Ultrasound diagnosis of caesarean scar defects

Abstract

Caesarean section (CS) scar defects are seen in up to 19% of women post lower segment caesarean section. Ultrasound and in particular transvaginal ultrasound, with or without saline, is the imaging modality of choice to delineate such defects. There are limited data available however which enable clinicians to quantify the risk of potential sequelae in women with a demonstrable CS scar defect.

Keywords: caesarean scar, cervical secretions , intra-uterine fluid myometrial thinning, scar defects

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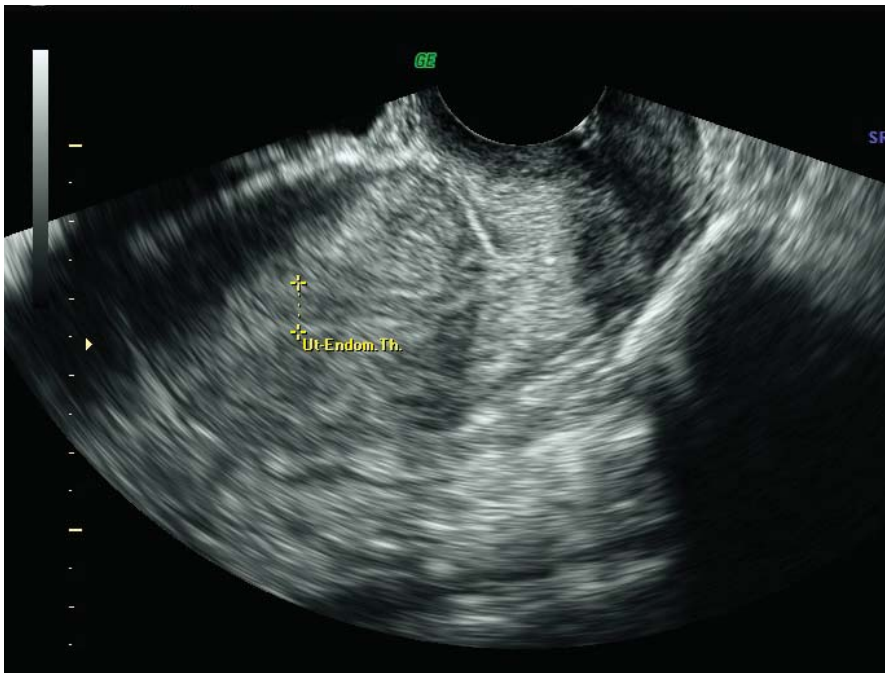


Figure 1: Anteverted uterus with white echogenic line extending from the uterine cavity to the edge of the myometrium anteriorly.

Introduction

Caesarean section (CS) scar defects can be identified using high resolution transvaginal ultrasound (TVS) and are present in up to 19% of women post CS[1]. The ultrasound features include myometrial thinning with a demonstrable defect in the myometrium noted on TVS or scar dehiscence at the level of the lower anterior myometrium in women who have undergone previous CS[2]. Detectable myometrial thinning is defined as deficient scar, dehiscence is partial separation of the scar and rupture is separation of the majority of the scar.

Primary caesarean delivery carries potential risks in subsequent pregnancies[3,4]. Complications associated with CS, although rare, are increasing in frequency and include uterine rupture or scar dehiscence during the ante- or intra-partum period, ectopic pregnancy implantation known as caesarean section scar ectopic pregnancy (CSEP), placenta accreta, placenta increta or placenta percreta[5]. Clinical history, which may raise the index of suspicion for CS defects in the non-pregnant woman, is non-specific and may include symptoms of chronic pelvic pain, dysmenorrhoea or post-menstrual spotting[6].

High resolution TVS provides a valuable tool for the investigation of infertility. The lower uterus and cervix can be examined with manipulation of the probe into the anterior or posterior fornix for the anteverted (Fig. 1) or retroverted (Fig. 2) uterus. When the uterus is located in the axial plane the lower uterus can still be examined by using a systematic approach to the area. TVS provides high definition of the tissue layers, which is not seen transabdominally and therefore plays an integral role in any gynaecological examination.

Previous CS scars can be examined for their

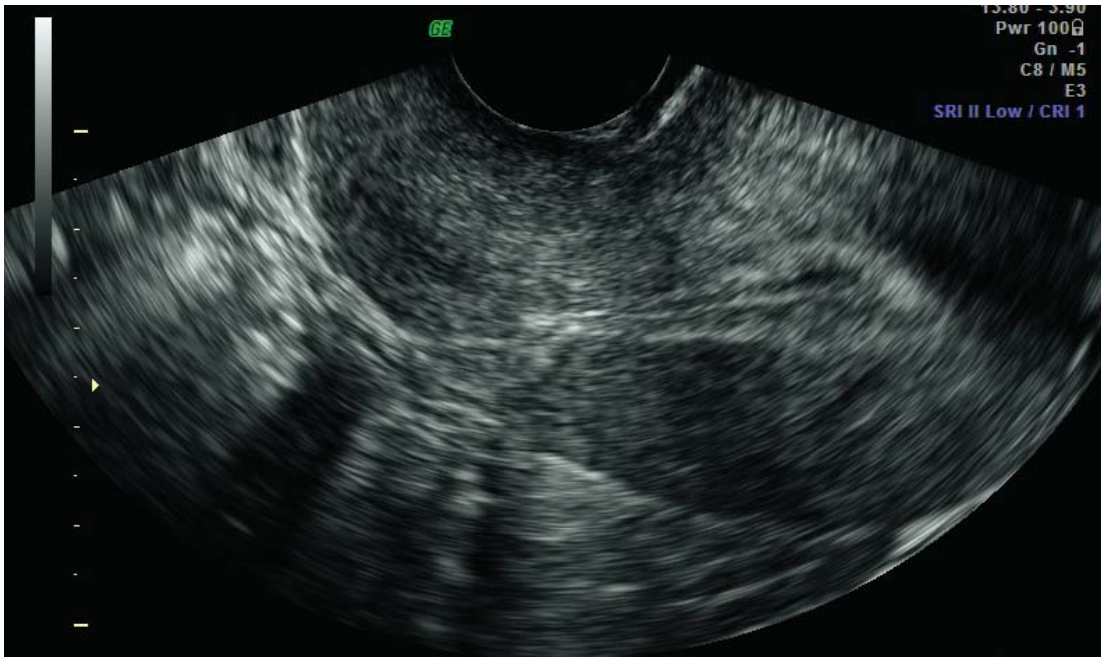


Figure 2: Retroverted uterus with intact CS.

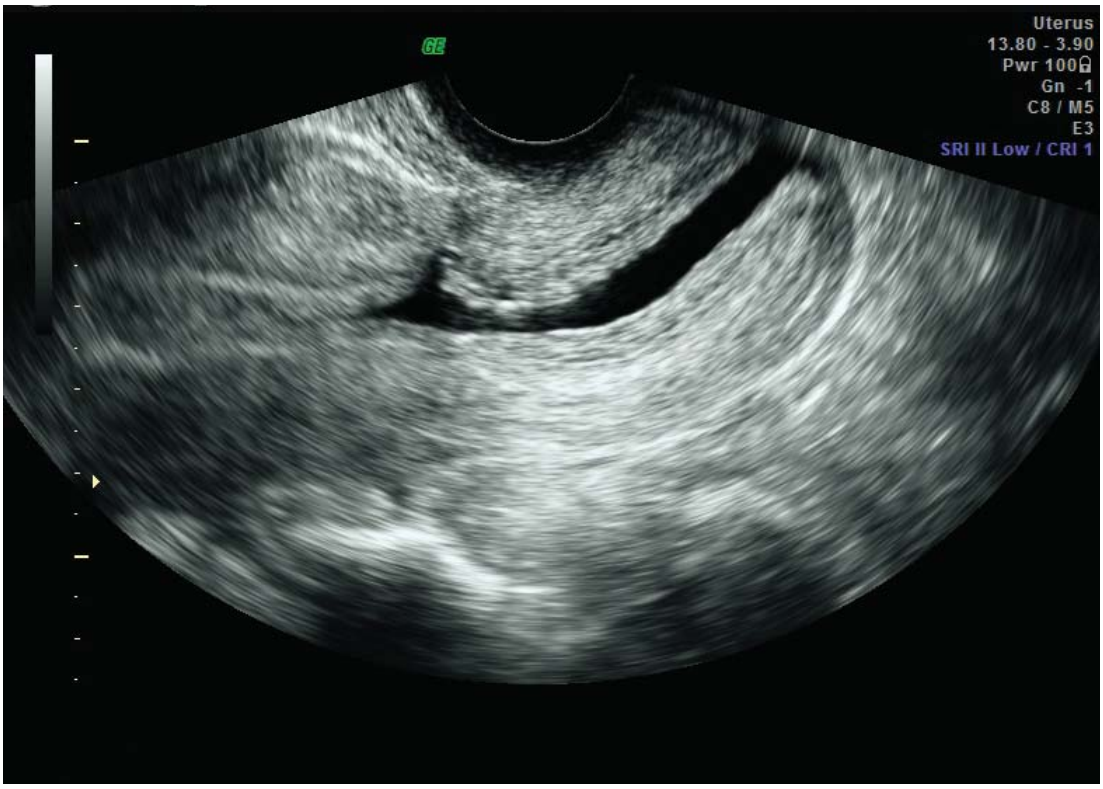


Figure 3: During the periovulatory period the endocervical canal contains mucus with a high fluid content, which provides excellent contrast and demonstrates the CS scar defect.

integrity using high resolution TVS. There is an increase in fluid within the cervix in the periovulatory period (Fig. 2) and this can act as a contrast in the cervical canal and into the isthmus and assist in identifying the location of a defect within the CS.

Management of the dehiscence within the CS can be expectant or surgical, however it is important to remember that there are no data to support the routine repair of CS defect noted incidentally on TVS[5,7,8]. When pregnancy occurs in women who have had a previous CS, prior knowledge of the integrity of the CS is not a predictor of either future delivery mode or delivery outcome.

Ultrasound studies of the uterus can demonstrate the intact CS scar, which appears as an echogenic line through the lower anterior myometrium (Figs. 4, 5, 6).

Carefully studying the scar in both longitudinal and transverse planes will demonstrate dehiscence and its location.

When the uterus is retroverted the probe can be maneuvered

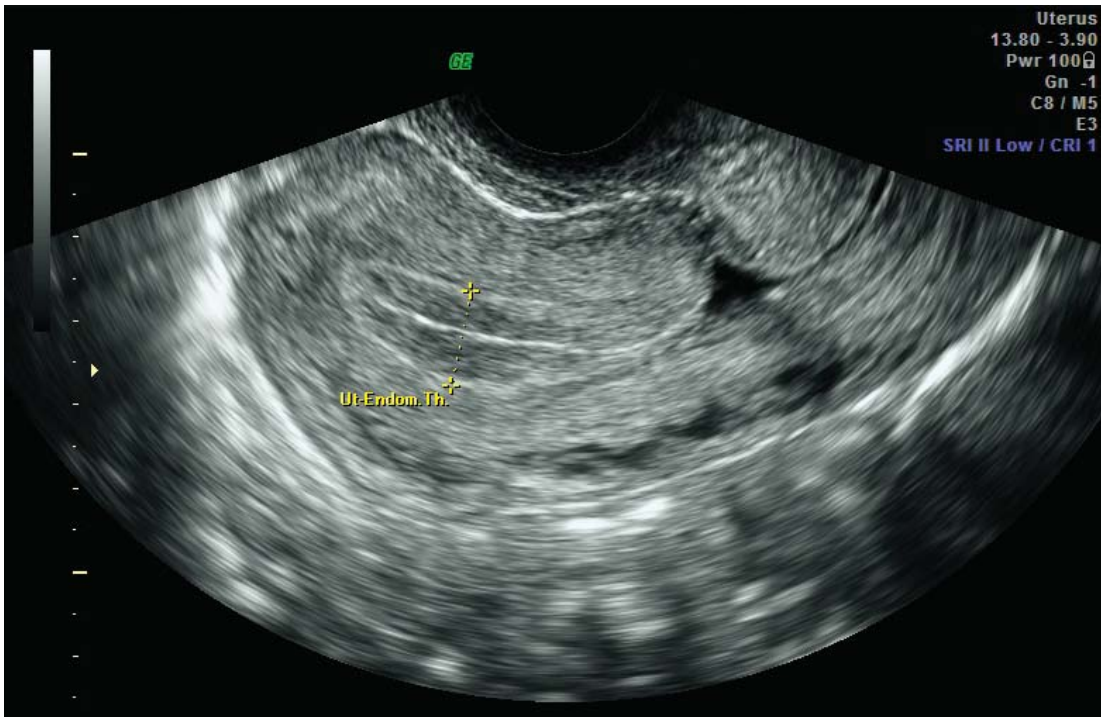


Figure 4: Thinning of the caesarean scar.

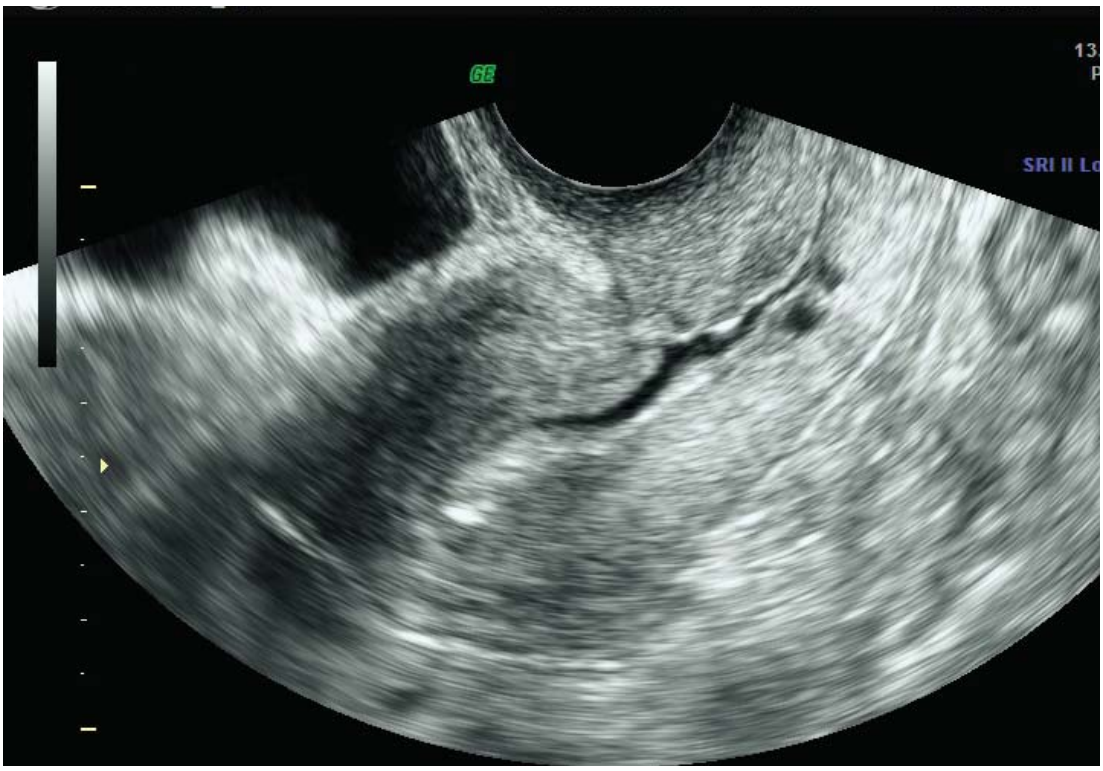


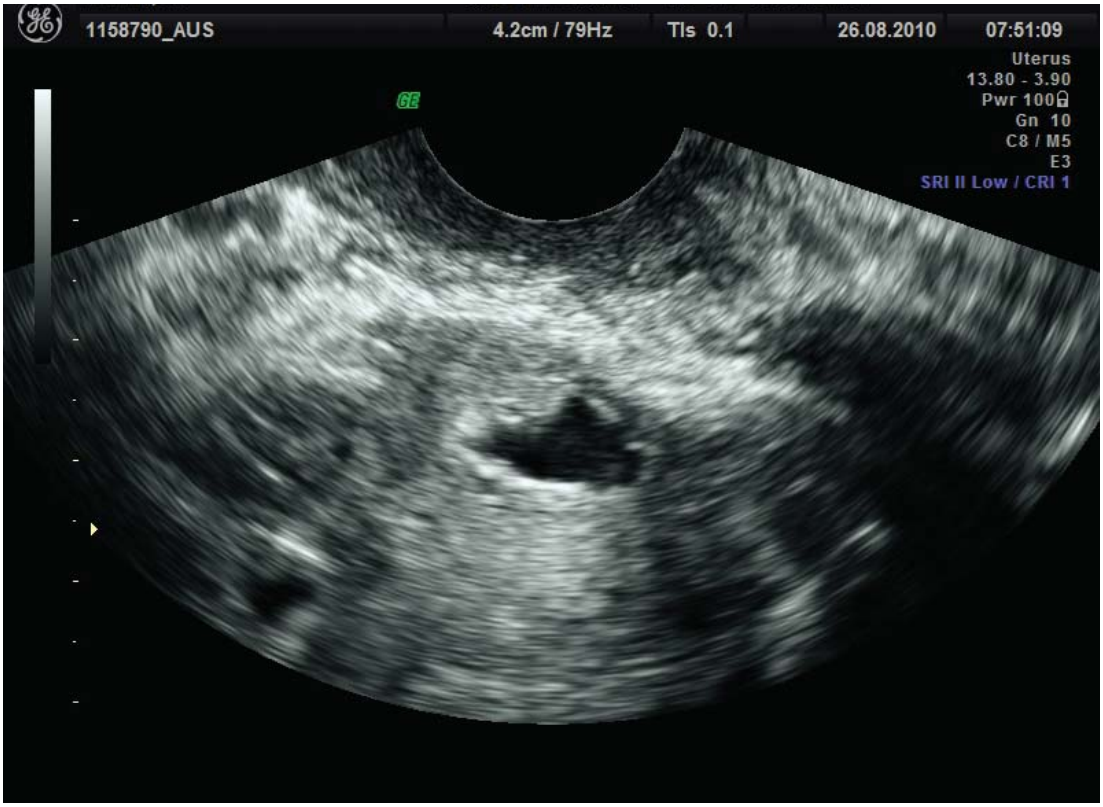
Figure 5: Thinning of the caesarean scar and fluid in the endometrial cavity.

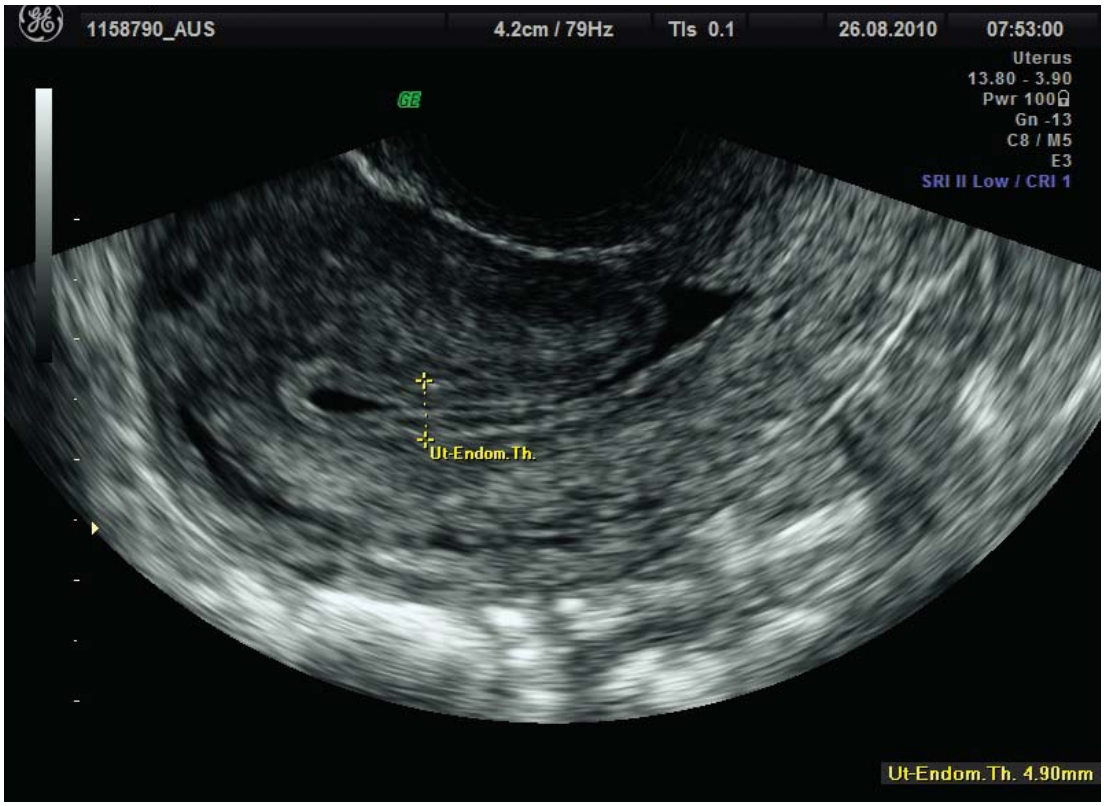
into the posterior fornix to image the uterus well. This allows the beam to intersect the scar at 90 degrees and will demonstrate the scar well (Figs. 2, 8, 9, 10).

In our fertility population, defects within the CS scar were more clearly delineated in women being stimulated for assisted conception; this was associated with an increase in intra-uterine/cervical secretions which in turn provided a natural contrast fluid.

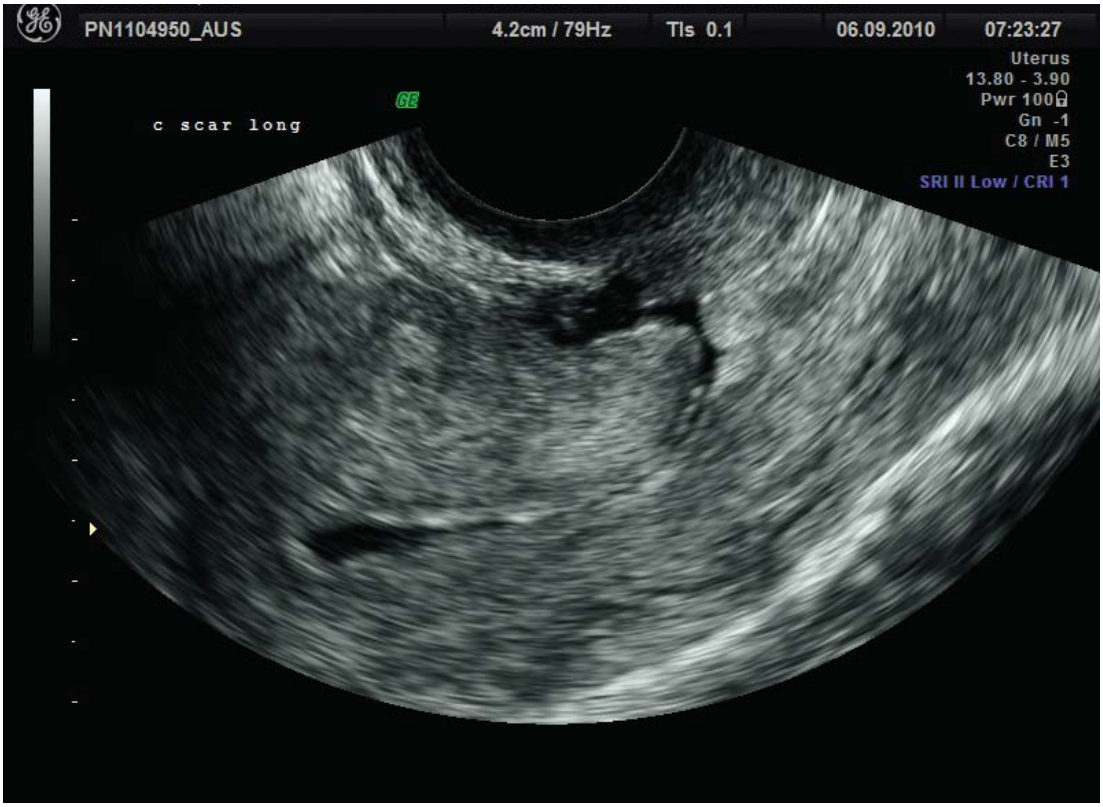
Pitfalls include not focusing on the area, not being able to position the probe in the anterior or posterior fornix (Fig. 11) for the optimal view of the region in question or the lack of intra-uterine/cervical fluid to act as a negative contrast agent to demonstrate the CS defect.

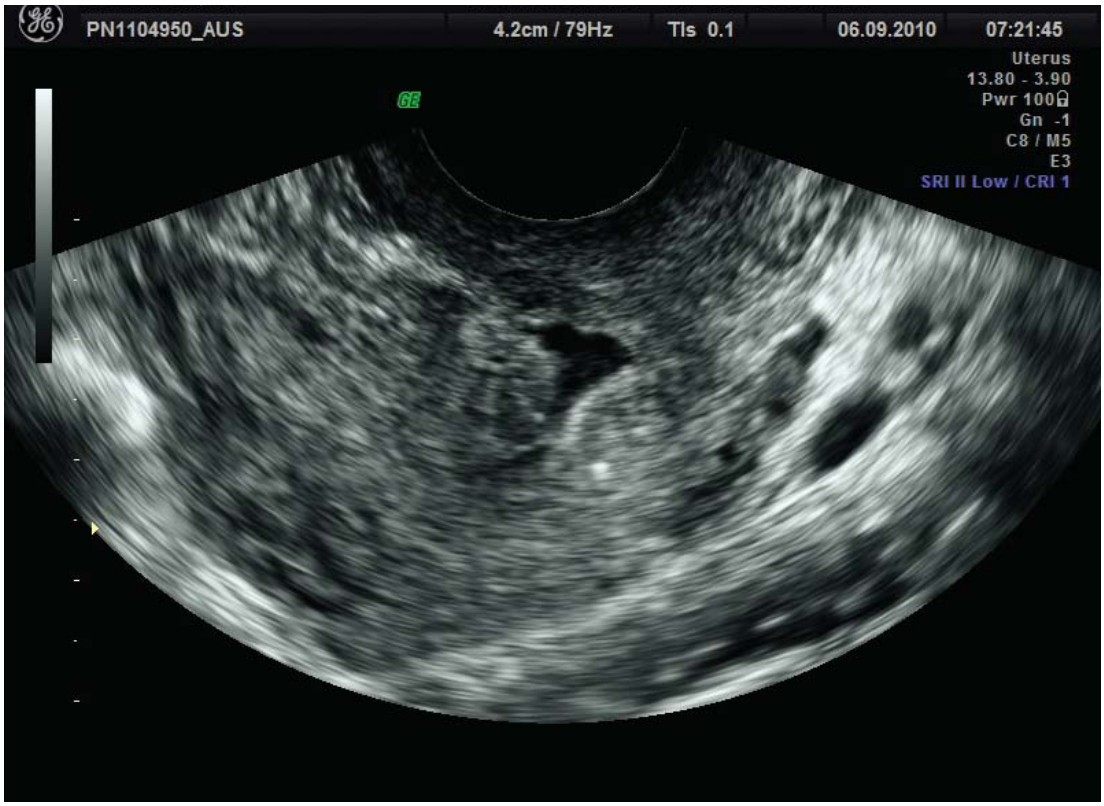
In conclusion, the detection of CS defects using TVS in women undergoing fertility investigations is well accepted. What is not fully understood is whether such CS defects do



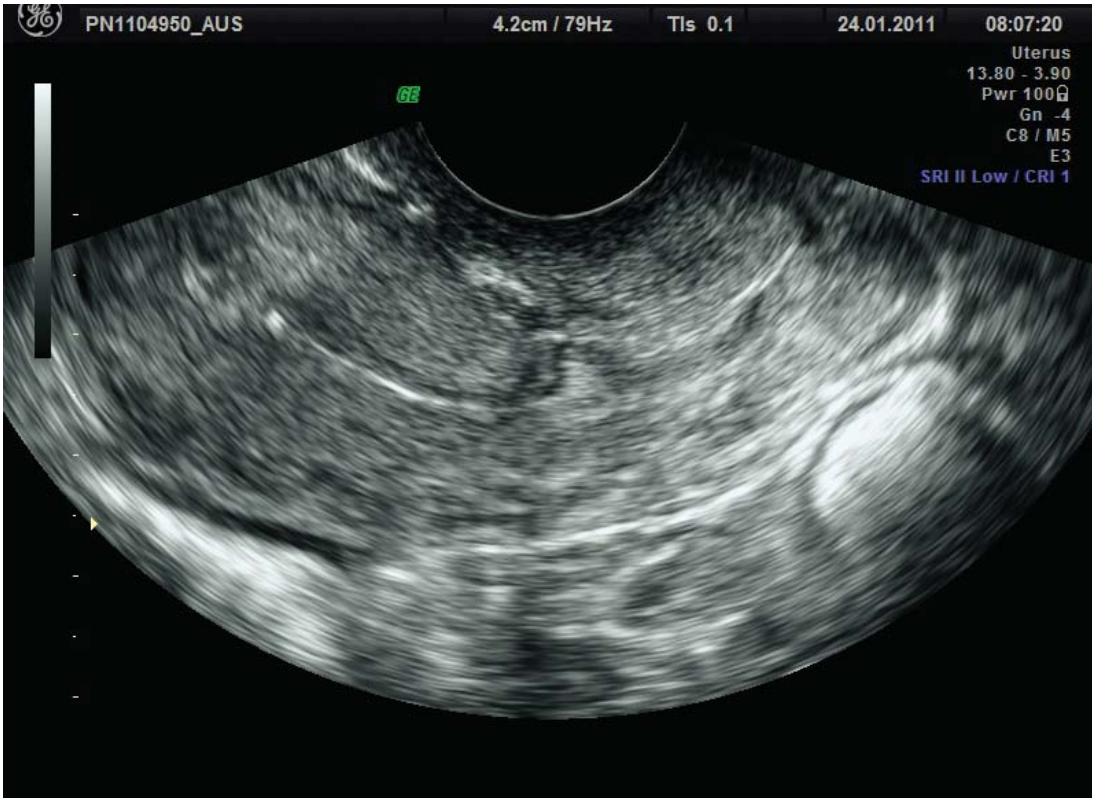


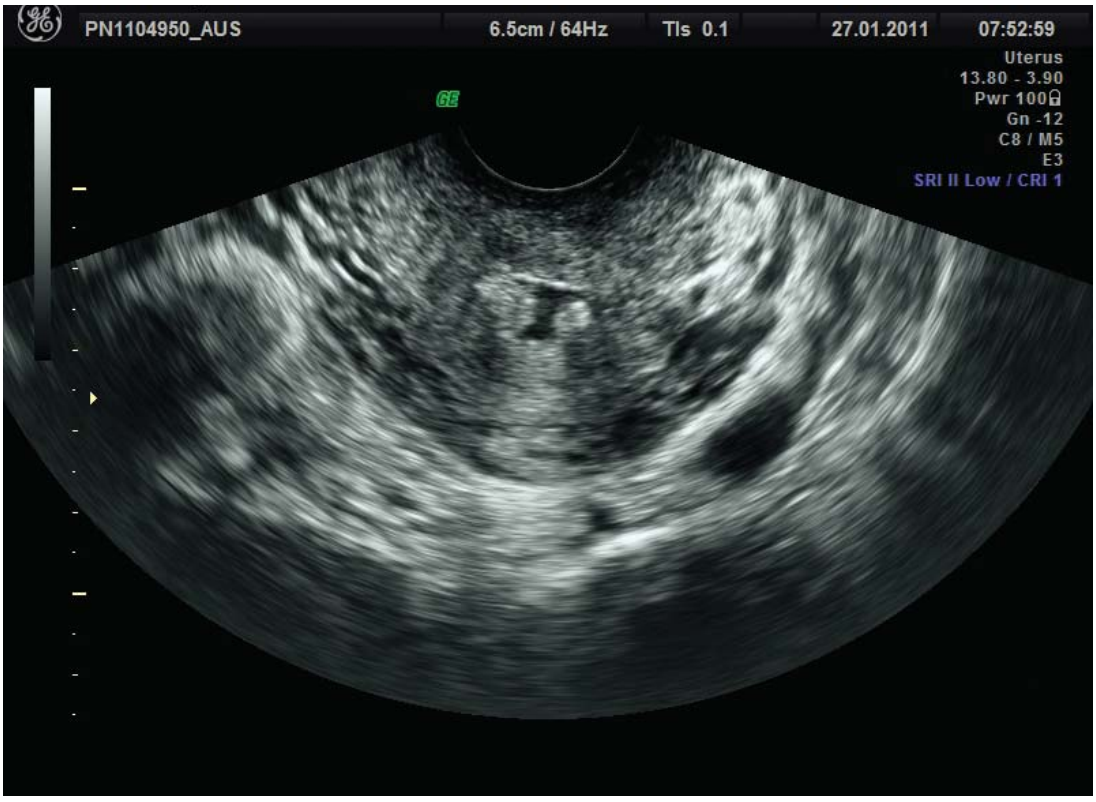
Figures 6a, b: Transverse and longitudinal views showing thin myometrium to the left lateral aspect of the scar.



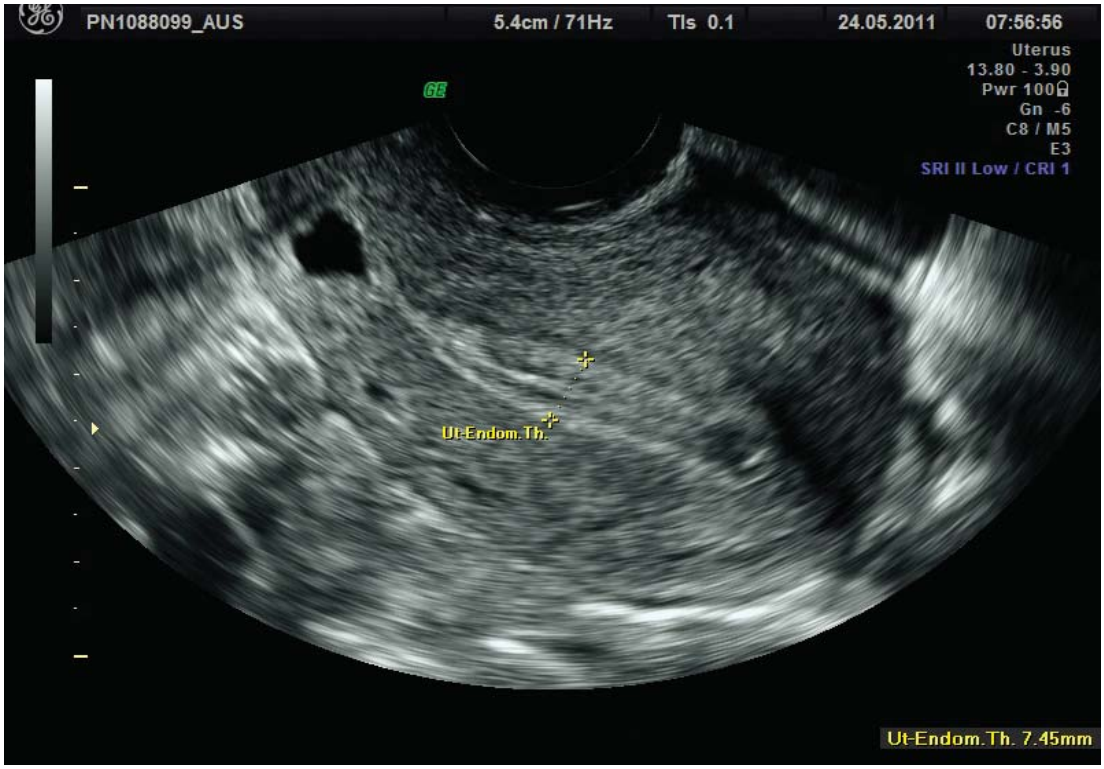


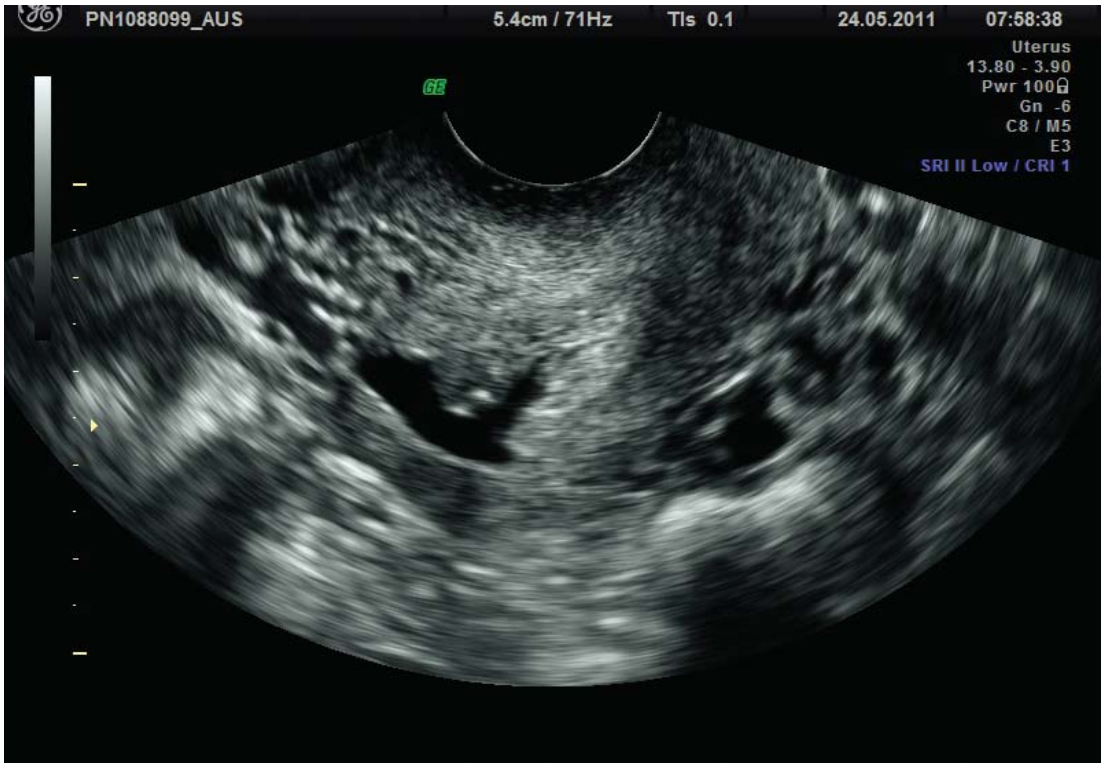
Figures 7a, b: Longitudinal and transverse views of dehiscence of the CS with fluid in the endometrial cavity.



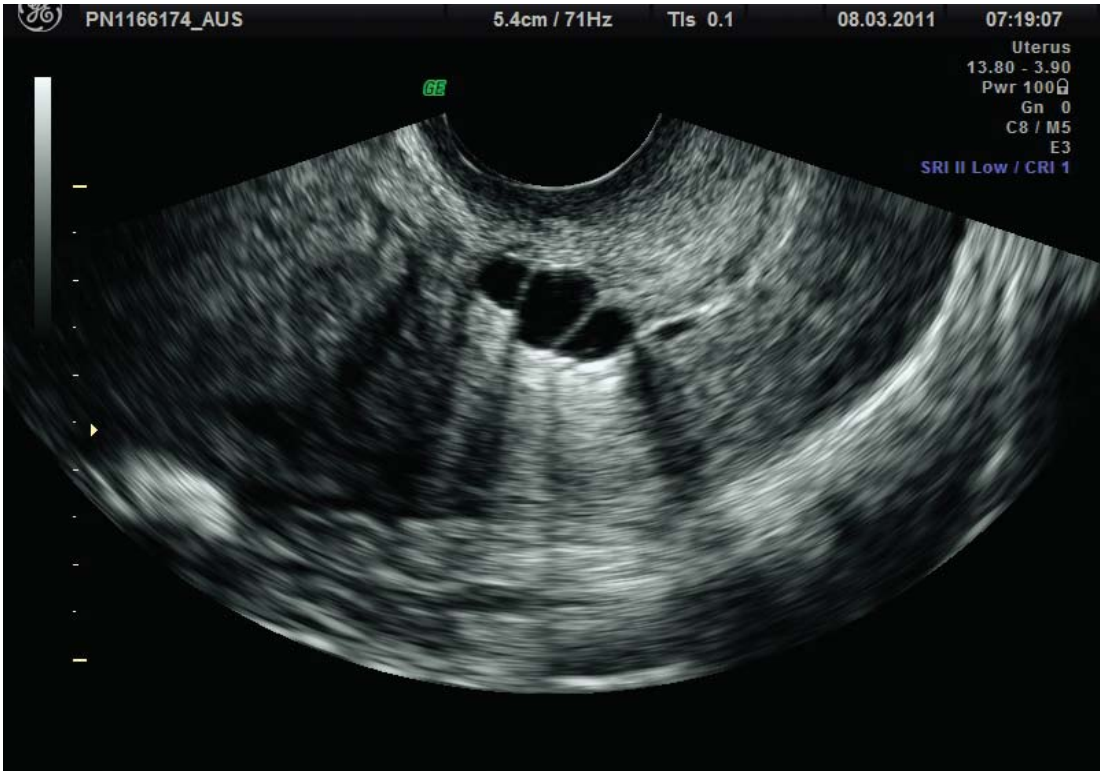


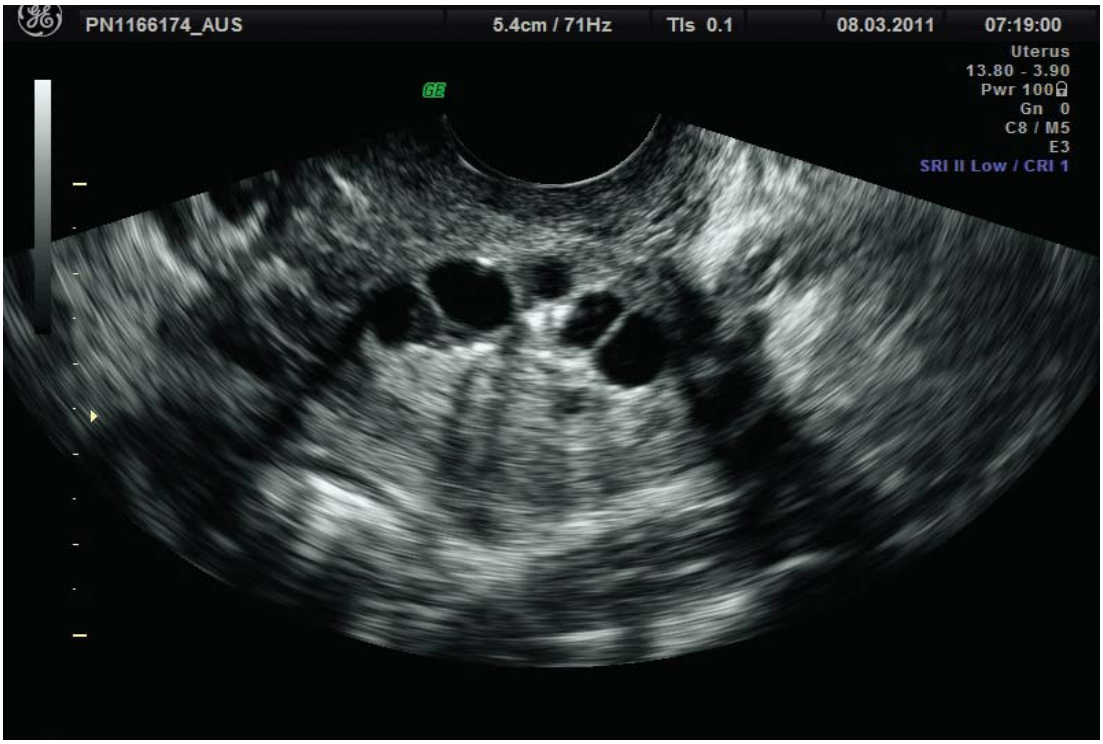
Figures 7c, d: Longitudinal and transverse views of the scar post repair with no fluid seen within the endometrial cavity.





Figures 8a, b: Retroverted uterus. Dehiscence of the CS to the right lateral aspect of uterus.





Figures 9a, b: Multiple cysts are noted along the scar line.

indeed result in demonstrable sequelae including CSEPs[5]. Is the history of CS itself a risk factor for sequelae or does a woman need to have a demonstrable CS defect noted on scan? Is the rate of complications the same in women with a CS scar defect compared to those women who have no demonstrable CS scar defect? These questions are still unanswered and future studies are required to guide the ultrasound community as to whether we should be routinely commenting on an incidental finding of a CS defect.

References

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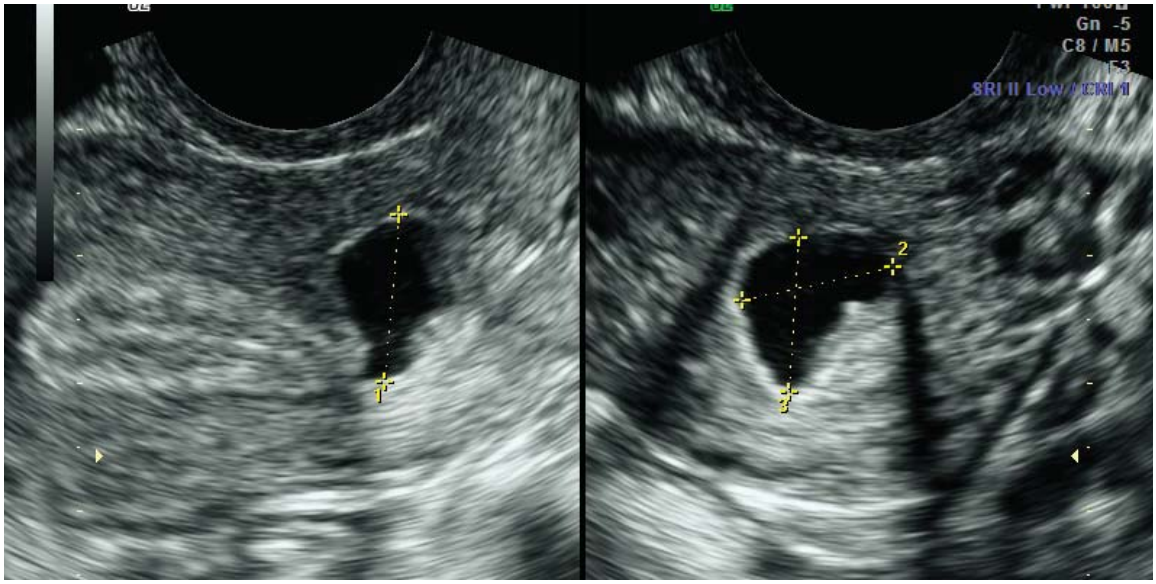

Figure 10: Longitudinal and transverse views demonstrate fluid filled cavity within the CS.

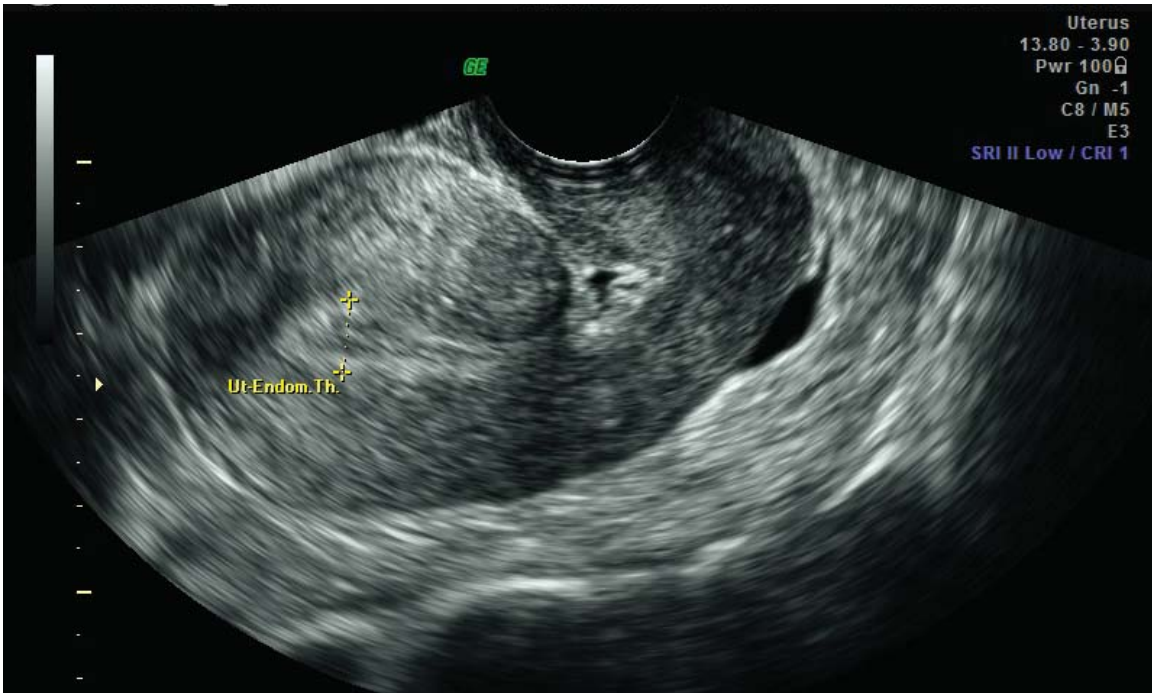

Figure 11: The probe is not within the anterior fornix providing a limited view of the CS.

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