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Management of Cesarean Scar Ectopic Pregnancy: A Case Series

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Abstract

Introduction

Cesarean scar ectopic pregnancy (CSEP) is defined as the implantation of gestational sac in a previous cesarean scar which is surrounded by myometrium and connective tissue. It is a rare complication of pregnancy, with an incidence varying from 1:1800 to 2216 pregnancies.

Materials And Methods

This is a retrospective review of a case series of 6 cesarean scar ectopic pregnancies identified in our institution at MGM medical college and hospital, over a period of 1 year.

Results

From a total of 102 ectopic pregnancies managed in 1 year, 6 cases of CSEP were identified giving an incidence of 5.8%. 2 out of 6 patients were asymptomatic (33.33%). Number of cesarean sections before CS- 3 patients had previous 2 cesarean deliveries (50%), 2 had previous 3 (33.33%) and 1 had previous 1 (16.66%).

4 patients were given systemic methotrexate, either single dose or multidose depending on the beta HCG value after 48 hours, of which 1 patient had to be taken up for exploratory laparotomy due to failure of medical therapy. 2 patients were managed surgically.

Conclusion

An increase in the incidence of caesarean scar ectopic pregnancies can be expected due to the increase in rate of caesarean sections. The most appropriate management option should be indivisualised based on hemodynamic stability, the level of beta HCG, gestational age and thickness of the overlying myometrium.

A misdiagnosis can lead to life threatening haemorrhage, uterine rupture, hysterectomy and increased maternal morbidity and mortality. Hence, anticipation and early diagnosis is of utmost importance.

Keywords: Cesarean Scar Pregnancy, Methotrexate, Beta HCG, Myometrial thickness

Introduction

Cesarean scar ectopic pregnancy (CSEP) is defined as the implantation of gestational sac in a previous cesarean scar which is surrounded by myometrium and connective tissue. It is a rare complication of pregnancy, with an incidence of 1:1800 to 2216 pregnancies. It has a rate of 0.15 % of women with previous caesarean section and 6.1 % of all ectopic pregnancies [1,2].

The average gestational age at diagnosis is 7 ± 2.5 weeks (ranging from 5 to 16weeks) [3].

An incorrect or a late diagnosis can result in life threatening complications such as early uterine rupture, maternal hemorrhage leading to hysterectomy and loss of fertility [4].

However, the exact cause and pathophysiology are not fully understood. The most likely mechanism is the implantation of blastocyst into microtubular tracts which are formed due to defective or insufficient healing at the site of previous cesarean scar [5].

There is also insufficient evidence if the number of previous cesarean sections or short interval between previous cesarean section and successive pregnancy can alter the healing process at previous cesarean scar and increase the risk of CSEP.

There are mainly 2 recognizable types of scar ectopic pregnancies- type 1 (endogenic) which develops in the myometrium and grows inwards into the uterine cavity and type 2 (exogenic) which progresses outwards to the uterine serosa and bladder. Patients with Type 2 CSEP require immediate management due to an increased risk of life-threatening complications such as uterine rupture and intraperitoneal hemorrhage in the first trimester [6].

Caesarean scar ectopic was also classified by JC Shih in 2017 based on the ultrasonography features to IV grades (Figure 1, 2, 3, 4)

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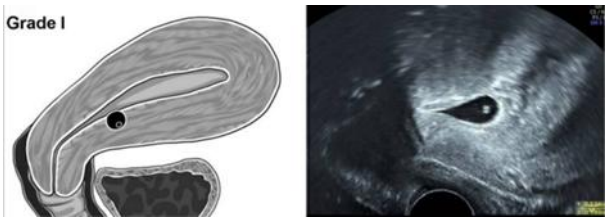

Figure 1: Depth of CSP embedded is less than the lower anterior corpus

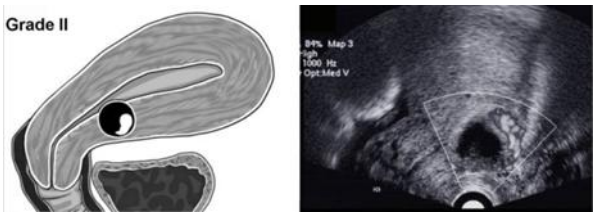

Figure 2: CSP occupies more than half of lower anterior corpus

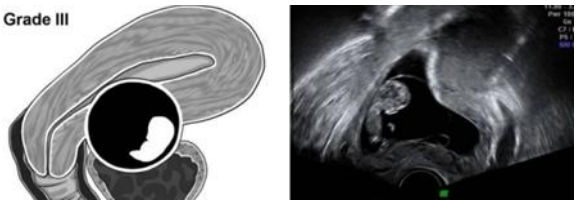

Figure 3: G sac buldges out the overlying rich myometrium and uterine serosa

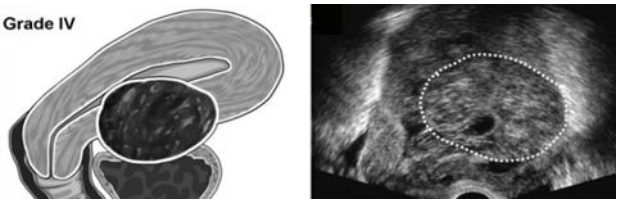

Figure 4: : G sac is an amorphous tumor with vascularity at caesarean scar

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Materials And Methods

This is a retrospective review of a case series of 6 cesarean scar ectopic pregnancies identified in our institution at MGM medical college and hospital, Kalamboli, over a period of 1 year.

Out of a total of 102 cases of ectopic pregnancy, 6 were diagnosed as caesarean scar ectopics which were included in the study. These cases were systematically reviewed as per their clinical presentation, beta HCG levels, USG findings, management, follow up and complications.

Case 1

A 29 yearold female, G3P2L2 (previous 2 LSCS, 1st caesarean 7 years back and 2nd 4.5 years back) with 10.4weeks gestation presented with vaginal bleeding since 2 days. Beta HCG on admission was 4050 mIU/ML. USG showed a complex mass in lower uterine segment in anterior wall of 4.3x3.4cm, absent cardiac activity, endometrial cavity was empty above the scar, mass was above the internal OS, myometrium overlying the mass was very thin (1.5mm), increased vascularity was seen around the mass on doppler, features were suggestive of grade 2 caesarean scar ectopic pregnancy. Single dose of injection methotrexate 1mg/kg was given with leucovorin 0.1mg/kg. Beta HCG repeated after 48 hours was 2175 mIU/ML, after which 3 more doses of injection methotrexate were given. Beta HCG after 1 week was 600 mIU/ML, after which patient was discharged and followed up weekly up to 5weeks at which it was <5 mIU/ML.

The CSEP was diagnosed by transvaginal ultrasound, according to the diagnostic criteria as reported by several authors. [7,8,9]

The criteria includes: (1) Empty uterus with clearly visualised endometrium, (2) Empty cervical canal, (3) Gestational sac located within the anterior isthmic portion of uterus at the presumed site of the caesarean section, (4) Thinned (<5mm) or absent myometrium between the gestational sac and bladder

Patients were managed medically and/or surgically and followed up weekly till beta HCG values were <5 mIU/ML

Case 2

A 34 year old female, G4P3L2D1 (previous 3 LSCS, 1st 6 years back, 2nd 4 years back and 3rd 3 years back) with 1.5months of amenorrhea with UPT positive presented with complaints of bleeding PV since 2 days. TVS was done s/o grade 1 caesarean scar ectopic pregnancy (Figure 5) - irregular G sac of 12.5x12.3x9 mm within the anterior myometrium at the level of caesarean scar with increased vascularity around it, myometrial thickness over the G-sac was 4.3mm.

Figure 5: Irregular G sac within the anterior myometrium at the level of caesarean scar

Beta HCG on admission was 410 mIU/L. Decision for medical management with single dose of methotrexate 50mg/m2 was taken. Beta HCG repeated after 48hours – 156 mIU/L.

Patient was observed for 1 week for any pain in abdomen USG was repeated s/o endometrial collection without any definitive G-sac (Figure 6 & 7), patient was discharged on Day 7 of admission and followed up weekly for 4 weeks after which beta HCG levels were <5 mIU/L

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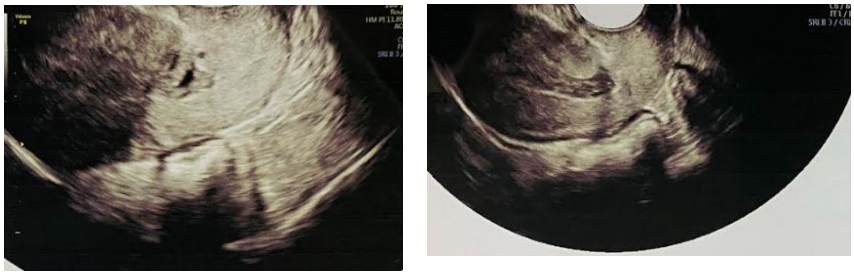

Figure 6 & 7: Endometrial collection with no evidence of G-sac

Case 3

A 34year old female, G3P2L2 (previous 2 LSCS, 1st 6 years back and 2nd 3 years back) with 5 weeks gestation came to MGM hospital Kalamboli for ANC registration. Beta HCG on admission was 910.8 mIU/L. Transvaginal ultrasound showed a G sac with a mean sac diameter of 10mm within the anterior myometrium at the level of scar, myometrial thickness was 3.5mm over the G-sac, yolk sac was present but fetal pole was not seen, there was high color doppler flow around the mass. Single dose of injection methotrexate alternating with Leucovorin 0.1mg/kg was given. Beta HCG after 48 hours was 608 mIU/L, after which 3 more doses of injection methotrexate was given, beta HCG after 1 week was 220 mIU/L. Patient was followed up weekly for 8 weeks after which beta HCG was negative.

Case 4

A 29 year old female, G4P3L2D1 (previous 3 LSCS, 1st caesarean 8years back, 2nd 5 years back and 3rd 3 years back) with 9.4weeks gestation, came to MGM hospital Kalamboli for ANC registration. USG was done s/o single live pregnancy of 9.4weeks gestation (Figure 8 & 9) with CRL of 2.54cm, cardiac activity was present, endometrial cavity and cervical canal was empty, gestational sac was seen in the anterior portion of uterine isthmus, thickness of myometrium at site of implantation was thin (2mm), myometrium was thinned out between gestational sac and bladder, there was increased vascularity around the fetus, suggestive of grade 2 cesarean scar ectopic pregnancy. Beta HCG on admission: 11410 mIU/L repeated after 48hours, 18240 mIU/L. Patient was posted for exploratory laparotomy in view of increasing beta HCG levels and cardiac activity being present.

Figure 8 & 9 : Single live intrauterine pregnancy of 9.4weeks with cardiac activity

Pfannensteil incision was taken, abdomen opened in layers. Uterus was densely adhered to anterior abdominal wall (Figure 10). Vasopressin injected into adhered uterine tissue. Adhesions clamped, cut and ligated. Hysterotomy incision taken, G sac excised. Products of conception removed (Figure 11) and sent for histopathology examination, decidua removed by suction. Methylene blue dye instilled retrograde to confirm bladder integrity. Bilateral tubal ligation done.

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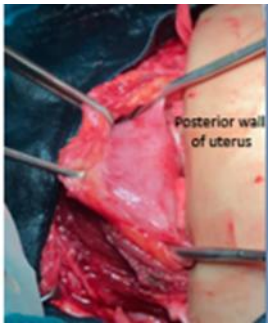

Figure 10 Adhered anterior wall of uteru

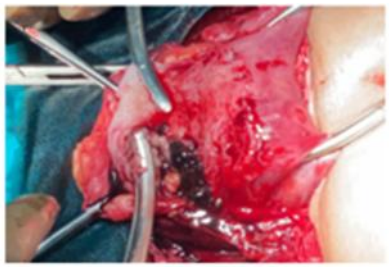

Figure 11 : Products of conception

Patients post op recovery was uneventful. Beta HCG repeated on post operative day 4 was 810 mIU/L. Patient was discharged and followed up weekly with beta HCG , which was <5 mIU/L after 2 weeks.

Case 5

A 28 year old female, G3P2L1D1 (previous 2 LSCS, 1st caesarean 5 years back and 2nd 3 years back) with 6.1weeks gestation presented with spotting per vagina. USG showed an empty uterine cavity, 6 weeks gestational sac (mean sac diameter 1.1cm) seen in lower uterine segment at LSCS scar site with increased vascularity around it, yolk sac present but foetal pole was not seen, 90% of sac was seen in scar defect occupying more than half thickness of myometrium, overlying myometrial thickness 1.5mm - features suggestive of grade 2 caesarean scar ectopic pregnancy. Beta HCG on admission was 25,780 mIU/L.

This patient did not fit into the criteria for medical management as the beta HCG levels were >5000 mIU/L.

But the patients refusal to undergo surgical management and she being hemodynamically stable with USG showing no cardiac activity, made us consider giving her a trial of single dose systemic methotrexate.. Beta HCG was repeated 48hours after the single dose which showed a rise up to 38,695 mIU/L, hence the patient was counselled and taken up for exploratory laparotomy in view of failed medical therapy.

Pfannensteil incision was taken, abdomen opened in layers up to parietal peritoneum. Utero-vesical fold was dissected and bladder was pushed down. Buldge was seen on the anterior wall of uterus (Figure 12), an incision of 1cm was taken over the buldge . Products of conception (Figure 13) removed with ovum forceps and suction cannula, gentle curettage done to remove the remaining products of conception. Uterus was closed with vicryl no.1 in continuous interlocking manner and hemostasis was achieved.

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Figure 12: Buldge on anterior wall of uterus

Figure 13: Products of conception after incision

Beta HCG was repeated on POD4 of exploratory laparotomy- 27200 mIU/L. Post operative period was uneventful. Patient was discharged and followed up weekly, beta HCG levels were reduced to <5 mIU/L after 3 weeks.

Case 6

A 30year old female, G2P1L1 (previous LSCS 7 years back) with 8.2 weeks of gestation, presented with bleeding per vagina and pain in abdomen since 2 days. Abdominal ultrasound showed a single live pregnancy of 7.4 weeks, with a mean sac diameter of 2.3cm, at lower uterine segment with thinning and stretching of myometrium over the scar site. Myometrial thickness was 4mm. doppler showed significant blood flow in the area of the mass. Beta HCG value was 85,000 mIU/L. Patient was posted for diagnostic and operative laparoscopy. Intraoperatively, bilateral adnexa was normal, anterior wall of the uterus was adhered to the bladder. Gestational sac was densely adhered to the scar (Figure 14). Dark reddish tissue suggestive of retained products of conception was removed and sent for histopathological examination. Uterus was closed in single layer (Figure 15) Beta HCG was repeated 48 hours after the surgery – 3000 mIU/L. patient was followed up weekly with beta HCG which became negative after 3weeks. Histopathology report revealed decidual and chorionic villi in the scar tissue.

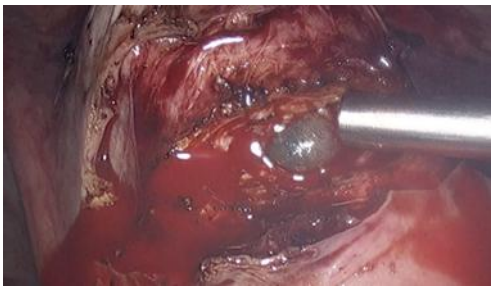

Figure 14: Laparoscopy showing G-sac in lower uterine

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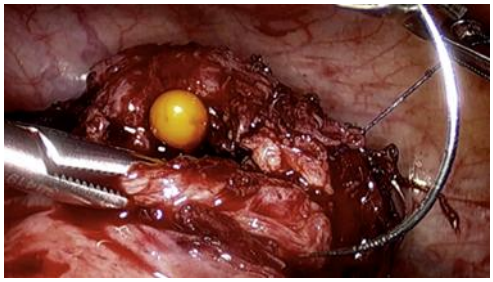

Figure 15: Laparoscopic closure of uterus in single layer

Summary of cases (Table 1)

CASE	AGE	GESTATIONAL AGE (WEEKS)	NO. OF PREVIOUS C-SECTION	INTERVAL BETWEEN CSP AND PREVIOUS C-SECTION (YEARS)	SYMPTOMS	HCG AT DIAGNOSIS (mIU/L)	SAC DIAMETER	TREATMENT	PROGNOSIS
1	29	10.4	2	7, 4.5	Bleeding p/v	4050		Methotrexate	Successful, no further therapy
2	34	6	3	6, 4, 3	Bleeding p/v	410	10mm	Single dose methotrexate	Successful, no further therapy
3	34	5	2	6, 3	-	910	10mm	Methotrexate	Successful, no further therapy
4	29	9.4	3	8, 5, 3	-	11,410	2.54cm	Exploratory laparotomy	Successful, no further therapy
5	28	6.1	2	5, 3	Spotting p/v	25780	1.1cm	Methotrexate + exploratory laparotomy	Successful, no further therapy
6	30	8.2	1	7	Bleeding p/v & pain in abdome	85000	2.3cm	Laparoscopy	Successful, no further

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n therapy

Results

Out of a total of 102 ectopic pregnancies managed in our institution over a period of 1 year, 6 cases of CSEP were identified. The incidence of CSEP in our institution was 5.8% of all ectopic pregnancies.

Women's age ranged from 28 to 34 years.

2 out of 6 patients were asymptomatic (33.33%). The most common clinical finding seen was vaginal bleeding seen in 4 of 6 cases (66.66%).

All 6 women had an empty uterine cavity and empty cervical canal at ultrasound with G-sac visible at the site of previous cesarean scar with increased vascularity around.

As for the number of cesarean sections before CSP, 3 patients had previous 2 cesarean deliveries (50%), 2 patients had previous 3 (33.33%) and 1 patient had previous 1 (16.66%).

In our study, 4 patients were given systemic methotrexate, either single dose or multidose depending on the beta HCG value after 48 hours, out of which 1 patient had to be taken up for exploratory laparotomy due to failure of medical therapy. 2 patients were managed surgically – 1 by laparoscopy and 1 by exploratory laparotomy.

There was no adverse outcome, and all patient had an uneventful recovery.

Discussion

We reported the clinical outcome of 6 cases of caesarean scar ectopic pregnancy.

Case 1 and 3 were given the multidose regimen of systemic methotrexate, case 2 was given a single dose of Inj. Methotrexate as they met the criteria for medical management of ectopic pregnancy: (1) Haemodynamic stability (2) Beta HCG < 5000 (3) Adnexal mass ≤ 3.5cm and absent cardiac activity. Case 4 was managed by exploratory laparotomy as the level of beta HCG was high and cardiac activity was present. Case 6 was treated by laparoscopy due to the high level of beta HCG.

Case 5 was given medical management despite a high beta HCG level due to the patients refusal to undergo surgical management and she being hemodynamically stable with USG showing no cardiac activity. However, despite 1 dose of injection methotrexate, level of beta HCG continued to rise. Hence, the decision for exploratory laparotomy was made, there was complete evacuation of all products of conception and beta HCG levels reduced on successive follow ups.

Due to the serious consequences of CSP, early diagnosis and management is of utmost importance. 1/3rd of the cases are incidentally diagnosed and are asymptomatic or have nonspecific symptoms[10]. In our case, 2 out of 6 patients were asymptomatic (33.33%). The most common clinical finding seen was vaginal bleeding seen in 4 of 6 cases (66.66%). 24.6% of cases complain of lower abdominal pain ± vaginal bleeding. [11]

The main pathogenesis of CSP include the factors that affect scar-healing of caesarean incisions, mainly improper closure of uterine incision, postoperative infection, existing health problems like diabetes mellitus and connective collagen tissue disorders, factors that reduce blood flow to the scar tissue such as smoking. [12,13] A short interval between the caesarean pregnancy and subsequent pregnancy is said to be a predisposing factor, as it could indicate incomplete or improper wound healing. However, in our study, the minimum interval from the previous caesarean delivery was 3 years.

Ultrasonography is the primary diagnostic tool. The diagnostic sensitivity of TVS is 85% [14]

There is no precise protocol for management of caesarean pregnancy, however various modalities of management have been proposed which include:

Expectant Management: In early CSP with no detectable embryonic activity with evidence of spontaneous resolution, weekly follow up with beta HCG is done till negative [15]

Medical Management

Methotrexate : It can be given as a single dose treatment of 50mg/m^2 or as a multi-dose regimen of 1mg/kg with alternate folinic acid rescue when Beta HCG levels are <5000 mIU/L

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Local embryocidal injection of potassium chloride or hyperosmolar glucose in cases of heterotrophic pregnancies [16]

Surgical Management

1. Primary open surgical management (laparotomy)
2. Hysteroscopy or laparoscopy
3. Hysterectomy: in cases of failed all other treatment modalities

In our study, 3 cases out of 6 were successfully managed by medical therapy in the form of systemic methotrexate and 3 required surgical management.

Uterine curettage has a doubtful role as by definition the CSEP is not within the uterine cavity. Therefore, the trophoblastic tissue is not only accessible but also such attempts can potentially rupture the uterine scar leading to life threatening haemorrhage and cause more harm. [17]

Conclusion

An increase in the incidence of caesarean scar ectopic pregnancies can be expected in the future due to the increase in rate of caesarean sections. Although, various modalities of management have been proposed, the most appropriate management options should be indivisualised, based on hemodynamic stability, the level of beta HCG, gestational age, presence of cardiac activity, and thickness of the overlying myometrium.

Patients with previous caesarean sections should be counselled regarding the possibility of a caesarean scar ectopic pregnancy in future. The importance of early registration in subsequent pregnancy should be emphasised. Every pregnant woman with history of caesarean section should be screened in the first trimester to rule out this life threatening complication

A misdiagnosis or late diagnosis can lead to life threatening haemorrhage, uterine rupture, need for hysterectomy and increased maternal morbidity and mortality. Hence, anticipation, early diagnosis and treatment is of utmost importance.

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