Reproductive outcomes of women with a previous history of Caesarean scar ectopic pregnancies


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BACKGROUND: Caesarean scar ectopic pregnancy is associated with a number of significant complications. In this study, we report on subsequent reproductive outcomes in a group of women following successful treatment of their scar pregnancies. METHODS: The study included those women who received treatment for their Caesarean scar pregnancies between April 1999 and October 2005. Their ability to conceive, the time it took to become pregnant and outcomes of subsequent pregnancies were all recorded. RESULTS: 40 women with Caesarean scar pregnancies were managed in our unit. The uterus was conserved in 38/40 cases. Follow-up data were available in 29/38 (76%) of women. Twenty-four out of 29 (83%) attempted to become pregnant. Twenty-one out of 24 [88%, 95% confidence interval (CI): 75–100] women conceived spontaneously. Twenty out of 21 (95%, 95% CI: 86–100) pregnancies were intrauterine and one woman (5%, 95% CI: 0–14) had a recurrent scar ectopic. Thirteen out of 20 (65%, 95% CI: 44–86) intrauterine pregnancies appeared normal. Nine out of 13 (69%) were delivered by Caesarean section. Seven out of 20 (35%, 95% CI: 14–56) intrauterine pregnancies ended in spontaneous abortions. CONCLUSIONS: Our study shows that reproductive outcomes following treatment of Caesarean scar ectopic pregnancies are favourable. The risk of complications including recurrent scar implantation appears to be low.

Keywords: Caesarean section; Caesarean scar ectopics; management; fertility; pregnancy outcomes

Introduction

Caesarean scar pregnancy is a rare form of ectopic pregnancy with an incidence of 1:1800–1:2200 pregnancies (Jurkovic et al., 2003; Seow et al., 2004). It is associated with a number of complications such as first or second trimester spontaneous abortion and pre-term delivery (Herman et al., 1995; Donald, 2002). However, the most significant complication of scar implantation is an abnormally adherent placenta, which may lead to life threatening haemorrhage requiring emergency hysterectomy (Jurkovic et al., 2003; Ben Nagi et al., 2005). This inevitably leads to the loss of women’s fertility and may have significant long-term adverse effects on women’s health and quality of life.

If the uterus is successfully conserved following the treatment of scar pregnancy, women have a chance to try for another pregnancy. However, because of their rarity, little is known about future fertility and pregnancy outcomes following Caesarean scar ectopics. In this study, we report on subsequent pregnancy outcomes in a relatively large group of women following successful conservative treatment of Caesarean scar ectopics.

Materials and Methods

The study included all women who were diagnosed with a Caesarean scar ectopic pregnancy in our department between April 1999 and October 2005. They included women from our local population who were referred for assessment either by their General Practitioners or by our Accident and Emergency Department. We also accepted tertiary referrals from Consultant Obstetricians and Gynaecologists based in other hospitals within the UK.

A transvaginal scan was performed in all of the cases by gynaecologists, who were trained in transvaginal sonography. The ultrasound diagnosis of Caesarean scar ectopic pregnancy was made using the previously reported criteria (Jurkovic et al., 2003). Implantation into a previous Caesarean section scar was diagnosed when the following criteria were met: (i) gestational sac located anteriorly at the level of the internal os within a visible myometrial defect at the site of the previous lower segment Caesarean section scar; (ii) evidence of functional trophoblastic/placental circulation on colour Doppler examination, which was characterized by high velocity (peak velocity >20 cm/s) and low impedance (pulsatility index <1) blood flow; (iii) negative ‘sliding organs sign’, which was defined as the inability to displace the gestational sac from its position at the level of the internal os using gentle pressure applied by the transvaginal probe.

The main objectives in the management of scar ectopic pregnancies were prevention of severe blood loss and conservation of the uterus. The management strategies varied in individual cases. They were determined by the severity of clinical presentation, gestational age, pregnancy viability and women’s choice. Twenty-eight out of 40 (70%) women underwent surgical evacuation of pregnancy under general anaesthesia. Peri-operative haemostasis was secured either by the insertion of Shirodkar cervical suture or by Foley catheter. The
remaining 12/40 (30%) women were managed conservatively either with local injection of methotrexate or expectantly. Our management protocols for medical treatment of Caesarean scar ectopics have been previously published (Jurkovic et al., 2003). The gestational sac was punctured transvaginally under ultrasound guidance, and embryocide was performed first by an intracardiac injection of 0.1–0.3 mEq KCl. Following the cessation of cardiac activity, 25 mg of methotrexate was injected into the chorionic cavity. All procedures were performed in the outpatient setting. All women were given i.v. analgesia (pethidine 50 mg) and antibiotic prophylaxis (methronidazole 500 mg + cefuroxime 1.5 g).

All women attended for a follow-up visit 6 weeks after the completion of treatment. An ultrasound scan was performed at the same time to exclude the possibility of retained products of conception and to assess the myometrial defect at the previous Caesarean scar site (Fig. 1). A scar was described as being deficient when there was a visible gap in the anterior uterine wall covered with thin layer of peritoneum or if there was a loss of >50% myometrial thickness in comparison with the myometrium adjacent to the scar.

Following successful treatment of Caesarean scar pregnancy, all women were encouraged to contact us when they fell pregnant again or if they experienced any complications. They also gave us their verbal consent to allow us to contact them from time to time in order to obtain information about their health and outcome of their subsequent pregnancies.

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 10 (SPSS Inc., Chicago, IL, USA). The two-tailed Mann–Whitney test was used to calculate significant differences of continuous variables. A value of $P < 0.05$ was considered statistically significant.

### Results

From April 1999 to October 2005, 40 women diagnosed with Caesarean scar ectopics were managed in our unit. Twenty-six out of 40 (65%, 95% CI: 50–80) women were referred to us from other hospitals, and 14/40 (35%, 95% CI: 20–50) women came from our local population. The patient’s demographic details are illustrated in Table 1. Twenty-eight out of 40 (70%, 95% CI: 56–84) Caesarean scar pregnancies were managed by primary surgical evacuation, 9/40 (22%, 95% CI: 9–35) were treated medically and 3/40 (8%, 95% CI: 0–16) were managed expectantly. Three out of nine (33%) women had failed medical treatment with methotrexate and they required surgical evacuation of Caesarean scar pregnancies. The uterus was successfully conserved in 38/40 (95%, 95% CI: 88–100) cases. Two (5%, 95% CI: 0–12) women with viable Caesarean scar pregnancies who opted for expectant management both had emergency hysterectomies. One woman miscarried at 17 weeks and the other woman had an elective Caesarean section at 38 weeks gestation. They both experienced severe bleeding due to abnormally adherent placentae, which could not be arrested by conservative surgical measures.

Follow-up data were available in 29/38 (76%, 95% CI: 62–90) women. Nine out of 38 (24%, 95% CI: 10–38) were lost to follow-up or they declined to participate in the study. A total of 24/29 (83%, 95% CI: 69–97) women attempted to conceive following their scar ectopic pregnancy, whereas 5/29 (17%, 95% CI: 3–31) had no desire for further pregnancies (Fig. 2). One of these women continued to experience heavy and irregular periods 5 months after an uneventful evacuation of scar pregnancy and she had an elective hysterectomy at her local hospital.

About 21/24 (88%, 95% CI: 75–100) women who tried to conceive became pregnant during the follow-up period. Eleven out of 21 (52%, 95% CI: 31–73) women conceived within 6 months of trying, 6/21 (29%, 95% CI: 10–48) fell pregnant between 7 and 12 months and 4/21 (19%, 95% CI: 2–36) women conceived more than 1 year following their scar ectopic pregnancy (Fig. 3).

Twenty out of 21 (95%, 95% CI: 86–100) pregnancies were intrauterine. Of these intrauterine pregnancies, 13/20 (65%, 95% CI: 44–86) appeared normal on first trimester scan and they had evidence of fetal cardiac activity, whereas 7/20 (35%, 95% CI: 14–56) intrauterine pregnancies ended in first trimester spontaneous abortions. One woman (5%, 95% CI: 0–14) had a recurrent Caesarean scar ectopic, but there were no cases of tubal ectopic pregnancies.

So far, nine pregnancies progressed to term and all the babies were delivered by elective Caesarean sections. Two pregnancies are still ongoing and the final outcomes of the remaining two cases are unknown. There were no cases of placenta praevia or uterine ruptures in these nine pregnancies.

The median age of women who conceived again was 35 years (range 27–42), which was less than the median age of 38 (range 34–39) of those who were unable to become pregnant, but this difference was not statistically significant ($P > 0.05$). Women who had normal pregnancies were younger (median age 34, range 32–42), compared with those who suffered spontaneous abortions (median age 37, range 35–39). However, this difference was also not statistically significant ($P > 0.05$).

### Table 1: Age of women diagnosed with Caesarean scar ectopics and outcomes of their previous pregnancies ($n = 40$)

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Median</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal birth</td>
<td>0</td>
<td>0–1</td>
</tr>
<tr>
<td>Caesarean section</td>
<td>2</td>
<td>1–4</td>
</tr>
<tr>
<td>Spontaneous abortion</td>
<td>1</td>
<td>0–8</td>
</tr>
<tr>
<td>Tubal ectopic</td>
<td>0</td>
<td>0–2</td>
</tr>
<tr>
<td>Termination of pregnancy</td>
<td>0</td>
<td>0–3</td>
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</tbody>
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Figure 1: Ultrasound scan of the uterus performed 6 weeks after completion of treatment for Caesarean scar ectopic pregnancy
Discussion

Our study confirmed that early diagnosis and active treatment of Caesarean scar ectopic pregnancy is safe and effective. None of the patients required open abdominal or laparoscopic surgery, and the uterus was successfully conserved in all women who opted for first trimester termination of scar pregnancies. Our data also showed that non-intervention in women with viable Caesarean scar ectopic pregnancy who opted to continue with their pregnancies is likely to result in severe haemorrhage, requiring emergency hysterectomy once the pregnancy progresses beyond the first trimester.

Most of our patients were able to conceive without difficulty following surgical evacuation or medical treatment of their Caesarean scar ektopics. The median time interval between previous scar ektopics and new conception was 5.3 months (range 1–48 months). In a previous study of seven women, Seow et al. (2004) reported a mean time interval of 13.3 months between the treatment of scar ektopics and subsequent pregnancies, but 2/7 (29%) pregnancies in their study occurred after IVF treatment.

Although the majority of subsequent pregnancies in our study were normal, the rate of first trimester spontaneous abortion was slightly higher than expected. This could be explained by the higher than average age of women in our study population. Although the numbers are relatively small, it is encouraging that none of the women suffered any significant antenatal problems. In particular, there were no cases of placenta praevia/accreta or uterine ruptures. All pregnancies, which progressed to full term, were delivered by elective Caesarean sections. Therefore, we are unable to comment about possible

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Figure 2: Flowchart of follow-up data for forty women with Caesarian scar ectopic pregnancies

Figure 3: Cumulative pregnancy rates in 48 months following ectopic pregnancy
risks of uterine scar rupture in labour in women with previous scar pregnancies. Decisions to perform elective Caesarean sections were made in all cases by the attending obstetricians. Although there is no evidence that a trial of scar would be hazardous in these cases, all the obstetricians felt that in the presence of a deficient scar a trial of vaginal delivery would be inappropriate. We did not advice for the closure of the uterine incision either as, according to a recent national survey, 96% of obstetricians in the UK use double-layer techniques to close the lower segment uterine incision (Tulley et al., 2002). Three out of the nine patients (33%) had their elective Caesarean sections in our institution, and hence we have a detailed description of the lower uterine segment, which was very thin in 2/3 (67%) women. Extensive omental adhesions and uncomplicated closures of the lower uterine segment were also documented in all of the three cases. However, we do not have operative notes for the remaining patients, who delivered in other hospitals.

Our findings are different from Seow et al. (2004), who reported a case of uterine rupture leading to maternal death at 38 weeks gestation in women with previous history of Caesarean scar pregnancy. However, in this case only a presumptive diagnosis of scar pregnancy had been made based on excessive bleeding encountered during surgical evacuation of a presumed missed spontaneous abortion. In addition, there were two cases of placenta accreta, one of whom was detected on a scan and the woman had an emergency hysterectomy at 32 weeks. The other case was not detected antenatally.

Only one woman in our study population suffered a recurrent Caesarean scar ectopic pregnancy. Her uterine defect was particularly large and it was extending into the lower part of the uterine corpus. Her scar was successfully repaired at laparotomy. She had two intrauterine pregnancies afterwards, but they both ended in first trimester spontaneous abortion (Ben Nagi et al., 2006). This low risk of recurrence indicates that Caesarean scar pregnancy is more likely to be a chance event rather than being caused by a particular affinity of the pregnancy to implant into the deficient scar. We therefore do not support the view expressed by Hasegawa et al. (2005) that repair of uterine scar either during or following evacuation of Caesarean scar ectopic pregnancy is necessary in order to decrease the risk of recurrence. Another possible approach would be to repair all deficient scars, which are detected incidentally on ultrasounds in non-pregnant women. This strategy would provide primary prevention of scar pregnancies. However, severely deficient uterine scars are not uncommon, and we have found them in 10% of the population of women with history of previous Caesarean sections (Ofili-Yebovi et al., 2006), although a Caesarean ectopic is a great rarity. Therefore, a policy of routine repair would result in a large number of operations being performed, which would be costly and difficult to justify. The efficacy of surgical repair of a defective Caesarean scar is also doubtful and it may lead to various complications, such as poor scar healing, adhesions formation and hysterectomy, which could be more detrimental to women’s future fertility.

In view of this, we believe that surgical repair should only be considered in rare cases of recurrent scar ectopics.

In conclusion, our study shows that reproductive outcomes following Caesarean scar ectopic pregnancies are good, with most women being able to achieve subsequent pregnancies in a relatively short time. The risk of complications, including recurrent scar implantation, appears to be low. If subsequent pregnancies are implanted normally within the uterine cavity, they are at low risk of complications and women could be managed in the same way as those with previous history of uncomplicated Caesarean section. This information may be used to counsel women with Caesarean scar ectopics about the available management options. Better understanding of future pregnancy outcomes is particularly helpful in women with viable scar pregnancies, who wish to preserve their fertility. In these cases, the decision whether to proceed with the pregnancy or to opt for a termination is very difficult, and we hope that the findings from our study may help women and their carers to make the right management decisions.

References


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