A Case of Mayer-Rokitansky-Kuster-Hauser (MRKH) Syndrome Type B With Vesico-Vaginal Fistula

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Mayer Rokitansky-Kuster-Hauser, Vesico-Vaginal Fistula, Amenorrhea.

Introduction
The Mayer Rokitansky-Kuster-Hauser (MRKH) syndrome is caused by embryologic underdevelopment of the Müllerian duct, with resultant agenesis or atresia of the vagina, uterus or both. It is characterized by congenital aplasia of the uterus and the upper two thirds of the vagina [1-4].

MRKH syndrome constitutes the second most common cause of primary amenorrhea, after gonadal dysgenesis [5]. The incidence is 1 in 5000 [2-5].

MRKH syndrome has been divided into two types: type A (typical form) is an isolated anomaly also known as the Rokitansky sequence. Type B (atypical form) is characterized by asymmetric uterine buds or abnormally developed fallopian tubes. This atypical form is associated with anomalies that involve other systems - renal, cardiac, otologic, and skeletal systems. MRKH syndrome in association with vesico-vaginal fistula and a solitary ectopic (pelvic) kidney has not been reported in literature.

Imaging
The upper part of the vagina and the uterus were absent. The outlined lower vagina measured about 2.8cm long. Subsequent filling of the vagina with approximately 20ml of gel failed to distend it. However, evidence of the instilled gel was seen within the urinary bladder as serpentine hyperintensities on T2W images. There is evidence of gas within the antero-superior aspect of the urinary bladder implying some degree of communication between the urinary bladder and the external environment.

Both ovaries were present but enlarged. The right kidney was absent. The left kidney measured 10.2 x 7.9cm and is noted within the left side of the pelvis with normal signal characteristics.

Clinical Presentation and Findings
A 28 year-old female with primary amenorrhea was referred from a district hospital after ultrasound scan detected the uterus was absent. She was not married and had had previous surgery for imperforate hymen. Her height was 1.6m. There was no skeletal deformity or hearing impairment. Her breasts, pubic hair and external genitalia appeared normal.

Figure 1: Sagittal T2W (right) images of the pelvis showing agenesis of the upper vagina and the uterus.
Mayer–Rokitansky–Kuster–Hauser (MRKH) syndrome is a class 1 Mullerian anomaly characterized by congenital absence of the upper two-thirds of the vagina and an absent or rudimentary uterus in women who have normal development of secondary sexual characteristics and a 46, XX karyotype. It results from agenesis or hypoplasia of the Mullerian (paramesonephric) ducts. Associated abnormalities of the kidneys and other organ systems are often seen [3,7]. In this case the patient had single kidney on the left in an ectopic position (pelvis).

Etiologically, this syndrome may be caused by the lack of development of the Mullerian ducts between the fifth and the sixth weeks of gestation. To explain this condition, it has been suggested that in patients with MRKH syndrome, there is a very strong hypersecretion of Mullerian-inhibiting factor (MIF), which would provoke the lack of development of the Mullerian ducts from primitive structures (as what normally occurs in male phenotype). These alterations are commonly associated with renal agenesis or ectopia. Specific mutations of several genes such as WT1, PAX2, HOXA7-HOXA13, PBX1, and WNT4 involved in the earliest stages of embryonic development could play a key role in the etiopathogenesis of this syndrome [3].

The diagnosis of MRKH syndrome is associated with profound psycho-social issues ranging from low self-esteem to infertility. As such early recognition by way of diagnosis is a crucial step in the multidisciplinary management of such cases.

Complete androgen insensitivity syndrome (CAIS, also called Morrison syndrome) is an important differential (absent gonads virilization) [6].

CAIS is an androgen receptor defect disorder associated with vaginal and uterine agenesis in women with a 46,XY karyotype [7].

Individuals with CAIS are phenotypic females with normal breast development, minimal pubic and axillary hair. Although the external genitalia are within normal limits, the vagina is typically absent or rudimentary and the uterus absent. Gonads found in the labia majora, inguinal ring, or intra-abdominally, were variably noted on physical exam [8].

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**Conclusion**

In patients presenting with primary amenorhea and congenital absence of the uterus, a high index of suspicion for MRKH should be maintained.

Further radiological evaluation may detect associated anomalies of the other systems, which will be essential for optimal management of the patient, as was demonstrated in our case.

Chromosomal analysis (Karyotypic studies) is essential to rule out CAIS which is the main differential.
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