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Original Research Article

Cesarean scar pregnancies, diagnosis and management

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ABSTRACT

Background: Objective of present study was to describe evaluation and management of pregnancies implanted into uterine Cesarean section scars, Cesarean scar pregnancies (CSP), is defined as gestational sac implanted in the myometrium at the site of a previous cesarean scar. Also known as Cesarean ectopic pregnancy.

Methods: In all antenatal patients attending the antenatal outpatient department of a tertiary care service hospital a transvaginal sonography was done for determining the gestational age as well as the viability of the pregnancy. In all patients with a history of previous Cesarean section(s), special effort was made to assess the possibility of implantation into the uterine scar by means of an early transvaginal and colour doppler ultrasound.

Results: Twelve Cesarean section scar pregnancies were diagnosed in a five-year period, of a tertiary care service hospital. Five (42%) patients with Cesarean scar pregnancies were treated surgically, four patients medically (33%), and two patients expectantly (17%) and one patient opted to continue the pregnancy. Surgical management was successful in all cases, although two of five (40%) women suffered bleeding (300-500ml). In the group of women who were managed medically the success rate was 3/4(75%). Expectant management was successful in one of two cases (50%). One patient who opted to continue pregnancy, underwent a cesarean hysterectomy at 33 weeks of gestation for placenta accreta.

Conclusions: Incidence of cesarean section scar pregnancies is increasing as is the increasing rate of cesarean deliveries. A high index of suspicion in all cases of post cesarean pregnancies, coupled with early transvaginal ultrasonography along with colour doppler confirmation and institution of early and individualized treatment, optimizes the clinical outcome. Although rare, the patient and her relatives must be made aware of the possibility of recurrent CSP.

Keywords: Cesarean scar, Pregnancy

INTRODUCTION

CSP is an iatrogenic complication of a previous cesarean delivery. The true incidence of CSP is unknown. Incidence of CSP is currently estimated at 1:1800-2200 pregnancies.^{1,2} With a history of a previous cesarean delivery, it is estimated that 0.15% of all pregnancies will be followed by a CSP in the woman's next pregnancy.³ Although rare, the possibility of a recurrent CSP is also possible and greater awareness on part of the clinician

and the patient is essential. Unfortunately, CSPs are often misdiagnosed as abortions in progress, ectopic and cervical pregnancies. CSP can have grave consequences in all the three trimesters for the patient if not recognized early or appropriately treated.

There are two types of CSP which have been reported. One in which there is a deep implantation in a cesarean scar defect towards the bladder and the abdominal cavity and the second type which involves an implantation

growing into the uterine cavity.⁴ In the former type of cesarean scar pregnancy, with deep myometrium implantation, it is more likely to cause torrential bleeding, placental problems (previa and accreta) and uterine rupture in case the pregnancy is allowed to progress with grave consequences for the patient, and the pregnancy is recommended to be terminated at the earliest.^{5,6} In case of the second type there are reports as resulting in viable births if the pregnancy is allowed to continue, but the clinical outcome remains uncertain and there is grave risk of life threatening haemorrhage at any stage of pregnancy and resultant peripartum hysterectomy.⁷

Therefore, comprehensive counselling of the patient and relatives, appraisal of the grave risks and uncertain and catastrophic outcomes, early and individualized treatment plans, as well as follow-up to ensure complete resolution of the CSP, are essential in ensuring optimal outcome.

METHODS

This study was set in a service tertiary care hospital. Antenatal patients who reported to the hospital had detailed history taken, clinical examination performed, all antenatal investigations and a pregnancy test carried out if early pregnancy, or a transvaginal sonography performed in the outpatient department or in the labour room, wherever the patient presented, to evaluate the location and viability of the pregnancy.

If there was a suspicion of a cesarean scar pregnancy the patient was referred to the Radiology department for confirmation and either a repeat ultrasound or MRI performed. Implantation into the previous Cesarean section scar was diagnosed (Figure 1).

Satisfaction criteria

- Urinary pregnancy test positive
- Uterine cavity empty with clearly visualized endometrium
- Cervix empty
- Gestational sac within the anterior portion of lower uterine segment at the level of the internal os at the site for cesarean scar
- Myometrium between gestational sac and bladder thin (<5 mm) or absent
- Marked peritrophoblastic colour flow around the gestational sac.

Haematological samples for complete blood count, blood group, cross-match and serum β -hCG, baseline liver and renal function tests were also performed.

Thereafter detailed counseling of the couple, or if the husband was not present then with close family members was carried out. They were informed that this is a relatively rare condition and the clinical outcome uncertain and quite variable and potentially catastrophic.

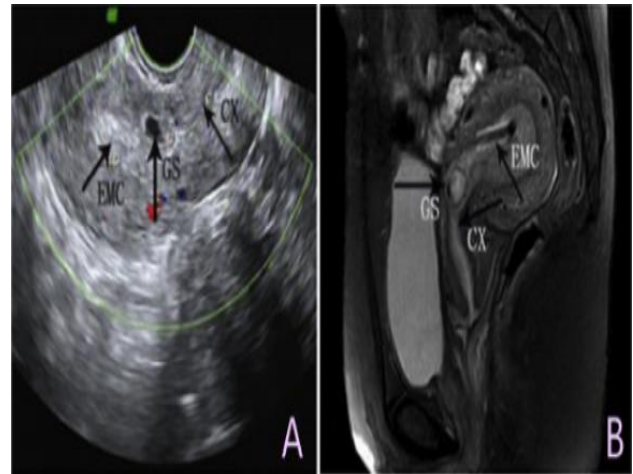


Figure 1. (A) Transvaginal ultrasonography shows a gestational sac (GS) in the lower anterior uterine wall with an empty endometrial cavity (EMC) and cervical canal (CX). (B) Magnetic resonance image shows a gestational sac implanted in the anterior wall of the uterus and protruded into the uterine cavity.

RESULTS

The gestational age of the Cesarean scar pregnancies ranged between 6 and 23 weeks. On ultrasound examination, 02/12 (16%) pregnancies had evidence of cardiac activity. The pregnancies diagnosed at >12 weeks' gestation consisted only of retained placental tissue following first-trimester embryonic demise.

Management in each patient was individualized based on severity of symptoms, gestational age, pregnancy viability, thickness of covering myometrium, level of serum Beta-hcg, patient age, number of children number of previous cesareans and the patients preferences. The objective was to eliminate the gestational sac while preserving the fertility in cases which presented early.

Five (42%) women with Cesarean scar pregnancies were initially treated surgically, four medically (33%), and two expectantly (17%) and one opted to continue the pregnancy.

Expectant management

Patients with minimal clinical symptoms and non-viable pregnancies. Expectant management was successful in one of two cases (50%). First patient, who was diagnosed with a scar pregnancy at 7 weeks' gestation, had a follow-up scan which showed that embryonic demise occurred at 10 weeks.

She was given systemic methotrexate and the pregnancy resolved without need for further intervention. The second patient who was managed expectantly had a spontaneous miscarriage at 11 weeks' gestation.

Table 1: The number of previous cesarean sections in women with scar pregnancies was (range, 1-2).

Case no.	Maternal age (years)	Conception	Gravidity and parity	Previous LSCS (n)	Gestation (weeks)	Initial hCG level (IU/L)	Gestational sac diameter (mm)	Viability
1	31	Spontaneous	G3, P1	1	11	7620	14	Non-viable
2	33	Spontaneous	G2, P1	1	6	9730	11	Non-viable
3	28	Spontaneous	G3, P1	1	6	4622	9	Non-viable
4	27	Spontaneous	G4, P2	2	10	6240	34	Non-viable
5	33	Spontaneous	G3, P2	2	23	283	25	Non-viable
6	34	Spontaneous	G3, P2	2	6	14560	20	Viable
7	30	Spontaneous	G2, P1	2	6	11 184	10	Viable
8	30	Spontaneous	G3, P2	2	14	8240	25	Non-viable
9	29	Spontaneous	G4, P3	1	6	23 700	19	Viable
10	28	Spontaneous	G3, P2	2	8	18 090	16	Viable
11	34	Spontaneous	G2, P1	1	6	15 540	7	Viable
12	43	IVF	G4, P0	0	9	92 880	37	Viable

Continuation of pregnancy

One patient, post IVF, who was not willing for termination of pregnancy, who opted to continue with it, despite detailed repeat counselling regarding life threatening bleeding at any stage of pregnancy with massive blood transfusion requirements to increased chances of placenta previa, placenta accreta uterine rupture, peripartum hysterectomy and increased maternal morbidity and mortality. She experienced three episodes of mild bleeding per vaginum in the antenatal period. She underwent a cesarean hysterectomy at 33 weeks of gestation for placenta accreta. A live male baby weighing 1450gm delivered by a classical incision, followed by cesarean hysterectomy with placenta in situ. The bleeding volume was approximately 4.0 litres and a massive blood transfusion was required. Her postoperative course was uneventful, and the patient was discharged from the hospital 7 days after the operation. The pathological examination confirmed placenta percreta.

Medical management

Patients with a viable pregnancy >7 weeks' gestation, muscular layer <2mm, and those with signs of abnormal placentation involving the myometrium were offered with local injection of methotrexate. Medical treatment involved an injection of 25mg methotrexate directly into the pregnancy or systemic methotrexate. The injection was administered transvaginally under continuous ultrasound guidance using a 20-G needle. Antibiotic prophylaxis of a single intravenous dose of 1gm Cefotaxime and 500mg metronidazole was given to all women. All procedures were performed on an outpatient basis under mild analgesia (50mg pethidine and 10mg metoclopramide intravenously). Four patients were managed medically. The success rate was 3/4(75%). Two women in this group required surgical intervention and blood transfusion due to heavy vaginal bleeding (500mL

approximately). In patients successfully treated with methotrexate the hCG resolution time was between 6 and 10 weeks. None of the women in this subgroup experienced any side effects, which could be attributable to the medication.

Surgical management

Patients with a pregnancy <7 weeks, muscular layer ≥ 3 mm directly underwent hysteroscopic surgery. Those who experienced heavy bleeding and those in whom non-surgical treatment failed. Five (42%) women with Cesarean scar pregnancies were initially treated surgically. Surgical management was successful in all cases, although two of five (40%) women suffered significant bleeding (300-500mL) which required the insertion of a Foley catheter into the cervix in order to achieve hemostasis. There were no cases of retained products of conception following surgical treatment.

Surgery involved the use of hysteroscopy resection and evacuation 02 cases. Hysteroscopy resection and evacuation under laparoscopy guidance 02 cases and laparotomy 01 case.

Mifepristone 200mg and methotrexate 25mg given to patients prior to hysteroscopy.

Hysteroscopy was carried out under general anaesthesia with the patient lying in the supine lithotomy position. Initial visualization to note the location, extent and vascularity of the CSP was done. Thereafter aspiration of the CSP was done and hemostasis obtained by bipolar coagulation and completion of procedure checked.

In two patients, a 22-G Foley catheter was inserted at the level of the implantation site and inflated with 30-90mL saline in an attempt to achieve hemostasis by compression. The catheter was left in situ for 12h in one case and 24 h in the other and then gradually deflated and

removed. Laparotomy was done in a haemodynamically unstable patient, CSP removed and the uterine defect secured.

Follow-up

Weekly clinical assessment and measurements of serum hCG levels done as an outpatient basis. Once hCG levels normalized, an ultrasound examination was performed to assess the size of the retained products of conception. Ultrasound examinations were then arranged on a monthly basis until it was confirmed that there was no remnant tissue. All patient who desired future pregnancies were advised to avoid conception for one-year attend for an early scan in order to assess the location of pregnancy.

DISCUSSION

Early diagnosis with the use of a transvaginal sonography should be able to establish with a high degree of accuracy the diagnosis of scar pregnancy. Diagnosis may be easier early in pregnancy, but as the pregnancy progresses, the differential diagnosis between CSP, cervical pregnancy and low intrauterine pregnancy becomes more difficult. It is also important to emphasize that both the maternal morbidity and duration of follow-up increase with gestation.

Natural progress of this disease is not well known. Very few of these pregnancies progressed beyond first trimester as the pregnancies usually terminate early.⁹ If the pregnancy progresses, then there would be a substantial risk of placenta previa /placenta accreta, uterine rupture, torrential haemorrhage, significant risk of hysterectomy, and resultant maternal morbidity and mortality. Despite cases being reported there are no established guidelines as to which is the most effective treatment with least complications.

If expectant treatment is an option, detailed counseling of the patient and family members is essential and the need of continuous supervision, added therapy as well as need for blood transfusion and prolonged follow-up is emphasized. Current data also indicate that expectant management is rarely successful and is particularly unsuitable for women with viable scar pregnancies.

In case the patient opts to continue the pregnancy, counseling detailing the extreme risk to the life of the patient, close monitoring and prolonged follow-up, need for round the clock presence of an attendant with communication and transport arrangement, severe personal restrictions which could severely affect her quality of life, uncertain outcome, and a very remote possibility of a positive outcome, should be emphasized. In CSP where the growth is towards the uterine cavity continuation of the pregnancy is possible uterine rupture in the third trimester and maternal death from antenatal intraoperative, or postoperative hemorrhage have also

been reported, showing the risk of pregnancy continuation to be very high.⁸

Different techniques have been described and these include: systemic administration of Methotrexate (MTX), injection of embryocides (such as MTX, potassium chloride) directly into the gestation sac or a combination of feticide followed by systemic administration of drugs. Patient and the family members have to be counseled that the weak myometrial scar can dehiscence and rupture during treatment as well as the need for prolonged follow up (due to the placental implantation on mainly fibrous tissue and hence absorption of the gestation sac is extremely slow, and they are educated regarding the same.¹⁰

Surgical options are either suction evacuation, hysteroscopic or laparoscopic resection of the caesarean scar pregnancy or scan guided sac aspiration.¹¹ Surgical complications inherent with that of hysteroscopy and laparoscopy pose a disadvantage along with the risk of uterine perforation. In a haemodynamically unstable patient with evidence of scar rupture, laparotomy should be done with intent to remove the pregnancy and secure the defect.

CONCLUSION

The incidence of caesarean scar pregnancy is on the increase secondary to the rise of caesarean section rates. Every woman with a previous caesarean section should be advised for early medical contact for location of pregnancy. Early diagnosis, individualized treatment choices are key factors in avoiding rupture, haemorrhage and preserving fertility.

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