Original Article

# Herlyn-Werner-Wunderlich syndrome (HWWS) - A case series and review of literature

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## Abstract

Herlyn- Werner- Wunderlich syndrome is a rare congenital anomaly of the Mullerian and Mesonephric ducts characterised by a triad of uterine didelphys, obstructed hemivagina and ipsilateral renal agenesis. Prevalence is 0.1-3.8%. Exact etiology is not known. We at Dr D Y Patil hospital, Mumbai, present a case series of this rare syndrome at our tertiary health care unit followed by a meticulous review of literature of similar cases and case series related to the topic. All the 3 cases had a varied presentation ranging from one at menarche with dysmenorrhoea, the other one with infertility and the last one with successful spontaneous conception with a previous preterm vaginal delivery and current pregnancy with malposition that delivered at term. USG is the gold standard a for diagnosis and MRI is a better modality for confirmation of diagnosis and planning further management. Management is by resection of the septum followed by drainage of the collection- hematocolpos or hematometra, amd in some cases ipsilateral hysterectomy in cases with non communicating horn. Fertility improves after surgical correction but abortion rates are high. Prognosis is good if diagnosed and treated early.

**Key Words**: Herlyn-Werner-Wunderlich syndrome.

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## INTRODUCTION

Herlyn-Werner-Wunderlich (HWW) syndrome is part of a spectrum of Müllerian duct anomalies that occur during the development of the embryo. The syndrome is characterized by uterus didelphys, obstructed hemivagina, and ipsilateral renal agenesis.[1] Exact etiology is not known but may be caused by developmental abnormality of Mullerian and wolfian ducts.[5,6]. Prevalence is 0.1% to 3.8%.[6]

**Classification of HWWS**: The new classification has been suggested by Lan Zhu *et al* in 2015[9]

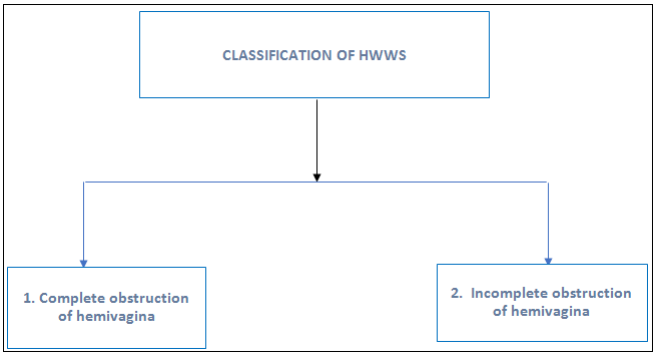


**Figure 1:**

The above 2 categories are further subclassified as following.

**Clinical Examination:** Clinical manifestations varies in different types of HWWS.[9] Completely obstructed hemivagina usually presents at early age (within few months after menarche) with dysmenorrhoea, hematometra, hematosalpinx and hematoperitoneum, abdominal pain, fever and secondary endometriosis.

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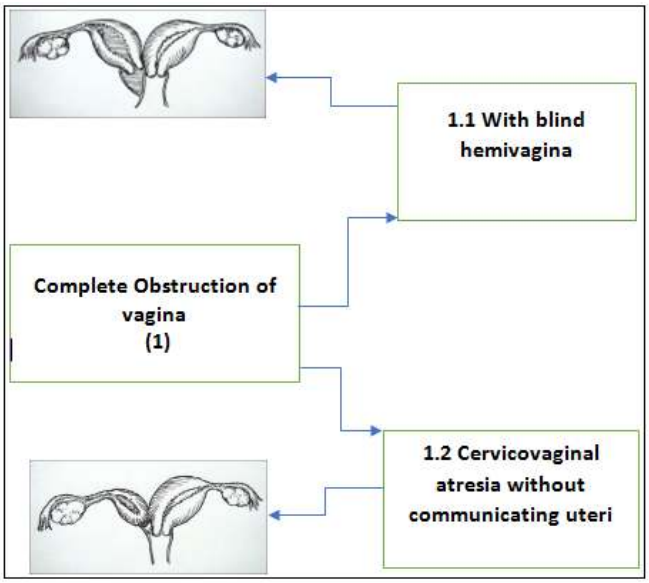


Figure 2

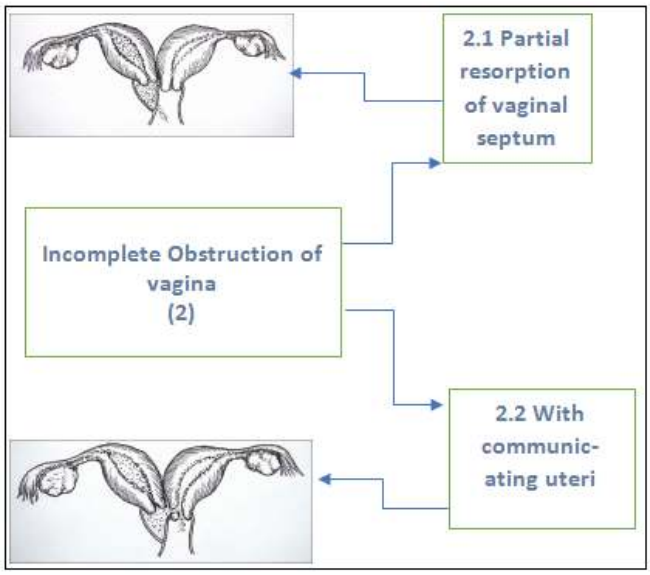


Figure 3

## CASE REPORS

We present a case series of 3 cases within a span of 6 months at our tertiary health care unit, Dr D Y Patil Medical College, Navi Mumbai. All the 3 cases had different presentations reflecting the wide spectrum of the syndrome.

### CASE 1

26 years old, G3P1L0A1, first was spontaneous miscarriage at 13 weeks of gestation, previous spontaneous preterm delivery at 26 weeks resulted in early neonatal death, currently 34 weeks came in advanced preterm labour. She was not registered antenatally and presented to emergency ward. There were no previous obstetric records. She was taken for emergency LSCS for fetal distress in view of meconium stained amniotic fluid. She had no previous ultrasound scans in the current pregnancy. Intraoperatively uterine didelphys bicollis was noted. Per speculum examination revealed partial vaginal septum. Sonography was done postoperatively on 7$^{th}$ day which confirmed uterine didelphys and absent left kidney. (Reported as HWW syndrome). Patient recovered well postoperatively and was discharged home with baby.

### CASE 2

18 year old, unmarried presented with complaints of dysmenorrhoea since 3 years and pain in the left iliac fossa which was spasmodic and worsening in nature since the last 1 month. Her periods were regular, moderate in flow and gradually painful and menarche was at 12 years. Abdomen examination revealed a left sided mildly tender lump above the inguinal ligament extending into the suprapubic region. Ultrasound revealed uterine didelphys with hematometra, suspected bilateral hydrosalpinx or tuboovarian mass with left renal agenesis. Laparotomy was perfomed which showed single pinpoint cervix, single vagina. Left sided hydrosalpinx along with left sided chocolate cyst was noted. (ovarian endometriosis). Bicornuate uterus with left sided non communicating horn was seen. Right sided horn was normal. Left sided horn with the tube and ovary was removed and sent for histology.

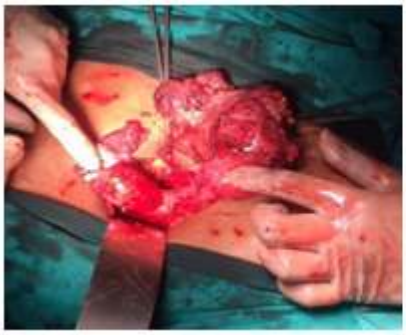

Figure 4:

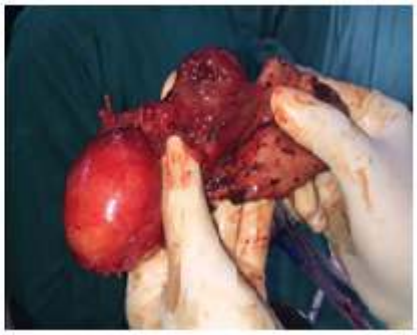

Figure 5:

## CASE 3

20 years, married since 2 years presented with primary infertility and chronic pelvic pain to our outpatient department. Clinical examination revealed 2 cervices on per speculum examination. Ultrasound examination was reported as uterine didelphys and bicollis with hematocolpos with oblique vaginal septum (which was not appreciated on per speculum examination), normal ovaries and absent right kidney. The same was confirmed on MRI. Diagnostic and operative Hysterolaparoscopy was performed which showed septate uterus, oblique septum extending from fundus to the cervix.[27] A vaginal septum was seen with a small haematoma. Uterine, cervical and vaginal septum was incised hysteroscopically under direct vision and tarry black coloured fluid (Old blood) drained from the hematocolpos. Tubal patency was checked by chromopertubation and both ovaries were normal. Patient recovered well postoperatively and conceived spontaneously within 6 months. She is being followed up regularly antenatally.

## DISCUSSION

Herlyn- Werner- Wunderlich Syndrome is a very rare congenital anomaly characterised by uterine didelphys and blind hemivagina associated with ipsilateral renal agenesis.[2,3,4] The presentation of the syndrome is varied as evident in our case series. The syndrome usually presents with recurrent and progressive pelvic pain after menarche as noted in our second case.[8,15]. The cases with obstructed hemivagina present earlier within a few months of menarche due to the swelling from hematocolpos which if not treated immediately may result in hematometra and secondary endometriosis.[7,18]. Similar presentation and outcome has been noted in the case report by Jindal G *et al* 2008[8]. The spectrum of presentation is very wide. On one hand they present with infertility while other variants conceive successfully and deliver vaginally in 33% of cases after surgical treatment.[9,16]. USG and MRI are very useful modalities for diagnosing and classifying Mullerian duct anomaly.[17] MRI is useful to characterise the pelvic anatomy better.[19] Surgical correction is the best treatment for this syndrome which can be vaginal septum resection done hysterolaparoscopically with drainage of hematocolpos or hematometrocolpos[8] as done in our third case of the series or by laparotomy with ipsilateral hysterectomy as in our second case. Prognosis of HWW syndrome is good with early diagnosis and early management. Fertility improves after surgical correction but abortion rates are high (74%) and premature delivery is common (22%). Caesarean section is required in 82% of cases.[20]

## REVIEW OF LITERATURE

Mullerian anomalies are congenital defects of the female reproductive tract that develop from the non fusion or even non development of the paramesonephric ducts or failure of resorption of the uterine septum.[10] It is a rare congenital disorder characterised by a triad of mullerian duct anomaly, obstructed hemivagina and mesonephric duct anomaly. The female reproductive tract develops from a pair of Müllerian ducts that form the fallopian tube, uterus, cervix, and the upper two-thirds of the vagina. The ovaries and lower third of the vagina are derived from germ cells that migrate from the primitive yolk sac and the sinovaginal bulb, respectively. Normal development of the Müllerian ducts depends on the completion of three phases: organogenesis, fusion, and septal resorption.[2] The exact etiology and pathogenesis of HWW syndrome is still not clear.[10,11,12], but probably associated with fact that the Wolfian duct is related to the actual development of the female internal genital organs as well as the kidneys[10,11,13]. They are inductor elements for complete fusion of the Mullerian ducts. For this reason embryologic anomaly of one Wolfian duct may cause unilateral renal agenesis with obstruction of hemivagina.[13,14]. This hypothesis is supported by Gruenwald's experiment in chick embryos.[14]. On the affected side the two Mullerian ducts do not fuse resulting in a didelphic uterus with the nonfusion with the centre of the urogenital sinus forming two separate vagina with one obstructed[10]. Few single case reports or small series reporting have been done in the past. This syndrome is named after Herlyn and Werner (1971) who initially described renal agenesis and ipsilateral blind hemivagina.[3] Later in 1976 Wunderlich described an association of right renal aplasia with a bicornuate uterus and simple vagina in the presence of an isolated hematocervix.[4] In 2004, 8 cases of HWS have been reported by Zurawin *et al*.[7] He suggested that the incidence of uterine didelphys in HWW syndrome varies from 1/200 to 1/28,000 cases and the incidence of accompanying unilateral agenesis is 43%.[7] Similarly in 2006, 12 cases of paediatric HWWS have been reported by Gholoum *et al*[8]. Tong *et al* in 2013 suggested the lateral distribution of hemivaginal obstruction and renal agenesis favoured the right side in 42 patients (60.0%). Approximately 75% of patients with didelphys uterus have a complete or partial vaginal septum[22], which is most commonly longitudinal in HWW and is thought to reflect a disorder of lateral fusion between the inferior portions of the two Müllerian ducts.[21] Early detection is important to prevent complications like hematometra, hematosalpinx and secondary endometriosis as well as to preserve the fertility.[10,24]. These patients commonly present with abdominal pain and less commonly, with

perineal discomfort, secondary to the enlarging hematocolpos, which may also lead to urinary retention and constipation in some cases, typically 12-18 months after menarche. In cases of infected hematocolpos, fever, chills, nausea and vomiting may be present.[23,24]. USG and MRI are useful for diagnosing HWW syndrome.[10,19]. Transvaginal ultrasound has traditionally been the preferred initial imaging modality due to low cost, avoidance of radiation exposure and better imaging of the uterus and adnexa.[23] The latter is an excellent and non invasive modality of imaging. It helps in classifying the different types of the anomaly and also helps in planning surgical management of the case.[17] Resection of the vaginal septum is the treatment of choice for obstructed hemivagina and resultant hematocolpos[8,25] Vaginal septotomy is accomplished most commonly through a hysteroscopic approach[26,27], although laparoscopic techniques have also been described. Laparoscopy adds the theoretical benefit of further delineating exact uterine and pelvic anatomy prior to vaginal septotomy. Patients who remain with stenosis of the vaginal septum after surgery can safely undergo re-resection of the septum with preserved ability to conceive and maintain pregnancy[10]. Either total or unilateral hysterectomy may be required in cases in which septal resection is not possible[26] and may also be considered in patients with recurrent stenosis and severe endometrial/uterine infection or in patients who do not wish further pregnancies[10] Prognosis is good, with the major concern being preservation of fertility. Women with uterus didelphys have a high likelihood of becoming pregnant[10,28,29,30] with approximately 80% of patients able to conceive[9,31] but with elevated rates of premature delivery (22%) and abortion (74%); cesarean section is necessary in over 80% of patients[31,32]

## CONCLUSION

HWW syndrome is a rare congenital disorder characterised by a triad of mullerian duct anomaly, obstructed hemivagina and mesonephric duct anomaly. The presentation varies according to the type of anomaly. Early recognition is important to prevent complications and for preservation of fertility. Prognosis is good if detected and managed early.

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