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CASE REPORTS

Isolated Mayer–Rokitansky–Kuster–Hauser syndrome (MRKH): Case Report

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Abstract

***Background:**Mayer–Rokitansky–Kuster–Hauser syndrome (MRKH) is a rare complex of congenital malformations characterized by aplasia of the uterus and upper (two-thirds) vagina in a woman with normal ovaries and fallopian tubes, secondary sexual characteristics and a 46XX karyotype. The clinical symptoms of MRKH syndrome are usually primary amenorrhea but with normal thelarche and adrenarche, as well as sexual intercourse disorders and infertility.*

***Case report:**In this case, a 22-year-old nulliparous woman with a female phenotype and normal secondary sex growth presented with primary amenorrhea and difficulty in sexual intercourse. On internal examination, the length of the vagina was 4 cm and the cervix was not palpable. Transvaginal ultrasound examination did not show a picture of the uterus, but both ovaries were normal size and there were several follicles. Diagnostic laparoscopy showed bilateral ovaries with intact tubes, but no uterus.*

Conclusion: Women with MRKH syndrome usually have normal ovarian function and usually present with primary amenorrhea. Treatment of MRKH syndrome must include sexological care of the patient and his partner.[6]The American College of Obstetricians and Gynecologists (ACOG) recommends dilation therapy as first-line treatment and vaginoplasty surgery should be performed for patients who have failed dilation therapy.

***Keywords:** Mayer–Rokitansky–Kuster–Hauser syndrome, uterine aplasia, primary amenorrhea*

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INTRODUCTION

Mayer–Rokitansky–Kuster–Hauser syndrome (MRKH) (mullerian agenesis) is a rare complex of congenital malformations characterized by aplasia of the uterus and upper (two-thirds) vagina in women with normal ovaries and fallopian tubes, secondary sexual characteristics and a 46XX karyotype.[1,2]

The incidence of MRKH syndrome is estimated to be 1 in 4500 female births. Most cases appear to be sporadic, but a few may be familial. Type I (isolated) MRKH is less common than associated MURCS.[2,4,5]

MRKH classification is divided into 3 types:

- Type I(isolated):Isolated uterovaginal aplasia
- Type II: asymmetric utero-vaginal aplasia or hypoplasia, with hypoplasia or absence of one or both fallopian tubes and presence of ovarian and/or renal system malformations.
- Type III or MURCS (Mullerian duct aplasia, Renal dysplasia, and Cervical Somite Anomalies), the most commonly associated anomalies are urological (15-40% of cases) and skeletal anomalies (20-40%) while hearing, cardiac, and digital defects (syndactyly or polydactyly) is rare.[1,3]

Clinical symptoms of MRKH syndrome are usually characterized by no menstruation (primary amenorrhea) but with normal thelarche and adrenarche, as well as sexual intercourse disorders and infertility.[3,6]This syndrome is the second most common cause of primary amenorrhea after gonadal dysgenesis which is characterized by the presence of normal body structure and normal psychophysical development. MRKH syndrome patients have a normal 46,XX karyotype, normal external genitalia (vulva, labia majora, labia minor and clitoris) and normal hormonal profile. Clinically, the patient will have an imperforate hymen and proximally blocked vaginal canal, which in turn causes primary amenorrhea and cyclic pelvic pain at puberty.[7,8]

Embryological evidence suggests that MRKH syndrome results from failure of development of the Mullerian ducts that occurs between the fifth and sixth weeks of gestation. This in turn leads to poor development of the vagina, cervix, uterus or even the absence of any of the organs. Failure of caudal development causes vaginal agenesis. Failure of the development of the midsection causes abnormal development of the uterus. Failure of the top leads to impaired development of the fallopian tube. The skeletal malformations associated with MURCS syndrome are associated with blastema changes of the lower cervical and upper thoracic somites (which develop into the spine and muscles of the back and body wall), the limb buds and the pronephric ducts.[1,2,7]

The MRKH syndrome phenotype is highly variable; in a 2016 study by Pan and Luo, 100% of patients showed complete vaginal atresia, although 1 to 3 cm of the lower vagina may be present. And 100% of patients also exhibit cervical aplasia. Malformations of the ovaries and fallopian tubes are rare in patients with MRKH syndrome and can vary in severity. Severe changes in these organs, including gonadal dysgenesis or tubo-ovarian agenesis, can affect hormone function. Subsequent studies found that 3.9% of MRKH sufferers had ovarian

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malformations, which concurs with Rokitansky, Rall et al., and Oppelt et al. illustrating that hypoplastic or aplastic ovaries are limited to a small number of cases.[9,10]

Diagnosis can be made using ultrasound, MRI, laparoscopy, and pyelography. Ultrasound is a simple and non-invasive method, and should be the first investigation in evaluating a patient with suspected Mullerian aplasia. This technique reveals the absence of uterine structures between the bladder and rectum. Magnetic resonance imaging (MRI) is a non-invasive technique which is the gold standard in these cases because it produces excellent images of the superficial and deep tissues and can clarify inconclusive ultrasound results regarding uterine cavitation. MRI should be performed when the ultrasound findings are inconclusive or incomplete, as it allows accurate evaluation of uterine aplasia, as well as clear visualization of the rudimentary tubes and ovaries. Uterine aplasia is best characterized on sagittal images, whereas vaginal aplasia is best demonstrated on transverse images. In addition, MRI can be used at the same time to look for malformations of the kidney and associated bones.[3,7,11]

Laparoscopy is an invasive procedure that requires hospitalization and anesthesia. May be performed in case of a dubious diagnosis after ultrasonography and/or MRI. Laparoscopy is primarily performed for women who are likely to undergo interventional therapy (neo-vaginal construction) to determine the exact anatomic location and abnormality of the uterus, possible fallopian tubes, vestigial lamina and ovaries.[3,7,11]

The sexuality of women with MRKH syndrome is also a concern. Many of them prefer anal or oral sex. Thus most of the medical therapy for MRKH syndrome has focused on surgical and non-surgical techniques to enhance sexual intercourse through the creation of a neovagina. With the increasing number of MRKH patients, there has also been increasing interest in the clinical aspects of patients with MRKH (18, 19).[9,10]

CASE REPORTS

A 22 year old nulliparous woman with a female phenotype presented with primary amenorrhea and difficulty in sexual intercourse. The patient has been married for 2 years and has never been pregnant. The patient had no history of taking hormonal drugs, no history of previous gynecological surgery. On physical examination, vital signs were within normal limits, with a normal female body appearance. The patient's height is 150 cm, weight 48 cm with BMI 21.33. Head and neck examination did not reveal webbed neck or facial malformations. Physical examination of the chest, heart and abdomen were also normal.

There were no major abnormalities of the extremities, such as polydactyly, syndactyly or absence of fingers. Breasts are well developed (Tanner 5) and have external genitalia. Female, clitoris, labia minor and labia majora appear normal. Distribution of pubic hair is also Tanner 5.

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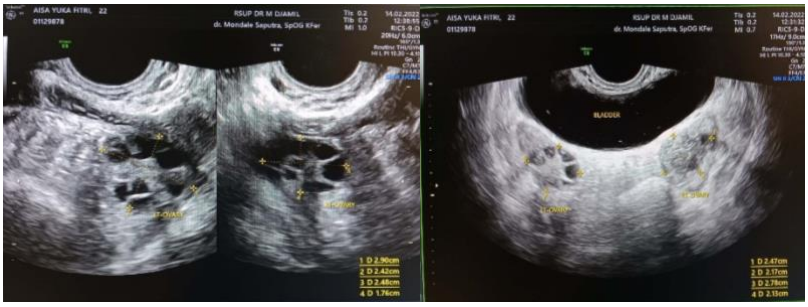
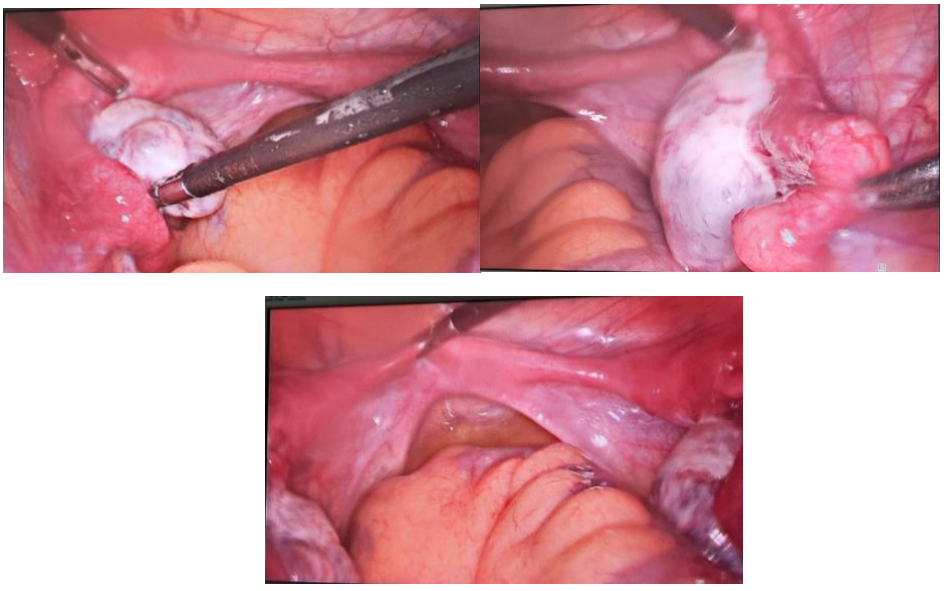


Picture1Transvaginal ultrasound: right and left ovaries with normal size

On internal examination, only 4 cm of the examiner's finger could be inserted during internal examination and the cervix was not palpable. Transvaginal ultrasound examination did not reveal a picture of the uterus, but both adnexa showed normal size ovaries, with the impression of uterine agenesis suspicious of MRHK syndrome. On transabdominal ultrasound examination, both kidneys appeared with normal shape and size.

Diagnostic laposcopy was performed in the patient, bilateral ovaries with intact tubes were seen, but no uterus was seen. From the examinations performed, the diagnosis of MRKH syndrome type I was made.



Picture2diagnostic laparoscopy (a) Right ovary and tube, (b) Left ovary and tube, (c) uterovaginal palsy

DISCUSSION

In this case, the diagnosis of MRKH type I was confirmedIsolated uterovaginal aplasia. This was obtained from ultrasound examination and laparoscopy. This isolated case is a rare case of MRKH syndrome.

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The initial symptoms of MRKH syndrome usually appear during puberty in the form of primary amenorrhea in young women, who have normal body structure and psychophysical development. Other frequently reported complaints include cyclic abdominal pain caused by accumulation of menstrual blood or dyspareunia and infertility. Due to the common embryological origin, congenital anomalies of the urinary tract are also common in this syndrome[6]

Once MRKH syndrome is diagnosed, a full examination should be performed to look for associated malformations. Because renal and skeletal abnormalities may be asymptomatic, transabdominal ultrasonography and spinal radiographs are necessary at a minimum. In cases of suspected hearing loss and/or cardiac abnormalities, a complementary audiogram and/or cardiac echography should also be performed. In addition, when diagnosing MRKH syndrome in a patient, it is important to consider family history. Depending on the background, examination of the patient's relatives may also be recommended, especially for kidney disorders but also for bone disorders.[7]

MRKH may be associated with a higher prevalence of anxiety and depressive symptoms, as well as with social insecurity, compared to women of the same age without these conditions. Regarding the sexuality of MRKH patients, most studies agree that MRKH is associated with pain and discomfort during sexual intercourse as well as with strong limitations in arousal, lubrication, and orgasm. In addition, MRKH women with neovagina experienced sexuality-related distress, suffered from sexual dysfunction more frequently, and reported lower sexual self-esteem and genital self-image compared to controls, reflecting that MRKH women may feel insecure about themselves. MRKH patients are more likely to experience a significant reduction in mental health-related quality of life,[13]So the next step in the treatment of women with MRKH syndrome must include sexological care of the patient and her partner.[6]

This patient was offered to perform neovaginal formation, because one of the patient's complaints was difficulty in sexual intercourse. The goal is to provide sexual satisfaction.

Management of neovagina creation, through surgical and non-surgical methods. The nonsurgical technique consists of dilating the vagina with an appropriate dilator. Also, through proper stretching exercises, it is possible to form a functioning vagina, even from a tiny opening. The most well-known modality is the Frank method, which consists of placing a special dilator into the vestibule area of the vagina. Another well-known method of increasing patient comfort was devised by Ingram et al, who constructed a bench with dilators that fit on the chair.[3,6,12]The most popular surgical techniques for vaginoplasty practiced in Europe today are the Vecchietti and Davydov procedures[1]

Since 2002, The American College of Obstetricians and Gynecologists (ACOG) has recommended dilation therapy as first-line treatment based on its high overall success rate (90-96%), being non-invasive with low complication rates, and low cost. Due to the low risk of adherence with dilators, treatment should be supervised and followed by a healthcare professional experienced in these therapies. ACOG recommends that surgery should be performed for patients who have failed dilation therapy and emphasizes that postoperative dilatation is necessary to avoid strictures. Dilation therapy as first choice was also supported

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by Callens et al., who further suggested laparoscopic Vecchietti vaginoplasty as second line therapy.[14–16]

Infertility is also a common problem for patients, including this patient. Patients with MRKH syndrome have well-functioning ovaries and a normal hypothalamic-pituitary-ovarian axis. From a hormonal and physiological point of view, MRKH patients are capable of reproduction and may have genetic offspring but are unable to bear children on their own. The options for these patients are adoption or hiring a surrogate mother. However, in many countries, including Indonesia, surrogacy is not allowed for ethical, legal or religious reasons. And now uterine transplantation has been developed as one of the infertility therapies in MRKH patients[6]

CONCLUSION

Mayer–Rokitansky–Kuster–Hauser syndrome (MRKH) is characterized by aplasia of the uterus and upper (two-thirds) vagina in a woman with normal ovaries and fallopian tubes, secondary sexual characteristics and a 46XX karyotype.[1,2]Clinical symptoms of MRKH syndrome are usually primary amenorrhea with normal thelarche and adrenarche, as well as sexual intercourse disorders and infertility. MRKH is divided into 3 types, namely Type I(isolated):the presence of isolated uterovaginal aplasia, ttype II: asymmetric utero-vaginal aplasia or hypoplasia, with hypoplasia or absence of one or both fallopian tubes and malformations of the ovaries and/or renal system and type III or MURCS (Mullerian duct aplasia, Renal dysplasia, and Cervical Somite Anomalies) .[1,3]The incidence of MRKH syndrome is very rare, varying between 1:4000 and 1:5000. The diagnosis of MRKH syndrome is established from the results of ultrasound imaging, MRI and laparoscopy. Once MRKH syndrome is diagnosed, a full examination should be performed to look for associated malformations. Treatment of MRKH syndrome must include sexological care of the patient and his partner.[6]The American College of Obstetricians and Gynecologists (ACOG) recommends dilation therapy as first-line treatment and vaginoplasty surgery should be performed for patients who have failed dilation therapy.[14–16]

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