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Case Report

Precocious Puberty as an Unusual Presentation in Mayer-Rokitansky-Kuster-Hauser Syndrome: A Case Report

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Abstract

Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is a rare congenital disorder that affects the female reproductive system, resulting in uterovaginal agenesis. It's typically presented as primary amenorrhoea in adolescence in female with normal development of secondary sexual characteristics and 46, XX karyotype. In this article, we report an unusual case of MRKHS of a girl of 7 years old who consulted for premature thelarche & pubarche. She has a normal karyotype (46, XX) with normal external genetalia. Gonadotropin releasing hormone (GnRH) stimulation test revealed a peak LH level of 1.77 UI/l and peak FSH level of 5.44 UI/l. Imaging disclosed advanced bone age at 10 years. Pelvic MRI showed uterine hypoplasia with partial vaginal agenesis.

Keywords: Mayer-Rokitansky-Küster-Hauser syndrome, precocious puberty.

INTRODUCTION

Mayer-Rokitansky-Küster-Hauser syndrome (MRKHS), also known as Müllerian aplasia, is a congenital disorder characterized by complete or hypoplasia of the uterus and upper part of the vagina in females due to malformation of the müllerian duct during embryogenesis [1]. MRKHS is divided into two subtypes: MRKHS type 1 which includes isolated abnormalities of the reproductive system, and MRKHS type 2, which also has a range of extragenital anomalies, including skeletal and renal malformations, short stature, ontological anomalies, and other defects [2].

MRKHS usually presents as primary amenorrhoea in adolescence in females showing normal development of secondary sexual characteristics and a normal 46, XX karyotype, which can explain delay in diagnosis [3].

In this article, we highlight a rare clinical presentation of Mayer-Rokitansky-Küster-Hauser syndrome in a child revealed by precocious puberty.

CASE PRESENTATION

A 7-year-old girl was presented to our consultation for breast enlargement and mastodynia. She was the third child born at full term by spontaneous delivery with normal birth weight. There was no antenatal history of any infection or chronic disease during gestation. There was no family history of similar cases or consanguinity. She had no psychomotor or congenital developmental issues. In addition, he was not exposed to essential oils such as lavender and tea tree. On physical examination, her height was 130 cm (+2 standard deviation (SD)) and weight 31 kg (+3SD). Her BMI was 18.34 kg/m2. She was Tanner stage 2 for breast and pubic hair development. The external genitalia were normal and she did not undergo a pelvic examination due to virginity. Routine hematological and biochemical analyses were normal. Endocrine evaluation revealed a basal luteinizing hormone (LH) < 0.1 mUI/ml and basal follicle stimulating hormone (FSH) of 1.02 mUl/ml and estradiol (E2) of 13.99 pg/ml Gonadotropin releasing hormone (GnRH) stimulation test revealed a peak LH level of 1.77 UI/l and peak FSH level of 5.44 UI/l. Additional hormone assays included a testosterone of 0.43 ng/ml, *dehydroepiandrosterone* sulfate (DHEA-S) level of 159 µg/dl and 17OH progesterone of 0.5 ng/ml. The bone age (BA) was 10

years using the Greulich and Pyle method. The MRI of the hypothalamic pituitary axis was normal. Her karyotype was also normal (46, XX). On abdominal - pelvic ultrasound, the estimated size of both ovaries was 27*8mm.The MRI ruled out adrenal masses and showed uterine hypoplasia with partial vaginal agenesis (Figure 1 & 2). Based on these results, she was diagnosed with Mayer-Rokitansky- Küster-Hauser syndrome (MRKHS) with precocious puberty.

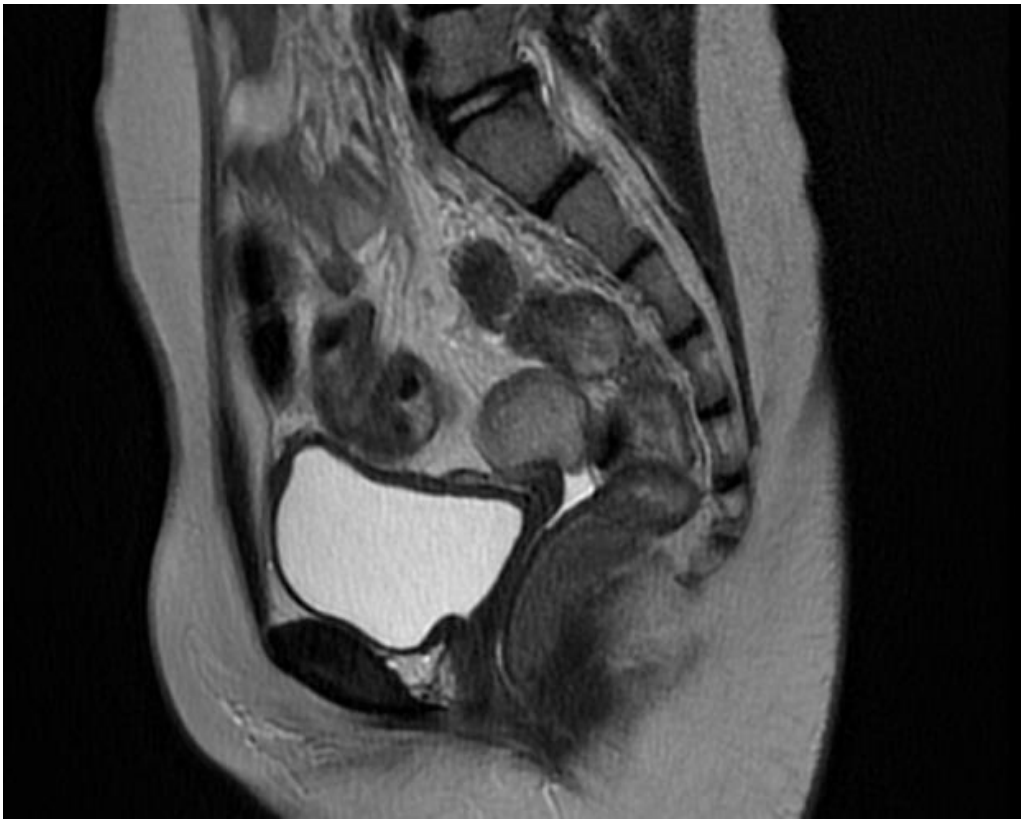

Figure 1: Uterine hypoplasia with partial vaginal agenesis on pelvic MRI in sagittal section

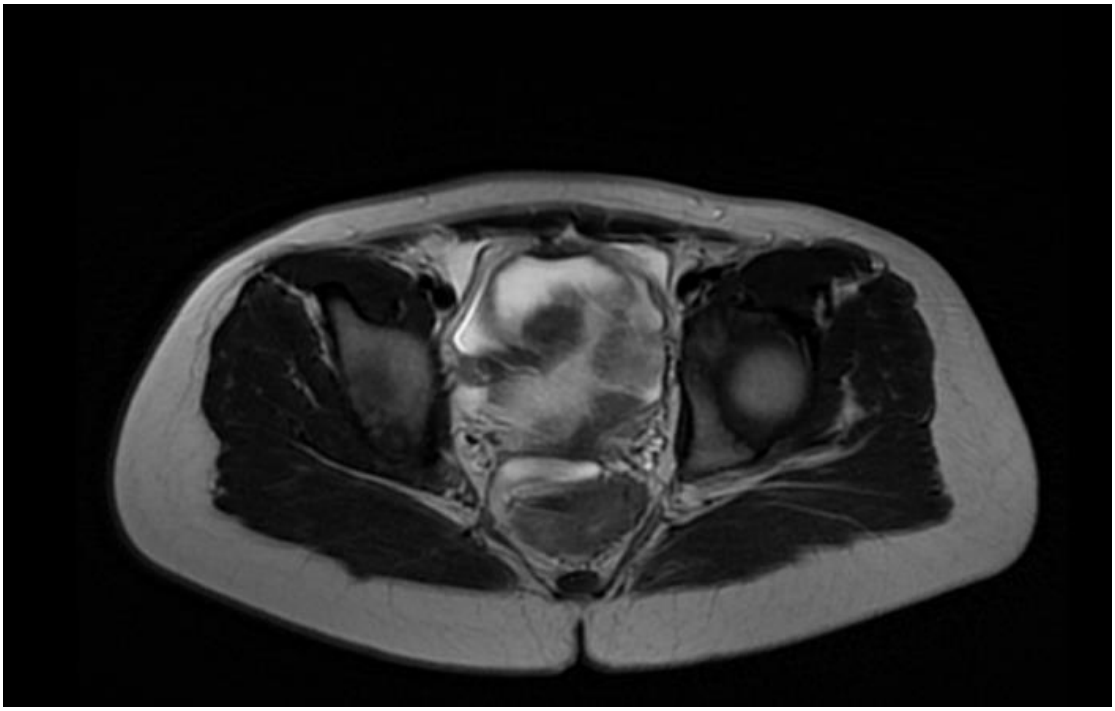

Figure 2: Uterine hypoplasia with partial vaginal agenesis on pelvic MRI in axial section

DISCUSSION

Mayer-Rokitansky-Kuster-Hauser syndrome (MRKHS) was first described by Mayer in 1829 [1]. It refers to the congenital aplasia or severe hypoplasia of the structures that derive from the mullerian ducts, including the upper vagina, uterus, and fallopian tubes in females with normal secondary sex characteristics and a normal female karyotype (46, XX) caused by an interruption in the development of the Müllerian duct system, occurring during the fifth and sixth weeks of gestation [4, 5].

This condition can occur as an isolated uterovaginal abnormalities or type I MRKHS as described in our case or in association with extragenital malformations as type II MRKHS. The prevalence is estimated to be in 1 in 5000 live female births but it remains poorly investigated [1].

The precise etiology of MRKH syndrome, which is mostly sporadic, is remains unclear, although familial cases have been documented to point towards genetic causes [6]. Primary amenorrhoea in late puberty is the first classical clinical manifestation of MRKHS, while some patients are diagnosed due to difficulty with sexual intercourse. Imaging, particularly magnetic resonance imaging, serum hormone testing, and karyotype analysis are used to confirm the diagnosis [1].

Our patient presented precocious puberty, which is the main feature of our report. To our knowledge, seven cases have previously reported the association of MRKHS with precocious puberty. The two first cases by Raybaud *et al*., in 2001 [7], one case in 2012 by Kang *et al*., [3] and four cases by Zhuanzhuan Ai *et al*., in 2022 [8]. The underlying pathogenic mechanism that explains the appearance of precocious puberty in MRKHS remains unclear. The interaction between the hypothalamus-pituitary axis, the ovaries, and the uterus is required for the control of the human female reproductive cycle, which is disrupted in MRKHS. Strissel *et al*., [9] suggested that interrupted communication between the uterus and ovary may disturb the hypothalamic feedback system, resulting in premature gonadotropins secretion, which may explain the appearance of precocious puberty in MRKHS.

CONCLUSION

In summary, the association between MRKH syndrome and precocious puberty is extremely rare. To the best of our knowledge, there has been no definite explanation for the coexistence of these two conditions. Further studies in a large number of MRKHS patients are required to clarify this association.

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