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A CASE REPORT OF MANAGING CAESAREAN SCAR PREGNANCY WITH LOCAL POTASSIUM CHLORIDE

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Abstract

Background: Caesarean scar pregnancy (CSP) is an uncommon type of ectopic pregnancy wherein a gestational sac develops in the myometrium of a previous caesarean section scar. The incidence of CSP is on the increase, associated with increasing caesarean delivery rates, and can cause uterine rupture and hemorrhage. Early diagnosis, as early as the third month of pregnancy, by means of transvaginal ultrasound is essential for its proper management. **Case Presentation**: In this study, we report the case of a 38-year-old Caucasian woman who had received two caesarean sections and a unicornuate uterus, who was evaluated after in vitro fertilization (IVF). At 8 weeks of gestation initial ultrasound showed a gestational sac which was consistent with CSP. Most supported sac and minimal myometrial thickness were seen on MRI. An ultrasound guided local potassium chloride injection was performed in the patient, given patient's preference for non-surgical therapy. **Management**: The patient was closely tracked following the injection. Following these ultrasounds, hCG levels decreased and more ultrasounds would show a nonviable pregnancy. In May 2024, follow up assessments demonstrated resolution of the CSP, with little to no complications, and return for normal menstrual function. **Conclusion**: This presentation describes CSP successfully managed without surgery by local injection of potassium chloride, which provides a promising means other than surgery to obtain fetal control, particularly early in gestation. In addition to preserving uterine integrity and future fertility, this approach may be applied to other CSPs as well. We are warranted to seek further research to assess how effective and safe this method could be in larger populations and establish standardized management protocols for CSP.

Background:

Caesarean scar pregnancy (CSP) is a rare, but potentially life-threatening form of ectopic pregnancy where the gestational sac implants in the myometrium of a previous caesarean section scar (Rouvalis, 2023; Robles et al., 2021). In recent years, the incidence of csp has been increasing, possibly because rates of cesarean deliveries have risen worldwide (Sharma et al. 2022; "A Rare Case Report of Caesarean Scar Ectopic Pregnancy", 2017). The incidence of CSP is estimated to occur in 1 in 1800 to 1 in 2226 pregnancies and the incidence of the ectopic pregnancy in women with a history of prior caesarean, accounts about 6.1%, (Guindi & Alafy, 2013; Singh et al. 2012).

CSP pathogenesis is not known fully but it is thought to involve implantation of the blastocyst through a mirosopic track or defect in the caesarean scar and then embedd within the myometrium (Yiing & Tony, 2017; Sultana et al., 2013). It may cause uterine rupture and hemorrhage and even hysterectomy

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(Vikhareva et al., 2018; Saha, 2023).
Early diagnosis of the disease (Ebner et al., 2011; Pandey et al., 2020) is essential to allow appropriate early management, which would prevent these life-threatening complications. Primary diagnostic tool is transvaginal ultrasound with sensitivity of up to 86.4% (Sonawane et al., 2023). Diagnosis is also confirmed by magnetic resonance imaging (MRI) and the extent of implantation can be evaluated (Singh et al., 2012; Tang et al., 2022).
The literature has described numerous treatment options including medical: methotrexate; local injection of potassium chloride (KCl); surgical: dilatation and curettage, laparoscopic or laparotomic excision and uterine artery embolization (Gupta et al., 2017; Saiyyed, 2018; Torky, 2020; Arora, 2023). Fadhlaoui et al. (2012) Ajong et al. (2018) stated that treatment choice in cases controlled depends on the gestational age, size of the gestational sac in the case of spontaneous miscarriage and patient's clinical condition and preferences.

Case Presentation:
A 38 year old female, gravida 3, para 3, with a history of two previous cesarean sections and a known unicornuate, uterus presented for assessment and evaluation for early pregnancy. On 17 December, 2023 the patient underwent IVF with two embryos transferred. On February 1, we found an empty uterus with a gestational sac in the anterior part of the lower uterine segment, which was consistent with CSP on initial transvaginal ultrasound. Gestational sac was approximately 37 x 41 mm in size, crown rump length was 8 weeks of gestation, and myometrial thickness over the sac was only 4 mm. There was no free fluid and the patient was hemodynamically stable.
Complete blood count (CBC), crossmatching, and serum human chorionic gonadotropin (hCG) levels (65,503 mIU/mL) were performed in the laboratory. Feb 1, 2024 MRI pelvis without contrast confirmed CSP diagnosis. MRI findings consisted of a well-defined gestational sac with diffuse thinning of overlying myometrium, approximately 2.5 mm, closed internal os, empty cervical canal and no ovarian masses or pelvic free fluid.

Investigations:
After diagnosis the patient was then admitted for management. During a follow up ultrasound on February 8, 2024, the embryo was now 9 weeks and 2 days gestation and a viable embryo was seen. As CSP carries risk and the patient desires a non-surgical approach, a local injection of potassium chloride was to be given under ultrasound guidance and local anesthesia.
When performed, the patient stayed under continuous monitoring and the procedure was performed on February 8, 2024. Laboratory results 6 weeks post procedure revealed decreased levels of hCG to 40,479 mIU/mL on 12 February 2024 with stable hemoglobin (Hb) levels at 13.4 g/dL.

Management:
Clinical follow-up and serial ultrasounds were closely monitored on the patient. A subsequent ultrasound on February 20, 2024 of a missed gestational sac without fetal heart activity was consistent with non-viability pregnancy on that date. The patient had minimal, on and off, vaginal bleeding, denied any fever or abdominal pain.
Follow up ultrasound on 6 March 2024 revealed an empty uterus with a small blood collection in the lower uterine segment, no gestational sac or free fluid. Serum hCG was 457 mIU/mL, and Hb was 14.2 g/dL. Follow up with the patient for hCG levels was advised.
Follow up appointments on a subsequent day showed progressive decline of hCG levels, with 59 mIU/mL April 14, 2024, and <13 mIU/mL May 25, 2024. For a week, the patient had no vaginal

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bleeding; sizeable no pain. We received an ultrasound on May 25, 2024 with a clear endometrial cavity and no collections.
The patient was then seen on May 28, 2024, when she resumed menstruation and was booked for a follow up hCG in the usual cycle. The patient had stable hemoglobin levels throughout the follow up period with no significant hemorrhagic complications.

Follow-Up:
Post procedure the patient was followed up and given particular attention to resolution of the CSP and return of normal menstrual function. Subsequent visits reported no complications, and patient reported menstrual cycle resumed as expected. Follow-up hCG levels showed resolution of the CSP, as baseline was reached.
This case demonstrates a potential non-surgical approach to the management of CSP through local KCl injection under ultrasound guidance. The CSP presented without any surgical intervention was successfully resolved and the patient remained stable, representation in early gestation may be a promising alternative for similar cases. The efficacy and safety of this approach in larger cohorts should be explored in future research, with a series of standardized protocols for the management of CSP being developed.

Fig (1): Shows Abdominal US if the fetus. (A&B)

Fig (1) A

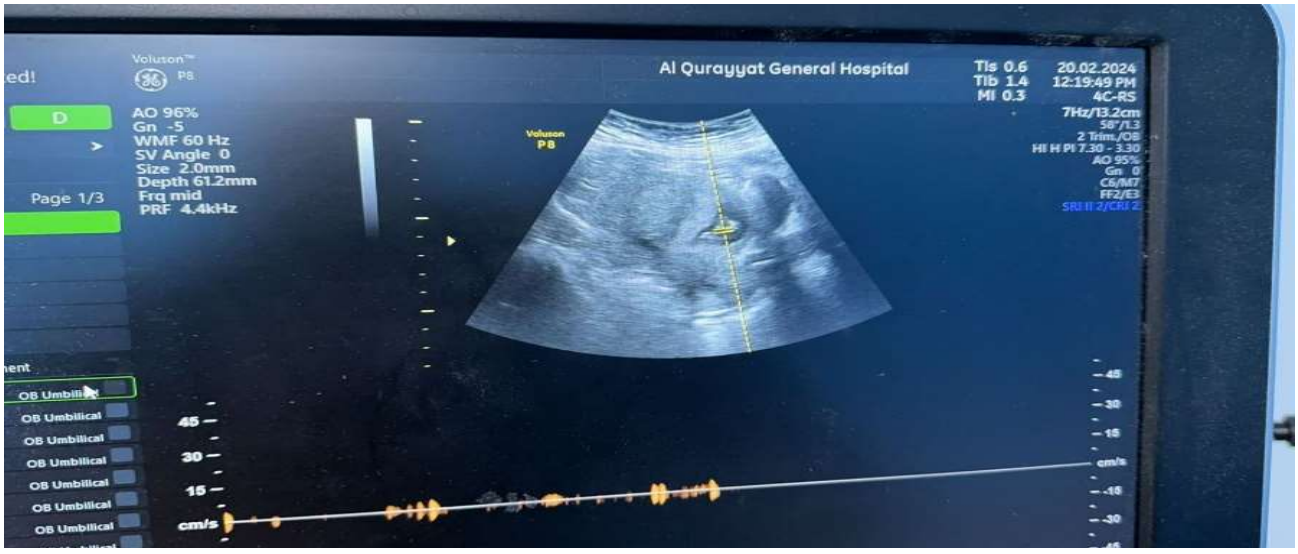

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Fig (1) B

Fig (2) Shows MRI spine, sagittal view, T2, showing gravid uterus with ectopic pregnancy.

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Fig (3): Shows vaginal US showing the fetus.

Discussion:

We describe the present case report of a caesarean scar pregnancy from which a local injection of potassium chloride (KCl) was used under ultrasound guidance and the pregnancy was managed successfully. In early gestation cases, this approach might be a viable alternate to surgical intervention, both potentially preserving the uterus and future fertility (Mollo et al., 2014; Ndubizu et al., 2017).

The purpose of this present case study was to assess safety and efficacy of this non-surgical treatment in the management of a caesarean scar pregnancy. A previous case in this case had a viable embryo at 9 weeks 2 days of gestation, with thin myometrium overlying the gestational sac, compatible with the CSP (Majangara et al., 2019; Shahid, 2017). Because of the high risks of CSP and the patient's desire for a non-surgical intervention, the decision to give the patient a local injection of KCl under ultrasound guidance via line was made.

Only a few case reports and small case series of such use of local KCl injection in CSP management have been reported (Manchanda & Sharma, 2023). One of the most common uses for this method is for fetal reduction in a multiple pregnancy; it has been demonstrated as a safe and effective substitute for systemic methotrexate or surgical intervention (Dutta, 2023; Nankali et al., 2013). In the present case, local injection of KCl led to demise of the embryo, decreased serum human chorionic gonadotropin (hCG) levels and resolution of gestational sac without any serious complication.

Local injection of KCl has numerous advantages to surgical approaches. This is a minimally invasive procedure that can be carried out under local anesthesia, which in theory decreases the complication risk of general anesthesia and major surgery (Valasoulis et al., 2022; Rheinboldt et al., 2015). It also protects the uterus and the possibility of future fertility is very important to those who want further pregnancy (Szkodziak et al., 2019; Sultana et al., 2016).

However, for now the management of CSP is a clinical challenge and the treatment may be different from the case to case. Thus, the choice of the treatment should be based on such factors as gestational

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age, the size of the gestational sac, the thickness of the myometrium, and the clinical state of the patient and preference (Thakker, 2023; Stabile et al., 2020).
The limitation of the present study is the single case nature causing a limited generalize for the findings. In addition, we have no long term follow up data on patient subsequent fertility and pregnancy outcomes. The efficacy and safety of this approach in the management of CSP needs to be further researched including with larger case series, and prospective studies.

Conclusion:
Finally, the present case report shows the possibilities of a non-surgical approach, local KCl injection for the management of caesarean scar pregnancy. This method may constitute a very safe and effective alternative to surgical intervention, especially in early gestation cases and the preservation of the uterus and future fertility. Nevertheless, management of CSP remains a complex clinical challenge and it is optimal to treat each patient case by case.

Conflict of interests:

The authors declare no conflict of interest.

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