UDC 618.5-089.888.11:618.177-089.888.61
DOI: 10.54503/0514-7484-2025-65.2-121

Cesarean Delivery Following Assisted Reproduction in a Patient with a Uterine Anomaly: Risk Factors and Neonatal Prognosis

N.N. Ghukasyan[1,3], A.P. Poghosyan[1,3], G.G. Okoev[2,3], V.T. Melkonyan[1], A.V. Aghazaryan[1], N.V. Hakobyan[1], H.H. Sedrakyan[3]

[1]«Erebouni» Medical Center
0087, 14 Titogradyan,
[2]Research Center of Maternal and Child Health Protection,
22 M. Mashtots Ave,
[3]YSMU aft.M.Heratsi,
0025, 2 Koryun, Yerevan, Armenia

Keywords: uterine didelphys, secondary infertility, intrauterine insemination

Introduction

Uterine anomalies, such as a bicornuate uterus, are rare congenital malformations that can significantly affect fertility and pregnancy outcomes. A bicornuate uterus results from a failure of the Müllerian ducts to fuse properly during embryonic development. This anomaly occurs in approximately 0,5–1% of women and is often associated with reproductive complications, including infertility, miscarriage, preterm birth, and fetal malposition [1–4].

Anatomically, a bicornuate uterus is characterized by the presence of two horns, which can vary in degree of separation and development. In some cases, the horns may be almost completely divided, as seen in a complete bicornuate uterus, while in others, the separation is partial. Each horn can have its own endometrial lining, which can allow for embryo implantation. However, the abnormal structure may impair blood flow, leading to an increased risk of miscarriage and other complications [5–8].

Despite these anatomical anomalies, women with a bicornuate uterus can conceive either naturally or through assisted reproductive technologies (ART). However, fertility in these patients is often reduced. Studies show that women with a bicornuate uterus have a higher incidence of infertility, with rates reaching up to 30%, compared to around 10% in women with a normal uterine structure [4]. This is largely due to the increased risk of abnormal embryo implantation, early pregnancy loss, and impaired fetal development.

In terms of pregnancy continuation, the likelihood of carrying a pregnancy to term is also reduced. Research indicates that women with a bicornuate uterus have a higher risk of preterm birth, low birth weight, and cervical insufficiency. Notably,

the cesarean section is often the preferred method of delivery in these cases, as vaginal delivery can lead to inadequate blood supply to one of the uterine horns and potential fetal injury [9–13].

According to various studies, cesarean section is the method of choice for delivery in 70–80% of women with a bicornuate uterus, particularly when additional complications, such as fetal malposition or obstructed labor, are present [2, 14, 15]. However, in the absence of these complications and with proper monitoring during pregnancy, vaginal delivery may still be an option.

This case study presents the successful conception and management of a pregnancy in a woman with a bicornuate uterus, highlighting the challenges and outcomes of assisted reproduction in such cases.

Case Presentation

A 32-year-old woman (gravida 1, para 1) with a history of secondary infertility for 5 years, applied for infertility treatment at the Reproductive Medicine Department of "Astghik" Medical Center in 2024. She was diagnosed with complete uterine didelphys and dysfunctional uterine bleeding. Her obstetric history includes a previous cesarean section delivery.

Initial hormonal evaluation showed no significant abnormalities, with normal levels of prolactin, TSH, free T4, 17-hydroxyprogesterone, FSH, and DHEA-S. Semen analysis of her husband revealed normozoospermia. Pelvic ultrasound confirmed the presence of complete uterine didelphys, which explained her secondary infertility.

Given the presence of intermenstrual bleeding and the structural uterine anomaly, a laparoscopy-hysteroscopy was performed on 05.02.2024. Polypectomy was successfully carried out on both the left and right uterine cavities. Following the surgical intervention, ovarian stimulation was initiated for intrauterine insemination (IUI).

On 08.04.2024, the patient underwent controlled ovarian stimulation using clomiphene citrate (100 mg/day for 5 days) and recombinant FSH (Gonal-F 75 IU/day for 7 days), followed by ovulation induction with Ovitrelle (hCG trigger). The response to stimulation was satisfactory. On 19.04.2024, intrauterine insemination was performed with the husband's sperm. The patient’s pregnancy was confirmed on 06.05.2024 with a beta-hCG level of 329 mIU/ml.

This case illustrates the successful conception of a pregnancy via intrauterine insemination in a patient with secondary infertility and complete uterine didelphys. Despite the uterine malformation, the combination of surgical treatment and ovarian stimulation resulted in a positive pregnancy outcome. Ongoing monitoring is essential for further assessment of pregnancy progression.

Results and Discussion

To our knowledge, this is the first reported case of a successful pregnancy resulting from IUI in a patient with a complete didelphic uterus. Uterine anomalies, including the didelphic uterus, can complicate fertility and are associated with various obstetric problems, such as preterm labor, abnormal fetal presentations, and an increased risk of miscarriage [4,5]. However, ART, such as IUI, have been shown to be an effective treatment for infertility in women with uterine anomalies when all anatomical and hormonal factors are adequately addressed [2].

A didelphic uterus is a congenital anomaly resulting from incomplete fusion of the Müllerian ducts, leading to duplication of the uterus, cervix, and sometimes the vaginal septum [8]. While this anomaly is relatively rare, it is important for fertility specialists to consider it when evaluating cases of secondary infertility, as it can affect pregnancy outcomes. In our case, the patient's secondary infertility was likely related to her uterine anomaly, which was confirmed by ultrasound. Previous studies have demonstrated that women with a didelphic uterus can conceive and carry a pregnancy to term despite an increased risk of complications such as preterm labor and abnormal fetal presentations [7, 14].

Our patient had a successful prior pregnancy with normal term delivery, which highlights that, despite the uterine anomaly, natural conception and a normal pregnancy outcome are possible under favorable circumstances. However, like her first pregnancy, a cesarean section was performed due to complications associated with uterine anatomy. As a result, this patient has undergone two cesarean sections, emphasizing the importance of an individualized approach to delivery in women with a didelphic uterus. A previous case report also described a successful vaginal birth after two prior cesarean sections in a patient with uterus didelphys, underscoring the variability in delivery outcomes depending on individual anatomical and obstetric factors [10].

One of the main challenges in pregnancy in women with a didelphic uterus is the choice of delivery method. While many women with this anomaly may have normal pregnancies, the high risk of preterm labor and abnormal fetal presentations requires careful consideration of the mode of delivery [3]. In most cases, if pregnancy occurs in one horn of the uterus and there are no other complications, vaginal delivery may be possible, especially if the fetus is in the correct presentation. However, with abnormal fetal presentations, such as breech and cesarean section is more commonly performed [13]. This is particularly important in the case of a didelphic uterus, where the limited space may complicate normal fetal descent. Additionally, complications such as placenta previa or uterine atony may arise [12].

Given the patient's history and her prior cesarean delivery, a repeat cesarean section was recommended in this pregnancy, as the risks for both the fetus and mother would be too high with attempting vaginal delivery. Thus, despite the uterine anomaly, cesarean section remains the preferred method of delivery,

especially when factors such as abnormal fetal presentation or placental anomalies are present [6].

Ovarian stimulation in combination with intrauterine insemination is the standard approach for women with unexplained infertility or anatomical issues, such as uterine anomalies [5]. In this case, controlled ovarian stimulation with clomiphene citrate and recombinant FSH was followed by an ovulation trigger injection and IUI. The patient's successful pregnancy demonstrates that ART can be a viable treatment for women with a didelphic uterus [1].

Management of uterine anomalies in the context of fertility remains complex, and optimal treatment protocols are still being discussed. While some studies suggest that surgical correction of uterine anomalies, such as septoplasty, may improve reproductive outcomes, the evidence for this is not definitive [4]. Furthermore, studies on fertility in women with a complete didelphic uterus are limited, with most focusing on the overall impact of uterine anomalies. Due to the rarity of the didelphic uterus, larger cohort studies are needed to better understand the most effective treatment strategies and long-term reproductive outcomes for women with this anomaly.

In conclusion, our case demonstrates that assisted reproductive technologies, including ovarian stimulation and intrauterine insemination, can result in a successful pregnancy in women with a didelphic uterus despite the challenges posed by this uterine anomaly. Careful monitoring and individualized treatment plans are crucial when managing these patients, and further research is needed to establish clear guidelines for fertility management in women with uterine anomalies.

Competing interests

The authors declare no competing interests.

Authors’ contributions

We all managed the case, followed up and wrote up the manuscript. All the authors have read and agreed to the final manuscript.

Accepted 07.03.25

Кесарево сечение при беременности, наступившей после вспомогательных репродуктивных технологий у пациентки с маточной аномалией: факторы риска и прогноз для матери и плода

Н.Н. Гукасян, А.П. Погосян, Г.Г. Окоев, В.Т. Мелконян, А.В. Агазарян, Н.В. Акобян, А.А. Седракян

Описанный нами случай подтверждает результаты успешного зачатия при помощи внутриматочной инсеминации у 32-летней женщины с вторичным бесплодием и врожденной маточной аномалией – двурогой маткой. Несмотря на маточную аномалию, овариальная стимуляция и хирургические вмешательства, включая полипэктомию, способствовали наступлению беременности. Этот случай акцентирует внимание на проблемах лечения бесплодия и ведения беременности при маточных аномалиях, что, в конечном итоге, привело к положительному результату. Необходим продолжительный мониторинг течения беременности и здоровья новорожденного в таких высокорисковых случаях.

Կեսարյան հատումը վերարտադրողական օժանդակ տեխնոլոգիաներից հետո արգանդի անոմալիա ունեցող հղիի մոտ. ռիսկի գործոններ և կանխատեսումներ մոր և պտղի համար

Ն.Ն. Ղուկասյան, Ա.Պ. Պողոսյան, Գ.Գ. Օկոև, Վ.Տ. Մելքոնյան, Ա.Վ. Աղազարյան, Ն.Վ. Հակոբյան, Հ.Հ. Մեղրակյան

Այս դեպքը բացահայտում է երկրորդական անպտղությամբ և արգանդի բնածին անոմալիա (երկեղջյուր արգանդ) ունեցող 32-ամյա կնոջ հաջող բեղմնավորումը ներարգանդային ինսեմինացիայի միջոցով: Չնայած նրա արգանդի անոմալիային՝ ձվարանների խթանումը և վիրաբուժական միջամտությունները, ներառյալ պոլիպէկտոմիան, հանգեցրին հղիության: Այս դեպքն ընդգծում է արգանդի անոմալիաների դեպքում անպտղության բուժման և հղիության կառավարման խնդիրները, որոնք ի վերջո հանգեցրել են դրական արդյունքի: Նման բարձր ռիսկային դեպքերում անհրաժեշտ է հղիության ընթացքի և նորածնի առողջության երկարատև մոնիթորինգ:

References

1. *Cahen-Peretz A., Walfisch A., Friger M., Sheiner E.* Maternal müllerian anomalies and future health of the offspring. Eur J Obstet Gynecol Reprod Biol., 2017 May, 212:20-24.
2. *Ciccocioppo U. et al.* Pregnancy outcome in women with uterine anomalies: A retrospective study. Fertility and Sterility, 2007, 88(4): 938–945.

3. *Dorji N., Tshering S., Tshering W.* Uterus didelphys with double vagina diagnosed during third cesarean section: A case report SAGE Open Medical Case… 1 January 2022, DOI:10.1177/2050313X211072967.
4. *Grimbizis G.F. et al.* Reproductive outcomes in women with uterine malformations. Human Reproduction Update, 2010, 16(4): 317–330.
5. *Hiersch L., Yeoshoua E., Miremberg H., Krissi. et al.* The association between Mullerian anomalies and short-term pregnancy outcome. The Journal of Maternal-Fetal & Neonatal Medicine, 2016, 29(16): 2573–2578.
6. *John K.M. et al.* One successful intrauterine device into uterus didelphys: a case report and literature review. PAMJ Clinical Medicine, 2021, 6(38). 10.11604/pamj-cm.2021.6.38.29179.
7. *Katke R.D., Acharya S., Mourya S.* Uterus didelphys with pregnancy and its different maternal and perinatal outcomes. Int J Reprod Contracept Obstet Gynecol., 2017, 6(10): 4690-3.
8. *Moncada-Madrazo M., Cristobal R.V.* Embryology, uterus. StatPearls, 2020.
9. *Ng PC., Kann KS.* Cervical Ectopic Pregnancy in a 23-Year-Old with Uterus Didelphys. Clin Pract Cases Emerg Med., 2017, 1(1):37–39.
10. *Ng'ang'a N., Ratzersdorfer J., Abdelhak Y.* Vaginal birth after two previous caesarean deliveries in a patient with uterus didelphys and an interuterine septal defect. BMJ Case Rep., 2017, 2017: bcr-2016-219149.
11. *Oelschlager AM.A., Debiec K., Micks E., Prager S.* Use of the levonorgestrel intrauterine system in adolescents with known uterine didelphys or unicorn ate uterus. Journal of Pediatric and Adolescent Gynecology, 2013, 26(2): e58.
12. *Rezai S., Bisram P., Lora Alcantara I. et al.* Didelphys uterus: a case report and review of the literature. Case Reports in Obstetrics and Gynecology, 2015, 2015;865821.
13. *Ross C., El-Hassan H., Lakasing L.* BMJ Case Rep., 2018, doi:10.1136/bcr-2017 221815.
14. *Sharmin S., Alam D., Rahman F.* Uterine didelphys with pregnancy outcomes: a case report. Chattagram Maa-O-Shishu Hospital Medical College Journal, 2018, 17(2): 53-55.
15. *Yaqoubi H.N, Fatema N.* Successful vaginal delivery of naturally conceived dicavitary twin in didelphys uterus: a rare, reported case. Case Rep Obstet Gynecol., 2017, 2017:1–4.