Surgical innovation begins at the end of your comfort zone

Approximately 1 in 4 women with menorrhagia and dysmenorrhea have clinical evidence of adenomyosis. For those who have completed childbearing, hysterectomy provides definitive symptom management. Several medical options, including combined oral contraceptives, GnRH agonist/antagonist, and antiandrogens, can be used if future fertility is desired. The levonorgestrel-releasing intrauterine device (LNG-IUD) is a highly effective alternative, with evidence suggesting reductions in pain, bleeding, and even uterine volumes among women with adenomyosis (1). Unfortunately, 3%–6% of women with an LNG-IUD will expel the device within 1 year of placement, and this rate is even higher in women with large uterine cavity volumes, menorrhagia, and dysmenorrhea (2). In this month's issue of *Fertility and Sterility*, Zhu et al. (3) describe a unique solution for a patient with adenomyosis and history of an LNG-IUD expulsion involving hysteroscopic suture fixation.

Since the development of the first endoscope—the *Lichtleiter* or "Light Conductor" by German physician Philipp Bozzini—surgeons have continuously pushed the boundaries of minimally invasive approaches. The advent of distention media, fluid management systems, and digital video burst open the doors to rapid innovation in the field of hysteroscopy. In 1978, Neuwirth performed the first submucous fibroid resection using a cutting loop electrode, and 3 years later, Goldrath used a neodymium laser to perform an endometrial ablation (4). In 2021, Zhu et al. (3) described the first case of hysteroscopic suture fixation of an LNG-IUD. In their video submission, they describe how using a traditional 25F hysteroscope, they were able to use a 4-mm endoscopic needle driver, scissors, and a knot pusher via an operative port to fixate an LNG-IUD with 2-0 ethylene terephthalate sutures to the posterior uterine wall.

The technique demonstrated by Zhu et al. (3) represents a bespoke solution for a unique patient scenario. While there is certainly a skill level required to accomplish the task of needle loading and driving, the investigators did an excellent job of explaining how to replicate their process. There are opportunities for further refinement of the technique, such as using a self-loading needle driver and facilitating IUD removal without requiring a second hysteroscopy. Whether hysteroscopic suturing poses an increased risk of intrauterine adhesion formation or endometritis that may negatively impact future reproductive goals requires further investigation. One must also acknowledge that while this technique fixes a short-term problem, the advent of three-dimensional printing may allow for personalized IUDs to be created that better fit the uterine cavity's shape and size and mitigate the need for suture fixation and its unknown associated risks.

With hysteroscopic suturing added to the pantheon of hysteroscopic innovations, we can continue to look forward to even more creative applications of the technique. If hysteroscopic suturing proves to be effective and does not introduce the risk of infection or adhesions, one can imagine how intrauterine fixation of an antiadhesion barrier or membrane may allow for more effective adhesion prevention. There are even teams working on the development of a 23F robotic hysteroscope that will allow for 2-handed surgery with improved surgical exposure and dissection, which may further enhance the ability for intrauterine suturing during hysteroscopy (5). There is so much that surgeons and patients alike can look forward to in the world of gynecologic surgery. With this wonderful description of a novel technique by Zhu et al. (3), we are continuously reminded that the hysteroscope is not the limit of what is possible, but that our creativity is.

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