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Standardised Sonographic Examination of Caesarean Scar Pregnancy

Caesarean scar pregnancy (CSP) is a rare but potentially severe condition characterised by the implantation of a pregnancy in the scar of a previous caesarean section. Accurate and early diagnosis of CSP is crucial to prevent severe complications like uterine rupture, haemorrhage, and placenta accreta spectrum disorders. With rising global caesarean section rates, the incidence of CSP is increasing. A standardised approach to diagnosing and evaluating CSP in the first trimester using transvaginal sonography can ensure proper management and reduce risks. This article outlines a structured method for sonographers to conduct a step-by-step sonographic evaluation, highlighting key diagnostic markers and classifications of CSP.

1. Assessment of the Uterine Scar and Pregnancy Location

The initial step in evaluating a potential CSP is a comprehensive scan of the uterus in both the sagittal and transverse planes using transvaginal ultrasound. The objective is to locate the gestational sac and assess its relationship to the caesarean scar. A transvaginal probe with a frequency between 5-8 MHz is recommended for optimal imaging. A clear view of the caesarean scar and its niche is essential, and the sonographer should ensure that the patient's bladder is either empty or partially filled to improve visualisation.

The Kuleva criteria should be followed to guarantee standardised imaging of the uterine scar. These criteria suggest scanning from the pelvic wall, ensuring the internal and external os of the cervix are visible and that the cervicoisthmic canal is apparent. Proper scanning helps identify the niche and differentiate between normal early pregnancies and potential CSP. A gestational sac located within or near the caesarean scar allows for the differentiation of CSP from other low-lying pregnancies.

2. Differentiating CSP from Other Low-Lying Pregnancies

The diagnosis of CSP can be challenging as it requires distinguishing it from other conditions, such as ongoing miscarriages, cervical pregnancies, and low-implanted intrauterine pregnancies. Specific sonographic markers can assist in making this distinction. CSP typically presents with an empty uterine cavity and cervical canal and a gestational sac located at the caesarean scar with diminished myometrial thickness separating it from the bladder. Vascularisation around the sac is usually prominent on Doppler ultrasound.

Critical features for distinguishing CSP include the presence of a gestational sac, yolk sac, or embryo, the shape of the gestational sac (irregularity might indicate a miscarriage), bulging of the sac towards the bladder, and vascularisation patterns. Furthermore, determining whether there is sliding tissue between the caesarean scar and endocervical canal helps differentiate between CSP and miscarriages. Applying gentle and firm pressure with the transvaginal probe can help assess this sliding.

3. Detailed Evaluation and Classification of CSP

Once a CSP is suspected, the next step is a thorough evaluation of its features. Important sonographic markers to document include:

- The location of the gestational sac relative to the uterine cavity line, an imaginary line between the endometrium and myometrium.
- Presence or absence of embryonic cardiac activity.
- Placental implantation and its relation to the caesarean scar and myometrium.
- Residual myometrial thickness adjacent to the caesarean scar.
- Bulging of the gestational sac or placental vessels beyond the uterine serosa (outer myometrial layer).
- Sliding movements between the uterus and bladder when pressure is applied to the transvaginal probe.

CSP is classified based on the location of the largest part of the gestational sac relative to the uterine cavity line and serosal line:

- **Type 1 CSP**: Most of the gestational sac crosses the uterine cavity line.
- **Type 2 CSP**: The largest part of the sac is embedded in the myometrium without crossing the serosal line.
- **Type 3 CSP**: The gestational sac crosses the serosal line, bulging towards the bladder or bowel.

This classification aids in determining the potential severity and risks associated with each type of CSP. For example, Type 3 CSP may require advanced therapeutic approaches to prevent complications. As the type of CSP can evolve with the progress of the pregnancy, especially within the first 14 weeks, ongoing assessment is vital.

Standardised sonographic evaluation of CSP in the first trimester is essential for early detection and appropriate management of this potentially life-threatening condition. Detailed assessment and classification of CSP are essential. Sonographers should be adequately trained to recognise CSP, differentiate it from other conditions, and document its features accurately. Uniform evaluation and consistent reporting can lead to better clinical decisions, prevent complications, and ultimately preserve fertility in affected women. While routine screening for CSP is not currently recommended for all women with a prior caesarean section, increased awareness and vigilance are crucial during early pregnancy scans.

Source: **Ultrasound in Obstetrics & Gynecology**
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