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Case Report

Surgical management of neovagina with amnion interposition in a urogynecology and pelvic floor unit: a case report

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ABSTRACT

This is a case report of a 20-year-old patient, diagnosed since adolescence with Mullerian aplasia, referred to the urogynecology service of our institution to perform a vaginosplasty as part of her treatment for sexual restoration. This was done through a modification of McIndoe's surgical technique to create a neovagina using amniotic membranes as graft interposition tissue for the vaginal mold. With a satisfactory surgical follow-up obtaining the objective of an anatomically functional vagina. The modified McIndoe surgical technique using amnion is a viable option and it should be considered in those institutions that have access to this tissue.

Keywords: Mullerian aplasia, Neovagina, McIndoe technique, Chorioamniotic membranes

INTRODUCTION

Mullerian disorders, also known as Mayer-Rokitansky-Küster-Hauser syndrome, are not an uncommon clinical condition, with an incidence of approximately 1 in 4,500-5,000 females.[1]

This is a clinical disorder that occurs during embryological development at the level of the Mullerian ducts, causing an alteration in the formation of the female reproductive organs. It is characterized by the congenital absence of the upper 2/3 of the vagina and uterus, or in some cases a rudimentary uterus can be found and even a functional endometrium.

It can be associated with other alterations more commonly at the skeletal level, or renal and urinary tract, the most frequent of the two up to 40% of cases, involving unilateral renal agenesis.[2]

The typical clinical picture will be an adolescent with a 46XX karyotype with primary amenorrhea, without alteration in the development of the external genitalia and phenotypically female, but with congenital vaginal agenesis.[3]

Treatment for the creation of a neovagina can be divided into non-surgical measures such as vaginal self-dilation and surgical measures. So far, multiple surgical techniques have been developed, with the use of vaginal molds created with autografts such as skin flaps, intestinal flaps, or biosynthetic grafts, as well as those surgical techniques without the use of grafts.[4]

In any of the methods performed throughout history, the common goal will always be to create a neovagina with the optimal anatomical and functional length.

CASE REPORT

A 20-year-old female patient, referred to the urogynaecology service of our institution for being followed up since she was 16 years old for medical history of primary amenorrhea and Mullerian aplasia, with no hereditary antecedents related to her condition. Physical examination, she had characteristics IV on the Tanner scale, phenotypically female, with normal external sexual

characteristics; labia majora, labia minora, clitoris, urethral meatus and perineum without anatomical alterations and internal genitalia with absence of the vaginal canal (Figure 1).

Complementary examinations, laboratory: normal follicle-stimulating hormone (FSH) and luteinizing hormone (LH), estradiol and free testosterone, pelvic ultrasound, rudimentary uterus and ovaries present, with normal characteristics. In the abdominal pelvic computed tomography (CT) scan simple and with contrast, uterus present, left kidney present and absence of right kidney. With diagnosis by physical examination, clinical and paraclinical studies, of vaginal agenesis due to Mayer-Rokitansky-Küster-Hauser syndrome type II due to the association with unilateral renal agenesis.

Once the diagnosis was established, and considering the patient's age, treatment options, doubts about her sexual life and fertility issues were explained. After discussing the nonsurgical and surgical options, informed consent was obtained from her and her family and she accepted the McIndoe neovagina creation with amnion graft.

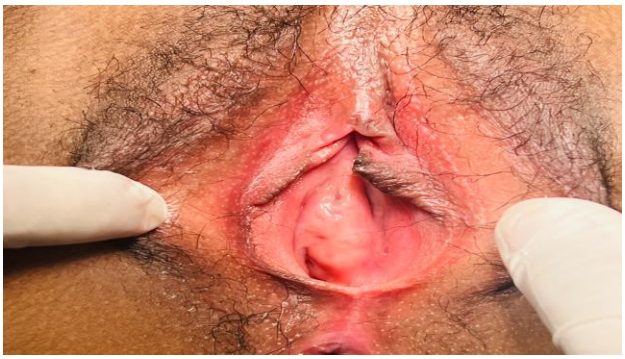

Figure 1: Normal external genitalia, with absence of vaginal canal.

Surgical technique

It was decided to perform as surgical treatment for the creation of neovagina, the McIndoe technique, which is the technique of choice in our urogynecology department. However, we modified with the use of amniotic membranes as interposition tissue for the vaginal mold.

In first place a patient was selected under strict criteria who by elective cesarean section was eligible to be a donor of amniotic membranes, under a complete screening for infectious diseases such as hepatitis B, hepatitis C, human immunodeficiency virus, as well as chorioamniotic or fetal infections. The results of all tests were negative, so the membranes were released for use. The membranes were preserved in sterile saline prior to the start of the surgical procedure for the vaginal mold (Figure 2).

The next step was to make the vaginal mold, using sterile gauze, inside a condom forming a mold of 8 cm in length, which was carefully wrapped with the amniotic membranes and fixing them with 2-0 catgut, taking special care that the fetal side of the membranes remained towards the outside of the mold and in contact with the vaginal wall (Figure 3).

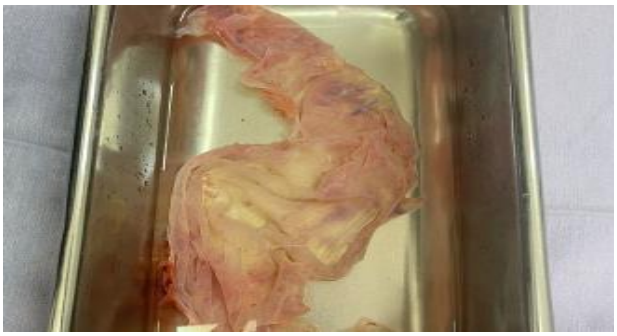

Figure 2: Amniotic membranes in saline solution.

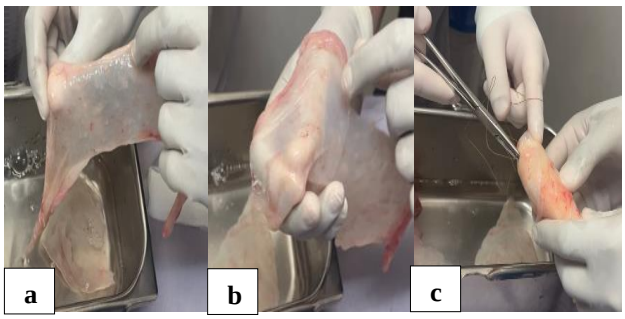

Figure 3 (a-c): Amniotic membranes, and preparation of the vaginal mold with amniotic membrane wrapping on the condom-covered gauze mold.

The procedure was done under regional anesthesia, in the lithotomy position, after urethral catheterization using a lone star retractor is positioned to facilitate exposure of the female urethra and surgical space.

In the first surgical stage, it was started by performing as described in the original McIndoe technique for vaginoplasty, a surgical tunnelling dissecting he vesicorectal space between bladder and rectum, as high as possible to the pouch of Douglas, and taking care not to enter the peritoneal cavity. Having a hemostatic control to ensure that there is no risk of possible hematomas and that the mold adheres properly to the vaginal cavity created (Figure 4).

In second surgical stage, we proceeded to place the mold in the vaginal cavity previously made, (Figure 5) and the approximation of the labia minora in the midline to ensure that the vaginal mold is maintained in the neocavity (Figure 6).

During the postoperative period broad spectrum antibiotics were used, she was discharged on the third day without complications and the Foley's catheter was kept for 7 days and removed at the time of her first postoperative follow

up, and 14 days later in her second follow up, vaginal mold was removed without complications (Figure 7).

Vaginal cavity was observed with no evidence of infection, with adequate re-epithelialization of the vaginal mucosa, and a vaginal length of 7 cm was measured (Figure 8).

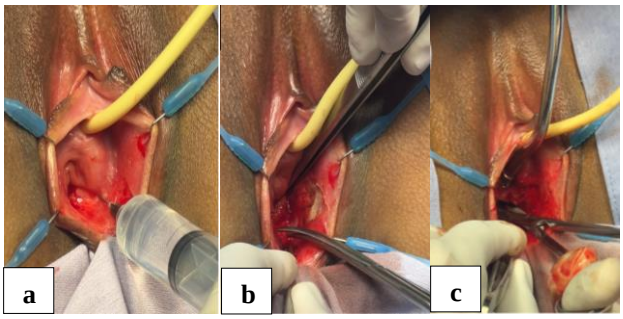

Figure 4: (a) Tissue hydrodissection, (b) and (c) surgical tunnelling of the vesicorectal space.

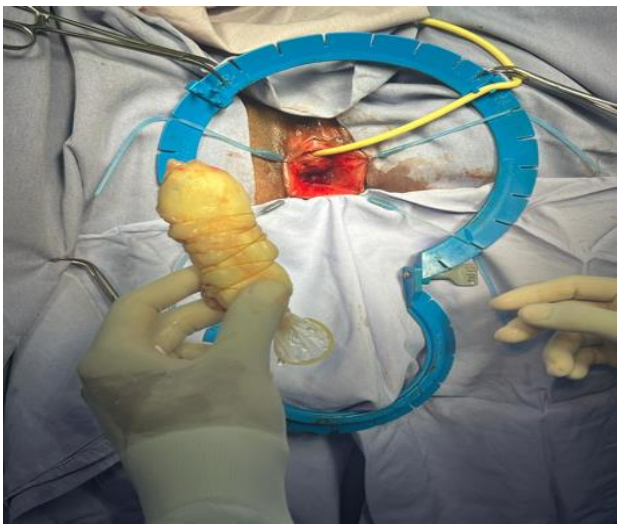

Figure 5: Visualization of the amnion grafting mold prior to its insertion into the vaginal cavity.

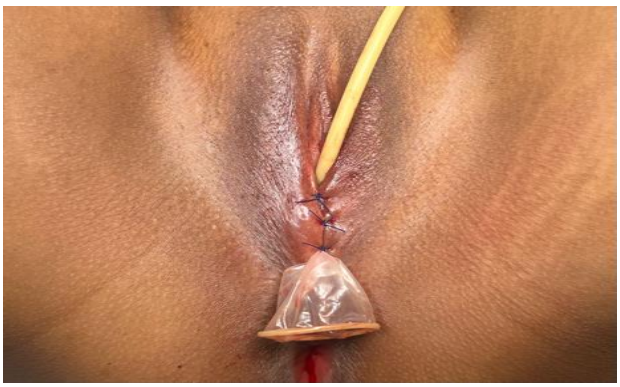

Figure 6: Approximation of the labia minora to prevent the extrusion of the vaginal mold.

The patient continued at home with indication to use a vaginal dilator 3 times a day for a period of 3 months, one of borosilicate glass was recommended to allow firmness and rigidity to ensure that the satisfactory results of the neovagina were maintained and continued. Subsequently, until the patient's sexual life began, it was recommended to use the vaginal dilator only at night.

The follow-up was maintained once a month, for three months, and after six months with gynecological examinations agreed upon where the correct epithelialization of the vaginal mucosa and an adequate length and vaginal diameter were corroborated (Figure 9).

Figure 7: Post-surgical result of the vaginal cavity.

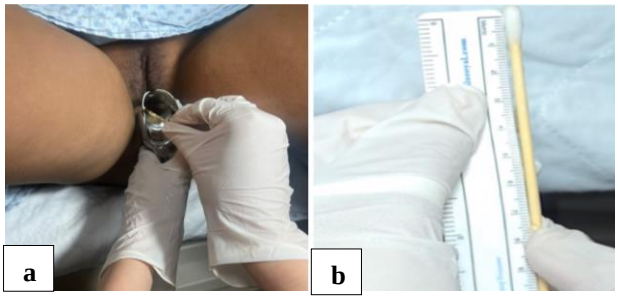

Figure 8 (a and b): Vaginal length 7 cm.

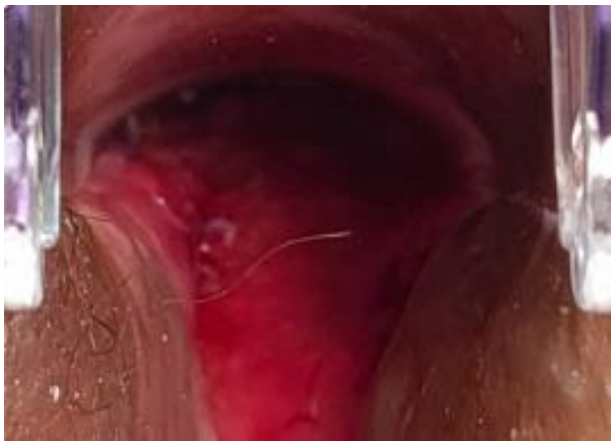

Figure 9: Complete epithelialization of the vaginal cavity.

DISCUSSION

There is currently no consensus on the ideal treatment for patients diagnosed with mullerian aplasia, however, the latest bulletin of the American College of Obstetricians and Gynecologists (ACOG) recommends non-surgical treatment as the first line of treatment. Considering it a safe, functional and low-cost method.[1,5]

However, many physicians are not trained in non-surgical vaginal dilatation techniques, or by decision of the treating medical team, prefer to offer patients surgical options in the first instance.

Considering also the psychological and emotional aspect of this population who may or may not be ready to undergo daily vaginal dilatation for extended periods of time, there is a risk of failure due to lack of adherence to such treatment.[6]

Throughout history, different surgical techniques have been performed for neovaginal creation with different approaches, or with or without the use of vaginal molds with grafts. We can mention Vecchietti procedure, bowel vaginoplasty by Baldwin, skin flaps (McIndoe), peritoneal vaginoplasty (Davydov) as well as the modifications of some of these by laparoscopy.

However, McIndoe's operation is one of the oldest techniques used with high surgical success, which consists in the creation of a vaginal cavity after dissection of the rectovesical space and the use of a vaginal mold with the use of grafts.

While the original surgery was described with the use of skin grafts, multiple modifications of this technique have been made, such as the use of peritoneum, artificial dermis, oral mucosa, intestinal mucosa and even the use of amniotic membranes.

The use of amniotic membranes is currently considered viable due to their multiple healing properties, inflammatory mediators, low antigenicity and antimicrobial properties, and studied for their easy tissue preservation, described and used several decades ago by Dino et al.[7]

This has been described as a viable option, with good anatomical and functional results in a number of studies and case reports. In the Institute of Medical Sciences of the University of California, Berkeley, USA, the use of the technique has been described as a viable option, with good anatomical and functional results.[8]

In the Institute of Medical Sciences of India, in a case series of 50 patients diagnosed with vaginal agenesis due to Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome, using the modified McIndoe technique with the use of amnion as a graft for the vaginal mold, they obtained an average vaginal length of 8.2±1 cm, with a mean of 6 cm, similar to the surgical result found in our case.[9]

Psychological support is a fundamental part of the medical-surgical management of these patients, so giving a comprehensive explanation of the risks and benefits, possible complications, the anatomical and functional results and adherence to an adequate post-surgical recovery to the patient and her family is a pillar of the success in this clinical condition.

CONCLUSION

Mullerian aplasia is a medical condition that is not uncommon, and it has many reproductive, sexual, and quality of life needs. It's important to know the therapeutic options available to this type of patient. The surgical technique used by McIndoe to create a neovagina is still viable and easy to reproduce. The mold has been described with the use of different grafts, but amniotic membranes are a viable alternative, as they reduce the risk of complications compared to other techniques that utilize different grafts. It is necessary to carry out further research on the properties of amniotic membranes to address different clinical situations.

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