A Variant of Herlyn Werner Wunderlich Syndrome

Carmela Joy P. Aquino-Cabral, MD and Gladys G. Tanangonan, MD, FPOGS, FPSRM, FPSGE
Section of Reproductive Endocrinology and Infertility, Department of Obstetrics and Gynecology, Philippine General Hospital, University of the Philippines Manila

Herlyn Werner Wunderlich Syndrome is a rare congenital Mullerian anomaly that commonly presents with uterine didelphys, obstructed hemivagina and ipsilateral renal agenesis. Presented here is a rare variant with contralateral dysplastic kidney with ectopic ureteral insertion instead of renal agenesis. The patient initially presented as a case of recurrent pelvic inflammatory disease who eventually underwent excision of vaginal septum with drainage of pyocolpos. Postoperatively, the patient had urinary incontinence and was eventually referred to Urology for further surgical intervention. The wide range of symptomatology and the uncommon anatomic presentation of this case led to the delay in the diagnosis and the consequent gynecologic complications.

Keywords: Herlyn Werner Wunderlich syndrome, ectopic ureter, pyocolpos

Introduction

Herlyn Werner Wunderlich syndrome is a rare congenital Mullerian anomaly that appears in varying clinical presentations. It is caused by embryological arrest of the Müllerian and mesonephric ducts at 8 weeks of gestation.[1] Although it is classically described as the presence of obstructed hemivagina, uterine didelphys and ipsilateral renal agenesis, it has many anatomic variants leading to atypical clinical presentations causing delay in diagnosis and subsequent occurrence of gynecologic complications. Owing to the close relationship of the urinary and the reproductive tract systems, an embryologic aberration in one of these systems should prompt a clinician to investigate for anomalies on the other system.

The Case

This is a case of a 20-year old nulligravid who presented with recurrent history of pelvic inflammatory disease presenting as recurrent abdominal pain accompanied by foul-smelling vaginal discharge. Two years prior to admission, the patient had a similar presentation accompanied by febrile episodes. She was found to have an acute abdomen and underwent exploratory laparotomy at a local hospital, revealing a cystically enlarged left ovary measuring about 12cm x 10cm x 8cm. The left ovary was reported to be adherent to the uterine corpus and the surrounding bowels. Salpingo-oophorectomy was performed and on cut section, purulent material was noted. A cul de sac mass was also noted intraoperatively and aspiration of the cul de sac mass was done obtaining purulent fluid. She was diagnosed to have pelvic inflammatory disease and was treated with 2 weeks of antibiotics postoperatively. On the interim, patient had tolerable dysmenorrhea from her first to third day of menses until 2 months prior to admission, her symptoms of foul-smelling vaginal discharge, abdominal pain and fever recurred. She was again admitted at the same hospital where she was treated medically with Ampicillin and

Metronidazole for 2 weeks. However, despite a 2-week course of antibiotics, the symptoms persisted. An abdominal CT scan (Figure 1) was done revealing a hypoplastic right kidney (Figure 1C) with severe hydronephrosis, dilated right ureters (Figures 1B, 1C) with possible ectopic insertions. A large thick-walled fluid-filled lesion was also noted on the mid-pelvis which was initially signed out as the dilated cervical canal (Figure 1C (P)). Patient was then referred to our institution. On examination, the patient had normal external genitalia, there was preferential entry of the examining finger to the right side of vagina due to a bulging cystic mass (Figure 2A) on the left, about 8 cm in diameter and located about 2 cm from the hymenal ring. The cervix was not appreciated but superior to the cystic mass is a nodular structure with small opening which seemed to be the cervix. The uterine corpus and adnexa could not be appreciated due to the vaginal mass. On rectal examination, the rectal mucosa was smooth and compressed by the vaginal mass anteriorly. A three-dimensional transvaginal and transabdominal ultrasound (Figure 3) was done showing uterine didelphys (3A) with left vaginal septum and pyocolpos on the left (3C). A cystic mass was noted on the right adnexa which was signed out as endometriotic cyst (3D) and another thin walled cystic structure was noted on the right side of the vagina which was signed out as Gartner's duct cyst (3E). Both kidneys were present but there was right pelvocaliectasia. Culture of the vaginal discharge, urine and blood was done. There was no growth on vaginal discharge and blood culture. Urine culture showed growth of Escherichia coli. Patient was initially managed as a case of pelvic inflammatory disease and complicated urinary tract infection. She was given Clindamycin and Amikacin and vaginal septum excision was done under regional anesthesia. On excision of the septum, 2 liters of foul-smelling purulent material was suctioned. About 3cm of vaginal septum was excised. The patient tolerated the procedure well and was sent home on the second postoperative day. On her follow-up, the patient had minimal non-foul-smelling vaginal discharge; however, she noted urinary incontinence, soaking about 2 adult diapers per day. On speculum examination, both vaginal canals were patent. The excised edges of the vaginal septum were healed and there was pooling of clear liquid on the speculum. Internal

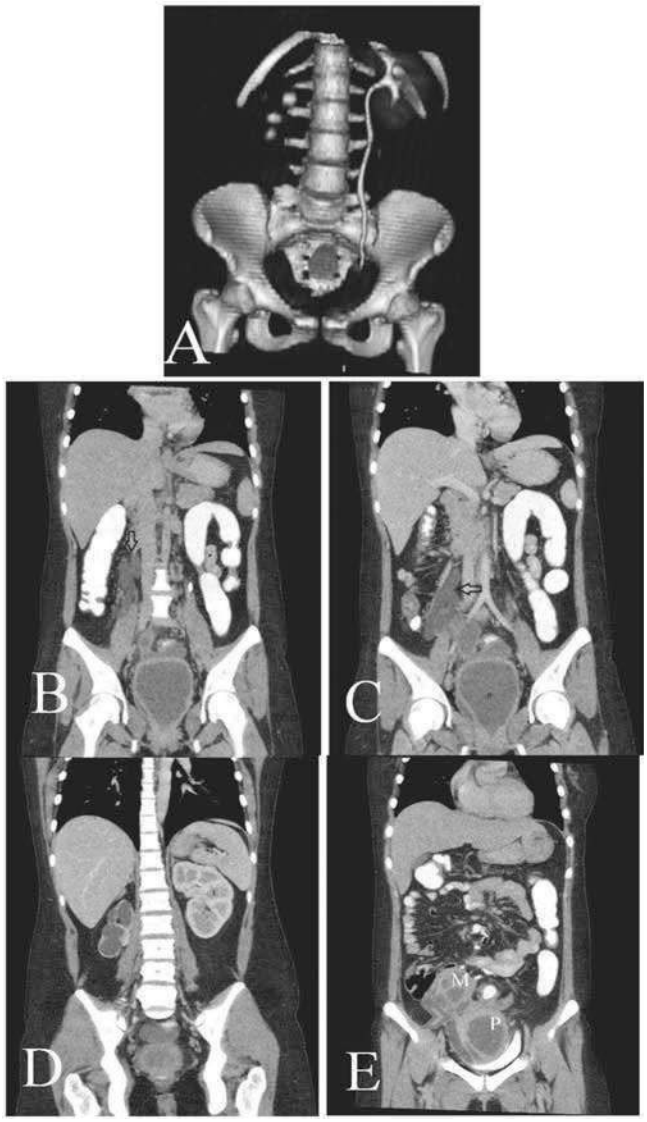

Figure 1. Abdominal CT scan, coronal reconstruction showing A. 3D volume rendered image shows the poor contrast filtration of the dysplastic right kidney in contrast to the normally functioning left kidney. Non-opacification of the right collecting systems limits adequate evaluation of the double ureter on the right B. Duplicated right ureter (arrow) with ectasia. C. Middle segment of the duplicated ectatic right ureters (arrow). D. Dysplastic right kidney (R). Notice its small size, thinned out cortex, and dilated calyces. The left kidney (L) is normal E. Right distal ureter (arrowhead) passing underneath the multiloculated right adnexal mass (M) with fluid filled left vaginal canal (P).

examination showed patent bilateral vagina; the edges of the excised septum were pliable. Both cervices were smooth, the corpus was not enlarged with a 6cm x 6cm cystic mass on the right. There were nodularities on the posterior culdesac. Her endometriosis was managed medically and she was referred to Urology and currently awaits renal surgery for her hypoplastic right kidney with possible ectopic ureteral insertion on the vagina.

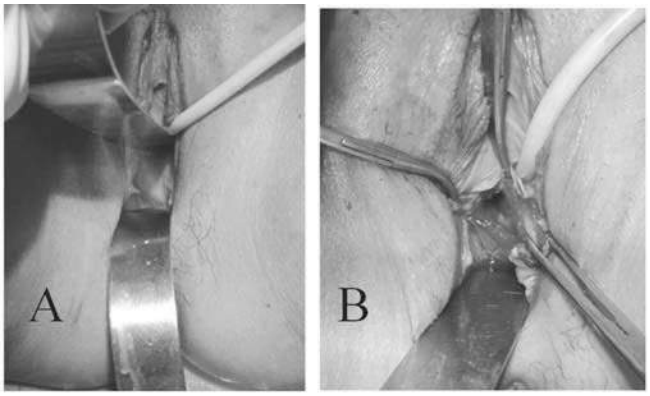

Figure 2. A. Bulging vaginal septum on the left about 2 centimeters from the hymen in a 20-year old with recurrent foul smelling discharge D. Opening of the blind hemivagina after excision of vaginal septum.

Discussion

Herlyn Werner Wunderlich Syndrome (HWWS) is a rare congenital Mullerian anomaly

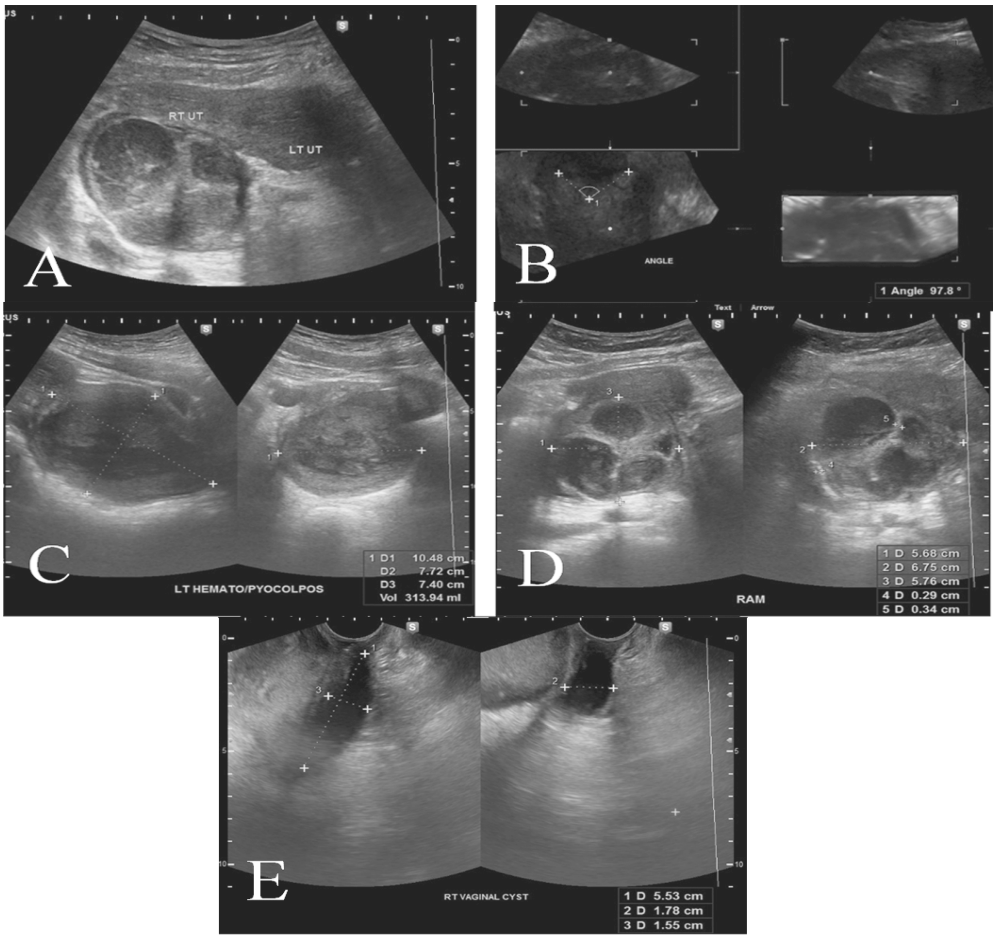

Figure 3. A. Transabdominal ultrasound showing left and right hemiuteri with the right adnexal mass which is multiloculated and multiseptated signed out as endometriotic cyst B. Three dimensional ultrasound showing heart-shaped uterus with an intercornual angle of 97.8 degrees C. Fluid filled left hemi-vagina (Volume 313 cc) D. Multiloculated and multiseptated right adnexal signed out as endometriotic cyst. E. Anechoic cystic on the lateral wall of the right hemivagina signed out as Gartner's duct cyst.

characterized by uterine didelphys, obstructed hemivagina and unilateral renal agenesis. Commonly, patients present with dysmenorrhea shortly after menarche. The case presented here had later onset of symptoms and a more complicated presentation. The anomaly presented 8 years after menarche with recurrent pelvic inflammatory disease. In a large retrospective analysis done on 79 patients with HWWS in China, patients with Herlyn Werner Syndrome were classified as having completely obstructed hemivagina (Class I) and with incompletely obstructed hemivagina (Class II) according to their clinical presentation.[2] Class I had earlier onset of symptoms with dysmenorrhea as the major presenting symptom while Class II patients had late disease presentations, being diagnosed on the third decade of life with intermittent mucopurulent discharge as the major presenting symptom as demonstrated by our case. Anatomically, the case presented does not exemplify the typical description of Herlyn Werner Syndrome because the patient had uterine didelphys and obstructed hemivagina on the left; the renal pathology was noted on the contralateral side and instead of renal agenesis, the kidney on the right was dysplastic and with double dilated ureters with possible ectopic vaginal insertion.

Case series done by Gotoh and Konayagi and Curarrino[3,4], reported the occurrence of ectopic ureter draining in a cystic mass on the lateral wall of the vagina that was interpreted as the Gartner's duct although no histologic confirmation was done. They proposed that an abnormality in the Wolffian duct occurring in the first few weeks of life can result to the occurrence of this complex malformation. In their case series with a total of 11 cases presented, 4 cases of ectopic ureteral insertion was associated with uterine didelphys. In a more recent report by Smith and Laufer[5] involving 27 patients, the most common urologic anomaly was still renal agenesis and only one presented with a contralateral duplex collecting system like our case. In the new classification of complex female genital tract anomaly, this case still falls on the distal mesonephric anomalies which include unilateral renal agenesis and ipsilateral blind or atretic hemivagina syndrome.[6,7] A similar case of renal dysplasia instead of agenesis was also reported by Acien, et al.[8] and Zhang, et al.[9]; however, the dysplastic kidneys on both case reports were noted on the ipsilateral side of vaginal septum in contrast to our case which presented with contralateral renal dysplasia. This presentation is rather uncommon and to our knowledge is the second reported case. The rarity of this anatomic variant often leads to misdiagnosis and repeated surgeries. In our case, the ectopic ureteral insertion was suggested with the CT scan result done prior to the patient's referral to our institution, and although the patient was already experiencing intermittent vaginal discharge, possibly pointing to a true incontinence brought about by the ectopic ureteral insertion, this symptom was not given emphasis because the more prominent symptom of foul-smelling purulent vaginal discharge may have masked the urine leakage. When the pyocolpos was drained after excision of vaginal septum, the patient noted significant amount of leakage. The increase in urine leakage could indicate that the ectopic ureter was inserted on the obstructed hemivagina or it could also be due to the relief from compression of the ectopic ureteral insertion from the bulging vaginal septum. In two similar reports by Duong and Shibata, et al.[10,11], the diagnosis of ectopic ureteral insertion was only made after the excision of vaginal septum when the patients presented with urinary incontinence postoperatively just like our case.

Even in complex female genital tract anomalies, a thorough and detailed history and physical examination with the aid of a transvaginal ultrasound could be all that is necessary to arrive at the correct diagnosis. In a case report by Shieh, et al.[12], ultrasound was able to detect an ectopic ureter that was inserted to a blind hemivagina. However, a case series on management and follow up of patients with obstructive hemivagina and ipsilateral renal anomaly (OHVIRA) showed that prior to referral to a tertiary institution, neither ultrasound nor magnetic resonance imaging can accurately diagnose the anomaly. Laparoscopy, hysteroscopy, vaginoscopy and hysterosalpingogram may be necessary in some cases when the result of imaging modality is inconclusive.[13] For dysplastic kidneys with ectopic ureteral

insertion, MRI has the advantage of providing good anatomic details even with poorly functioning renal moieties but its high cost precludes its routine use. More important than the imaging modalities is the familiarity with the syndrome and its related presentations. In the case presented, ultrasound examination was the diagnostic modality done because it is low-cost and readily available. A CT scan done on our case prior to referral to our institution helped in the diagnosis of the hypoplastic kidney and dilated ureter with the possibility of ectopic insertion but it was not able to identify uterine didelphys.

Surgical management of this complex disease is accomplished with simple excision of vaginal septum. In majority of cases, patients are asymptomatic after septum excision with no post-operative complications. Unfortunately, the case presented experienced postoperative urinary incontinence and subsequently, urology referral had to be done postoperatively. In cases where dysplastic kidney and ectopic ureteral insertion is present, removal of the dysplastic or non-functioning kidney and ureter may be necessary. Ideally, in patients with HWWS where an ectopic ureteral insertion is suspected, urology referral prior to excision of vaginal septum should be done. The ectopic ureter should be localized and its tract identified so that resection of the ectopic ureter and renal surgery can be done at the time of excision of vaginal septum.

The complexity of Herlyn Werner Wunderlich Syndrome and its varying presentations may cause diagnostic delay and mismanagement leading to irreversible complications that often leave significant effect on the patient's quality of life and reproductive capacity. In this case, had the vaginal septum been excised during the time of her first surgery, then the endometriosis and the recurrent hospitalizations could have been prevented. Detailed history and physical examination could not be overly emphasized and familiarity with the associated conditions is paramount in the proper management of this rare and complex syndrome.

References

1. Jung EJ, et al. Herlyn-Werner-Wunderlich syndrome: An unusual presentation with pyocolpos. Obstet Gynecol Sci 2017; 60(4): 374-7.
2. Lan Zhu, Na Chen, Jia-Li Tong, Wei Wang, Lei Zhang, Jing-He Lang. New classification of Herlyn- Werner-Wunderlich syndrome Chinese Med J 2015; 128(2).
3. Gotoh T and Koyanagi T. Clinicopathological and embryological considerations of single ectopic ureters opening into Gartner's duct cyst: a unique subtype of single vaginal ectopia. J Urol 1987; 137: 969-72.
4. Currarino G. Single vaginal ectopic ureter and gartner's duct cyst with ipsilateral renal hypoplasia and dysplasia (or Agenesis). J Urol 1982; 128: 988-92.
5. Smith NA and Laufer MR. Obstructed hemivagina and ipsilateral renal anomaly (OHVIRA) syndrome: management and follow-up. Fertil Steril 2007; 87(4).
6. Acie´n P, Acie´n MI. The history of female genital tract malformation classifications and proposal of an updated system. Hum Reprod Update 2011; 17: 693-705.
7. Acie´n D and Acie´n M. The presentation and management of complex female genital malformations. Hum Reprod Update 2016; 22(1): 48-69.
8. Acie´n P, Garc?´a-Lo´pez F, Ferrando J, Chehab HE. Single ectopic ureter opening into blind vagina, with renal dysplasia and associated utero-vaginal duplication. Int J Gynecol Obstet 1990; 31: 179-85.
9. Zhang A, Zeng X, Woo JC, Morrell M, Xu D. An unusual case of Herlyn-Werner-Wunderlich syndrome with a complete septate uterus and complicated urinary tract with rare ectopic ureteral opening. 2018. DOI: 10.1002/ijgo.12578
10. Duong DT, Shortliffe LM. A case of ectopic dysplastic kidney and ectopic ureter diagnosed by MRI. Nat Clin Pract Urol 2008; 5: 632-6.
11. Shibata T, Nonomura K, Kakizaki H, et al. A case of unique communication between blind-ending ectopic ureter and ipsilateral hemi-hematocolpometra in uterus didelphys. J Urol 1995; 153: 1208-10.
12. Sheih CP, Chiang CD, Liao YJ, Li YW. Ultrasonic detection of a single vaginal ectopic ureter inserted into an imperforate hemivagina. J Clin Ultrasound 1997; 25: 133-5.
13. Wang ZJ, Link HD, Coakley FV, Yeh BM. Ectopic ureter associated with uterine didelphys and obstructed hemivagina: preoperative diagnosis by MRI. Pediatr Radiol 2010; 40: 358-60.