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Case Series

Case Series - Caesarean Scar Pregnancy

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Abstract:

The prevalence of Caesarean scar ectopic (CSP) pregnancies, a rare form of ectopic gestation where the trophoblast infiltrates a weakened myometrium at the site of a previous caesarean section scar, has seen an uptick commensurate with the increased frequency of caesarean deliveries. CSP, accounting for approximately 1 in 2000 pregnancies, poses significant risks due to the progressive implantation and invasion of the trophoblast. Timely and accurate diagnosis, primarily through ultrasonography, is critical in mitigating the heightened risk of maternal complications associated with delayed identification. Prompt detection not only facilitates immediate intervention but also significantly enhances patient outcomes by preserving future fertility prospects. In instances where ultrasonographic findings are ambiguous or insufficient, Magnetic Resonance Imaging (MRI) plays a pivotal role in the pre-therapeutic evaluation. This paper discusses a series of CSP cases managed with various therapeutic strategies, emphasizing the efficacy of early intervention in preventing complications and maintaining reproductive potential.

Keywords: scar ectopic pregnancy, uterine scar, methotrexate, serum β-hcg, expectant management, laparotomy, hysterectomy Accreta, Caesarean section, Percreta.

Introduction

Caesarean scar pregnancy (CSP), a rare form of ectopic gestation, occurs when the gestational sac implants in a previous cesarean section scar. This condition, first reported in English medical literature in 1978 [1], is recognized as one of the most severe complications of cesarean delivery. It represents a significant clinical challenge due to its association with high maternal morbidity and mortality. The incidence of CSP is approximately 1 in 2000 pregnancies, with a prevalence of about 0.15% in women with a prior cesarean section and accounting for 6.1% of all ectopic pregnancies in this demographic [2]. The unpredictability of CSP's natural history, ranging from life-threatening conditions like uterine rupture and hemorrhage to placenta accreta spectrum (PAS) disorders, underscores the critical importance of prenatal diagnosis and prompt management.

Diagnostic Criteria

The primary method for diagnosing CSP is ultrasound, both trans abdominal (TAS) and transvaginal (TVS). Diagnostic criteria include the visualization of a gestational sac within the prior cesarean scar area, detection of embryonic/fetal pole and/or yolk sac, empty uterine cavity, and thin or absent myometrium between the gestational sac and bladder [3]. Additionally, the sliding sac sign may be absent, and Doppler examination often reveals high-velocity, low-impedance peri-trophoblastic vascular flow surrounding the sac [4].

Pathophysiology and Classification

The pathogenesis of CSP involves the formation of a microtubular tract in the uterine scar due to inadequate healing, where implantation occurs. CSP is classified into two types: Type I (endogenic), where the sac implants within the scar and progresses towards the cervico-isthmic space or uterine cavity, and Type II (exogenic), characterized by deep implantation into the scar with subsequent invasion into the myometrium and potential for uterine rupture [5]. The former may result in a viable pregnancy but with a high risk of bleeding, while the latter poses a more significant, life-threatening risk.

Increasing Incidence and Management Options

The rising incidence of CSP correlates with the increasing number of uterine surgeries and the enhanced precision of diagnostic modalities [6]. Management of CSP varies and includes expectant,

medical, and surgical approaches, tailored to the patient's gestational age, clinical presentation, and hemodynamic status [7]. Medical management predominantly involves methotrexate, especially effective when the serum β-hCG is below 12,000 mIU/ml, and the gestational sac is smaller than 8 weeks without fetal cardiac activity [8]. Surgical options range from minimally invasive techniques like hysteroscopic removal to more extensive procedures like laparotomy with wedge resection in cases of uterine rupture or imminent rupture.

Cases Overview

This series presents four cases of CSP at a tertiary care hospital, highlighting the diversity in presentation and management. The outcomes emphasize the importance of early and accurate diagnosis, individualized treatment planning, and the potential impact on future fertility. Large-scale prospective studies are needed to establish optimal management protocols and assess long-term outcomes in CSP.

Case 1: A 37-year-old multiparous woman (Gravida 3, Para 2, Live 2), at 7 weeks of gestation, with a history of two previous lower segment caesarean sections (LSCS), the last being 6 years prior, presented with vaginal bleeding. Clinical examination yielded unremarkable results. However, trans abdominal ultrasonography (Figure 1) revealed a single intrauterine gestational sac with a viable fetal pole, corresponding to a gestational age of 7 weeks and 6 days, located in the lower uterine segment adjacent to the thinned anterior myometrium, indicative of a Caesarean scar ectopic pregnancy. Laboratory investigations were normal, including a beta-human chorionic gonadotropin (β-hCG) level of 47,604.82 mIU/mL.

Medical management commenced post-counseling, involving an intramuscular injection of Methotrexate (50 mg). Subsequent β-hCG monitoring 48 hours later showed an increase to 75,915 mIU/mL. Following detailed consultation, the patient opted for an exploratory laparotomy. The procedure involved a 3 cm incision above the previous uterine scar near the left angle, removal of a sac-like structure with bluish discolouration (measuring 2 cm), and complete retained products of conception (RPOC), followed by closure of the uterine incision.

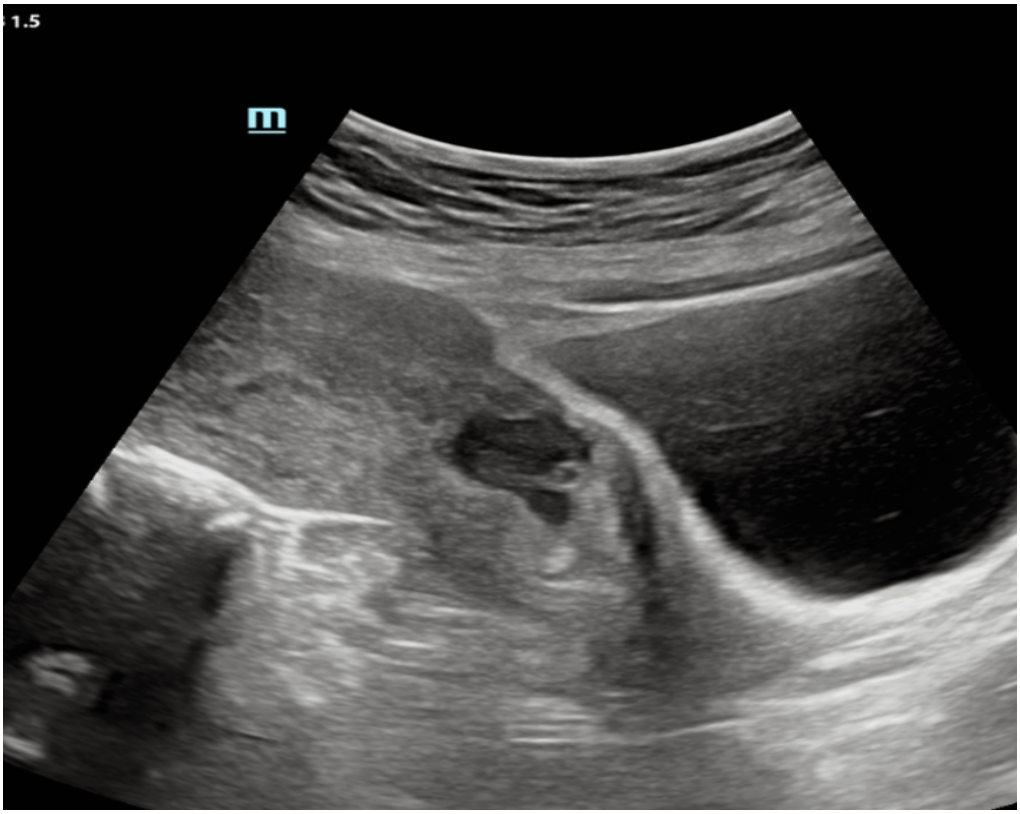

Figure 1: Transabdominal sonography showing gestational sac at caesarean scar region in anterior uterine wall showing yolk sac and embryonic pole corresponding with 7 weeks 6days along with thinning of scar.

Case 2: A 32-year-old woman, G2P1L1, at 8 weeks and 4 days of gestation, with a history of one LSCS conducted 5 years prior, reported lower abdominal pain. Clinical and vital parameters were within normal limits. Ultrasonography (USG) revealed an ectopic gestational sac with an embryonic pole of 7 weeks and 3 days at the scar region of the anterior wall at the uterovesical junction, caus-

ing thinning and dehiscence indicative of a scar pregnancy (Figure 2). Magnetic Resonance Imaging (MRI) confirmed the presence of a cystic structure in the anterior uterine wall at the uterocervical junction measuring 24x35x31 mm with a thinned anterior myometrium and a visible fetal pole-like structure measuring 10 mm. The patient underwent exploratory laparotomy with hysterotomy, involving a small transverse incision over the lower uterine segment (LUS) over the sac, complete sac removal, uterine cavity cleaning, and subsequent closure of the uterine incision.

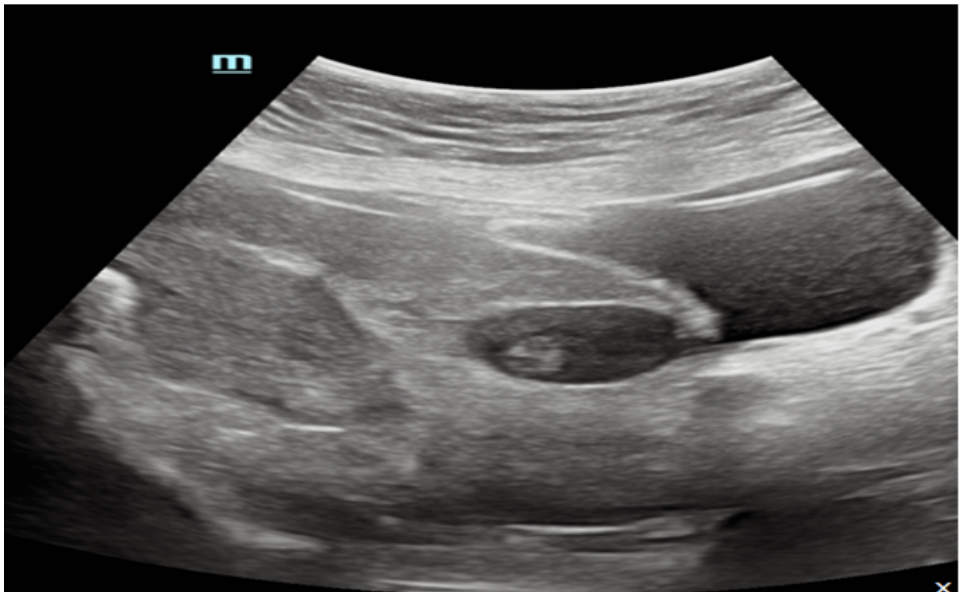

Figure 2: Transabdominal Sonography showing gestational sac at caesarean scar region in anterior uterine wall showing embryonic pole corresponding with 7 weeks 3days along with scar dehiscence

Case 3: A 37-year-old woman, G2P1L1, at 6 weeks of gestation, with a previous caesarean, underwent routine early sonography (Figure 3) which revealed a small gestational sac at the caesarean scar region in the anterior wall of the uterocervical junction, with an overlying myometrial scar thickness of 5 mm. Her β-hCG level was over 1500 mIU/mL. Initial management included conservative treatment with an intramuscular injection of Methotrexate (50 mg), followed 24 hours later by suction and evacuation under ultrasonographic guidance. This procedure successfully removed complete RPOCs without significant bleeding. Follow-up β-hCG levels showed a declining trend.

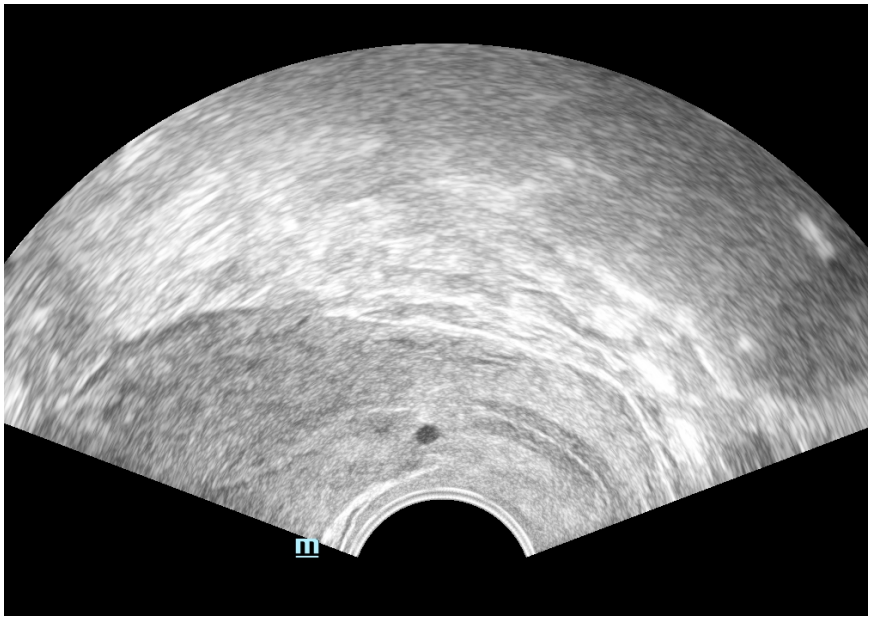

Figure3: Transvaginal sonography showing Tiny gestational sac at caesarean scar region in anterior uterine wall.

Case 4: A 32-year-old woman was referred with a suspected ruptured ectopic pregnancy. She presented in a hemodynamically unstable state, and emergency ultrasonography revealed hemoperitoneum with an empty uterine cavity.

After resuscitation, an exploratory laparotomy was performed. Approximately 1000 ml of hemoperitoneum was found, but the fallopian tubes appeared normal. The source was identified as a corpus luteal hemorrhagic cyst. Postoperatively, a detailed sonography (Figure 4) and serum β-hCG assessment confirmed a small gestational sac in the caesarean scar region of the anterior uterine wall, correlating with 5 weeks and 2 days of gestation.

The patient opted for expectant management with serial β-hCG monitoring.

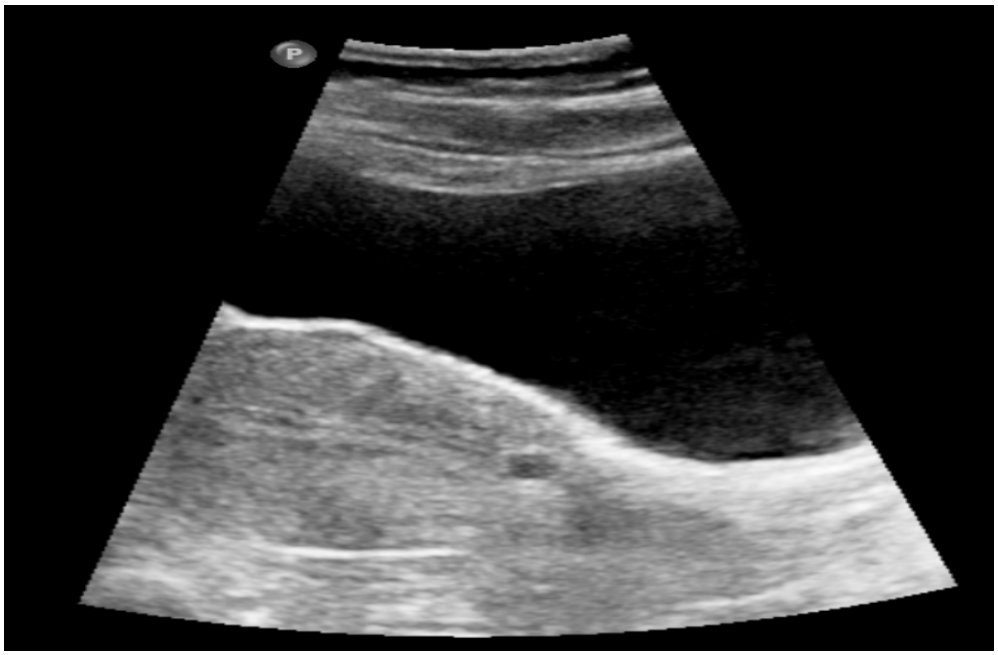

Figure 4:Transabdominal sonography showing small gestational sac at caesarean scar region in anterior uterine wall corresponding with 5 weeks 2days

Table 1: Comparative Overview of Caesarean Scar Pregnancy Cases

Case Number	Mean Gestational Age at Diagnosis	Presenting Symptoms and Signs	Mean Serum β-hCG Level (mIU/mL)	Management Approach
Case 1	7 weeks, 6 days	Bleeding per vagina	47,604.82	Laparotomy with wedge resection
Case 2	8 weeks, 4 days	Pain in abdomen	52,346	Laparotomy with wedge resection
Case 3	6 weeks	Detected on routine early scan	2,200	Medical management with suction evacuation
Case 4	5 weeks, 4 days	Hemoperitoneum due to corpus luteal hemorrhage	1,250	Conservative management

Conclusion

The case series presented in this study illuminates the complex nature of Caesarean scar pregnancy (CSP), a rare but increasingly identified type of ectopic pregnancy. The significance of CSP lies in its potential to lead to severe maternal morbidity and mortality, particularly due to risks such as uterine rupture, hemorrhage, and placenta accreta spectrum disorders. The management of CSP remains challenging, with a range of approaches from conservative to surgical interventions, each with its inherent risks and benefits. The increasing incidence of CSP is notable and appears to be correlated with the rising rates of cesarean sections and other uterine surgeries. This trend underscores the need for heightened awareness and vigilance among healthcare providers. Early and accurate diagnosis, primarily through ultrasonography, is critical in mitigating risks associated with CSP. The ability to detect CSP in its early stages can lead to more effective management, potentially preserving fertility and preventing severe complications.

Our case series highlights the diversity in the presentation and management of CSP, demonstrating that no single approach is universally applicable. Instead, treatment must be individualized, tak-

ing into account factors such as the type of CSP, gestational age, clinical presentation, hemodynamic status, serum β-hCG levels, and the patient's desire for future fertility. In some cases, conservative management with methotrexate or expectant management may be sufficient, while in others, more invasive surgical interventions may be necessary. The choice of treatment should be a collaborative decision-making process between the patient and a multidisciplinary team of specialists. The outcomes in these cases also bring to the forefront the implications of CSP on future fertility. Surgical treatments, while sometimes necessary, can compromise the structural integrity of the uterus, potentially leading to fertility issues or complications in subsequent pregnancies. Conversely, conservative treatments may not completely resolve CSP, leaving women at risk for recurrence.

Furthermore, this case series serves as a call for more extensive research in this area. Prospective studies with long-term follow-up are essential to develop standardized management protocols for CSP and to understand its impact on subsequent pregnancies. Such studies could also shed light on preventive measures, potentially reducing the incidence of CSP.

In conclusion, CSP is a complex condition requiring a nuanced understanding and approach. The growing incidence of this condition, coupled with its potential for severe complications, highlights the importance of early diagnosis, individualized treatment planning, and comprehensive follow-up. As cesarean delivery rates continue to rise globally, the medical community must be prepared to address this challenge effectively, prioritizing patient safety and fertility preservation.

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