The Wayward Seed: An Ectopic Gestation in a Cesarean Section Scar*

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ABSTRACT

Pregnancy implantation within the scar of a previous caesarean delivery is the rarest location for an ectopic pregnancy. With increasing incidence of cesarean section worldwide, more and more cases are diagnosed and reported.

A 36 years of age, Gravida 3 Para 1 (1-0-1-1) with a CS delivery and one completion curettage for abortion presented with hypogastric pain and vaginal spotting. She was admitted with an impression of Missed Abortion at eleven weeks age of gestation. Initial scan showed embryonic fetal demise, eight weeks and two days by crown to rump length (CRL) for which completion curettage was planned. On her 3rd hospital day, evacuation curettage was attempted. It was aborted when profuse vaginal bleeding ensued upon the insertion of the hysterometer. Carbetocin 100 mcg/IV and Tranexamic acid 1gm/IV were given to control the bleeding. Repeat scan showed Abortion in progress eight weeks and one day by CRL; Abortus was noted at the lower uterine segment and cervical canal. On her 4th hospital day, evacuation curettage was rescheduled with anesthesia assist, however the profuse bleeding that resulted when a piece of tissue was grasped with an ovum forceps, cautioned the operator not to proceed further. Hemorrhage was controlled with an intrauterine balloon tamponade, antifibrinolytics and carbetocin. Suspicious of the presence of an ectopic gestation, emergency ultrasound was requested showing features of CS scar pregnancy. She underwent medical management with methotrexate and exhibited a successful outcome.

The case presented aims to highlight the difficulty of diagnosing CS scar pregnancy clinically and by sonography. The importance of having a high index of clinical suspicion in women with risk factors, the pathophysiology, appropriate methods of diagnosis and timely intervention are likewise emphasized. A delay in diagnosis and/or treatment of this rare event can lead to serious maternal morbidity and even death.

Keywords: Cesarean section, Scar, Ectopic, Methotrexate

INTRODUCTION

An ectopic pregnancy results when the embryo implants outside the uterine cavity. Majority of these pregnancies (95%)[1] are located in the fallopian tube, however, there are types of ectopic gestations which also occur in the ovary (3%), cervix (1%) abdomen (1%), and previous caesarean section (<1%)[1]. Caesarean scar pregnancy (CSP) is a rare but serious complication of early pregnancy[1] .

The first case of a CSP was reported in English medical literature in 1978[2]. Over the past five years, there has been a substantial increase in the number of CSPs published[2]. This may reflect a true increase in its incidence because of the rising caesarean section rate worldwide or an apparent one as a result of better detection by liberal use of transvaginal ultrasound.

Jurkovic et al.[1] have estimated the prevalence of CSP to be 1:1800 women attending the early pregnancy assessment. Between 1978-2001, only 19 cases appeared in the literature (Fylstra, 2002; Seow et al., 2004). A recent case series estimates an incidence of 1:2226 of all pregnancies, with a rate of 0.15% in women with a previous CS and a rate of 6.1% of all ectopic pregnancies in women who had at least one caesarean delivery[9]. It was noted in a review of local literature that this is the first case of CSP in the country.

The most probable mechanism that can explain scar implantation is when the blastocyst enters into the wall through a microscopic dehiscent tract which may have been created through a trauma that occurred in association with caesarean delivery or any other uterine surgery (Cheng et al 2003) or even following manual removal of placenta (Fylstra 2002). It presents as vaginal bleeding and hypogastric pain like any other ectopic gestations. A high index of suspicion is therefore crucial in its diagnosis.

Of all diagnostic tools available today, ultrasound is the first-line diagnostic modality for CSP. Majority of the CSPs reported have been diagnosed by transvaginal scan (TVS) in the early weeks of pregnancy.

Generally, termination of pregnancy (TOP) in the first trimester is strongly recommended, as there is a high risk of subsequent uterine rupture, massive bleeding and life-threatening complications. Gestational age and viability, evidence of myometrial deficiency and presenting clinical symptoms have been considered by various authors to determine the appropriate management, which could either be surgical or non surgical.

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CASE REPORT

A 36 years of age, Gravida 3 Para 1 (1-0-1-1), single, call center agent from Tondo, Manila, was admitted for the second time on December 18, 2012 because of hypogastric pain. Two weeks prior to admission, she noted that she missed her period for the past three months but had no complaints. A home kit pregnancy test revealed a positive result on consultation with her obstetrician. A TVS was requested to establish the viability of pregnancy, but the patient failed to comply.

One week prior to admission, she complained of crampy and intermittent hypogastric pains radiating to the lumbosacral area. This was not associated with any other symptoms. She consulted with her attending physician who requested for TVS and the result showed: Embryonic fetal demise, eight weeks and two days by crown to rump length, singleton, normal ovaries (figure 1). She was then advised to wait for vaginal bleeding before completion curettage. The pain persisted, this time becoming intolerable and accompanied by scanty bloody vaginal discharge. She was referred to our institution with an impression of Missed Abortion, ten to eleven weeks age of gestation.

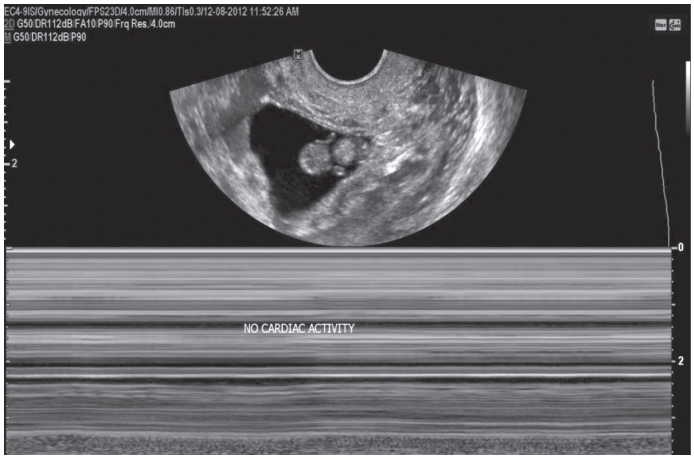

Figure 1. Initial transvaginal scan done 8 weeks and 2 days showing an intrauterine pregnancy with embryonic demise

Pertinent past medical history revealed that she had an appendectomy in 2003. She delivered to a live, term, baby boy by primary low segment caesarean section, due to arrest in cervical dilatation, in Pulilan Bulacan last 2007. Her second pregnancy in April 2012, resulted in spontaneous abortion at eleven weeks age of gestation, for which completion curettage was performed in our institution.

Her father is hypertensive and is maintained on Losartan. She has no family history of diabetes mellitus, cardiac diseases, malignancy and other heredofamilial diseases.

The fourth of six siblings, she works as a call center agent. She was separated from the father of her first child four years ago, and has been in a relationship with a 23 year old call center agent for the past two years.

She is currently at 11 weeks and 5 days age of gestation. Her last menstrual period was September 27, 2012 with an expected date of confinement on July 4, 2013.

On physical examination, she was conscious, coherent, ambulatory, not in cardiorespiratory distress and with stable vital signs with a BMI of 19.33 kg/m2(normal). She had a flat abdomen with a midline caesarean section scar. There was direct hypogastric tenderness where a midline mass was felt just above the symphysis pubis. On speculum examination, the cervix was smooth, pinkish, with scanty bloody discharge. Chadwick sign was noted on vaginal mucosa. On internal examination, the introitus allowed two examining fingers with ease. The cervix was posterior, closed, soft and non-tender on motion. Uterus was symmetrically enlarged to 12 weeks age of gestation, doughy, smooth and non-tender. No adnexal mass nor adnexal tenderness were noted.

The admitting impression was Gravida 3 Para 1 (1-0-1-1), Missed Abortion 11 weeks and 5 days age of gestation.

The plan of management was for completion curettage when the cervix opens. An informed consent was secured and a baseline complete blood count showed normal results. Oxytocin drip was started and evening primrose oil soft gel was inserted deep into the vagina to prime the cervix. On her second hospital day, hypogastric pains persisted accompanied by scanty bloody vaginal discharge. Vital signs were stable and internal examination revealed a soft cervix that admitted the tip of a finger.

On her 3rd hospital day, on and off hypogastric pains were still felt but this time with moderate amount of vaginal bleeding. Internal examination showed one cm cervical dilatation and the patient was prepared for evacuation curettage under slow IV sedation with 50 mg promethazine and 50 mg meperidine. She was instructed to void before transfer to the OR. Placed in the dorsal lithotomy position, and perineal asepsis and antisepsis technique were done followed by the application of sterile drapes.

Evacuation curettage was started with the insertion of hysterometer halfway into the uterine cavity when there was sudden profuse vaginal bleeding. The procedure was aborted and oxytocin drip was shifted to 1 liter D5LRS as fast drip. Carbetocin 100 mcg was given as IV bolus followed by tranexamic acid 1 gram IV. The brisk bleeding was controlled within minutes. At this point, uterine perforation was entertained. An emergency transvaginal ultrasound was requested which showed the following results: Abortion in progress 8 weeks and 1 day by crown to rump length. Normal both ovaries; scanty fluid in the cul de sac. Within the cervix and lower uterine segment is a collapsing gestational sac. No fistulous tract seen. Abortus is

at the lower uterine segment and cervical canal (figure 2). Relieved that no perforation was noted, the team nonetheless continued to monitor the patient. Save for tachycardia, she remained stable as the bleeding stopped. Hemoglobin and hematocrit were requested and they showed slight anemia. Two units of packed RBC were requested and subsequently transfused. The team rescheduled the procedure the following day and prepared for the possible recurrence of haemorrhage.

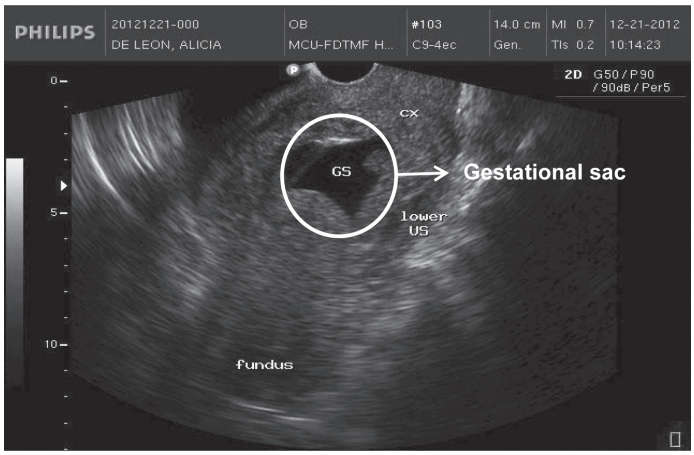

Figure 2. Repeat transvaginal scan done after 13 days showing a collapsed gestational sac at the lower uterine segment. Embryonic demise with abortion in progress

On her fourth hospital day, evacuation curettage was again attempted under general anesthesia with propofol. The sudden profuse bleeding that resulted after the initial tissue was obtained cautioned the operator not to proceed further. An intrauterine balloon tamponade was inserted using foley catheter french 16 (figure 4), carbetocin 100mcg and tranexamic acid 1gm thru IV were given to control the bleeding. At this time, an impression of CSP was entertained. An emergency transvaginal ultrasound with color flow mapping was performed with the following results: Lower uterine segment as described suggestive of CS scar pregnancy. No fluid in the cul de sac. There is note of thin intact endometrium from the midportion of the uterus to the fundus. The Lower uterine segment is bulging with complex mass at the anterior portion measuring 8.1 x 5 x 5.9 cm which is noted at the CS scar. There is presence of color flow mapping (figure 5). The sonologist meticulously reviewed the previous ultrasound results and compared the two findings, leading her to conclude the presence of this rare type of ectopy. With a working diagnosis of C-section scar pregnancy, the team identified the factors on which to formulate the appropriate treatment options for the patient to choose from. They included the patient's desire for future fertility, her present clinical condition, the β HCG level, and the resources at hand. A baseline quantitative serum β HCG was immediately requested which revealed a value of 730.1 mIU/ml. The treatment options and their advantages and disadvantages were discussed with her and her partner and they consented to undergo medical management. Blood samples for baseline complete blood count (CBC), actual platelet count, kidney and liver function tests were drawn and they showed normal results.

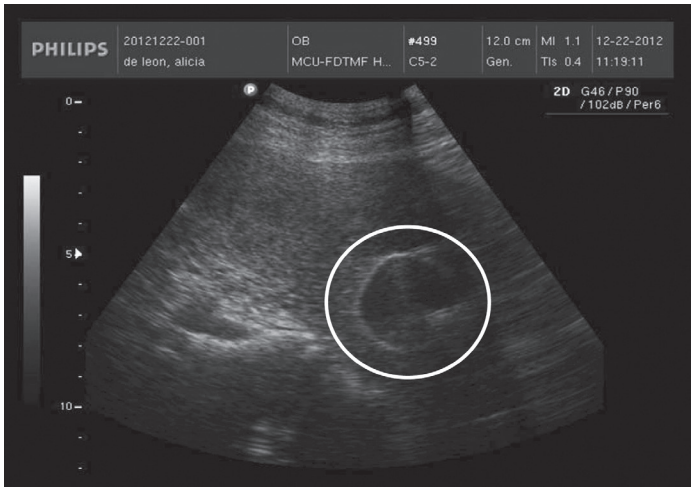

Figure 4. Transvaginal scan done after Intrauterine Balloon tamponade showing an inflated balloon at the lower uterine segment with intact endometrium at the upper segment.

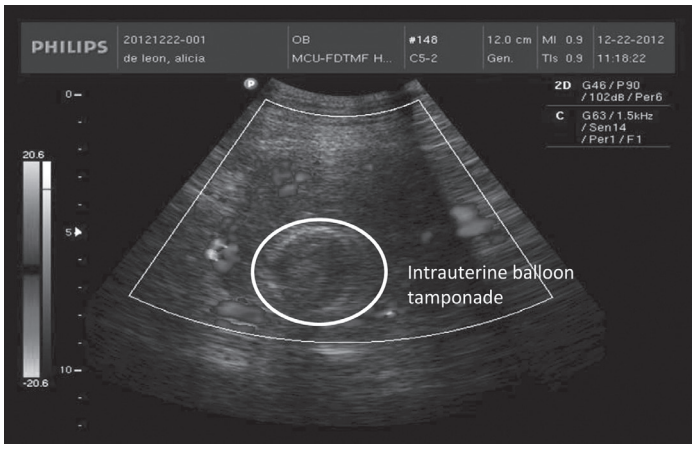

Figure 5. Perivascular flow at the area of complex mass surrounding the inflated balloon after intrauterine tamponade insertion. Color flow showed circumferential peritrophoblastic flow within the mass.

Methotrexate (MTX) 69.5 mg (2.78cc) by intramuscular route was given based on the dose of 50 mg per meter square of body surface area (BSA). Intravenous antibiotics with metronidazole and ampicillin were also started. The tissues obtained were submitted for histopathology studies and they revealed immature placental tissue, degenerated villi and necrotic tissues.

On her 1st day post MTX treatment, patient had no complaints nor any adverse reaction to MTX therapy. Five

cc of sterile water from the intrauterine balloon were aspirated every day until it was spontaneously expelled after three days. On her 2nd day post MTX treatment, she complained of mild hypogastric pain and vaginal spotting but vital signs remained stable. On physical examination, the abdomen was soft and non tender. She was observed on subsequent days for profuse vaginal bleeding and hemodynamic instability but she remained asymptomatic with stable vital signs all throughout.

Asymptomatic, with stable vital signs and showing no adverse reactions to the drug, she was sent home on her 4th post MTX treatment day. On discharge, she was advised to have a repeat serum beta HCG seven days post MTX treatment at the outpatient service. Contraception with pills was her choice until three consecutive normal beta HCG levels were obtained. Metronidazole and Ampicilin were given as home medications to be completed for 7 days. She was also advised to avoid sun exposure, intake of NSAIDs, penicillin and any alcoholic beverages.

Final Diagnosis: Gravida 3 Para 1 (1-0-2-1) Ectopic Pregnancy in a Previous Caesarean Section Scar; S/P Methotrexate therapy, Intrauterine balloon tamponade insertion and Blood transfusion

Weekly serum beta HCG were obtained and decreasing results were as follows: 3.5 mIU/ml, 2.9 mIU/ml and 1mIU/ml (figure 7). A month after the treatment, she had her monthly menstrual cycle. She followed up at the OPD five months after the treatment with a TVS finding of an intact CS scar with no evidence of complex mass (figure 6).

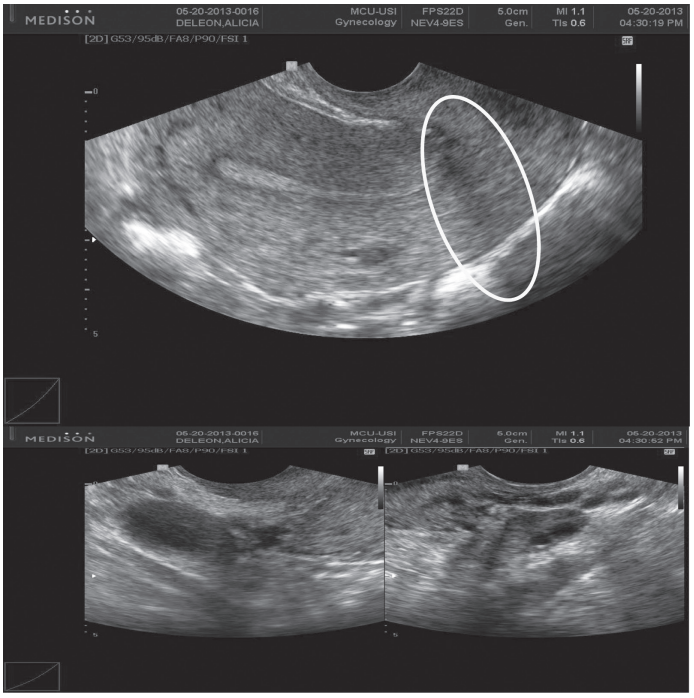

Figure 6. Intact CS scar with no evidence of complex mass. Normal both ovaries.

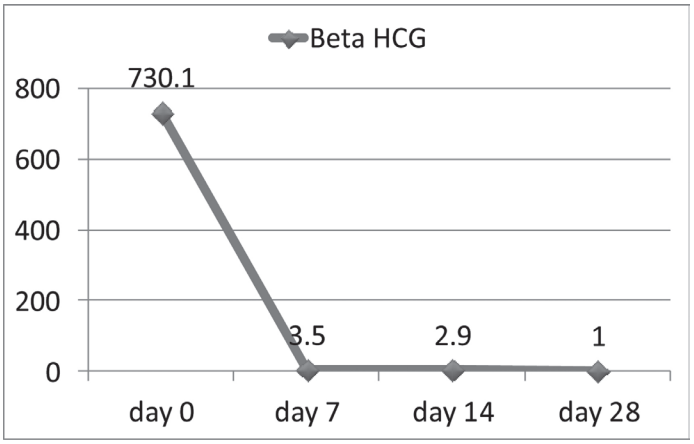

Figure 7. Weekly beta HCG showed decreasing results.

DISCUSSION

In approximately 98% of pregnancies, the blastocyst normally implants in the endometrial lining of the uterine cavity[16], typically into the upper posterior wall of the uterus. Implantation anywhere else is considered an ectopic pregnancy. Nearly 95% of ectopic gestations are implanted in the various segments of the fallopian tube[17] and majority are ampullary implantations[18] . The remaining 5% implant in the ovary, peritoneal cavity, cervix and cesarean section scar[18]. Of all the reported types, the CSP, which was the case presented, is the rarest form of ectopic pregnancy[19]. In the study of Jurkovic et al, the gestational age at diagnosis ranged from 5+0 to 12+4 weeks (mean 7.5 ± 2.5 weeks)[18]. CSP has been described in spontaneously conceived pregnancy as well as after in vitro fertilization (IVF) and embryo transfer (ET)[2]. IVF-associated heterotopic CSP, a rarer event, has also been described, both with twins[3] and triplets[4]. No particular predilection has been reported for maternal age or parity, the number of previous caesarean sections and interval between the previous C-section and the occurrence of CSP (Chuang et al 2003).

The local incidence of ectopic pregnancy is 75,000 cases per year. The national statistics data of the Philippine Obstetrics and Gynecologic Society showed the prevalence at 0.01 from 2008 to 2011[47]. The mortality rate associated with ectopic pregnancy is 10% worldwide[48,49]. The 2005 to 2009 of DOH maternal mortality registered 0.01% to 0.02%[50]. It was not clear from this report how many cases are ectopic pregnancies. There is also paucity of international and local data on deaths due to CSP. This recent review of local literature showed no reports of CSP.

It has been reported that in CSP, the gestational sac is completely surrounded by the myometrium and the fibrous tissue of the scar, quite separate from the endometrial cavity[5]. The most probable mechanism that can explain scar implantation is the invasion of the myometrium through a microtubular tract between the caesarean section

scar and the endometrial canal[6,7]. Such a tract can also develop from the trauma of other uterine surgeries like curettage, myomectomy, metroplasty, hysteroscopy and even manual removal of placenta[8]. The predisposing risk factors seen in our patient were her previous uterine procedures of caesarean section and dilatation and curettage. Damage to the decidua basalis during these procedures may have persisted in the endometrium in the form of tiny dehiscent tracts or minute wedge defects setting the stage for a CSP to implant on.

A CSP is more aggressive in its behaviour than placenta accreta because of its early invasion of the myometrium[9]. Pathological findings after a total hysterectomy suggest that the villi are not merely penetrating the myometrium but are bound with or implanted in it[20]. The study of Vial et al[21], identifies two different types of CSPs; the first is an implantation on the prior CS scar with progression towards the cervico-isthmic space or the uterine cavity. Such a CSP may progress to a viable birth but with the risk of a life-threatening hemorrhage. The second is a deep implantation into a CS defect growing towards the bladder and abdominal cavity, a type that is more prone to rupture. Based on the sonographic pictures of our patient, it appears that she had the first type of CSP.

Ceasarean section scar pregnancy may present from as early as 5-6 weeks to as late as 16 weeks[13]. A light, painless vaginal bleeding is commonly the early presenting symptom in 39% of patients and approximately 16% of women complain of accompanying mild to moderate pain only. About 9% complain solely of abdominal pain[10]. Severe acute pain with profuse bleeding implies an impending rupture. Collapse or hemodynamic instability strongly indicates a ruptured CSP. The non specific signs of vaginal bleeding and mild to moderate pain, mislead the team to diagnose and treat the patient that it was just an abortion in progress case. It was the high index of suspicion by the operator that lead to the diagnosis of CSP.

Since the clinical diagnosis of an early pregnancy implanted in a previous caesarean scar can be very difficult, it may occasionally be delayed until the uterus ruptures and the patient experiences life threatening hemorrhage (Seow et al., 2000, 2004; Weimin and Wenqing, 2002; Yang and Jeng, 2003; Maymon et al., 2004). Thus, a prompt and accurate diagnosis is crucial. The sudden profuse hemorrhage during the two attempted curettages alerted the operator to consider the presence of CSP. This lead the team to request for an emergency ultrasound as a diagnostic tool of choice to confirm its presence .

The second ultrasound following the first attempt of completion curettage showed the products of conception at the lower uterine segment. The sonographer signed it out as abortion in progress. The absence of uterine perforation in this scan convinced that indeed the bleeding was due to the diagnosis described. When the gestational sac is seen in the lower part of the uterine cavity, the differential diagnosis between spontaneous abortion in progress, cervico-isthmic pregnancy and cesarean scar pregnancy can be difficult[1]. If the gestational sac is found at the level of the uterine isthmus in a patient with a previous caesarean section, the possibility of a cesarean scar pregnancy is highly considered, especially when the cervical os is closed. Unfortunately, these features were not observed by the sonologist.

Reports show that the most important investigation, however, is based on sonographic and Doppler flow findings (Marchiole et al., 2004)[52]. Indeed, as demonstrated by our case, transvaginal sonogram combined with Doppler is a reliable tool for diagnosis[6]. Transvaginal sonogram has a diagnostic sensitivity of 90.9% and specificity of 99.9%[51]. To reduce the risk of a false diagnosis, Maymon et al.[35] recommended a combined approach: a TVS to obtain the fine details of the gestation sac and its relation to the scar, followed by a meticulous abdominal scan with a full bladder. This was done by the second sonologist who painstakingly reviewed the two images following the aborted curettages.

Ultrasound imaging criteria to diagnose CSP are the following[7]:

- empty uterine cavity and cervical canal (figure 8)
- development of the gestational sac in the anterior uterine wall at the isthmus (presumed site of the previous lower segment cesarean section scar (figure 3).
- evidence of functional trophoblastic circulation on Doppler examination, defined by the presence of an area of increased peritrophoblastic vascularity on color Doppler examination (figure 5)

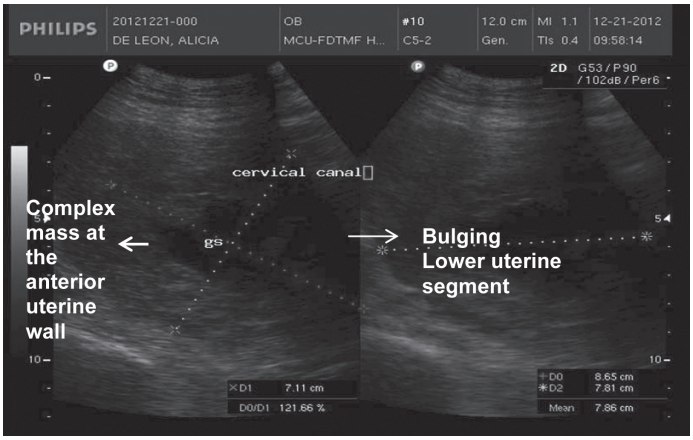

Figure 3. Transvaginal ultrasound image of thin intact endometrium from the midportion of the uterus to the fundus, bulging lower uterine segment with complex mass containing a collapsed gestational sac at the anterior wall measuring 8.1 x 5 x 5.9 cm. Interpreted as pregnancy of CS scar

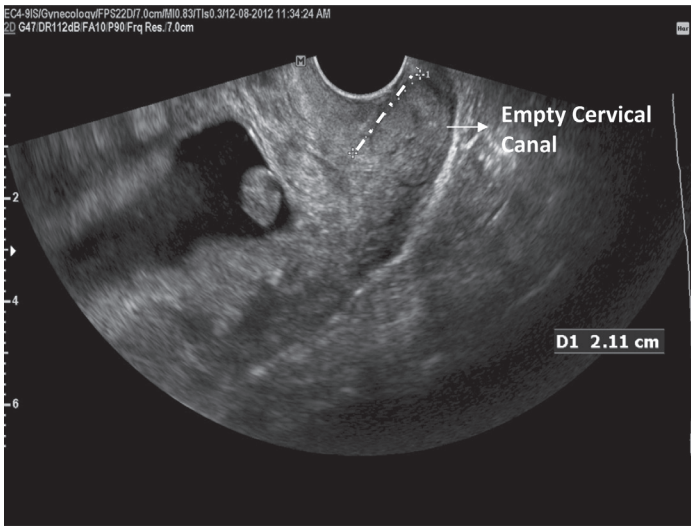

Figure 8. Transvaginal sonogram showing an empty cervical canal.

- the absence of healthy myometrium between the bladder and sac, allowing differentiation from cervico-isthmic implantation[7] (figure 9).

Our patient met all the sonologic criteria of CSP mentioned above. These sonographic findings confirmed the diagnosis of CSP and it provided the team with important data that guided them in proposing management options to the parties concerned.

Literature has reported two options in the treatment for CSP, mainly surgical and medical. Currently, there is no consensus on the preferred mode of management for CSP. Presentation of the patient often dictates what management option to take. Treatment modality should be tailored to each patient taking into consideration the gestational age and the desire for fertility. Our patient is of low parity and is desirous of another pregnancy. She had a non viable pregnancy on a previous CS scar. The profuse bleeding she had with attempts at curettage, resulted in anemia that necessitated transfusion. She had low levels of β HCG, normal liver and kidney function tests. The implantation site was distended and thinned out, making surgical management a technical challenge. She was also financially drained. At this point, the team with the informed consent of the patient and the partner, opted for the non surgical management.

Metothrexate is the most common type of medical therapy that is suitable for use in early pregnancy, and can be administered systemically and locally[44]. Its administration is a standard medical treatment for tubal ectopic pregnancy. There should be no reason to doubt its efficacy on CSP[10]. This drug is a folic acid antagonist that inhibits DNA synthesis and cell reproduction, primarily in actively proliferating cells such as malignant cells, trophoblasts, and fetal cells[22]. The kidneys rapidly cleared it from the body, with 90% of an intravenous dose excreted unchanged within 24 hours of administration[22]. It may be single or multidose, and can be combined with uterine artery embolization or curettage as an adjunct[8].

Ideally, a candidate for medical management with MTX should meet the following criteria[43]:

- hemodynamic stability
- no severe or persistent abdominal pain
- commitment to follow up until the ectopic pregnancy has resolved
- human chorionic gonadotropin beta-subunit (hCG) concentration less than 1500 mIU/mL
- no fetal cardiac activity
- normal baseline liver and renal function tests result.

These treatment option was considered in our patient because she met all the criteria stated above. CSPs have been shown to respond well to it (dose of 50 mg/m2), especially in those with β HCG levels below 1500 mIU/ml[14]. The overall success rate of medical treatment in properly selected women is nearly 90 percent[14].

The dose of MTX used to treat our patient (50 mg/m2 or 1 mg/kg) was relatively low. In some protocols, reduced folates (leucovorin, also called folinic acid, N5-formyl-tetrahydrofolate, citrovorum factor) are given to bypass the metabolic block induced by MTX, thereby saving normal cells from toxicity[23]. This protocol was not considered in our patient because of its unavailability in our area and its prohibitive cost.

Adverse reactions to MTX are usually mild and self-limited. The most common are stomatitis and conjunctivitis. Rare side effects include gastritis, enteritis, dermatitis, pneumonitis, alopecia, elevated liver enzymes, and bone marrow suppression. It is estimated that 30% of patients in the single dose protocol will have side effects; this rate is lower than those with multidose regimens (40 %)[14]. These adverse reactions were not seen in our patient.

Women who are not appropriate candidates for medical therapy should be managed surgically[15]. These patients are:

- hemodynamically unstable
- with signs of impending or ongoing ectopic mass rupture (ie, severe or persistent abdominal pain or more than 300 mL of free peritoneal fluid outside the pelvic cavity)
- with clinically important abnormalities in baseline hematologic, renal or hepatic laboratory values
- immunodeficient
- with active pulmonary disease
- with peptic ulcer disease
- hypersensitive to MTX
- with coexistent viable intrauterine pregnancy
- breastfeeding

- unable to be compliant with post-therapeutic monitoring
- unable to a timely access to a medical institution

The surgical option for CSP is either by open laparotomy or by a number of minimally invasive procedures including robotic surgery.

Laparotomy followed by wedge resection of the lesion (hysterotomy) should be considered in women who do not respond to conservative medical and/or minimally invasive surgical treatments, present too late, or if facilities and expertise for operative endoscopy are not available[3, 18]. It is mandatory when uterine rupture is confirmed or strongly suspected. Laparotomy has the advantage of complete removal of the CSP and simultaneous repair of the scar, followed by a quick return of the beta hCG to normal level within 1-2 weeks. Some consider this as the best treatment option[3, 18]. The excision of the old scar not only avoids the possibility of residual trophoblasts being left in situ,[27] but also removes the microtubular tracts thereby reducing the risk of recurrence.

This option was not considered in our patient because of the added expense, the technical challenge of properly excising and repairing a thinned out cesarean section scar and the risk of possible morbidity.

Guan et al, demonstrated the laparoscopic removal of ceasarean scar pregnancy using a Harmonic® scalpel (Johnson and Johnson) with temporary bilateral uterine artery ligation[46]. In this case, the gestational sac was evacuated with minimal blood loss from the myometrium that resulted to shorter hospital stay, rapid decrease in β HCG concentrations and provided decrease risk of haemorrhage. The patient was discharged on the same day without complication. The team of Jan Persson et al duplicated this treatment modality with robot assisted laparoscopy[45].

In 2005, Wang et al[29] described a successful treatment of CSP by operative hysteroscopy and suction curettage, the first of its kind reported in English language literature. At 4-week follow up, serum β HCG level became normal, with restoration of normal echotexture of the uterus on ultrasound scan. They conclude that this procedure offers an important alternative treatment for CSP, with a short operative time (mean 36.7 ± 20.8 minutes), less blood loss (mean 50.0 ± 0.0 ml), short post-operative stay (mean 1.1 ± 0.9 days) and a rapid return of the pregnancy test to negative (<4 weeks, mean 22 days). Most importantly, the fertility is conserved after the surgery. Similarly Chao et al[30] described a successful hysteroscopic management of a CSP after failed curettage and MTX treatment. The success rate of this modality (8/8 = 100%) is encouraging, however, the total number of cases managed is small.

These surgical procedures were not considered in our patient because of its cost and the unavailability then of the endoscopy equipment.

Uterine curettage as a primary treatment for CSP is discouraged. The lack of direct visualisation, risk of a local haematoma formation and the need for a prolonged beta HCG follow up remain the major drawbacks[38]. The gestational sac of a CSP is not actually within the uterine cavity, and the chorionic villi implant into the caesarean section scar of the lower segment. In this procedure, the trophoblastic tissue is unreachable by the curette and such attempts can potentially rupture the uterine scar leading to severe haemorrhage. As was illustrated in our patient, serious bleeding during uterine curettage for abortion raised alarm for the presence of a CSP[40].

Uneventful viable intrauterine pregnancies have been reported after all modalities of conservative management of a CSP [6,9,31,32, 33] The largest series[34] showed a 50% incidence, with a mean interval of 13.3 months (range 3-34 months) between the previous CSP and subsequent pregnancy. With the advent of sonohysterography, post-CS uterine wall integrity can be detected in the nonpregnant state. This development is important for women who are at risk, namely with a history of ectopic pregnancy, placental pathology or multiple C-sections [1, 35]. Five months after her CSP, our patient underwent repeat transvaginal sonogram and showed an intact CS scar. She was advised to wait for the washout period before attempting another pregnancy.

The earliest and best time to conceive after MTX treatment of ectopic pregnancy has not been addressed. Although there is little data to suggest any danger in conceiving soon after treatment with MTX, some women may prefer to wait at least six months to minimize any potential teratogenic effect in a new pregnancy[36]. This is similar to toxicology literature that recommends a four to six month washout period[28]. For our patient, the team recommended this six months wait before she could attempt another pregnancy. One study reported that patients with ectopic pregnancies treated with MTX had a timely return of menses and superior rates of conception compared with those treated with conservative surgical management[26].

A retrospective study of women who conceived after MTX treatment for ectopic pregnancy, found no difference in fetal malformation and adverse outcome rates in those who conceived within less than six months (mean 3.6±1.7 months) compared with six or more months (mean 23.6±14.7 months)[28]. At present, there is no apparent deleterious effect of previous MTX treatment on the offspring, hence, it is reasonable to allow the patients to conceive. Women in this population should take folic acid supplement daily, according to routine preconceptual recommendations.

Our patient is still desirous of future fertility despite knowing the possible serious risks such as uterine rupture

and placenta accreta. With three consecutive insignificant levels of β HCG, regular menses, five months wash out period and an intact CS scar, pregnancy could be safely allowed after another month. When it happens, an early TVS is advised in order to assess the location of the new pregnancy. It would be prudent for her team of doctors, to examine the appearance of her previous caesarean section scar, closely monitor the progress of pregnancy and be vigilant and prepare for possible life threatening complications[12].

CONCLUSION

This is the first reported case of CSP in our institution and in the country. Its unwelcomed presence has raised awareness among clinicians to wary of its life threatening consequences.

Cloaked with nonspecific signs and symptoms, unearthing its presence can challenge even the experienced practitioner. A high index of suspicion on the patient with the risk factors is crucial. Ultrasound plays a significant role that is indispensable in its diagnosis and planning for its treatment option. The dictum that every woman witth a previous caesarean section presenting to the early pregnancy unit should have a routine check of the caesarean section scar appearance cannot be over emphasized. A widely accepted set of criteria of ultrasound diagnosis by TVS and color flow Doppler, which yields a high diagnostic accuracy is expected to emerge as a future gold standard. The data presented may have raised awareness on this type of ectopy however, they cannot reliably guide clinicians regarding optimal management and advice in areas such as future risk of recurrence, role of the interval between previous caesarean delivery and the occurrence of CSP, and the effect of caesarean section wound closure technique on CSP.

The obstetrician as the leader of the team, must be prepared to deal with a very subtle challenge of deciding which is the best management option for the patient, and be familiar with the advantages and disadvantages of each one. Early detection and conservative treatment alone do not determine the ultimate outcome, and more emphasis should be placed upon reducing the known etiological factors, which may contribute to the rapidly growing number of pregnancies implanted in a scarred uterus. While more studies are needed to compare different treatment methods in terms of their safety, reproductive outcome, optimal medication and dosage as well as economic feasibility, it is hoped that this index case has somehow taught us to be prepared for CSP and the possible catastrophy it can bring.

This case puts to fore the wisdom of performing caesarean deliveries only for indicated and valid reasons because now we know that future gestations can thrive on a scar. And like the wayward seed that thrives even on arid lands, it can either wither and die or wreck havoc in its wake.

REFERENCES

1. Jurkovic D, Hillaby K, Woelfer B, Lawrence A, Salim R, Elson CJ. First Trimester Diagnosis and Management of pregnancies implanted into the Lower Uterine Segment CS Scar; *Ultrasound Obstet gyneco* 2003; 21: 220-7.
2. Larsen JV, Solomon MH. Pregnancy In a uterine scar sacculus: an unusual cause of postabortal haemorrhage. *S Afr Med J.* 1978: 142-3.
3. Solomon LJ, Fernandez H, Chauveaud A, Doumerc S, Frydmem R. Successful management of Heterotopic CS scar pregnancy : KCl injection with preservation of intrauterine gestation: case report: *Hum Reprod* 2003; 18: 189-91.
4. Hsieh BC, Hwang JL, Pan HS, Huang SC, Chen CY, Chen PH. Heterotopic CS scar pregnancy, combined with intrauterine pregnancy successfully treated with embryo aspiration for selective embryo reduction: case report. *Hum Reprod* 2004; 19: 285-7.
5. Coniglio C., Dickinson JE. Pregnancy following prior CS pregnancy rupture: Lesson for modern obstetric practice. Aust NZJ Obstet Gynaecol 2004; 44:162-6.
6. Fylstra DL. Ectopic pregnancy within a Cesarean Scar: a review Obset Gynecol Surv 2002; 57: 537-43.
7. Godin P-A, Bassil S, Donnez J. An ectopic pregnancy developing in a previous CS scar; *Fertil Steril* 1997; 67: 398-400.
8. Fait G, Goyert G, Sundareson A, Dickens A JR. Intramural pregnancy with fetal survival: case history and discussion of etiologic factors. *Obstet Gynecol* 1987; 70: 472-4.
9. Seow KM, Cheng WC, Chuang J, Lee C, Tsai YL, Hwang JL. Methotrexate for CS scar pregnancy after IVF and embryo transfer; *A case report J reprod Med* 2000; 45: 754-7.
10. Rotas MA, Halberman S, Levgur M. Cesarean Scar Ectopic pregnancies: etiology, diagnosis, and management; Obstet Gynecol 2006; 107: 1373-7.
11. Marcus S, Cheng E, Goff B. Extrauterine pregnancy resulting from early uterine rupture. Obstet; Gynecol; 1999; 94: 804-5.
12. Seow K-M, Huang L-W. Lin YH, Yan- Sheng Lin, Tsai Y-L, Hwang J-L, CS scar pregnancy; issues in the management, *Ultrasound Obstet Gynecol* 2004; 23: 247-53.
13. Smith A, Maxwell D, Ash A. Sonographic diagnosis of CS scar pregnancy at 16 weeks; *J. Clinical Ultrasound.*
14. Barhart KT, Gosman G, Ashby R, Sammel M. The medical management of Ectopic pregnancy: a meta- analysis comparing single dose and multtidose regimens. *Obstet Gynecol* 2003; 101:778.
15. Medical Management of Ectopic pregnancy. ACOG. Practice Bulletin #94. *American College of Obstetrics and Gynecologists*, 2008.

16. *Am J Obstet Gynecol* 2012; 206: 289-299.

17. Speroff L, Fritz M. Clinical and Gynecologic Endocrinology and Inferility, 7th edition; New York Lippincott Williams and Wilkins; 2004.

18. Lau S, Tulandi T. Conservative Medical and Surgical Management of Interstitial ectopic pregnancy. *Fertil Steril* 1999; 72: 207-215.
19. Ash A, Smith A, Maxwell D. *Cesarean Scar pregnancy BJOG* 2007; 114 (3): 253-263.

20. Chazotte C, Cohen WR. Catastrophic Complication of previous Cesarean Section. *AM J. Obstet Gynecol* 1990; 163: 738-42.

21. Vial Y, Petignant P, Hohfield P. Pregnancy in a Cesarean Scar. *Ultrasound Obstet Gynecol* 2000; 16: 592-3.

22. Bleyer WA: The Clinical Pharmacology of Methotrexate; *New Applications of an old drug* 1978; 41 (1): 36.

23. Walling J, From Methotrexate to premetrexed and beyond. A review of the pharmacodynamic and clinical properties of antifolates. *Invest new Drugs* 2006; 24:37.

24. Kelly H, Harvey D, Moll S. A Cautionary tale: Fatal Outcome of Methotrexate therapy for management of Ectopic Pregnancy. *Obstet Gynecol* 2006; 107 (2Pt 2): 439.

25. Stovall TG, Ling FW, Buster JE: Outpatient Chemotherapy of unrup tured ectopic pregnancy; *Fertil Steril* 51 (3), 435-438 (1989).

26. Stovall TG, Ling FW, Buster JE: Reproductive Performance after Methotrexate treatment of Ectopic Pregnancy. *AM J. Obstet Gynecol* 1990; 162 (6): 1620.

27. McLaren JF, Burney RO, Milki AA, Westphal LM, Dahan MH, Lathi RB. Effect of Methotrexate exposure on subsequent fertility in women undergoing controlled ovarian stimulation; *Fertil Steril* 2009; 92 (2): 515

28. Svirsky R, Rozovski U, Vaknin Z, Pansky M, Schneider D, Halperin R. The Safety of conception occurring shortly after methotrexate treatment of an ectopic pregnancy. *Reprod Toxicol* 2009; 27 (1): 85.

29. Wang C-J, Yuen L-T, Chao A-S, Lee C-L, Yen C-F, Soong Y-K. Caesarean scar pregnancy successfully treated by operative hysteroscopy and suction curettage. *BJOG* 2005;112: 839-40.

30. Chao A, Wang TH, Wang CJ, Lee CL, Chao AS. Hysteroscopic management of cesarean scar pregnancy after unsuccessful methotrexate treatment. *J Minim Invasive Gynecol* 2005;12:374-6.

31. Clark SL, Koonings PP, Phelan JP. Placenta previa/accreta and prior cesarean section. *Obstet Gynecol* 1985;66:89-92.

32. Lai YM, Lee JD, Lee CL, Chen TC, Soong YK. An ectopic pregnancy embedded in the myometrium of a previous cesarean section scar. *Acta Obstet Gynecol Scand* 1995;74:573-6.

33. Armstrong V, Hansen WF, Van Voorhis BJ, Syrop CH. Detection of Cesarean scars by transvaginal ultrasound. *Obstet Gynecol* 2003; 101:615.

34. Seow K-M, Hwang J-L, Tsai Y-L, Huang L-W, Lin Y-H, Hseih B-C. Subsequent pregnancy outcome after conservative treatment of a previous caesarean scar pregnancy. *Acta Obstet Gynecol* 2004;83: 1167-72.

35. Maymon R, Halperin R, Mendlovic S, Schneider D, Vaknin Z, Herman A,etal. Ectopic pregnancies in Caesarean scars: the 8 year experience of one medical center. *Hum Reprod* 2004;19:278-84.

36. Nawroth F, Foth D, Wilhelm L, Schmidt T, Warm M, Ro¨ mer T. Conservative treatment of ectopic pregnancy in a cesarean section scar with methotrexate: a case report. *Eur J Obstet Gynecol Reprod Biol* 2001;99:135-7.

37. Feldenkamp M, Carey JC. Clinical teratology counselling and consultation case report. *Teratology* 1993;7:533-9.

38. Arslan M, Pata O, Dilek TU, Aktas A, Aban M, Dilek S. Treatment of viable cesarean scar ectopic pregnancy with suction curettage. *Int J Gynecol Obstet* 2005;89:163-6.

39. Weimin W, Wenqing L. Effect of early pregnancy on a previous lower segment cesarean section scar. *Int J Gynecol Obstet* 2002;77:201-7.

40. Nonaka M, Toyoki H, Imai A. Cesarean section scar pregnancy may be the cause of serious hemorrhage after first-trimester abortion by dilatation and curettage. *Int J Gynecol Obstet* 2006;95:50-51

41. Vial Y, Petignat P, Hohlfeld P. Pregnancy in a Cesarean scar. *Ultrasound Obstet Gynecol* 2000;16:592-3.

42. Batioğlu, S., Haberal, A., Yeşilyurt, H. and Ekici, E. (1997) Successful treatment of cornual pregnancy by local injection of methotrexate under laparoscopic and transvaginal ultrasonographic guidance. *Gynecologic and Obstetric Investigation*, 44, 64-66.

43. Potter MB, Lepine LA, Jamieson DJ. Predictors of success with methotrexate treatment of tubal ectopic pregnancy at Grady Memorial Hospital. *Am J Obstet Gynecol* 2003; 188:1192.

44. Chuang J, Seow KM, Cheng WC, Tsai YL, Hwang JL. Conservative treatment of ectopic pregnancy in a caesarean section scar. *BJOG* 2003;110:869-70.

45. Jan Persson, Gudmundur Gunnarson, Bengt Lindahl. Robot-assisted laparoscopic surgery of a 12-week scar pregnancy with temporary occlusion of the uterine blood supply. *Journal of Robotic Surgery* 2009. Volume 3, Issue 1 page 53-55

46. Guan X, Ohuoba E, Ng V. Temporary Uterine Artery Ligations for Minimizing Bleeding in Laparocopic Resection of Cesarean Section Pregnancy. *Journal of Minimally Invasive Gynecology* 2013. Volume 20, Number 6- S101

47. Philippine Obsterics and Gynecologic Society-Nationwide Statistics, 2008-2011

48. Kamwendo F, Forslin L, Bodin L, Danielsson D. Epidemiology of ectopic pregnancy during a 28 year period and the role of pelvic inflammatory disease. *Sex Trans Infect* 2000; 76 (1):28-32

49. Akbar N, Shami N, Anwar S, Asif S. Evaluation of predisposing factors of tubal pregnancy in muligravidas and primigravidas. *J Surg IPMS* 2002; 25:20-23.

50. Maternal Mortality, leading causes, number and rate per 1000 live births 2005-2009. www.doh.gov.ph

51. Diagnostic Errors in the management of ectopic pregnancy. Chez RA, Moore JG. *Surg Gynecol Obstet*. 1963 Nov; 117():589-96

52. Marchiole P, Gorlero F, de Caro G, Podesta M and Valenzano M (2004) Intramural pregnancy embedded in a previous Cesarean section scar treated conservatively. *Ultrasound Obstet Gynecol* 23, 307-309.