Herlyn–Werner–Wunderlich syndrome: An “early” onset case report and review of Literature

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Abstract

Herlyn–Werner–Wunderlich syndrome (HWWS) is a rare congenital mullerian anomaly consisting of uterus didelphys, hemivaginal septum, and unilateral renal agenesis [1,2]. Most authors reported cases of Herlyn–Werner–Wunderlich syndrome with prepuberal or postpuberal onset with cyclical abdominal pain and a vaginal mass [3–8]. Only six cases are reported in Literature with early onset of this syndrome under 5 years (9–14). Our case is about 3 years old girl, with all the features of this syndrome who came to our attention for lower abdominal mass. The aim of this article is to share our experience and focus the attention on the importance of high level of suspicion of HWWS in neonatal period to early diagnosis and treatment. The possible early presentation of this syndrome should be suspected in all neonates (females) with renal agenesis confirmed postnatally or with prenatal diagnosis. It is common, in fact, an error of evaluation with planning of removal of mass, that can damage patients in term of chance for a successful reproductive outcome. For all these reasons, our team consider HWWS as differential diagnosis in newborn with prenatal ultrasonography of a cystic mass behind the urinary bladder in the absence of a kidney and plan a pelvic ultrasound (with aim to identify an uterus, normal or dydhelfus, and presence or absence of pelvic mass), an examination under anesthesia and cystoscopy and vaginoscopy, if it is necessary. A high level of suspicion, indeed, is the key to early diagnosis.

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1. Introduction

Herlyn–Werner–Wunderlich syndrome (HWWS) is a rare congenital mullerian anomaly consisting of uterus didelphys, vaginal septum, and unilateral renal agenesis [1,2]. Most authors reported cases of Herlyn–Werner–Wunderlich syndrome with prepuberal or postpuberal onset with cyclical abdominal pain and a vaginal mass [3–8]. Only six cases are reported in Literature with early onset of this syndrome under 5 years [9–14]. Our case is about 3 years old girl, with all the features of this syndrome who came to our attention for lower abdominal mass. The aim of this article is to share our experience and focus the attention on the importance of high level of suspicion of HWWS in neonatal period to early diagnosis and treatment.

2. Case report

A 3-years-old girl was admitted to our department with diagnosis of lower abdominal mass, that had made at other hospital, associated with 1 year history of lower abdominal pain. This pain had worsened in the last 5 months and it was sometimes associated with dysuria. On physical examination, a tender, mobile, and painless mass was palpated in the right lower abdomen. The external genitalia were normal in appearance, no alterations of external genitalia or hymen, but her vaginal mucosa appeared to bulge into the perineum. Routine urine and blood exams were normal. Abdominal and pelvis ultrasound (US) showed a cystic mass in the pelvic cavity measuring $3 \times 5$ cm, normal uterus, no visualized right kidney, suggesting its absence. MRI with contrast was performed and showed 2 communicating cystic masses in right lower abdomen and pelvis. The upper measured $6 \times 2$ cm and the lower $1.5 \times 2.5$ cm (Fig. 1). The lower was placed between bladder and rectum. Only right ovary was identified. The uterus appeared normal for age. The right kidney absence was confirmed. Transverse vaginal septum was identified. After discussion about differential diagnosis, we suspected HWWS syndrome and we planned an examination under anesthesia and cystoscopy and vaginoscopy. Cystoscopy showed normal bladder with absence of right hemitrigone and evidence of normal left ureteric orifice. Careful examination of genitalia revealed that a bulging of the vagina was a right transverse vaginal septum (Fig. 2). Intraoperative vaginoscopy by left orifice revealed a normal hemivagina, with cervix, and blind right hemivagina. A transvaginal resection of vaginal septum was performed with releasing of mucous (100 cc about) (Figs. 3 and 4). A final vaginoscopy showed unique vaginal cavity with double cervix. A 12F Foley catheter was placed in the bladder. The postoperative...
recovery was uneventful; bladder catheter was removed in third postoperative day. The child drained mucous from the vagina for about 20 days after surgery. One month postoperatively, follow-up ultrasound examination revealed absence of pelvic mass, not abdominal fluid, didelphys uterurus (not seen on the previous ultra- sounds) and both ovaries. The child has been followed up for 1 year, she is healthy and symptom free. External genitalia are normal on physical examination. The plan is to follow up the child regularly until puberty in association with our gynecologist.

3. Discussion

Herlyn–Werner–Wunderlich syndrome consists of unilateral renal agenesis, a blind vagina, and uterus didelphys.

The association of renal agenesis with unilateral blind hemi- vagina was reported as Herlyn–Werner syndrome in 1971 [15], whereas the association of renal aplasia, bicornuate uterus with isolated hematocervix, and a simple vagina was reported by Wunderlich in 1976 [16]. This syndrome is a rare variant within the spectrum of mullerian duct anomalies. The most basic classification of mullerian ductal defects consists of (a) agenesis and hypoplasia, (b) defects of vertical fusion, and (c) defects of lateral fusion [8]. Indeed, HWWS may represent a failure of vertical and lateral fusion of mullerian structures. The actual incidence of mullerian anomalies is unknown. Patients with HWWS are usually asymptomatic until menarche when they present an

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**Fig. 1.** MRI showing two cysts. Upper (U) 6 x 2 cm and lower (L) 1.5 x 2.5 cm.

**Fig. 2.** Physical examination of genitalia. U (urethra), I (hymen), VS (vaginal septum).

**Fig. 3.** (A) Identification of transverse vaginal septum; (B) section by bipolar of vaginal septum; (C and D) evidence of spill of mucus (hydrocolpus); (E and F) evidence of left hemivagina (E) and right hemivagina (F).
Table 1
This table summarizes the largest series of HWWS.

| Series-n (references) | Median age at presentation | Symptoms | Treatment |
|-----------------------|----------------------------|----------|-----------|
| 13 [3]                | 17.2 years                 | Severe pelvic pain, progressive dysmenorrhea, and irregularity in menses | 7 Vaginal septum excision and marsupialization |
|                       |                            |          | 4 Refused procedures |
|                       |                            |          | 2 Clinical follow-up |
|                       |                            |          | Surgical treatment |
| 39 [4]                | 18.1 years                 | Dysmenorrhea, Cystic mass in vaginal wall, Abnormal vaginal discharge | Vaginal excision of obstructive septum ± hysteroscopic metroplasty ± cervicoplasty |
| 87 [5]                | 20.7 years                 | Dysmenorrhea (94%), spotting (41%), chronic pelvic pain (24%), vaginal discharge (14%), dyspareunia (14%), fever (3%), and acute abdomen pain (2%) | Vaginal septectomy |
| 70 [6]                | 16.4 years                 | Dysmenorrhea, Intermittent mucopurulent discharge, Irregular vaginal hemorrhage, Endometriosis | Surgical treatment of the haematocolpos/haematometrocolpos |
| 11 [7]                | 13 years                   | Lower abdominal pain, progressive dysmenorrhea, irregular menses, discharge of longstanding, partially clotted menstrual blood, menorrhagia, and acute abdominal pain | All patients were treated by vaginal septectomy with marsupialization and drainage of the hematocolpos/hematometrocolpos |
| 12 [8]                | 13 years                   | Menstrual irregularity 4 | One patient required a laparotomy and salpingectomy for pyosalpinx and intraabdominal abscess formation |

Hydrometrocolpos on the side of obstructed hemivagina producing a mass effect and pain. However, the diagnosis of HWWS may be delayed by several months because menstruation is often normal. Many authors [3–8], indeed, reported cases of HWWS in post-pubertal adolescents or adult women where hematocele produces a more pronounced mass effect and pain with more complications. If this syndrome is suspected, the diagnosis is simply and it can be made by ultrasound and computed tomography and/or MRI of the abdomen and pelvis [17]. Resection of the vaginal septum is the treatment of choice for obstructive hemivagina. It can

Table 2
This table summarizes all cases of HWWS, under 5 years old, who are reported in Literature.

| Patient (reference) | Age at presentation | Symptoms/history | Treatment |
|---------------------|---------------------|------------------|-----------|
| 1 [9]               | 5 months            | Acute urinary retention | Not known |
|                     | 3 years             | Painless abdominal mass | Endoscopic incision and resection |
| 1 [10]              |                     | She had a history of prior open drainage of a similar mass on day 1 of life and percutaneous drainage of a similar mass at age 1 year | |
| 1 [11]              | 4 years             | History of abdominal pain of 1-year duration | Abdominal exploration through a Pfannenstiel |
| 1 [12]              | Newborn             | Prenatal diagnosis of a dilated left pelvic kidney and postnatal diagnosis of a uterus didelphys with a communication between the left hemiuterus and the fluid-filled structure | Trans-hymenal surgical resection |
| 1 [13]              | Newborn             | A reddish, prolapsed mass over the infant’s vaginal introitus | Trans-hymenal incision and catheter drainage |
| 1 [14]              | Newborn             | Prenatal sonography revealed the absence of the left kidney and a retrovesical cystic lesion suspected as hydrometrocolpos. Postnatal evaluation confirmed that the cystic lesion was a hydrocolpos associated with double uterus and blind hemivagina | Not known |
be made by abdominal approach through a Pfannenstiel incision or laparoscopy or by trans-hymenal approach [3–14,18]. In our opinion, the transhymenal approach is the best choice because it is efficient and simply to apply, reducing risks of abdominal surgery and with good esthetic results. However, a certain preoperative diagnosis must be present to perform it. The timing of diagnosis is an important goal for surgeon to avoid complications and preserve reproductive capacity. Laparoscopic approach should be reserved to cases of adolescent with suspicion of endometriosis that can be associated with HWWS [6]. Patients with this syndrome after treatment can have normal sexual relations and fertility is not compromised, even if the spontaneous abortion rate is high (40%) [19].

We decided to describe our case and share our experience based on the results of review of Literature. The largest series of HWWS are summarized in Table 1 [3–8], but all of these reported adolescent patients or prepuberal. We found only 6 cases of HWWS with onset under 5 years and their main features are shown in Table 2 [9–14]. Our case is the seventh “early” case of HWWS in Literature.

4. Conclusion

In conclusion, the main aim of this report is focusing the attention on the possible early presentation of this syndrome that should be suspected in all neonates (females) with renal agenesis confirmed postnatally or suspected prenatally. It is common, in fact, an error of evaluation with planning of removal of mass, that can damage patients in term of chance for a successful reproductive outcome. For all these reasons, our team considers HWWS as differential diagnosis in newborn with prenatal ultrasonography of a cystic mass behind the urinary bladder in the absence of a kidney and plan a pelvic ultrasound (with aim to identify an uterus, normal or didelphys, and presence or absence of pelvic mass), an examination under anesthesia and cystoscopy and vaginoscopy, if it is necessary. A high level of suspicion, indeed, is the key to early diagnosis.

Conflict of interests

The authors have no conflicts of interest to disclose. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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Authors contribution

All authors conceptualized and designed the study, drafted the initial manuscript, and approved the final manuscript as submitted.
Dr. Angotti Rossella conceptualized and designed the study, drafted the initial manuscript, and approved the final manuscript as submitted.
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Prof. Mario Messina conceptualized and designed the study, drafted the initial manuscript, and approved the final manuscript as submitted.

All are agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Consent

We have consent form from patient.

Guarantor

Rossella Angotti is the guarantor of this paper.

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