

Is it necessary to correct a caesarean scar defect before a subsequent pregnancy? A report of three cases

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Abstract

Rates of caesarean section have increased over recent years and so too have associated complications, one of which is a caesarean scar defect (CSD). The defect may cause gynaecological symptoms, such as menometrorrhagia, infertility, chronic abdominal/pelvic pain or it may be asymptomatic. The presence of CSD may lead to obstetrical sequelae such as preterm delivery, uterine rupture, caesarean scar pregnancy or abnormal placenta implantation. Three cases of CSD are described here. In one case, surgical correction of the CSD was performed before a subsequent pregnancy with an uncomplicated obstetric outcome. In the other two cases, surgical correction of the CSD was not performed and the pregnancies were complicated by caesarean scar dehiscence and caesarean scar pregnancy. We suggest that women with a CSD may benefit from surgical correction of the defect before becoming pregnant to reduce the likelihood of serious complications.

Keywords

Caesarean scar defect, caesarean section, niche, caesarean scar pregnancy, myometrial thickness

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Introduction

Caesarean section (CS) rates have increased over recent years and according to data from 150 countries, current rates range from 6% to 27.2%.¹ Accordingly, the

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number of CS complications has increased.² Among early complications postpartum haemorrhage, obstetric hysterectomy due to uterine rupture or atony, urological complications, thromboembolic complications and amniotic fluid embolism may occur.² Late complications after CS include abdominal pain caused by adhesions, caesarean scar, endometriosis, ectopic pregnancy, caesarean scar defect (CSD), abnormal placenta implantation and even mortality.²⁻⁵

First described in 1995 following examinations of myometrium samples after hysterectomy in patients who had undergone CS,⁶ a CSD may form at the site of hysterectomy on the anterior wall of the uterine isthmus. Improper healing of the caesarean incision leads to thinning of the anterior uterine wall, which creates an indentation and fluid-filled pouch at the CS site.⁷ The complication is also known as uterine scar defect, caesarean scar syndrome, diverticulum, sacculation, isthmocele, scar pouch or niche.^{5,7-10} The type of surgical technique used for uterine closure has been proposed as an important factor in the formation of CSD.³ Other factors such as prolonged labour, cervical dilatation >5cm before CS, oxytocin, retroverted uterus, low incision of the uterus have also been suggested as being responsible for the abnormal healing of the caesarean scar.¹¹

The CSD may be asymptomatic or manifest with clinical symptoms including metrorrhagia (64%), dysmenorrhea (53%), chronic pelvic pain (40%), infertility and dyspareunia (18%).¹² CSD may expand and lead to scar dehiscence or uterine rupture in a subsequent pregnancy as well as result in scar pregnancies and abnormal placentas.^{4,5} Transvaginal ultrasound (TVUS) examination with the possible use of saline infused sonohysterography has been used in the diagnosis of CSD.^{4,13} One classification system for CSD was based on the shape of the niche detected

from ultrasound findings.⁷ The niche was categorised according to its shape as follows: triangle, semicircle, rectangle, circle, droplet, inclusion cysts. Using this system, investigators found semi-circular and triangular niches were the most common of the six shapes.⁷

Although, there are no current guidelines for the management of CSD, the case series presented below supports the consideration of CSD correction before subsequent pregnancy to reduce the likelihood of serious obstetric complications.

Case reports

This report of three case histories was approved by the Local Bioethics Committee of Medical University of Lublin (KE-0254/60/2018) and each patient gave informed consent for publication.

Case 1

This was a 31-year-old woman who had previously had a CS because of prolonged first stage of labour with cervical dilatation up to 7 cm. She was admitted to hospital with menometrorrhagia and transvaginal ultrasound examination showed the presence of a CSD. The scar thickness was 0.19cm and the CSD measured 0.86cm with a rectangular shape (Figure 1a).⁷ Surgical CSD correction was recommended but the patient deferred treatment, ignored contraceptive advice and shortly afterwards became pregnant.

Sonography confirmed a single pregnancy with correct location of gestational sac within the uterus. The pregnancy was monitored every two weeks, and additional clinic visits were made if the patient experienced pain in the location of the CSD. At each clinic visit, TVUS assessments of the lower uterine segment were made and a thickness <0.25cm was assessed as a high risk of uterine rupture.¹³

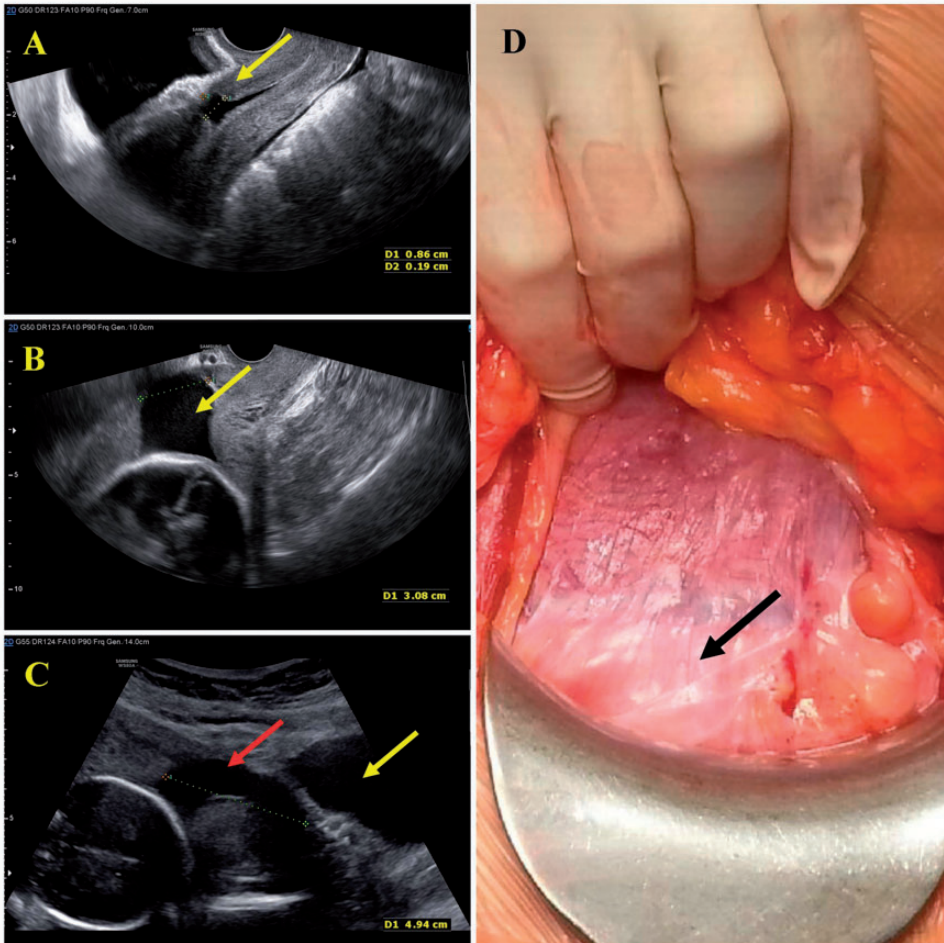


Figure 1. (a) The caesarean scar defect (CSD) in contact with the bladder was visualized by transvaginal ultrasound (TVUS) examination (yellow arrow). Residual myometrial thickness at the CSD measured 0.19cm (D1), the width (i.e., the gap between the upper and lower myometrial edges) of the CSD measured 0.86cm (D2). (b) At 26 weeks gestation, the caesarean scar dehiscence measured 3.08cm (D1; yellow arrow). (c) At 30 weeks gestation, the caesarean scar dehiscence measured 4.94cm (D1; red arrow). The yellow arrow indicates a half-empty bladder to balance the pressure of the foetus on the caesarean scar dehiscence. (d) At 36 weeks gestation, the caesarean scar dehiscence (transverse extent) during the CS was estimated to be 8 cm (black arrow).

During her pregnancy, the patient was hospitalized three times. At 26 weeks, she reported moderate pain in the CS scar. A scar dehiscence of 3.08cm was visualised by TVUS (Figure 1b). At 30 weeks, scar dehiscence was estimated to be 4.94 cm (Figure 1c). At 36 weeks, the patient was

admitted to the hospital because of lower abdominal pain; scar dehiscence was confirmed by TVUS and because of the high risk of uterine rupture an emergency CS was performed. The caesarean scar dehiscence (transverse extent) was estimated to be 8 cm (Figure 1d).

The patient delivered a healthy girl with a birth weight of 2810g. During her CS, the CSD was repaired. At the two-year follow-up, the patient reported no symptoms related to the CSD and TVUS confirmed there was no defect. The patient has no future pregnancy plans.

Case 2

This was a 32-year-old woman who had been actively trying to conceive for 18 months and had been diagnosed with asymptomatic CSD. She was admitted to hospital for surgical correction of the defect. A possible predisposing factor for the CSD was a previous CS because of a prolonged second stage of labour. Laparotomy with hysteroscopy support was performed. Only serosa of the anterior wall covered the CS scar. The CSD was classified as droplet-shaped with inclusion cysts (Figure 2a).⁷

Twelve months after the repair of the CSD, residual myometrial thickness measured 0.97cm (Figure 2b) and the patient successfully conceived. During the 11–14 week ultrasound scan, placentation was observed in the area of the surgically repaired CSD. During the second trimester ultrasound examination, placenta previa was diagnosed (Figure 2c). Colour Doppler ultrasound images confirmed that invasive placental vessels were not present in the CSD and there was no evidence of any abnormally invasive placenta. An elective CS was performed at 39 weeks without complications. No scar dehiscence nor any abnormally invasive placenta were observed during the caesarean (Figure 2d). A healthy girl was delivered weighing 3520g.

Case 3

The third case was a 30-year-old woman who had previously had a CS at full cervical dilatation because of prolonged second

stage labour. She was admitted to hospital at 6 weeks gestation because of suspicion of pregnancy of unknown location. A large CSD was visualized on TVUS examination. The gestational sac was implanted on the anterior uterine wall at the cervicoisthmic level over the CSD (Figure 3a). The residual myometrial thickness at the CSD was 0.1cm and it had a rectangular shape (Figure 3b).⁷ Diagnosis was confirmed using TVUS in 3D mode with Oblique View software (Figure 3c).

During hospitalization, spontaneous miscarriage occurred and dilatation and curettage was performed. After the procedure, the CSD was visualized during TVUS examination (Figure 3d). Surgical correction of the CSD was performed three months later (i.e., laparotomy with hysteroscopic support). At the six month follow-up, the patient reported no symptoms related to the CSD and TVUS confirmed there was no defect. The patient wanted to try and conceive again.

Discussion

The prevalence of CSD is difficult to quantify because many cases may be asymptomatic and there are no accepted guidelines for its diagnosis.¹⁴ Accordingly, the prevalence of symptomatic CSD has been estimated to vary widely from 19% to 88%.¹⁴ In addition, there is a lack of consensus on the most appropriate repair method for CSD and the effect of the procedure on future pregnancy outcomes has not been evaluated.^{8,10,15,16} This case series presents three different scenarios of CSD presence in pregnant patients.

Despite early recognition of a CSD, the first patient we reported on did not consent to treatment and dehiscence of CSD occurred during her subsequent pregnancy with a risk of uterine rupture. By contrast, the second patient underwent surgical treatment for CSD prior to her pregnancy and

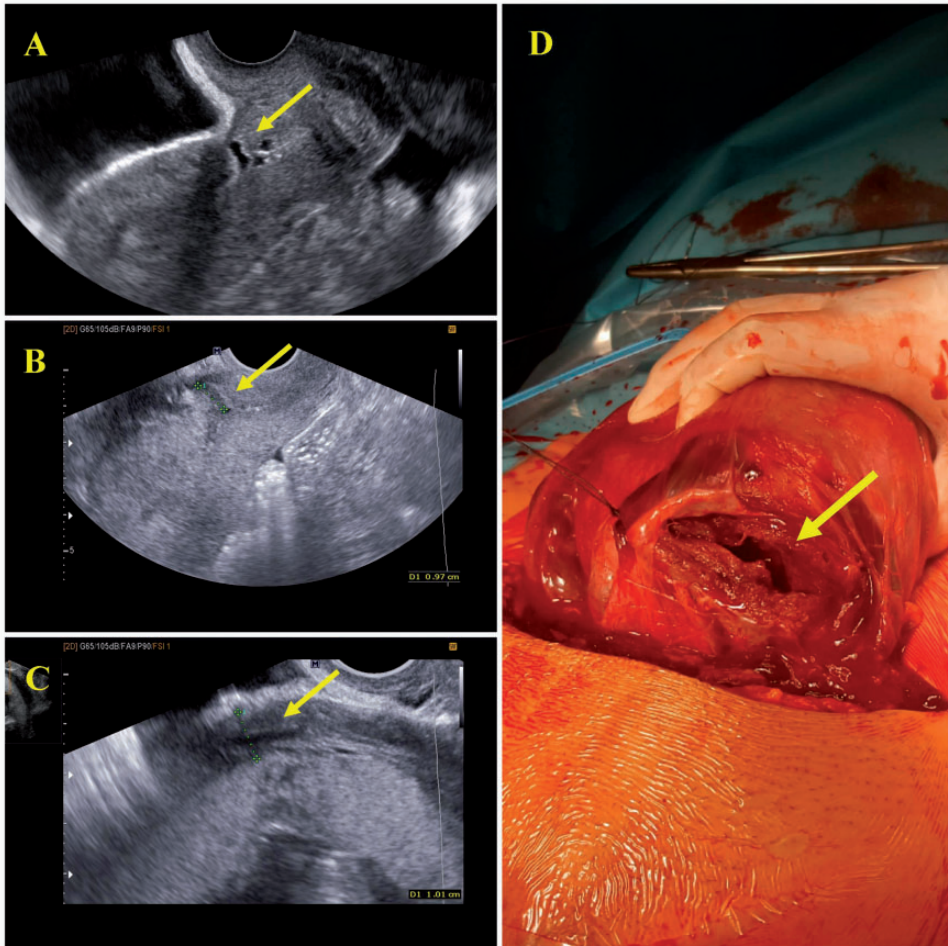


Figure 2. (a) A CSD was confirmed by TVUS (yellow arrow). The CSD was classified as droplet-shaped with inclusion cysts. (b) Twelve months after CSD repair, the residual myometrial thickness was estimated to be 0.97cm (D1; yellow arrow). (c) At 22 weeks gestation, the CSD was covered by the placenta (yellow arrow). Placenta previa was diagnosed. (d) An elective caesarean section (yellow arrow) was performed at 39 weeks without complications. No scar dehiscence nor any abnormally invasive placenta were observed during the caesarean.

delivered a healthy infant without any obstetric complications. In the third case, the gestational sac implanted over a large CSD which led to pregnancy failure (spontaneous miscarriage). The patient subsequently underwent surgical correction for the CSD.

A study has demonstrated the superiority of laparoscopic CSD repair compared

with hysteroscopy for protection against abnormally invasive placenta, scar dehiscence and caesarean scar pregnancy.¹⁷ In a study of 38 women with symptomatic CSD who underwent laparoscopic repair of large defects, eight patients became pregnant and all delivered healthy infants via CS at 38–39 weeks gestation.⁵ However, a study of 11 women aged 26–39 years who underwent

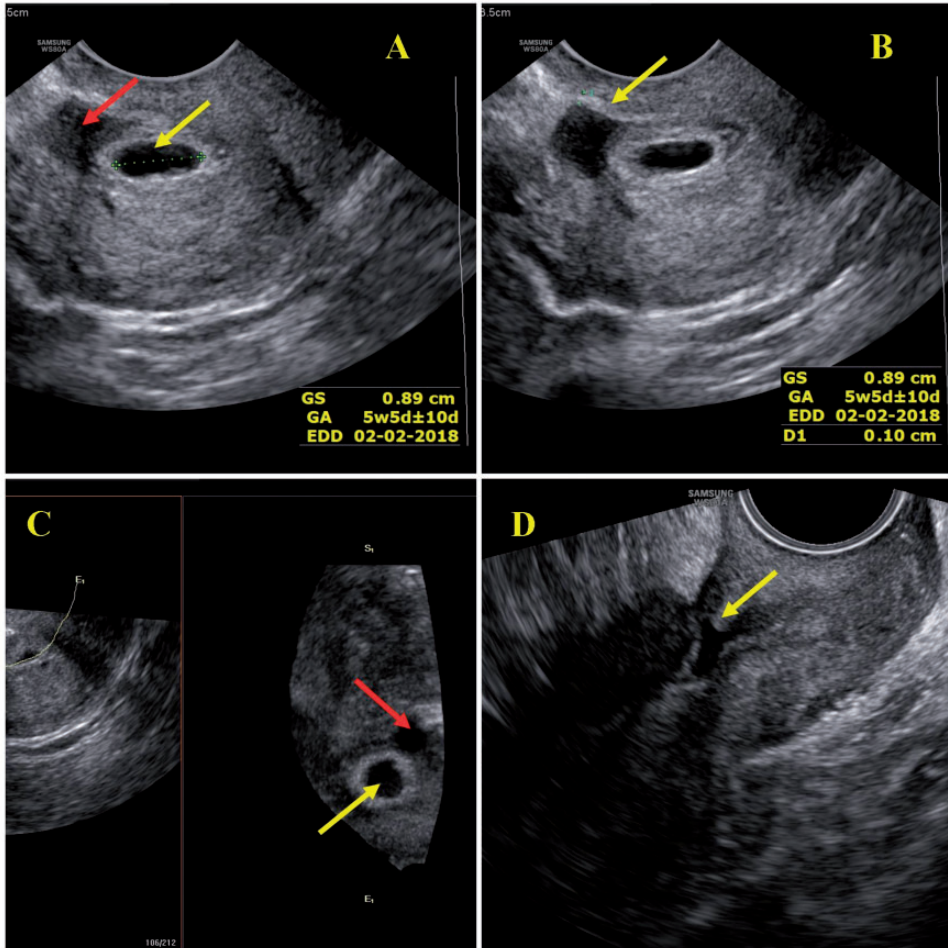


Figure 3. (a) A large CSD (red arrow) was visualized on TVUS examination. The gestational sac (yellow arrow) was implanted on the anterior uterine wall at the cervicoisthmic level in relation to the CSD. (b) The residual myometrial thickness of the CSD was 0.1cm (D1; yellow arrow). (c) Diagnosis of CSD was confirmed using TVUS in 3D mode with Oblique View software. The gestational sac (yellow arrow) was located superior to the CSD (red arrow). (d) During hospitalization, spontaneous miscarriage occurred and dilatation and curettage was performed. The figure shows the CSD after the procedure (yellow arrow).

laparoscopic correction of symptomatic CSD found that improvement of the women’s health after laparoscopy did not necessarily equate to improvement of CS scar sonomorphology.⁸ The authors of this study concluded that surgery should be offered only to patients with symptomatic caesarean scar syndrome.⁸

Although it has been suggested that elective repeat CS or pre-pregnancy surgical repair of the defect are not routinely required for large CSDs,¹⁸ we believe prior surgical repair may be a safe option. We suggest that in patients with CSD who are planning to conceive, surgical correction of the defect would prevent serious

obstetrical complications. The three cases we present here draw attention to the potentially serious consequences of untreated CSD in subsequent pregnancies.

A limitation of our study is that we reported on only three patients. While difficult to achieve, further randomized controlled studies of sufficient sample size are required to confirm if correction of a CSD should be recommended before a subsequent pregnancy. We believe that the treatment may reduce the risk of abnormal placenta implantation, scar dehiscence and CSP. Awareness of CSD among gynaecologists and other practitioners who treat and diagnose abdominal and pelvic pain (i.e., general practitioners, surgeons, urologists, and radiologists) should be encouraged to prevent complications in pregnant patients with the defect.

Declaration of conflicting interest

The authors declare that there are no conflicts of interest.

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