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Case Report
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Novel Ultrasound-Guided Transrectal Approach for Oocyte Retrieval in Mayer–Rokitansky–Küster–Hauser (MRKH) Patient

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Abstract

Background: Mayer–Rokitansky–Küster–Hauser (MRKH) syndrome is a congenital disorder affecting approximately 1 in 5000 female births. Characterized by the absence or underdevelopment of the uterus and upper vagina, these patients typically have normal ovarian function. However, anatomical variations including blind-ending vagina, ovarian maldescent, and renal ectopia often complicate oocyte retrieval. These challenges frequently necessitate laparoscopic oocyte retrieval.

Case Report: We present a 32-year-old woman with MRKH syndrome seeking embryo cryopreservation for future use via surrogacy. We describe a minimally invasive technique: ultrasound-guided per rectal oocyte retrieval under sedation. The procedure was successfully completed without complications. This is the first documented case of this approach in MRKH patients.

Conclusion: Transrectal oocyte retrieval offers a safe, effective, and less invasive alternative to laparoscopic or transabdominal methods for women with MRKH syndrome, potentially expanding fertility preservation options in this population.

Keywords: MRKH syndrome; Oocyte retrieval; Transrectal approach; Fertility preservation; Renal ectopia

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Key Points

1. Women with Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome may present with a blind-ending vagina, ovarian maldescent, and renal ectopia, all of which can complicate fertility-related procedures.
2. Invasive interventions such as laparoscopy are often required in these patients to facilitate reproductive treatments.
3. Transrectal oocyte retrieval offers a minimally invasive alternative and can be a safer fertility option for women with MRKH compared to conventional surgical approaches.

Introduction

Mayer–Rokitansky–Küster–Hauser (MRKH) syndrome, also known as Müllerian agenesis or Müllerian aplasia, is a rare congenital disorder resulting from incomplete embryologic development of the Müllerian ducts [1]. This condition is characterized by agenesis or hypoplasia of the uterus and upper two-thirds of the vagina, while patients typically exhibit normal ovarian function and a normal female karyotype (46, XX). The estimated prevalence is approximately 1 in 5,000 live female births [1], making it one of the leading causes of primary amenorrhea in adolescents.

The etiology of MRKH syndrome remains poorly understood and is believed to be multifactorial, with genetic, epigenetic, and environmental factors contributing to its heterogeneity [2]. Clinically, affected women most often present during adolescence with normal pubertal development but primary amenorrhea. In addition to a blind-ending vagina and absent uterus, extra genital anomalies are frequently observed. These include renal malformations such as unilateral renal agenesis, ectopic or horseshoe kidneys, as well as skeletal abnormalities and, in some cases, hearing and cardiac defects. Maldescent of the ovaries is another reported feature that poses challenges in reproductive

management [3].

In recent years, advances in reproductive medicine have expanded the possibilities for biological motherhood through assisted reproductive technologies (ART). Options such as gestational surrogacy and, more recently, uterine transplantation, have transformed the reproductive outlook for women with MRKH. However, fertility-related procedures remain technically challenging owing to ovarian maldescent and associated renal anomalies [4]. Laparoscopic approaches and abdominal oocyte retrieval have traditionally been employed to overcome these difficulties, but minimally invasive alternatives such as transrectal ultrasound-guided oocyte retrieval is a safer and less invasive options in these groups of patients.

Case Presentation

A 32-year-old woman with a known diagnosis of MRKH syndrome was referred for embryo cryopreservation. She was classified as MRKH type II, with complete absence of the uterus and the upper two-thirds of the vagina along with presence of pelvic kidney. Additional evaluation revealed polycystic ovary syndrome (PCOS) based on ultrasound features and biochemical parameters. Her anti-Müllerian hormone (AMH) level was 30.6 pmol/L, consistent with a high ovarian reserve. Magnetic resonance imaging and pelvic ultrasound demonstrated ovaries positioned high (Figure 1).

Controlled ovarian stimulation was performed using an antagonist protocol. The patient received recombinant FSH 300 IU daily, followed by ovitrelle 250 mcg for final oocyte maturation. A total of 17 oocytes were retrieved using a novel technique of transrectal oocyte retrieval (TROR). Of these, 16 were mature, 12 fertilized successfully, and 8 developed into good-quality blastocysts.

Bowel preparation was conducted according to previously published protocol [5]. The day before the procedure, the patient was placed on a soft diet transitioning to clear liquids, followed by administration of 4 sachets of macrogol in 2 L of water over 2 hours. Two glycerin suppositories were taken at bedtime, and fasting was maintained for 8 hours prior to the procedure. On the day of TROR, the patient arrived 1 hour before the procedure to ensure complete rectal evacuation.

The procedure was carried out under moderate sedation with intravenous analgesia and prophylactic antibiotics, maintaining full aseptic technique. The patient was placed in the lithotomy position, and the perineal and rectal areas were disinfected with betadine, sterile gel, and thoroughly washed with saline. Transrectal ultrasound was performed, and follicles were aspirated under direct visualization. At the end of the procedure, the rectum was carefully inspected to confirm absence of bleeding or trauma.

Discussion

A previous study has demonstrated that the transrectal approach can achieve oocyte yields comparable to conventional transvaginal oocyte retrieval [5].

When the transvaginal route is not feasible, oocyte retrieval has been attempted via the transabdominal route. However, this approach is associated with notable limitations, including lower oocyte yield compared with transvaginal retrieval [6]. During laparoscopy, ovarian follicles cannot be directly visualized, and laparoscopically assisted transabdominal procedures require general anesthesia, a fully equipped operating theatre, and a specialized surgical team, all of which restrict widespread application.

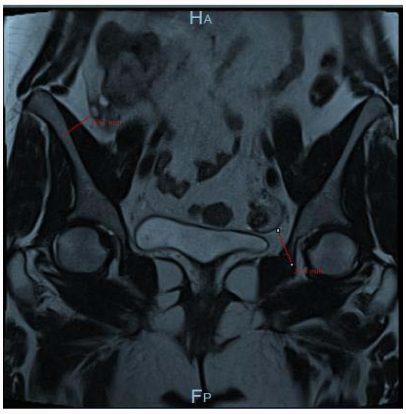

Figure 1: MR scan image showing high ovaries.

The transrectal approach, by contrast, provides a minimally invasive technique with direct access to the ovaries *via* the rectum under ultrasound guidance. The retrieval needle can be advanced to aspirate follicles efficiently, and this method builds upon the well-established safety record of transrectal ultrasound-guided prostatic biopsies [7,8]. In female patients, it represents a practical and less invasive alternative to transabdominal or laparoscopic techniques, particularly in anatomically challenging cases such as MRKH syndrome.

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