International Journal of Reproduction, Contraception, Obstetrics and Gynecology
Nair SR et al. Int J Reprod Contracept Obstet Gynecol. 2026 Apr;15(4):1436-1439
www.ijrcog.org
pISSN 2320-1770 | eISSN 2320-1789

DOI: https://dx.doi.org/10.18203/2320-1770.ijrcog20260917

Case Report

Beyond transvaginal retrieval: laparoscopic oocyte aspiration in three challenging cases

Sreelakshmy R. Nair, Subhadra Subramanian*, Cyriac Pappachan, Skariah Pappachan

Department of Reproductive Medicine, Lifeline Multispeciality Hospital, Adoor, Kerala, India

Received: 12 February 2026
Revised: 13 March 2026
Accepted: 16 March 2026

***Correspondence:**
Dr. Subhadra Subramanian,
E-mail: subhadra.may15@gmail.com

ABSTRACT

Laparoscopic oocyte retrieval is a surgical method for retrieving oocytes, primarily used when standard transvaginal approaches are not feasible due to anatomical or pathological barriers. This technique is especially relevant for fertility preservation in patients with pelvic tumors, inaccessible ovaries, or when concurrent pelvic surgery is indicated. We report 3 cases in which transvaginal approach was difficult and hence laparoscopy was used.

Keywords: Oocyte aspiration, *In vitro* fertilization, Mayer-Rokitansky-Küster-Hauser syndrome, Frozen pelvis

INTRODUCTION

Over the past decade there has been increasing demand for *in vitro* fertilization (IVF) as evidenced by proliferation in the number of centers performing IVF due to rise in infertility. There were around 500 centers in 2010 but as on 2025 there were 7300 centers registered with National ART and surrogacy registry.[1] Increased acceptance of IVF among all communities, delayed parenting age and strong personal choices are few reasons for the same.

Oocyte retrieval is a key step in IVF where mature eggs are collected from the ovaries using a minimally invasive procedure. This step is crucial because the number and quality of oocytes retrieved directly influences the fertilization rates, embryo development, and overall IVF success.[2]

Laparoscopy was the earliest method used for this purpose.[3] However, the technique has been progressively replaced by less invasive ultrasound-guided vaginal aspiration.[4] Comparative studies showed that while laparoscopy initially allowed direct visualization and aspiration, it presented drawbacks including general anaesthesia, higher surgical risks, and potential negative impacts on follicular fluid conditions.[5,6] By the late 1980s, transvaginal ultrasound techniques were becoming preferred, offering higher pregnancy rates, lower invasiveness, reduced costs, and greater patient acceptance.[7]

Laparoscopic oocyte retrieval (LOR) is currently indicated in cases where transabdominal or transvaginal approaches are deemed difficult.[8] Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome, ectopic ovary with unicornuate uterus, malposition of ovaries, cervical and vaginal cancer, and large fibroids are few indications in which LOR has been tried successfully till now.[9-14] We report 3 cases in which transvaginal approach was difficult and LOR was performed.

CASE REPORTS

Case 1

A 28-year-old lady with primary amenorrhoea was referred to our hospital for fertility prospects. Patient had not attained menarche and was married 8 years ago. On examination, she had normal breast development and secondary sexual characters. On investigating, her

karyotype was 46 XX, anti Mullerian Hormone (AMH) was 3 ng/ml with MRI of pelvis showing absent uterus and normal ovaries. She was provisionally diagnosed as MRKH syndrome. Neovagina recreation was done in due course of time.

She underwent IVF in our centre-oral contraceptive pill priming followed by antagonist protocol and recombinant human chorionic gonadotropin (rhCG) trigger. Folliculometry was done by transabdominal ultrasound (TAS) due to reduced elasticity of neovagina. LOR was performed and 9 oocytes were retrieved. seven embryos (5 grade 1 blasts, 1 grade 2 blast and 1 grade 3 blast) were identified on day 5. As of the date of writing this manuscript, we were waiting for surrogate.

Case 2

A 35-year-old lady with abnormal uterine bleeding and dysmenorrhoea presented with subfertility. Past history was eventful in that she underwent laparoscopic myomectomy 6 years ago following which she had a miscarriage at 6 weeks. The following year she conceived again but had abortion at 5th month due to cervical incompetence. Subsequently Mirena LNG-IUS was inserted for abnormal uterine bleeding with adenomyosis and was expelled thrice. Four years prior to presentation, she had adenomyomectomy for the same. On examination per abdomen she had uterus of 20 weeks size. Transvaginal ultrasound (TVS) revealed bulky adenomyotic uterus with endometrioma. Hysterosalpingogram showed intrauterine adhesions. Her AMH was 3.5 ng/ml.

Antagonist protocol with agonist trigger and folliculometry by TAS was done due to high positioned ovaries. Considering the difficulty in approaching conventionally, she underwent LOR with dense adhesiolysis and endometriotic cystectomy. 11 oocytes were retrieved and by day 5, 9 embryos were developed (5 grade 2 blasts and 4 grade 3 blasts). She has undergone hysterectomy after LOR due to severe dysmenorrhea and waiting for surrogate to transfer the embryos.

Case 3

A 29-year-old lady, married since 4 years, had history of severe dysmenorrhea. She underwent hysterolaparoscopy with adhesiolysis 3 years ago following which IVF was tried but failed. On examination per abdomen, she had uterus of 22 weeks size. TVS confirmed adenomyosis and AMH was 1.3 ng/ml.

She underwent IVF for the second time antagonist protocol, folliculometry was done by TAS due to difficult positioning of ovaries (Figure 1). LOR was done and 4 oocytes retrieved. She had frozen pelvis and hence dense adhesiolysis was also performed prior to LOR (Figures 2 and 3). Two embryos of grade 2 blasts were obtained by day 5 and awaiting surrogate. Patient had undergone laparoscopic hysterectomy after LOR due to worsening adenomyosis.

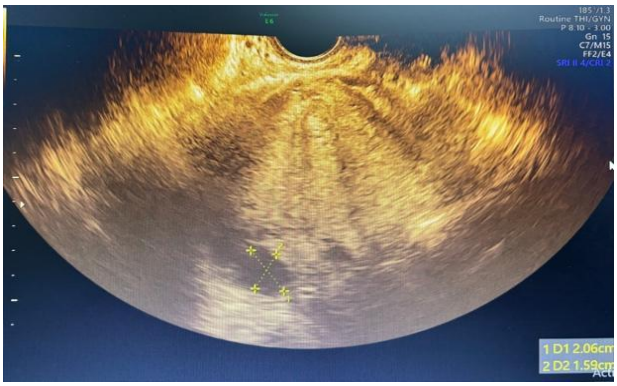

Figure 1: Transabdominal USG image of folliculometry scan of case 3 showing dominant follicle.

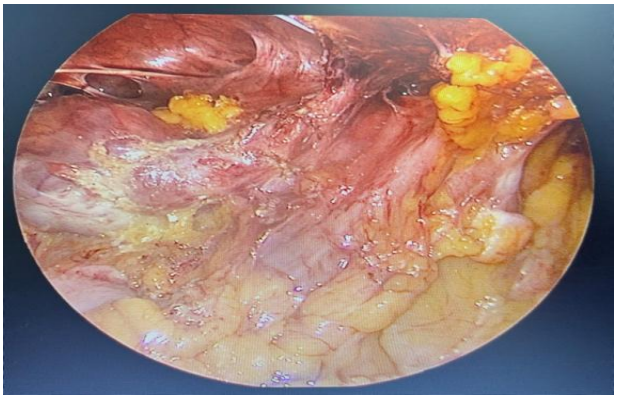

Figure 2: Laparoscopy image of dense adhesions in case 3.

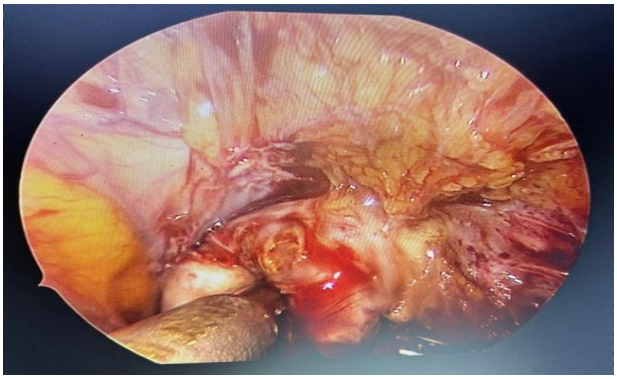

Figure 3: Laparoscopy image of oocyte aspiration in case 3 after adhesiolysis.

DISCUSSION

In this retrospective case reports, 3 patients from 2022 to 2025 had undergone LOR. Indication for 1 patient was MRKHS wherein reduced elasticity of the neovagina mandated transabdominal USG for follicular monitoring and laparoscopy for OA. Two patients had severe

adenomyosis and bulky uterus with difficult access and high positioned ovaries which necessitated laparoscopy for oocyte retrieval and additionally both patients benefitted with concomitant dense adhesiolysis surgery done in the same sitting.

General procedure which was undertaken for LOR is being described below.[15] Patients were positioned in modified dorsal lithotomy position, supraumbilical 10 mm telescopic port was created. Three ancillary ports of 5 mm were created- 2 on left and 1 on right through which 17 G ovum aspiration needle was used for puncture of the left and right ovaries, respectively. For facilitating more exposure of the ovaries for visualisation of follicles, 2 of the patients with frozen pelvis needed dense adhesiolysis prior to aspiration. Careful dissection of ovaries containing stimulated follicles from bowel, omentum, bladder and uterus required immense skill and patience to avoid rupture of follicles during dissection.[16] Laparoscopic forceps was used for fixing ovaries while follicular aspiration.

When aspirating multiple follicles near each other, the needle tip was retained in the ovary to reduce the number of times subsequently the ovarian cortex is transfixed and to reduce the inherent risk of bleeding. Follicular fluid was collected in same 10 ml sterile tubes as used during transvaginal oocyte retrieval and transported in a warming block (37 °C) to IVF lab for further processing.

In the largest case series of 23 women with MRKH syndrome undergoing LOR along with vaginoplasty in the same sitting, the oocyte retrieval rate was 11.4±5.4.[9] In another study involving 11 patients with MRKH syndrome undergoing both procedures, a mean of 10.4±4.4 oocytes were retrieved and 8.8±3.1 embryos were cryopreserved.[17] These data were comparable with our patient's retrieval rate.

Extensive literature searches for LOR specifically in cases of frozen pelvis or endometriosis have not yielded results. More probable reasons might be that they might have been candidates for transabdominal ultrasound guided aspiration.[18] However, in our patients, prior extensive surgeries invariably excluded this approach. There are no randomized controlled trials addressing the question as to which technique yields good oocyte retrieval and good pregnancy rates in women undergoing IVF.[19] Combined diagnostic laparoscopy with oocyte aspiration reduced patient morbidity, time and cost benefits, and gave opportunity for oocyte-sperm compatibility testing in vitro in one study.[20]

While direct comparisons between the different ways of accessing oocytes have not been done in recent years understandably due to ethical and moral reasons, transabdominal or laparoscopic access could be reserved for special cases. In a retrospective case-control study evaluating the predictive factors for transabdominal ultrasound guided oocyte aspiration, difficulty in visualizing ovaries through transvaginal mode, history of pelvic surgery and obesity were the determining variables to help stratify the patients with difficulty in doing conventional transvaginal oocyte aspiration.[6] These criteria might also be extrapolated to LOR.

In our case reports, all 3 patients had successful retrieval without any intraoperative and postoperative complications and are awaiting surrogacy due to their background history.

Drawbacks of this technique were use of significant anesthesia, difficulty in assessing the depth of follicles, incomplete drainage, risk of inadvertent puncture during dissection.[21]

CONCLUSION

We report 3 cases in which laparoscopy was used for oocyte retrieval. Though this modality was historically the first way to retrieve oocyte, due to ease of vaginal approach, laparoscopy has taken a back seat. Inspite in selected cases, LOR might be the optimal choice. Future studies to delineate such category of patients who benefit the most from this approach needs to be done.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. National ART and Surrogacy. National ART & Surrogacy Registry. Available at: https://registry.artsurrogacy.gov.in. Accessed on 12 February 2026.
2. Gordon CE, Lanes A, Srouji SS, Ginsburg ES. Association between oocyte retrieval technique and number of oocytes retrieved. J Assist Reprod Genet. 2022;39(12):2747-54.
3. Steptoe PC, Edwards RG. Birth after the reimplantation of a human embryo. Lancet. 1978;2:366.
4. Deutinger J, Reinthaller A, Csaicsich P, Riss P, Fischl F, Bernaschek G. Müller-Tyl Follicular aspiration for in vitro fertilization: sonographically guided transvaginal versus laparoscopic approach. Eur J Obstet Gynaecol Reprod Biol. 1987;26(2):127-33.
5. Imoedemhe DAG, Chan RCW, Ramadan IAG, Sigue AB. Changes in follicular fluid gas and pH during carbon dioxide pneumoperitoneum for laparoscopic aspiration and their effect on human oocyte fertilizability. Fertil Steril. 1993;59(1):177-82.
6. Roman-Rodriguez CF, Weissbrot E, Hsu CD, Wong A, Siefert C, Sung L. Comparing transabdominal and transvaginal ultrasound-guided follicular aspiration: A risk assessment formula. Taiwanese J Obstet Gynecol. 2015;54(6):693-9.

7. Mahmoud MK, Punukollu D, Mahmood T. In vitro fertilization. Obstet Gynaecol Reprod Med. 2013;23(8):238-46.
8. Mahran A, Abdelraheim AR, Eissa A, Gadelrab M. Does laparoscopy still has a role in modern fertility practice? Int J Reprod Biomed. 2017;15(12):787-94.
9. Vanni VS, Alteri A, De Santis L, Cermisoni GC, Rabellotti E, Delprato D, et al. Laparoscopic Oocyte Retrieval and Cryopreservation during Vaginoplasty for Treatment of Mayer-Rokitansky-Kuster-Hauser Syndrome. JoVE. 2022;(183):63634.
10. Pereira N, Willson S, McCarter K, Chung PH, Kligman I, Rosenwaks Z. Combined transvaginal and transabdominal oocyte retrieval in a patient with an ectopic ovary and unicornuate uterus. Fertil Steril. 2021;115(5):1347-9.
11. Nakagawa K, Ohgi S, Nakashima A, Horikawa T, Saito H, Sugiyama R. Laparoscopically-assisted transabdominal oocyte retrieval in an infertility patient with ovarian malposition. Reprod Med Biol. 2009;8(2):8587.
12. Giampaolino P, Mercorio A, Serafino P, Iorio GG, Buonfantino C, Bifulco G, et al. Laparoscopic oocyte retrieval for fertility preservation in a patient with squamous cell carcinoma of the vagina. Fertility Sterility. 2023;120(3 Pt 2):701-2.
13. Lavery S, Carby A, Ghourab G, Christopoulos G. Clinical experience of a fertility preservation programme for women with gynaecological cancer. Int J Obstet Gynaecol. 2016;123:227-32.
14. Gopinath PM, Manoharan, Sahityalakshmi. Abdominal oocyte pickup in patient with uterine factor infertility: A case report. Onco Fertil J. 2021;4(2):81-3.
15. The ESHRE Working Group on Ultrasound in ART. Recommendations for good practice in ultrasound: oocyte pick up. Human Reprod Open. 2019;4:oz025.
16. Yovich JL, Matson PL, Yovich JM. The optimization of laparoscopic oocyte recovery. Int J Fertil. 1989;34(6):390-400.
17. Candiani M, Vanni VS, Papaleo E, Delprato D, Tandoi I, Gervasio V, et al. Oocyte Retrieval during Laparoscopic Vaginoplasty to Reduce Invasiveness in the Treatment of Mayer-Rokitansky-Küster-Hauser Syndrome. J Minimally Invas Gynecol. 2020;27(1):74-9.
18. Barton SE, Politch JA, Benson CB, Ginsburg ES, Gargiulo AR. Transabdominal follicular aspiration for oocyte retrieval in patients with ovaries inaccessible by transvaginal ultrasound. Fertil Steril. 2011;95(5):1773-6.
19. Wiseman DA, Short WB, Pattinson HA, Taylor PJ, Nicholson SF, Elliott PD, et al. Oocyte retrieval in an in vitro fertilization-embryo transfer program: comparison of fourmethods. Radiology. 1989;173(1):99-102.
20. Shoham (Schwartz) Z, Barash A, Yemini M, Borenstein R. Combined Diagnostic Laparoscopy And Follicular Aspiration For Human In Vitro Fertilization. Acta Obstetricia et Gynecologica Scandinavica. 1990;69:23-6.
21. Willets S, Samanta J, Mathur R. Role of laparoscopic oocyte retrieval in modern practice. Fertil Sci Res. 2023;10(2):71-7.

Cite this article as: Nair SR, Subramanian S, Pappachan C, Pappachan S. Beyond transvaginal retrieval: laparoscopic oocyte aspiration in three challenging cases. Int J Reprod Contracept Obstet Gynecol 2026;15:1436-9.