

Robotic Ultrasound-Guided Repair of a Symptomatic Uterine Isthmocele

Kathryn Quillen, MD; Rebecca Byrd; Mary Ann Son, MD; Shon Rowan, MD

West Virginia University Department of Obstetrics, Gynecology, and Reproductive Sciences; Morgantown, West Virginia

Background

- A uterine isthmocele is a myometrial discontinuity at a prior hysterotomy site resulting in thinning of the anterior lower uterine segment and formation of a niche.
- Increasingly recognized after cesarean delivery, isthmoceles may cause blood or fluid retention, chronic inflammation, and impaired endometrial function.
- Symptoms include abnormal uterine bleeding, pelvic pain, infertility, and adverse obstetric outcomes including cesarean scar ectopic pregnancy and uterine rupture.
- Residual myometrial thickness and defect morphology may negatively impact implantation and future pregnancy safety.
- Conventional laparoscopic repair frequently requires hysteroscopic assistance for defect localization.

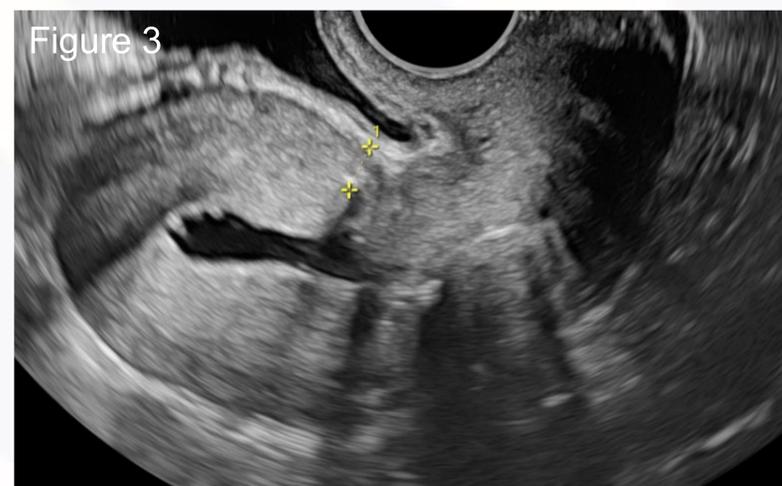
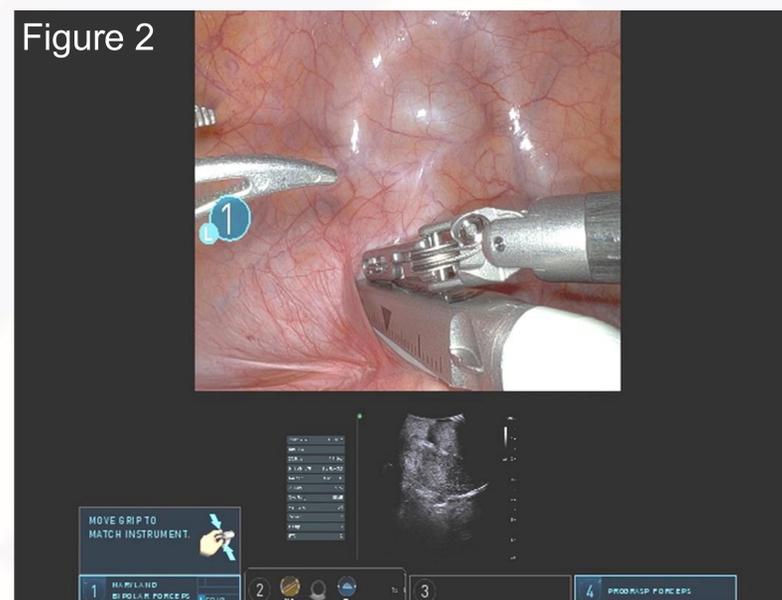
Objective

To describe a minimally invasive robotic technique incorporating intraoperative ultrasound for real-time defect localization and precise multilayer repair of a symptomatic uterine isthmocele.

Case Presentation

A 39-year-old G10P0262 with a history of two prior cesarean deliveries, cesarean scar ectopic pregnancy managed with D&C, recurrent miscarriage, and prior hysteroscopic adhesiolysis presented with abnormal uterine bleeding and infertility. Saline infusion sonohysterography demonstrated a cesarean scar defect with 1mm residual myometrial thickness (**Figure 1**).

Figures



Surgical Technique

- Diagnostic hysteroscopy was performed to confirm defect localization.
- Robotic-assisted laparoscopic repair was subsequently performed using a minimally invasive approach.
- A robotic intraoperative ultrasound probe controlled directly from the surgeon's console enabled real-time defect localization and continuous assessment of residual myometrial thickness (**Figure 2**).
- Fibrotic scar tissue was sharply excised to healthy, well-vascularized myometrium to optimize tissue approximation and healing.
- Multilayer uterine closure was performed.
- Restoration of uterine contour and defect closure were confirmed intraoperatively with ultrasound assessment.

Results

- Uncomplicated postoperative recovery
- Follow-up saline infusion sonohysterography at 2 months demonstrated restoration of myometrial thickness to 6-7mm (**Figure 3**).
- Complete resolution of abnormal uterine bleeding.
- Unassisted conception within six months of surgical repair.
- Ongoing viable intrauterine pregnancy at follow-up.

Discussion

Robotic ultrasound-guided isthmocele repair is a safe and effective minimally invasive technique allowing precise localization, complete fibrotic excision, and accurate multilayer closure under single-surgeon console.