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# The Largest Documented Caesarean Scar Ectopic Managed Laparoscopically: A Case Report

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## Abstract

Cesarean scar ectopic is added to the list of ectopic pregnancy. It has become 2nd common site of ectopic pregnancies the after tubal pregnancy. With the global rise in cesarean sections, cesarean scar ectopic pregnancies are being diagnosed more frequently. During a first-trimester ultrasound, in the absence of a gestational sac in the uterine cavity and with a history of previous cesarean sections or uterine surgeries, the anterior myometrium above the internal OS should be observed for a scar ectopic. Delay in diagnosis increases maternal morbidity. This case report presents a patient with an undiagnosed scar ectopic pregnancy beyond 12 weeks of gestation, which had grown to a large size. This is the largest size of scar ectopic pregnancy reported and treated by laparoscopic surgery.

## Keywords

Ectopic Pregnancy, Cesarean Scar Ectopic Pregnancy (CSEP), Trans Vaginal Ultrasound (TVS), Laparoscopic Surgical Management, Largest Size Scar Ectopic Pregnancy

## 1. Introduction

CSEP was first reported in 1978 by Larsen JV and Soloman MH as a case of pregnancy in a uterine scar sacculus. The incidence of CSEP varies from 1 in 1800 to 1 in 2500 *of all pregnancies*, with a 6.1% incidence among women diagnosed with ectopic pregnancy who have had a previous cesarean section [1] [2].

The incidence of CSEP is increasing in the current era due to the rising rate of cesarean sections. A cesarean section scar defect referred to as a niche or isthmocele results from incomplete healing of the myometrial incision made during a

cesarean delivery. This may result from incision low near internal OS, improper closure of myometrial incision, infection or haematoma formation. The fibrotic and poorly vascularized area at the scar site lacks the normal decidual barrier, facilitating abnormal trophoblastic adherence and invasion. There are others. Other mechanisms also are put forward for such abnormal implantation [3].

There are three widely recognized types of CSEP: Type 1, Type 2, and Type 3. This classification depends on whether the implanted scar ectopic grows toward the uterine cavity with anterior myometrial thickness > 3 mm (Type 1), or whether the gestational sac is completely or partially implanted within the scar defect with myometrial thickness 1 - 3 mm (Type 2) (a gestational sac size < 30mm, b > 30 mm). Type 3 describes anterior myometrial thickness of 1 mm or less, with the gestational sac bulging out anteriorly below the cesarean scar, with or without trophoblastic invasion. Recently, they have been further classified into subtypes depending on the size of the ectopic pregnancy (a gestational sac size < 50 mm, b > 50 mm). Based on this, the current case is classified as Type 3b without anterior myometrial invasion [4]. The term CSEP should be used in all pregnancies with implantation within, or close contact with, the caesarean section scar defect and not about the healed caesarean scar [5].

Type 3 CSEP may result in first-trimester uterine rupture, massive intraperitoneal hemorrhage, and consequently permanent fertility loss if a hysterectomy is required. In some cases, it may also lead to maternal death [3].

## 2. Case Report

A 38-year-old woman, G3P2L2, with two previous full-term cesarean sections done for postdates, presented with the chief complaints of 3 months of amenorrhea followed by intermittent brownish discharge for the past 20 days, along with mild pelvic pain for 2 days. Her past menstrual history was regular. There was no history of contraceptive use, and her last delivery was 2 years ago. She had taken MTP (medical termination of pregnancy) pills over the counter after 3 months of amenorrhea, following which she developed abnormal menstruation.

She had no other associated medical comorbidities. Her general examination and vital signs were normal. On per speculum examination, the cervix appeared normal. There was a brownish discharge, with no active bleeding observed. On the TVS (transvaginal ultrasonography) examination, the uterine cavity was empty, and an irregular gestational sac of approximately 6 cm was seen within the cesarean section scar defect, protruding anteriorly and to the left towards the bladder (**Figure 1**). The gestational sac was surrounded by placental tissue, with no evidence of a yolk sac or fetal pole (**Figure 2**, **Figure 4**). Color Doppler showed low-resistance blood flow around the sac (**Figure 3**). A thin layer of myometrium was measured in the sagittal plane, measuring 0.9 mm, covered the gestational sac under the bladder. No trophoblastic invasion into the myometrium was evident. Measurement of CSEP in transverse plane on color doppler should be assessed to know about the relation to uterine vessels. This was concluded to be an anembryonic Type 3b scar ectopic pregnancy. The internal OS was closed, and the

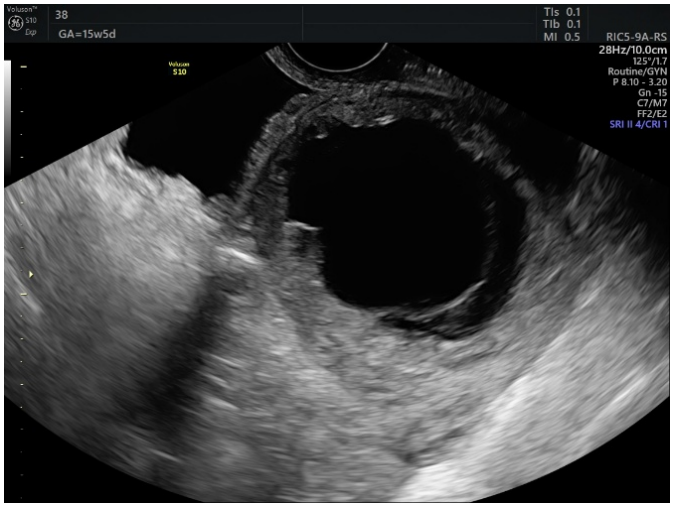


**Figure 1.** Scar ectopic pregnancy sagittal section, anterior bladder, uterine cavity empty.

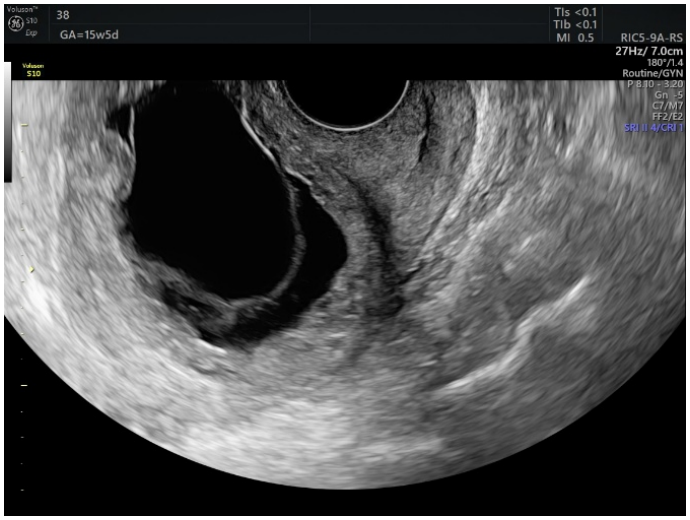


**Figure 2.** Scar ectopic coronal section.

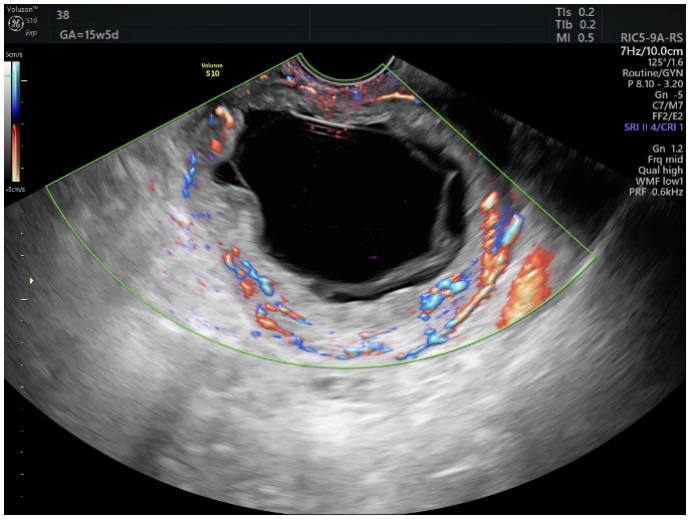


**Figure 3.** Scar ectopic, low resistance trophoblastic blood flow.

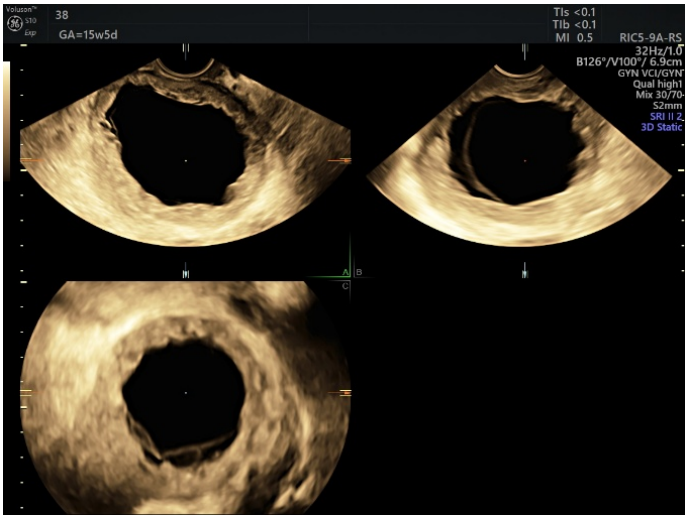


**Figure 4.** Scar ectopic 3 D picture.

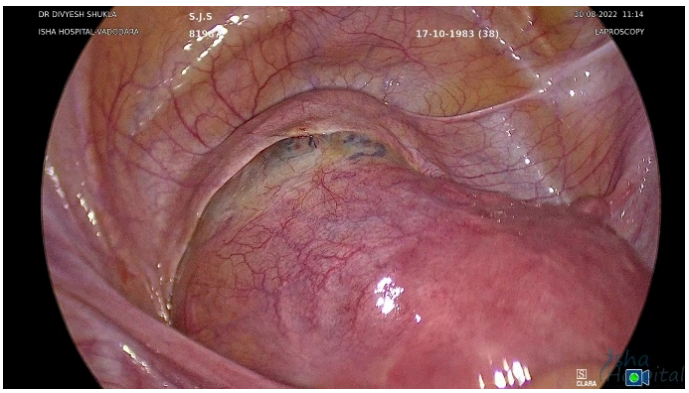


**Figure 5.** Scar ectopic pregnancy more bulge on left side.

endocervical canal was empty. Her serum beta-hCG level was only 9.3 IU/ml. These low levels could be explained by her prior use of MTP pills. Other routine laboratory investigations required as preoperative tests were within normal limits.

Informed consent was taken, and counseling was done with the patient and her husband regarding the requirement for conservative laparoscopic surgery. The procedure was carried out under general anaesthesia. First, a hysteroscopy was performed; it revealed a large anterior scar defect with ectopic tissue attached to it. The ectopic tissue appeared organized and was not protruding towards the uterine cavity. The uterine cavity was normal.

Laparoscopic surgery was performed by inserting the primary port above the umbilicus and three ancillary ports. A large 6 cm bulge was observed anteriorly above the internal os (**Figure 5**). The bladder was pushed anteriorly with a thick peritoneum. Increased surface vascularity was observed over the myometrial bulge. Dilute vasopressin (0.1 unit/ml) of about 20 ml was injected into the anterior myometrium at multiple sites to achieve vasoconstriction and reduce blood loss. The vesical fold of the peritoneum was cut from one round ligament to the other, and the bladder was dissected down from over the scar ectopic site by sharp

dissection up to about 1.5 cm lower down over the anterior vaginal wall (**Figures 6-8**). This was to ensure complete excision of the anterior bulge, *i.e.*, CSEP margins. Sharp dissection was carried out all around the CSEP margins with ultrasound dissectors until the bleeding edges of the normal myometrium were visualized. Ectopic pregnancy tissue was seen adherent underneath and was completely removed along with the excised thin anterior myometrium (**Figure 9**). The excised specimen was removed using an endobag through the left lower port (**Figure 10**).

The anterior myometrial uterine defect resulting from excision of the scar defect was closed with barbed monofilament sutures using an in-out technique in two layers: the first layer involved suturing the full thickness of muscle, and the second layer involved approximation of superficial myometrial fibers. Complete hemostasis was achieved at the end (**Figure 11**, **Figure 12**). The vesical peritoneum was sutured with interrupted sutures (**Figure 13**).

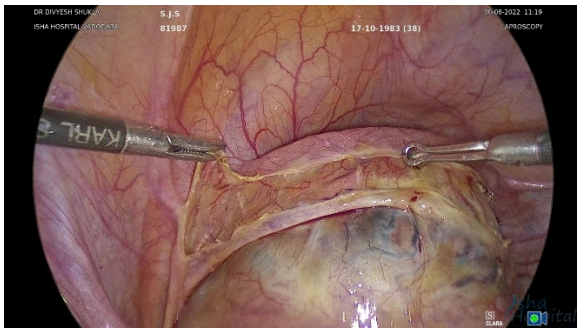

**Figure 6.** Dissection of the peritoneum.

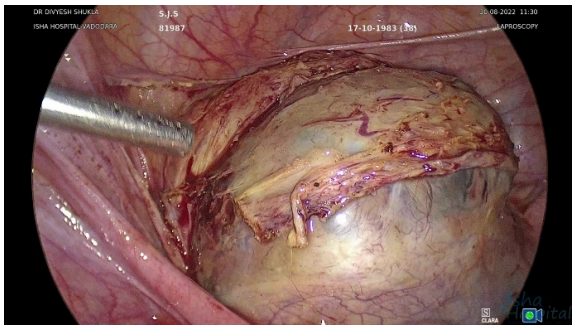

**Figure 7.** Bladder dissection over the scar ectopic site.

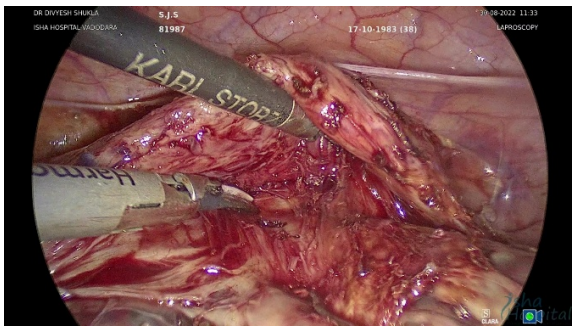

**Figure 8.** Bladder dissection lower limit.

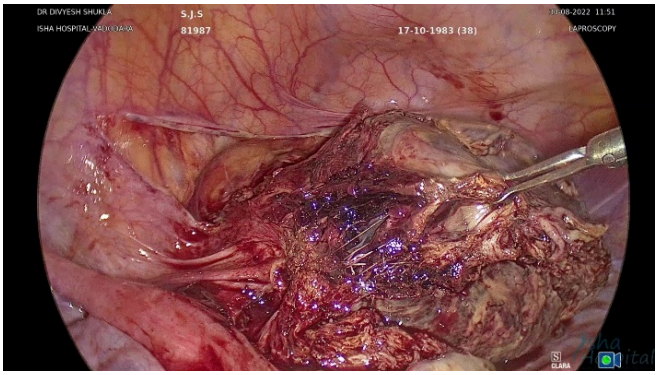


**Figure 9.** Removal of excised defect along with ectopic pregnancy material.

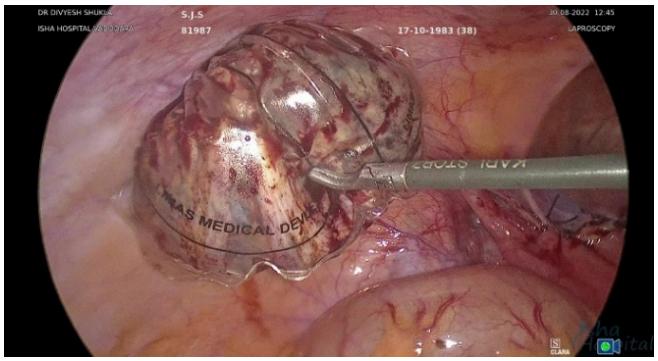


**Figure 10.** Endobag removal of removed tissue.

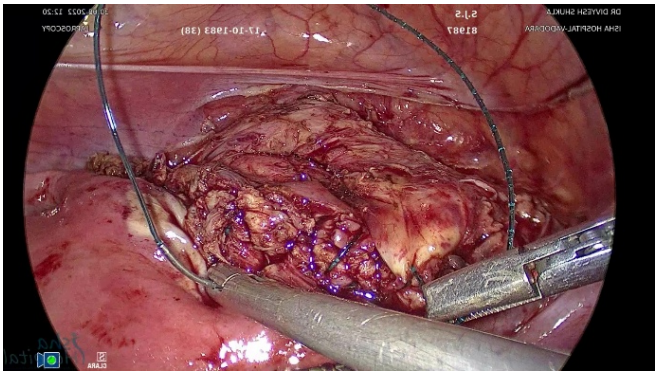

**Figure 11.** Suturing of myometrium using barbed suture in 2 layers.

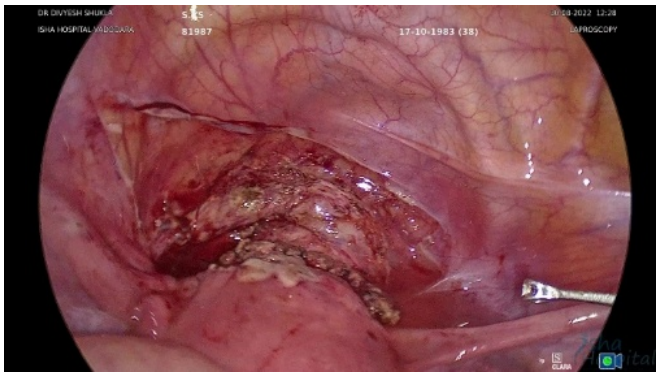


**Figure 12.** Complete haemostasis after suturing.

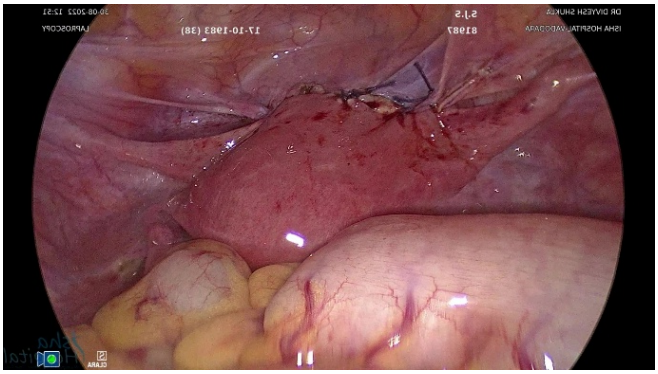

**Figure 13.** Peritoneal closure by interrupted sutures.

The patient's postoperative stay was uneventful, and she was discharged after 24 hours from the hospital. She was advised a course of postoperative analgesics and antibiotics as per hospital policy for 5 days. Her follow-up on day 8 was without any complaints, and the dressing and suture removal at the port sites showed healthy healing. Complete decline of $\beta$-hCG to undetectable levels was ensured by postoperative day 8.

## 3. Discussion

CSEP represents implantation at the site of a previous cesarean section scar, although less frequent it may increase maternal morbidity. It accounts for approximately 6.1% of all ectopic pregnancies in women with a history of cesarean delivery. The incidence ranges from 1 in 1800 to 1 in 2500 pregnancies and is expected to rise with the global increase in cesarean delivery rates [1]. The rate of caesarean scar ectopic does not necessarily rise with an increasing number of caesareans in women [6].

The pathogenesis of CSEP is thought to involve the implantation of the embryo into the scar defect following previous cesarean section. Certain procedures within the uterine cavity that can cause damage to the basal layer of endometrium can also increase the risk of scar ectopic such as, myomectomy, dilation and evacuation, manual removal of placenta, and assisted reproductive technique procedures [7].

In the present case after clinical history and investigations, TVS was performed to diagnose Type 3b scar ectopic pregnancy. On TVS thin myometrium of.9 mm without trophoblastic invasion was confirmed. We do not routinely perform MRI (Magnetic resonance imaging) in our cases of scar ectopic pregnancy. MRI may reconfirm the same findings or provide additional information about the extent of myometrial invasion as a complementary investigation [8]. This case was notable for being the largest size of cesarean scar ectopic pregnancy ever reported in the literature to be managed by laparoscopic surgery.

Management of CSEP must be individualized, taking into account the gestational age, size of the gestational sac, myometrial thickness at the level of cesarean scar, trophoblastic invasion into the myometrium or bladder, viability of the em-

bryo/fetus, patient's hemodynamic stability, and desire for the future fertility. Medical management with systemic or local methotrexate may be considered in selected early cases, especially when $\beta$-hCG levels are low (<5000 IU/L). Expectant management is also an option [9].

However, surgical intervention is suited in cases with advanced gestation with large sac size, failed medical management, if there is a risk of first trimester rupture or haemorrhage from caesarean section scar defect when trophoblast invades myometrium, or when the patient prefers definitive treatment [10].

Laparoscopic resection offers a minimally invasive yet definitive treatment option, allowing for direct visualization, complete removal of the gestational tissue, repair of the uterine wall defect, and preservation of fertility. In this case, precise laparoscopic dissection ensured safe exposure of the lower uterine segment. The gestational sac was excised using energy devices following the injection of dilute vasopressin to minimize blood loss. A key component of successful management is layered myometrial closure, which restores uterine integrity through proper approximation and reduces the risk of recurrence of ectopic pregnancy at this site. Temporary uterine artery ligation was not performed, although the trophoblastic tissue showed blood flow. Many published case reports have mentioned temporary ligation of the uterine artery as part of the surgical technique [11]. These cases had trophoblastic tissues invading the myometrium and in others myometrium and bladder, or there was a complication of suction and evacuation or a hysteroscopic procedure. Dissection of bladder in the case of trophoblastic invasion can result in massive haemorrhage. In all such cases, temporary uterine artery ligation helps in reducing bleeding [12]. In our case there was no myometrial invasion was present confirmed on preoperative ultrasound. The declining levels of beta-HCg also was another reason not to attempt additional vascular ligation before resecting scar ectopic pregnancy. Despite all it is mandatory a skilled laparoscopic surgeon is required to deal with such patients. Complete hemostasis was ensured at the end of surgery [11]. Published data mentions majority of scar ectopic pregnancy in similar situation being treated surgically by laparotomy [13] [14].

In cases of type 1 and type 2 ectopic pregnancies treatments such as dilation and suction evacuation under USG (ultrasound) guidance can be performed [15]. This procedure may carry a high risk of incomplete evacuation and uterine perforation. Hysteroscopic cold knife evacuation is also a recommended treatment for such pregnancy. Surgical expertise is required to conduct such procedures. By hysteroscopic procedures, visually completeness is ensured [16]. We in our hospital have a policy of carrying out bimanual compression of the uterus for such bleeding following hysteroscopic cold knife evacuation procedures and the bleeding effectively stops in all the patients. Suction evacuation and hysteroscopic cold knife evacuation procedures are suited for CSEP of 3 cm or less in size and when the available residual myometrial thickness of a minimum 1 mm [4]. Uterine artery embolization is generally not offered, as it may impair fertility, and is generally followed by additional procedures [17]. Some studies recommend uterine artery embolism in cases

of scar ectopic pregnancy even before any vaginal procedures [18]. Complications of incomplete evacuation, vaginal bleeding or intraperitoneal bleeding during vaginal procedures require Laparoscopic surgery or a laparotomy.

Laparoscopic surgeries offer a balanced approach with both therapeutic and diagnostic benefits in type 3 CSEP [19]-[21]. Laparoscopic surgery can be performed even in hemodynamically unstable patients by stabilizing them during surgery with necessary fluid and blood components.

Postoperative recovery was uneventful in this case, with a further decline in beta-hCG levels and a resumption of normal menstrual cycles within 6 weeks. Long-term follow-up is essential especially when future pregnancy is desired. There is a recurrence risk of CSEP (3.2% - 5.0%). After 3 to 6 months following surgery, the cesarean scar defect should be assessed for its size and available residual myometrial thickness. The patients desirous of future pregnancy should be monitored and on confirmation of pregnancy, USG should confirm its intrauterine location. Some studies have reported high recurrence rates of up to 15.6% and successful pregnancy rates of up to 60% [22]. Generally in pregnancy following the previous caesarean section the placental attachment is either fundal or on the posterior wall of the uterus [3]. Elective caesarean delivery is recommended for the future pregnancies following laparoscopic surgery for CSEP.

In agreement with the published data laparoscopic excision of scar defect and removal of scar ectopic pregnancy as a safe, fertility-preserving, and definitive treatment irrespective of the size with residual myometrial thickness is 1 mm or less. Laparoscopic surgery is also of choice when a large size cesarean ectopic pregnancy is diagnosed. The delayed diagnosis in this case had resulted in a large size of scar ectopic pregnancy. Other indications are failed conservative management or failed evacuation of cesarean scar pregnancy, causing remnant placental tissue in scar defect [20]. Early diagnosis is required at the time of first-trimester on TVS, otherwise the scar ectopic pregnancy may remain undiagnosed and may grow to a large size. The beta-hCG levels had started declining and were low at the time of presentation of the patient.

## 4. Conclusions

CSEP is a rising concern with increasing global cesarean delivery rates. Its clinical implications are significant due to the potential for early uterine rupture, massive haemorrhage, and adverse fertility outcomes. Therefore, it should be diagnosed during the first trimester TVS examination. Surgical treatment described in various published data varies according to the surgeon's expertise.

Laparoscopic surgery helps in the accurate localization and complete excision of a large uterine scar defect, removal of gestational tissue, and multilayer closure of the uterine defect. Today, there are no limits to performing laparoscopic surgery. Laparoscopic resection and repair of the scar defect, along with removal of cesarean scar pregnancy, should be considered the preferred modality over laparotomy when surgery is indicated. Long-term follow-up is required if the patient

desires future fertility.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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