type may be responsible for uterine rupture and bleeding [2].

Early diagnosis is mandatory in order to maximize the subsequent pregnancy outcome and reducing the complications. For this reason, every pregnant woman with a history of cesarean section should be screened early in the first trimester of pregnancy [3]. In particular, transvaginal ultrasound is used for detecting the pregnancy. Treatment is challenging and different protocols have been proposed, which consider both medical and surgical approaches. Minimally invasive approaches are extensively preferred since their importance in reducing blood losses, surgery time and post-operatory pain [4,5]. In particular, the CSP resection through a transvaginal approach is a promising treatment with a low complication rate [6]. The laparoscopy approach is preferrable when the CSP is progressing in the uterine serosal surface. Uterine artery embolization plus dilation and curettage (D&C) and hysteroscopy can be a treatment modality but it requires the radiologist aid which is hardly available in some peripherical hospitals [7]. However, this approach has a low risk of heavy bleeding and hysterectomy [8]. The actual trend should focus on individualized treatments according to many factors including clinical presentation, beta-human chorionic gonadotropin levels, imaging features, and the surgeon's skill [9-11]. In this article we present a case report laparoscopic management of a 13-week viable CSP which resulted in massive bleeding and was not suitable for medical treatments.

METHODOLOGY AND RESULTS

A 28-year-old G3P2A0 patient, referred to our primary care for heavy vaginal bleeding. She has not had any previous check-ups due to the COVID-19 lockdown and the restricted policies for in-person hospital consultations. In obstetric history, our patient had two previous caesarean deliveries. On examination, blood pressure was 90/60 mmHg and she was tachycardic with a pulse rate of 120 beats/min. Furthermore, laboratory investigations revealed a hemoglobin level of 8.2 g/dL. The patient underwent an abdominal ultrasound examination which identified a viable ectopic caesarean section scar pregnancy of 13 weeks.

She was counselled regarding the various management options of ectopic pregnancy and a possible hysterectomy was proposed for her case; however, she insisted on receiving a conservative treatment and laparoscopy was suggested.

Initially, after the trocar access, the uterus was found extensively adherent to the anterior abdominal wall and the bladder (**Figure 1**). For this reason, using the 5-mm Ligasure, lysis of adhesions was initiated. Subsequently, the bladder was gently dissected until reaching the vagina. At this point, the scar pregnancy was identified at the level of the low uterine segment. The surgery continued with an hysterotomy and dissection at this level. First, the gestational sac was identified and extracted along with the trophoblastic tissue. Then, the fetus was extracted and removed using an endobag (**Figure 2**). The hysterotomy was then repaired with interrupted monofilament stitches in 2 layers with the achievement of adequate hemostasis. The surgery then ended with bilateral tubal ligation.

Methotrexate could have been an alternative treatment if the patient did not present with massive bleeding and require immediate intervention. After surgery, the patient underwent strict monitoring of vital parameters. Postoperative methotrexate was not needed as beta-HCG returned to normal within 2 weeks of serial testing.

DISCUSSION

The first case of scar ectopic pregnancy was reported by Larsen and Solomon in 1978 [12]. However, the exact pathogenesis of cesarean scar ectopic pregnancy remains a challenge with one major prevailing hypothesis. It has been postulated that

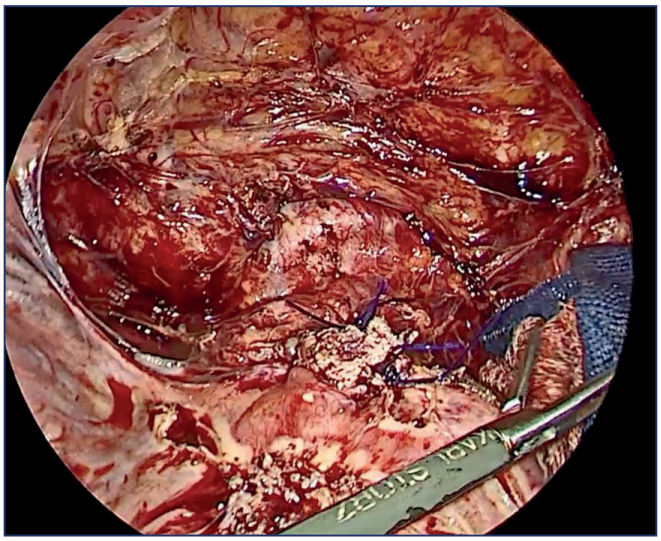

Figure 1. *At the beginning the uterus was found extensively adherent to the anterior abdominal wall and the bladder.*

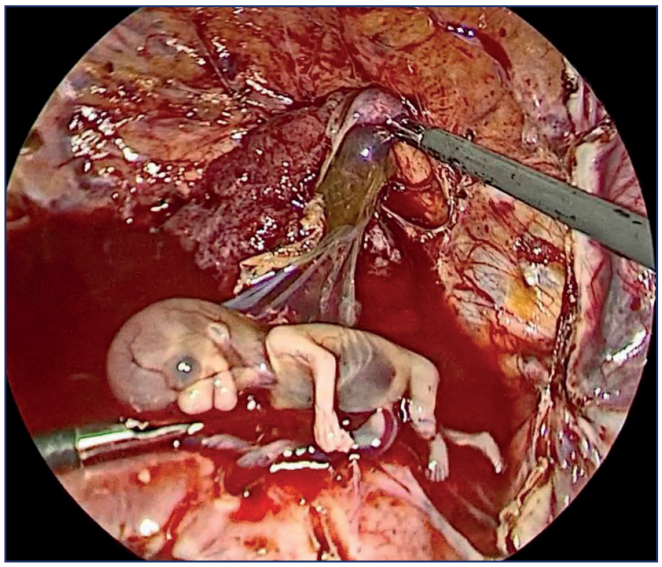

Figure 2. *Fetus extracted from the uterus.*

a previous uterine surgery leads to a microscopic uterine dehiscent tract that allows the blastocyst to invade into the myometrium. This defect occurs secondary to poor vascularization of the uterine segment with fibrosis and incomplete healing after caesarean section, hysterotomy, dilatation and curettage, myomectomy, abnormal placentation, and manual removal of placenta. This hypothesis however fails to explain the occurrence of scar ectopic pregnancy in the absence of any previous uterine manipulation [13].

Early diagnosis is vital to prevent the high risk of rupture and bleeding with the associated morbidity and mortality. The diagnosis is made based on the tranvaginal ultrasound evaluation and the proposed diagnostic criteria include the following [14]:

- empty uterus with clearly visualized endometrium;
- empty cervical canal;
- gestational sac implanted in the lower anterior uterine segment at the presumed site of cesarean section incision scar;
- thin or absent myometrium between the gestational sac and the bladder;
- doppler flow at the previous cesarean scar.

Given the rarity of CSP, there is no consensus on the management therapy and current standards of therapy have been derived from data obtained from case reports or small case series with a limited number of patients. Management options and treatment plan should ideally be tailored to the patient's case. Points to be considered when determining a treatment plan include location, size and gestational age of the pregnancy, the hemodynamic stability and desire for future fertility [11]. Moreover, when dealing with fertility desire a careful consideration must be posed for possible psychological distress of the couple [15, 16].

The various modalities for the management of CSP include conservative management, medical termination with methotrexate, uterine artery embolization (UAE) and surgical treatment. Conservative management is usually not recommended in the treatment of CSP due to the high risk of bleeding and rupture. Methotrexate injection into the gestational sac can be performed transabdominally or transvaginally under US guidance. This treatment modality is most suitable in an asymptomatic patient less than 8 weeks of gestation, with a myometrial thickness less than 2 mm, embryonal cardiac activity and BHCG less than 5000 [17]. Although considered successful, this modality has its drawbacks. Bhcg levels may take up to 16 weeks to normalize and the risk of rupture and hemorrhage still exists. Additionally, there is a chance of recurrence of CSP at the site of the C section scar along with increased risk of other complications such as placenta accrete [11].

UAE is another nonsurgical option to treat CSP. It is used in patients who underwent treatment with methotrexate to decrease the risk of hemorrhage. A meta-analysis of 194 articles that includes 126 case reports, 45 cases series, and 23 clinical studies, concluded that hysteroscopic or laparoscopic hysterotomy is the best first-line approach to treating CSP, with UAE being reserved for significant bleeding with or without a high suspicion index for arteriovenous malformations [18].

It is very rare that a CSP reaches 13 weeks undiagnosed. The hemorrhage, low hemoglobin, and the hypotension led us to opt for a surgical intervention rather than a medical treatment with expectative management. Dissection of the vesico-uterine space in this case is challenging because of the extensive adhesion due to the previous c-sections, but also because of the very thin limit between the bladder and the ectopic pregnancy. It may be expected a lot of bleeding during the hysterotomy, but surprisingly and unlike laparotomy, even though it was 13 weeks, the amount of bleeding was only 150 cc. This is probably due to the high pressure of the pneumoperitoneum but also to the fast repair of the hysterotomy. With an experienced and skilled laparoscopic surgeon, a conservative management is totally feasible. It saved all the complications and long hospitalization of laparotomy. Moreover, it also allowed to correct the isthmocele and prevent probably an eventual recurrence. Larger series are required to observe the risk of recurrence after such a procedure and to extend it to a lesser term CESP. Moreover, other clinical scenarios could benefit from minimally invasive technology, until the most rare and unusual complications such as sigmoidal pregnancy which may origin also a viable pregnancy [19].
In conclusion, CSP remains a challenging case to diagnose and manage and high index of suspicion [20] is required to allow early initiation of management. In the absence of clear guidelines for treatment, individualized plans are recommended. Expansion of our current knowledge is essential to provide basis for future studies.

CONCLUSIONS

The success of this technique may help amplifying its usage in other similar scenarios. In particular, the failure of medical treatment may be the first indication in trespassing the laparoscopic surgery approach. Further investigations about minimally invasive technologies seems undeferrable.

COMPLIANCE WITH ETHICAL STANDARDS

Authors contribution

Z.S.: conceptualized the article. E.J.F., A.D., E.F., N.H., A.A., C.C.: Cured data, methodology and results. Z.S., G.B.: Wrote and edited the article into its final form.

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Study registration

N/A.

Disclosure of interests

The authors declare that they have no conflict of interests.

Ethical approval

The authors received IRB exemption for this project.

Informed consent

Obtained.

Data sharing

Data are available under reasonable request to the corresponding author.

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