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Successful pregnancy in a woman with Herlyn-Werner-Wunderlich syndrome: A case report and literature review

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ABSTRACT

Herlyn-Werner-Wunderlich (HWW) syndrome is a rare congenital condition characterized by renal agenesis, uterine didelphys, and obstructed hemivagina. This report presents the case of a 19-year-old woman who reported lower abdominal pain and offensive vaginal discharge. Imaging revealed a didelphys uterus, two vaginas, two cervixes, hematocolpos, and an absent right kidney. Surgical intervention involved draining the hematocolpos and excising the uterine septum. After surgery, the patient successfully conceived and had a full-term pregnancy, delivering via cesarean section without complications. This case highlights the importance of early diagnosis and surgical management in preventing complications such as endometriosis and infertility. Prompt recognition and treatment are crucial for preserving fertility in patients with HWW syndrome.

1. Introduction

The unusual congenital condition known as Herlyn-Werner-Wunderlich (HWW) syndrome is characterized by renal agenesis, uterine didelphys, and blocked hemivagina, also known as obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) [1,2]. It was first described in 1971 by Herlyn and Werner [2]. It occurs secondary to mesonephric duct-induced Mullerian anomalies. It typically presents when young women reach menarche and experience dysmenorrhea, irregular menses, pelvic masses, and stomach pain [3].

The rare occurrence of the illness makes the diagnosis challenging most of the time, requiring a high index of suspicion. The most sensitive diagnostic technique is now magnetic resonance imaging (MRI), although ultrasound and computed tomography (CT) are still the most commonly used methods [1]. Excision of the vaginal septum is the treatment of choice, and it is successful in that about 80 % of patients are eventually able to become pregnant [1]. Delay in diagnosis increases the risk of complications such as endometriosis and infertility [1,2].

This case is reported in accordance with CARE criteria [4], along with a review of the literature.

2. Case Presentation

A 19-year-old woman presented to the clinic with lower abdominal pain and offensive whitish vaginal discharge. The patient denied experiencing associated symptoms such as urinary symptoms, or changes in bowel habits.

The patient had experienced menarche at the age of 13 and had regular menstrual cycles, with menstruation lasting for 7 days every 30 days, with normal flow. However, she mentioned a history of dysmenorrhea. The patient had been diagnosed with an absent right kidney at the age of 14, as confirmed by CT and MRI, with regular follow-up of kidney function tests with normal results. Additionally, the patient had no significant past surgical history.

On vaginal examination, findings were right vaginal wall swelling with a bulged hymen indicating an obstructed right hemivagina, and the presence of thick whitish vaginal discharge. Abdominal examination yielded tenderness in the right lower abdominal quadrant.

Laboratory tests revealed a hemoglobin (Hb) level of 13.1 g/dL, a platelet count (PLT) of 195 × 10^3/μL, and a white blood cell count (WBC) of 9.71 × 10^3/μL, C-reactive protein level of 41 and creatinine level of 0.54.

Ultrasonography (US) demonstrated two uterine cavities with a right-sided mass measuring 4.5 × 3.5 cm with no adnexal pathology

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seen and minimal fluid in the pouch of Douglas (POD). CT showed single normal-looking left kidney and congenital absent right kidney (Fig. 1). There were two uterine cavities which could represent bicornuate or uterus didelphys and a collection of 5 × 4 cm near the cervix.

The patient consented to examination under general anesthesia and possible surgical intervention of incision and drainage, after receiving counseling regarding operation general risks and specific complications.

Examination during operation found fullness of the right vagina and right rectal space associated with hematocolpos versus pyocolpos.

The patient then underwent pararectal and paravaginal spaces incision and drainage, which showed pus collection, then uterine septum excision and application of a Penrose drain to prevent further collection.

Pus culture showed *Enterococcus* and anaerobic bacteria susceptible to amoxicillin/clavulanic acid and metronidazole, which were given intravenously according to protocol. The patient was then discharged on the same regimen orally.

One week later, the patient was followed up at the obstetrics/gynecology clinic with a pelvic MRI, as instructed, which revealed two separate uteri with widely divergent apices, and two separate cervixes consistent with uterus didelphys (Fig. 2). A small amount of pelvic free fluid was noted, but no drainable collection or abscess formation was observed. The Penrose drain was removed and the patient was discharged home.

Based on the findings, the patient was diagnosed with HWW syndrome class 1, which includes a didelphys uterus, two vaginas, two cervixes, right complete obstructed hemivagina, and an absent right kidney.

The patient successfully conceived and had a full-term pregnancy after one year; she delivered by cesarean section due to fetal distress. During the operation examination showed two uterine cavities with pregnancy in the left cavity, and two cervixes with both openings in the vagina. The patient had no postoperative complications.

3. Discussion

Mullerian duct anomalies (MDAs) are female genital tract congenital anomalies that caused by either non-development or failure of fusion of the Mullerian ducts or resorption of the septum of the uterus [5,6]. They are classified by the American Society for Reproductive Medicine (ASRM) from class I to class VII [7,8].

HWW syndrome is a class III MDA and accounts for 0.16–10 % of all MDAs [5,8], which is described by two separate unicornuate uterine cavities with a double cervix externally [7]. It is a rare condition presented with a right-sided dominance triad of ipsilateral kidney anomalies, uterus didelphys, and imperforate hemivagina [5,6]. It is classified according to the level of vaginal imperforation; class 1 is complete imperforation, and class 2 is incomplete [5]. The patient reported here had a right-sided triad, and class 1 HWW.

The exact etiology and pathophysiology are unknown [5,6,8]. However, it is suggested to be embryological arrest at six to nine weeks of gestation [8]. Mesonephric ducts are essential for the development of the genitourinary system and the development and position of paramesonephric ducts, so if one of them is absent, the fusion of the ipsilateral kidney and ureter fails, resulting in kidney anomalies such as renal agenesis (the most common), cystic renal dysplasia, and horseshoe kidney. The condition also affects the medial fusion of paramesonephric ducts, resulting in didelphys, and lateral displacement of the paramesonephric duct, resulting in lack of connection to the urogenital sinus. Consequently, an imperforate vagina develops [8,9].

OHVIRA syndrome is extremely rare, with only a few case reports documented in the literature. Many of them manifest in the early stages of infancy due to secretions accumulating in a blocked vagina under the influence of maternal hormones [10]. However, the majority of cases are identified during adolescence, with the mean age of diagnosis being 14 years [11]. The syndrome typically presents with vague symptoms, although patients commonly report acute pelvic pain following menarche, caused by the restriction of menstrual outflow [11]. Other symptoms may include pelvic mass, normal regular menstruation, dysmenorrhea [6,8], as well as symptoms such as frequency, urgency, and vaginal discharge [8]. Approximately 90 % of patients initially experience pelvic pain, followed by pressure sensations, with around 40 % developing an abdominal mass. It is uncommon for primary infertility to be present [9]. The patient reported her had regular menses and presented with lower abdominal pain and whitish vaginal discharge.

Any abnormalities identified on antenatal ultrasounds should be promptly reported to the radiologist. This is crucial because in a significant proportion of prepubertal girls (62.8 %) with OHVIRA syndrome, the diagnosis may be made following antenatally diagnosed kidney dysplasia or kidney agenesis [12]. When antenatal ultrasound screening for congenital defects is not conducted, individuals with OHVIRA syndrome often remain undiagnosed until after menarche [12]. In the reported case, after detecting renal agenesis on sonography, further evaluation was not pursued, and the syndrome was not diagnosed.

Diagnostic laparoscopy may be unnecessary, as the diagnosis relies on the patient's medical history, physical examination, and relevant imaging studies [8]. US is the primary method for diagnosis, although MRI may be necessary for confirmation [12]. In the present case, following a physical examination and the collection of the patient's medical history, sonography, MRI, surgery all were performed to establish a definitive diagnosis.

Seventy-five percent of cases have a longitudinal vaginal septum, either entire or partial [9]. The restriction of menstrual flow in the internal urogenital organs of patients with obstructed hemivagina can result in problems such as hemoperitoneum, hematometra, hematosalpinx, and even pelvic peritonitis [13]. Additionally, cases of pelvic

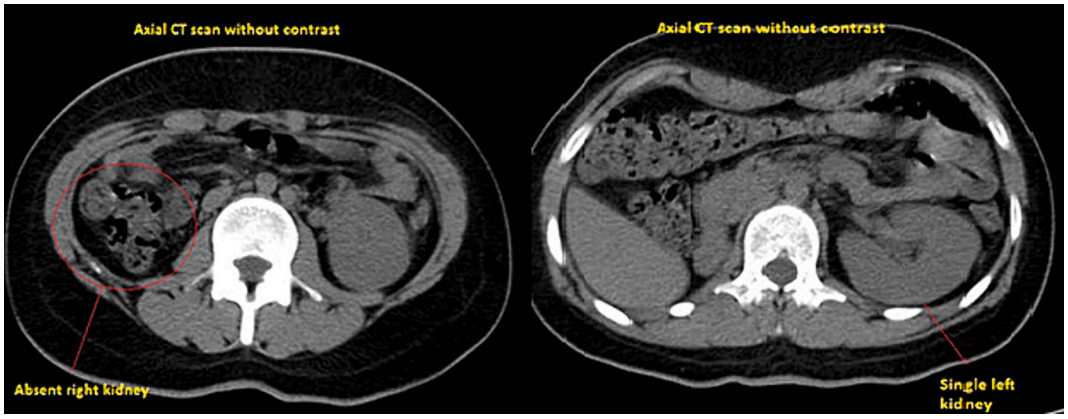

Fig. 1. CT scans showing single normal-looking left kidney and congenital absent right kidney.

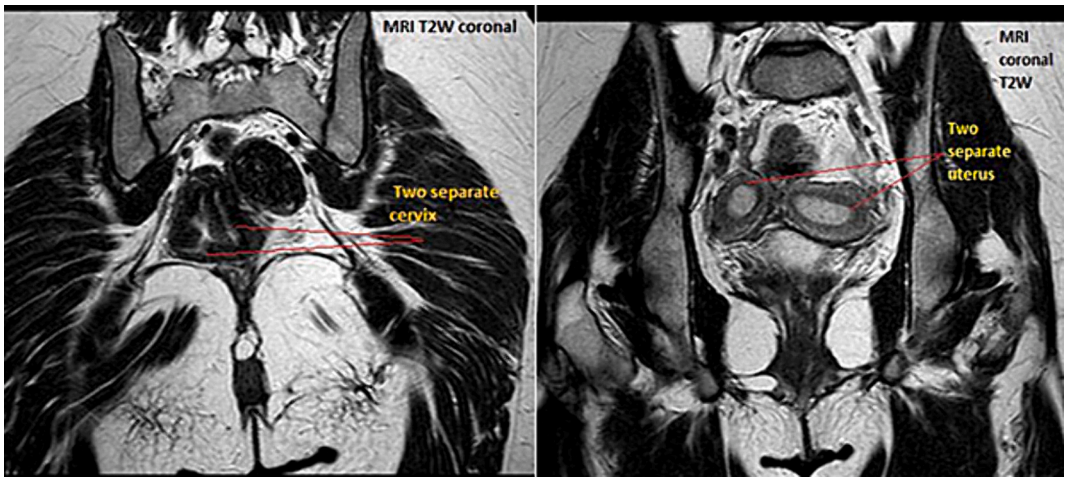

Fig. 2. Follow-up MRI showing two separate uteri with widely divergent apices, and two separate cervixes, consistent with uterus didelphys.

inflammatory disease or endometriosis have been reported, which may influence fertility or quality of life [11]. The patient reported here had a complete longitudinal septum and presented with pyocolpos, which was responsible for her symptoms.

Similar to what was performed for this case, the most crucial aspect of treating OHVIRA syndrome is draining the hematocolpos or pyocolpos and surgical vaginal septum excision [12]. This procedure aims to remove the obstruction. In addition to alleviating discomfort related to the obstruction, surgery also reduces the risk of retrograde menstrual seeding, which can result in pelvic endometriosis [10].

Follow-up is recommended for prepubertal patients with OHVIRA syndrome to monitor the function of the unaffected (single) kidney and to identify any new symptoms [12]. Patients can continue to lead a regular sexual life, and some may even become pregnant and carry their baby to term [10]. The patient reported here had normal regular menses and became pregnant after being treated with minimally invasive methods. She delivered her baby at full term with no complications.

4. Conclusion

Due to the variable presentation of OHVIRA syndrome, its diagnosis can be challenging. Therefore, it is crucial for gynecologists to have a high level of suspicion and consider OHVIRA syndrome early when antenatal ultrasound reveals renal abnormalities. Similarly, pediatricians should include renal evaluation in their assessment when uterine or vaginal anomalies are detected. Timely detection and appropriate management of OHVIRA syndrome are essential to prevent complications and preserve fertility.

Contributors

Anas R. Tuqan, Rayan R. Salahaldin, Mais E. Abubaker, Basel A. Zaben, and Anas M. Barabrah contributed to conception of the case report, acquiring and interpreting the data, drafting the manuscript, undertaking the literature review, and revising the article critically for important intellectual content.

Mohammad H. Rayyan contributed to patient care, conception of the case report, acquiring and interpreting the data, and revising the article critically for important intellectual content.

Saadeh S. Jaber contributed to patient care, acquiring and interpreting the data, revising the article critically for important intellectual content.

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Patient consent

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Provenance and peer review

This article was not commissioned and was peer reviewed.

Conflict of interest statement

The authors declare that they have no conflict of interest regarding the publication of this case report.

References

[1] The American Fertility Society classifications of adnexal adhesions, Distal tubal occlusion, tubal occlusion secondary to tubal ligation, tubal pregnancies, müllerian anomalies and intrauterine adhesions, Fertil. Steril. 49 (1988) 944–955, https://doi.org/10.1016/s0015-0282(16)59942-7.

[2] S.M. Khaladkar, V. Kamal, A. Kamal, et al., The Herlyn-Werner-Wunderlich syndrome - a case report with radiological review, Pol. J. Radiol. 81 (2016) 395–400, https://doi.org/10.12659/PJR.897228.

[3] D. Kabiri, Y. Arzy, Y. Hants, Herlyn-Werner-Wuderlich syndrome: uterus didelphys and obstructed hemivagina with unilateral renal agenesis, Isr. Med. Assoc. J. 15 (2013) 66.

[4] D.S. Riley, M.S. Barber, G.S. Kienle, et al., CARE guidelines for case reports: explanation and elaboration document, J. Clin. Epidemiol. 89 (2017) 218–235, https://doi.org/10.1016/j.jclinepi.2017.04.026.

[5] P. Vaidya, P. Agarwal, A. Vaidya, Herlyn-Werner-Wunderlich syndrome: a case report, JNMA J. Nepal Med. Assoc. 61 (2023) 283–286, https://doi.org/10.31729/jnma.8096.

[6] A.C. Aveiro, V. Miranda, A.J. Cabral, et al., Herlyn-Werner-Wunderlich syndrome: a rare cause of pelvic pain in adolescent girls, BMJ Case Rep. 2011 (2011), https://doi.org/10.1136/bcr.04.2011.4147.

[7] A. Ludwin, I. Ludwin, Comparison of the ESHRE-ESGE and ASRM classifications of Müllerian duct anomalies in everyday practice, Hum. Reprod. 30 (2015) 569–580, https://doi.org/10.1093/humrep/deu344.

[8] D. Cox, B.H. Ching, Herlyn-Werner-Wunderlich syndrome: a rare presentation with pyocolpos, J. Radiol. Case Rep. 6 (2012) 9–15, https://doi.org/10.3941/jrcr.v6i3.877.

[9] R. Mittal, Herlyn-Werner-Wunderlich Syndrome, J. Obstet. Gynaecol. India 66 (2016) 128–130, https://doi.org/10.1007/s13224-015-0707-8.

[10] S.K. Bajaj, R. Misra, B.B. Thukral, et al., OHVIRA: uterus didelphys, blind hemivagina and ipsilateral renal agenesis: advantage MRI, J. Hum. Reprod. Sci. 5 (2012) 67–70, https://doi.org/10.4103/0974-1208.97811.

[11] Y. Mabuchi, J. Hirayama, N. Ota, et al., OHVIRA syndrome pre-operatively diagnosed using vaginoscopy and hysteroscopy: a case report, Med. Int. 1 (2021) 20, https://doi.org/10.3892/mi.2021.20.
[12] A. Sijmons, S. Broekhuizen, K. van der Tuuk, et al., OHVIRA syndrome: early recognition prevents genitourinary complications, Ultrasound 31 (2023) 61–64, https://doi.org/10.1177/1742271X221102576.
[13] R. Gündüz, E. Ağaçayak, M.S. Evsen, OHVIRA syndrome presenting with acute abdomen findings treated with minimally invasive method: three case reports, Acta Chir. Belg. 122 (2022) 275–278, https://doi.org/10.1080/00015458.2021.1911096.