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ЕЖЕМЕСЯЧНЫЙ НАУЧНЫЙ ЖУРНАЛ

Медицинские новости Грузии

საქართველოს სამედიცინო სიახლენი

GEORGIAN MEDICAL NEWS

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GMN: Georgian Medical News is peer-reviewed, published monthly journal committed to promoting the science and art of medicine and the betterment of public health, published by the GMN Editorial Board since 1994. GMN carries original scientific articles on medicine, biology and pharmacy, which are of experimental, theoretical and practical character; publishes original research, reviews, commentaries, editorials, essays, medical news, and correspondence in English and Russian.

GMN is indexed in MEDLINE, SCOPUS, PubMed and VINITI Russian Academy of Sciences. The full text content is available through EBSCO databases.

GMN: Медицинские новости Грузии - ежемесячный рецензируемый научный журнал, издаётся Редакционной коллегией с 1994 года на русском и английском языках в целях поддержки медицинской науки и улучшения здравоохранения. В журнале публикуются оригинальные научные статьи в области медицины, биологии и фармации, статьи обзорного характера, научные сообщения, новости медицины и здравоохранения. Журнал индексируется в MEDLINE, отражён в базе данных SCOPUS, PubMed и ВИНИТИ РАН. Полнотекстовые статьи журнала доступны через БД EBSCO.

GMN: Georgian Medical News – საქართველოს სამედიცინო სიახლენი – არის ყოველთვიური სამეცნიერო სამედიცინო რეცენზირებადი ჟურნალი, გამოიცემა 1994 წლიდან, წარმოადგენს სარედაქციო კოლეგიისა და აშშ-ის მეცნიერების, განათლების, ინდუსტრიის, ხელოვნებისა და ბუნებისმეტყველების საერთაშორისო აკადემიის ერთობლივ გამოცემას. GMN-ში რუსულ და ინგლისურ ენებზე ქვეყნდება ექსპერიმენტული, თეორიული და პრაქტიკული ხასიათის ორიგინალური სამეცნიერო სტატიები მედიცინის, ბიოლოგიისა და ფარმაციის სფეროში, მიმოხილვითი ხასიათის სტატიები.

ჟურნალი ინდექსირებულია MEDLINE-ის საერთაშორისო სისტემაში, ასახულია SCOPUS-ის, PubMed-ის და ВИНИТИ РАН-ის მონაცემთა ბაზებში. სტატიების სრული ტექსტი ხელმისაწვდომია EBSCO-ს მონაცემთა ბაზებიდან.

WEBSITE

www.geomednews.com

К СВЕДЕНИЮ АВТОРОВ!

При направлении статьи в редакцию необходимо соблюдать следующие правила:

1. Статья должна быть представлена в двух экземплярах, на русском или английском языках, напечатанная через **полтора интервала на одной стороне стандартного листа с шириной левого поля в три сантиметра**. Используемый компьютерный шрифт для текста на русском и английском языках - **Times New Roman** (**Кириллица**), для текста на грузинском языке следует использовать **AcadNusx.** Размер шрифта - **12**. К рукописи, напечатанной на компьютере, должен быть приложен CD со статьей.

2. Размер статьи должен быть не менее десяти и не более двадцати страниц машинописи, включая указатель литературы и резюме на английском, русском и грузинском языках.

3. В статье должны быть освещены актуальность данного материала, методы и результаты исследования и их обсуждение.

При представлении в печать научных экспериментальных работ авторы должны указывать вид и количество экспериментальных животных, применявшиеся методы обезболивания и усыпления (в ходе острых опытов).

4. К статье должны быть приложены краткое (на полстраницы) резюме на английском, русском и грузинском языках (включающее следующие разделы: цель исследования, материал и методы, результаты и заключение) и список ключевых слов (key words).

5. Таблицы необходимо представлять в печатной форме. Фотокопии не принимаются. **Все цифровые, итоговые и процентные данные в таблицах должны соответствовать таковым в тексте статьи**. Таблицы и графики должны быть озаглавлены.

6. Фотографии должны быть контрастными, фотокопии с рентгенограмм - в позитивном изображении. Рисунки, чертежи и диаграммы следует озаглавить, пронумеровать и вставить в соответствующее место текста **в tiff формате**.

В подписях к микрофотографиям следует указывать степень увеличения через окуляр или объектив и метод окраски или импрегнации срезов.

7. Фамилии отечественных авторов приводятся в оригинальной транскрипции.

8. При оформлении и направлении статей в журнал МНГ просим авторов соблюдать правила, изложенные в «Единых требованиях к рукописям, представляемым в биомедицинские журналы», принятых Международным комитетом редакторов медицинских журналов - http://www.spinesurgery.ru/files/publish.pdf и http://www.nlm.nih.gov/bsd/uniform_requirements.html
В конце каждой оригинальной статьи приводится библиографический список. В список литературы включаются все материалы, на которые имеются ссылки в тексте. Список составляется в алфавитном порядке и нумеруется. Литературный источник приводится на языке оригинала. В списке литературы сначала приводятся работы, написанные знаками грузинского алфавита, затем кириллицей и латиницей. Ссылки на цитируемые работы в тексте статьи даются в квадратных скобках в виде номера, соответствующего номеру данной работы в списке литературы. Большинство цитированных источников должны быть за последние 5-7 лет.

9. Для получения права на публикацию статья должна иметь от руководителя работы или учреждения визу и сопроводительное отношение, написанные или напечатанные на бланке и заверенные подписью и печатью.

10. В конце статьи должны быть подписи всех авторов, полностью приведены их фамилии, имена и отчества, указаны служебный и домашний номера телефонов и адреса или иные координаты. Количество авторов (соавторов) не должно превышать пяти человек.

11. Редакция оставляет за собой право сокращать и исправлять статьи. Корректура авторам не высылается, вся работа и сверка проводится по авторскому оригиналу.

12. Недопустимо направление в редакцию работ, представленных к печати в иных издательствах или опубликованных в других изданиях.

При нарушении указанных правил статьи не рассматриваются.

REQUIREMENTS

Please note, materials submitted to the Editorial Office Staff are supposed to meet the following requirements:

1. Articles must be provided with a double copy, in English or Russian languages and typed or compu-ter-printed on a single side of standard typing paper, with the left margin of **3** centimeters width, and **1.5** spacing between the lines, typeface - **Times New Roman** (**Cyrillic**), print size - **12** (referring to Georgian and Russian materials). With computer-printed texts please enclose a CD carrying the same file titled with Latin symbols.

2. Size of the article, including index and resume in English, Russian and Georgian languages must be at least 10 pages and not exceed the limit of 20 pages of typed or computer-printed text.

3. Submitted material must include a coverage of a topical subject, research methods, results, and review.

Authors of the scientific-research works must indicate the number of experimental biological species drawn in, list the employed methods of anesthetization and soporific means used during acute tests.

4. Articles must have a short (half page) abstract in English, Russian and Georgian (including the following sections: aim of study, material and methods, results and conclusions) and a list of key words.

5. Tables must be presented in an original typed or computer-printed form, instead of a photocopied version. **Numbers, totals, percentile data on the tables must coincide with those in the texts of the articles.** Tables and graphs must be headed.

6. Photographs are required to be contrasted and must be submitted with doubles. Please number each photograph with a pencil on its back, indicate author's name, title of the article (short version), and mark out its top and bottom parts. Drawings must be accurate, drafts and diagrams drawn in Indian ink (or black ink). Photocopies of the X-ray photographs must be presented in a positive image in **tiff format**.

Accurately numbered subtitles for each illustration must be listed on a separate sheet of paper. In the subtitles for the microphotographs please indicate the ocular and objective lens magnification power, method of coloring or impregnation of the microscopic sections (preparations).

7. Please indicate last names, first and middle initials of the native authors, present names and initials of the foreign authors in the transcription of the original language, enclose in parenthesis corresponding number under which the author is listed in the reference materials.

8. Please follow guidance offered to authors by The International Committee of Medical Journal Editors guidance in its Uniform Requirements for Manuscripts Submitted to Biomedical Journals publication available online at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
http://www.icmje.org/urm_full.pdf
In GMN style for each work cited in the text, a bibliographic reference is given, and this is located at the end of the article under the title "References". All references cited in the text must be listed. The list of references should be arranged alphabetically and then numbered. References are numbered in the text [numbers in square brackets] and in the reference list and numbers are repeated throughout the text as needed. The bibliographic description is given in the language of publication (citations in Georgian script are followed by Cyrillic and Latin).

9. To obtain the rights of publication articles must be accompanied by a visa from the project instructor or the establishment, where the work has been performed, and a reference letter, both written or typed on a special signed form, certified by a stamp or a seal.

10. Articles must be signed by all of the authors at the end, and they must be provided with a list of full names, office and home phone numbers and addresses or other non-office locations where the authors could be reached. The number of the authors (co-authors) must not exceed the limit of 5 people.

11. Editorial Staff reserves the rights to cut down in size and correct the articles. Proof-sheets are not sent out to the authors. The entire editorial and collation work is performed according to the author's original text.

12. Sending in the works that have already been assigned to the press by other Editorial Staffs or have been printed by other publishers is not permissible.

Articles that Fail to Meet the Aforementioned Requirements are not Assigned to be Reviewed.

ავტორთა საყურადღებოდ!

რედაქციაში სტატიის წარმოდგენისას საჭიროა დავიცვათ შემდეგი წესები:

1. სტატია უნდა წარმოადგინოთ 2 ცალად, რუსულ ან ინგლისურ ენებზე,დაბეჭდილი სტანდარტული ფურცლის 1 გვერდზე, 3 სმ სიგანის მარცხენა ველისა და სტრიქონებს შორის 1,5 ინტერვალის დაცვით. გამოყენებული კომპიუტერული შრიფტი რუსულ და ინგლისურენოვან ტექსტებში - **Times New Roman (Кириллица)**, ხოლო ქართულენოვან ტექსტში საჭიროა გამოვიყენოთ **AcadNusx.** შრიფტის ზომა – 12. სტატიას თან უნდა ახლდეს CD სტატიით.

2. სტატიის მოცულობა არ უნდა შეადგენდეს 10 გვერდზე ნაკლებს და 20 გვერდზე მეტს ლიტერატურის სიის და რეზიუმეების (ინგლისურ, რუსულ და ქართულ ენებზე) ჩათვლით.

3. სტატიაში საჭიროა გაშუქდეს: საკითხის აქტუალობა; კვლევის მიზანი; საკვლევი მასალა და გამოყენებული მეთოდები; მიღებული შედეგები და მათი განსჯა. ექსპერიმენტული ხასიათის სტატიების წარმოდგენისას ავტორებმა უნდა მიუთითონ საექსპერიმენტო ცხოველების სახეობა და რაოდენობა; გაუტკივარებისა და დაძინების მეთოდები (მწვავე ცდების პირობებში).

4. სტატიას თან უნდა ახლდეს რეზიუმე ინგლისურ, რუსულ და ქართულ ენებზე არანაკლებ ნახევარი გვერდის მოცულობისა (სათაურის, ავტორების, დაწესებულების მითითებით და უნდა შეიცავდეს შემდეგ განყოფილებებს: მიზანი, მასალა და მეთოდები, შედეგები და დასკვნები; ტექსტუალური ნაწილი არ უნდა იყოს 15 სტრიქონზე ნაკლები) და საკვანძო სიტყვების ჩამონათვალი (key words).

5. ცხრილები საჭიროა წარმოადგინოთ ნაბეჭდი სახით. ყველა ციფრული, შემაჯამებელი და პროცენტული მონაცემები უნდა შეესაბამებოდეს ტექსტში მოყვანილს.

6. ფოტოსურათები უნდა იყოს კონტრასტული; სურათები, ნახაზები, დიაგრამები - დასათაურებული, დანომრილი და სათანადო ადგილას ჩასმული. რენტგენოგრამების ფოტოასლები წარმოადგინეთ პოზიტიური გამოსახულებით **tiff** ფორმატში. მიკროფოტოსურათების წარწერებში საჭიროა მიუთითოთ ოკულარის ან ობიექტივის საშუალებით გადიდების ხარისხი, ანათალების შეღებვის ან იმპრეგნაციის მეთოდი და აღნიშნოთ სურათის ზედა და ქვედა ნაწილები.

7. სამამულო ავტორების გვარები სტატიაში აღინიშნება ინიციალების თანდართვით, უცხოურისა – უცხოური ტრანსკრიპციით.

8. სტატიას თან უნდა ახლდეს ავტორის მიერ გამოყენებული სამამულო და უცხოური შრომების ბიბლიოგრაფიული სია (ბოლო 5-8 წლის სიღრმით). ანბანური წყობით წარმოდგენილ ბიბლიოგრაფიულ სიაში მიუთითეთ ჯერ სამამულო, შემდეგ უცხოელი ავტორები (გვარი, ინიციალები, სტატიის სათაური, ჟურნალის დასახელება, გამოცემის ადგილი, წელი, ჟურნალის №, პირველი და ბოლო გვერდები). მონოგრაფიის შემთხვევაში მიუთითეთ გამოცემის წელი, ადგილი და გვერდების საერთო რაოდენობა. ტექსტში კვადრატულ ფჩხილებში უნდა მიუთითოთ ავტორის შესაბამისი N ლიტერატურის სიის მიხედვით. მიზანშეწონილია, რომ ციტირებული წყაროების უმეტესი ნაწილი იყოს 5-6 წლის სიღრმის.

9. სტატიას თან უნდა ახლდეს: ა) დაწესებულების ან სამეცნიერო ხელმძღვანელის წარდგინება, დამოწმებული ხელმოწერითა და ბეჭდით; ბ) დარგის სპეციალისტის დამოწმებული რეცენზია, რომელშიც მითითებული იქნება საკითხის აქტუალობა, მასალის საკმაობა, მეთოდის სანდოობა, შედეგების სამეცნიერო-პრაქტიკული მნიშვნელობა.

10. სტატიის ბოლოს საჭიროა ყველა ავტორის ხელმოწერა, რომელთა რაოდენობა არ უნდა აღემატებოდეს 5-ს.

11. რედაქცია იტოვებს უფლებას შეასწოროს სტატია. ტექსტზე მუშაობა და შეჯერება ხდება საავტორო ორიგინალის მიხედვით.

12. დაუშვებელია რედაქციაში ისეთი სტატიის წარდგენა, რომელიც დასაბეჭდად წარდგენილი იყო სხვა რედაქციაში ან გამოქვეყნებული იყო სხვა გამოცემებში.

აღნიშნული წესების დარღვევის შემთხვევაში სტატიები არ განიხილება.

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MAYER–ROKITANSKY–KUSTER–HAUSER SYNDROME. LAPAROSCOPIC SIGMOID VAGINOPLASTY FOR THE TREATMENT OF VAGINAL AGENESIS - SINGLE CENTER EXPERIENCE IN GEORGIA-CASE REPORT.

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Abstract.

Introduction and hypothesis: Sigmoid vaginoplasty is a safe and acceptable procedure for vaginal agenesis with good cosmetic results and acceptable complications rate. Sigmoid colon vaginoplasty is the treatment of choice because of its large lumen, thick walls resistant to trauma, adequate secretion allowing lubrication, not necessitating prolonged dilatation, and short recovery time. We investigate the feasibility, safety, and clinical therapeutic effect of laparoscopic sigmoid vaginoplasty in women with Mayer–Rokitansky–Kuster–Hauser (MRKH) syndrome. Intestinal vaginoplasty has several advantageous features, such as scarless surgery, low incidence of contraction of the reconstructed vagina, maintenance of vaginal depth, spontaneous mucus production, and a low rate of complications. Therefore, this technique is becoming popular in many countries. Following the global trend, the demand for intestinal vaginoplasty for girls suffer from vaginal atresia and transsexuals is also increasing in Georgia. However, there are few reports on intestinal vaginoplasty in Tbilisi. In this article, we examined the safety and effectiveness of rectosigmoid colon vaginoplasty in the population. To avoid vaginal, prolapse, it is important to decide the length of the rectosigmoid segment so that a pull on it does not cause it to become lax, while excessive stress on the feeder vessels is avoided.

Methods: In September 2023, With the participation of plastic surgeons, laparoscopic treatment of total vaginal aplasia was performed on women aged 23 years, with normal female karyotype and typical secondary sex characteristics. diagnosed with MRKHs because of primary amenorrhea. The diagnosis, which has an estimated prevalence of 1 in 5000 live female births, is frequently made during adolescence after tests for primary amenorrhea

Results: Operation was performed under general anaesthesia. The patient was placed in the fog leg position to permit access to the perineum. The operating time was 165 min. The hospital stay was 7 days. A functional neovagina was created 11–15 cm in length and two fingers in breadth in our patient. No introitus stenosis was observed. No intra- or post-operative complications occurred. None had complained of local irritation or dyspareunia. Patient had post-surgery sexual intercourse was satisfied with her sexual life and the mean total Female Sexual Function Index (FSFI) score was 25.17±0.63. The cosmetic result was excellent.

Conclusions: The laparoscopic sigmoid vaginoplasty can achieve the goal of making a functional neovagina. The main advantage of this surgical technique is that it is minimally invasive and that there are fewer complications of post-operation. It is an acceptable procedure for patients with MRKH syndrome.

Key words. Mayer–Rokitansky–Kuster–Hauser syndrome, laparoscope, sigmoid colon, vaginoplasty plastic surgery.

Introduction.

Mayer–Rokitansky–Kuster–Hauser (MRKH) syndrome is a rare developmental disorder of the female reproductive system with an incidence of about 1/5,000–1/4,000 [1]. MRKH syndrome is caused by the abnormal differentiation of the paramesonephric duct during the embryonic period and is one of the most common causes of primary amenorrhea [2]. Patients with MRKH syndrome have normal sexual characteristics and 46 XX chromosomes, characterized by uterine and vaginal hypoplasia in the upper two-thirds. It can be divided into two types according to its clinical manifestations: type I is the simple type, characterized by a primordial uterus and an absent vagina, whereas other systems such as the urinary and skeletal systems develop normally, which is the most common type; type II is also called the complex type, showing malformation or dysplasia of the urinary system, the skeletal system, and other systems, in addition to a bilateral primordial uterus and an absent vagina, about 25—50% of which are combined with urinary system malformation; 10—15% are combined with urinary system malformations and skeletal malformations, cardiovascular malformations, deafness, cleft palate, etc. [3]. Vaginoplasty can be performed in a variety of ways. The surgery is aimed at reconstructing the vagina, solving the patient's sexual problems, and improving the patient's quality of life [4]. Many techniques have been used for vaginoplasty, including amniotic membrane, fap, peritoneum, and biological mesh. However, each of these techniques has its limitations, such as stenosis, insufficient length, insufficient lubrication, risk of bladder injury, and high cost. Sigmoid vagina replacement can well imitate the normal vaginal structure in terms of morphology and function and is a relatively common operation at present [5]. In addition, laparoscopic surgery has the advantage of minimal trauma, quick recovery, minor post-operative pain, and an abdominal incision. We hypothesize that laparoscopic sigmoid vaginoplasty might be better than other techniques.

2023, with the introduction of endoscopic instruments and the improvement of surgical techniques in our hospital, we have started to use laparoscopic sigmoid vaginoplasty in collaboration with plastic surgeons, for patients with MRKH syndrome. We analyzed the case in our hospital over the past 1 year to study the feasibility and effectiveness of this procedure.

Materials and Methods.

Patient: A 23-year-old woman who presented at our gynecology department with the complaint of primary amenorrhea. At physical examination, she had a phenotypically normal vulva with no vaginal canal. Magnetic resonance

imaging of the abdomen and pelvis revealed normal ovaries and absence of uterus and vaginal canal. No other congenital malformations were found. Karyotype was 46, XX.

In September 2023, 1 patient with MRKH syndrome underwent laparoscopic sigmoid transvaginal surgery in our hospital. The patient's age was 23 years at the time of surgery. Pelvic and abdominal ultrasonography, sex hormone determination, and chromosome examination were performed pre-operatively. She had no uterus. There was not urinary malformation, no arrhythmia, and none with cardiac or skeletal malformation. The secondary sexual characteristics of the patient was well developed, and the sex hormone test was normal. Among the patient, the karyotype of the chromosome was 46 XX, (Table 1).

Table 1. *Clinical characteristics of the patient MRKH.*

MRKH (Mayer–Rokitansky–Kuster–Hauser syndrome)	Type II
Uterus states	No uterus
Chromosome examination	Normal 53 (46, XX)
Age (years old)	23 years
Marital status	Unmarried
Family history	No
Surgery history	No
Urinary malformation	No
BMI (body mass index)	24
Merkel's diverticulum	No

Bowel Preparation: The patient consumed a semiliquid diet for 3 days before the operation. Metronidazole was also prescribed. At 12 h before the operation, the patient received a cleansing enema and intravenous nutrition. Traditional skin preservation of the perineal region was performed before the operation.

Main Instruments: Laparoscopic instruments and equipment (Stortz), an ultrasonic knife (Ethicon), and a laparoscopic linear closure cutter (ATB45) and horizontal and tubular stapler (CDH29) were selected.

Pre-Operative Preparation: After receiving a general anesthetic, the patient was placed in the lithotomy position (left high right low, Trendelenburg position). In the middle of the umbilicus, a "veresh" needle was inserted to establish a pneumoperitoneum and maintain a pressure of 14 mmHg. A trocar was then placed on the site, the same procedure as during colorectal surgery. The ureters and ovaries in the abdominal cavity were then examined, and the depth of the pelvic cavity was measured. The length of the sigmoid colon and mesocolon was assessed. The distribution and shape of the arterial branches were observed using transillumination of the mesocolon to determine the length of the sigmoid colon and artery revascularization.

Operative Method.

Placement of the Laparoscopic Sigmoid Vaginoplasty Instruments: We established a 14 mmHg (1 mmHg=0.133 kPa) CO2 artificial pneumoperitoneal cavity. We selected four conventional laparoscopic incisions: the upper edge of the umbilicus (10 mm), 3 cm on the right side of the umbilicus (5 mm), the right lower abdominal (5 mm), and the outer third of the line between the umbilicus and the left anterior superior iliac spine (5 mm) (Figure 1).

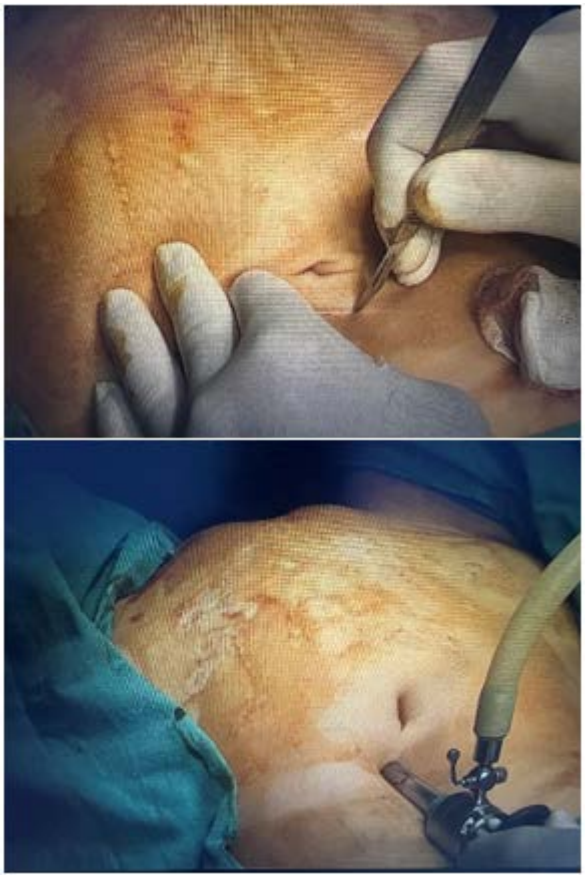

Figure 1. *Placement of the Laparoscopic Instruments, mobilisation Sigmoid Colon.*

Vaginal Cavitation:

By plastic Surgeons a transverse incision was made below the urethra between the labia minora. By gentle blunt and sharp dissection, a three-finger-wide space was created dorsal to the urethra and bladder and ventral to the rectum, to reach the pelvic cavity. An ultrasonic knife was used to cut the pelvic foor peritoneum below the primordial uterus (Figure 3).

Obtaining the Desired Sigmoid Segment: Laparoscopic display of the descending colon, sigmoid colon, and mesenteric blood supply of the rectum was performed. Proximal and distal tangents were selected according to the depth of the pelvic cavity and the length of the sigmoid mesangial to ensure a 15-cm segment of the intestine. The lateral sigmoid peritoneum was opened using an ultrasonic knife from the tangent line of the proximal rectum, and the anteroposterior mesangium was opened in a fan shape. The sigmoid colon was dissociated to the retrofexion of the pelvic peritoneum, and the main arteries of the mesentery were reserved. The grafted sigmoid colon was obtained by sealing and cutting the proximal and distal ends of the sigmoid colon with a laparoscopic linear closure cutter (Figure 2).

Sigmoid Anastomosis: The trocar incision on the right abdominal wall was extended to 2.5 cm, the distal end of the descending colon was pulled out of the abdominal wall incision,

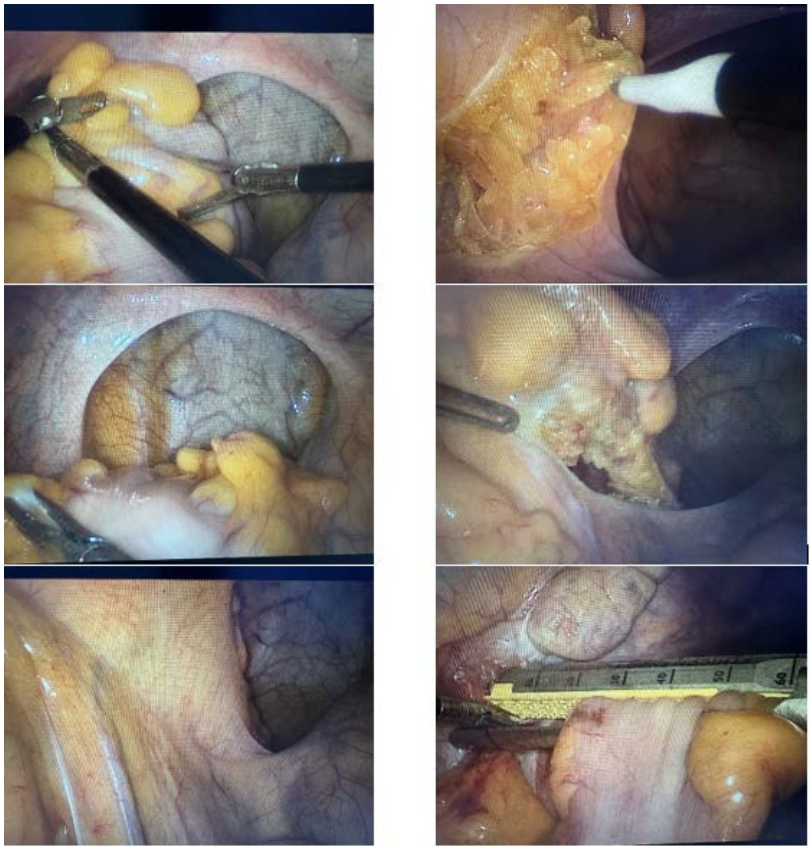

Figure 2. *Cutting the proximal and distal ends of the sigmoid colon with a laparoscopic linear closure cutter.*

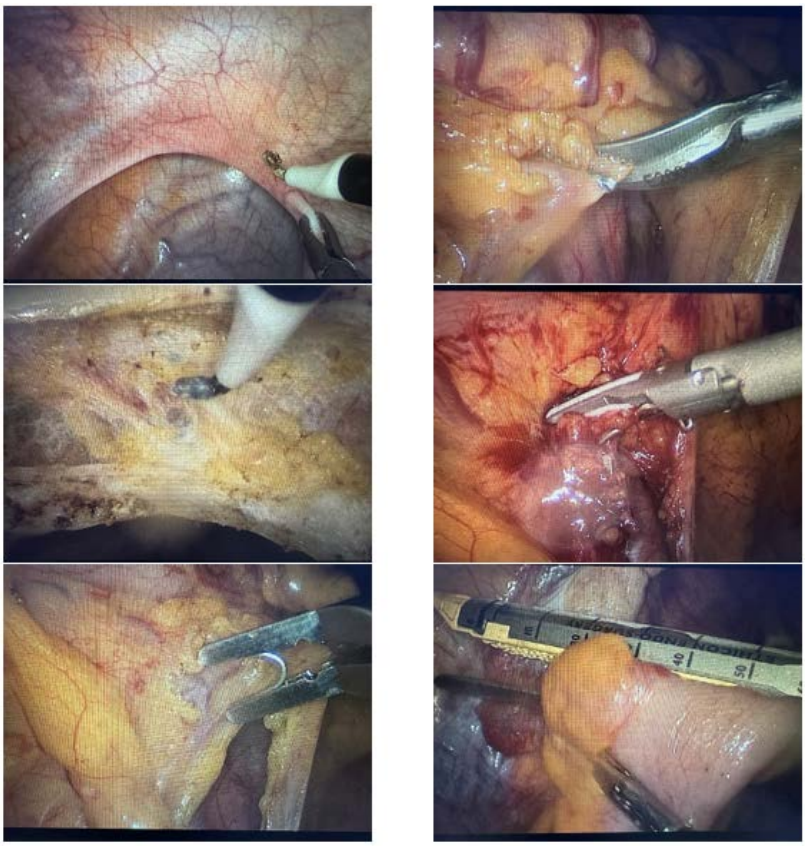

Figure 3. *Creation of the space by plastic Surgeons.*

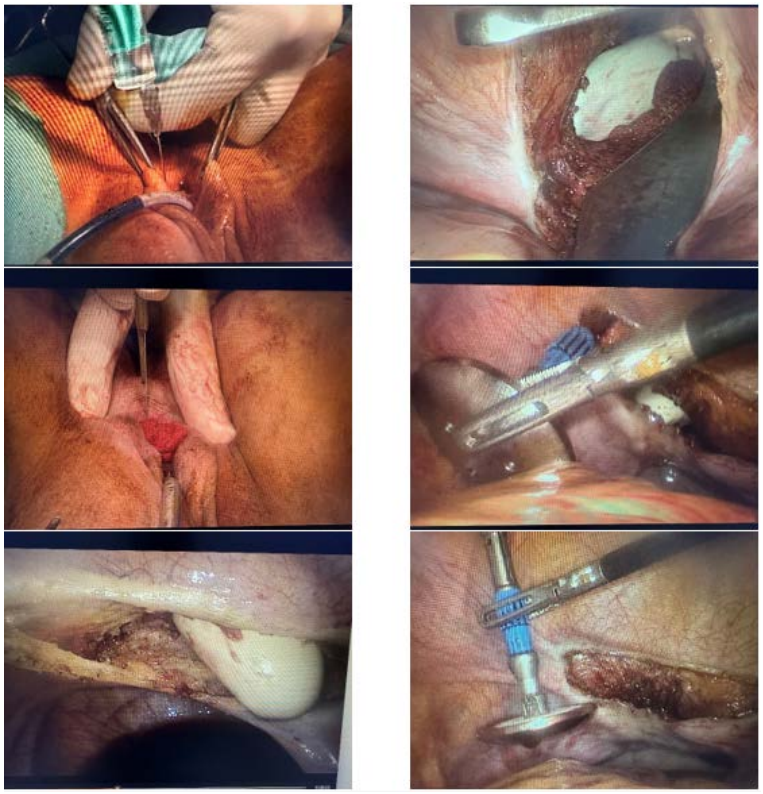

Figure 4. *Sigmoid Anastomosis by tubular stapler.*

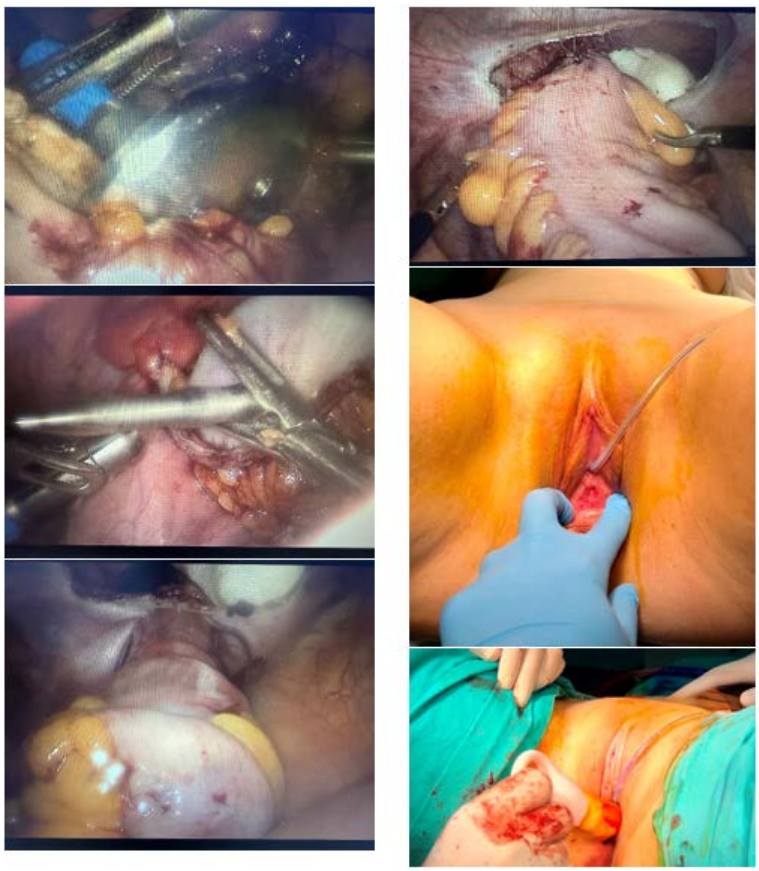

Figure 5. *Laparoscopic examination. Pre-operative and post-operative images.*

a stapler screw was inserted, sutured and fixed, and then returned to the abdominal cavity. The tubular stapler was inserted through the anus to the broken end of the rectum, connected with the screw drill, and sutured distally to the descending colon. The tubular stapler was activated and then withdrawn. The two sides of the intestinal ends cut by the anastomat were in a continuous annular shape (Figure 4).

Vaginogenesis:

The distal end of the free sigmoid colon was sent into the acupoint and pulled to the outer opening of the acupoint. After the intestinal wall edge was aligned with the vaginal vestibular mucosal edge, the synthetic line was used for intermittent suture (Figure 4).

Laparoscopic Examination:

The edge of the pelvic peritoneal incision was sutured and fixed around the intestinal segment. It should be checked whether the intestinal mesangium of the sutured, fixed, and free intestinal segment and the anastomosis sites are normal (Figure 5).

Vaginoplasty-Risks and Complications.

General Risks: As with any other surgical procedure, vaginoplasty techniques carry general risks, such as hemorrhage, infection, and anesthetic accidents. Severe scars may form as a result of vaginoplasty, making future corrective surgeries impossible, and also making the individual sensitive about the unsightliness of the perineum and vulva. Blood clots may form in the deep veins following surgery, called deep vein thrombosis. Surgical risks such as these are less common if the patient is in good health prior to the operation.

Specific Risks: Specific risks to vaginoplasty include vaginal fistula, uterovaginal or vault prolapse depending on whether or not the individual has a uterus, and colitis in the neovagina as well as diversion colitis in the closed-off end. Peritonitis may occur whenever the peritoneal cavity is breached.

Stenosis: Vaginal stenosis is a common complication of vaginoplasty and needs expert evaluation and timely correction to provide adequate caliber and depth to the new organ. This is necessary for both sexual intercourse and for proper external menstruation to occur. Introital stenosis alone may occur following surgery.

Nerve Damage: Nerve damage may occur during dissection of the tissues in the perineal and pelvic area, leading to hypoesthesia or dysesthesia. Chronic pain may also be present due to nerve damage.

Risks of Intestinal Vaginoplasty: Intestinal vaginoplasty is a major procedure, which may be followed by paralytic ileus, peritonitis, constipation, and difficulty in urination. It may be associated with excessive mucus production and can lead to having to wear a sanitary pad constantly. The risk of neovaginal and diversion colitis also exists. Moreover, the long-term risk of colon carcinoma arising in a sigmoid segment used for vaginoplasty has not been fully quantified as yet. **Fistula:** The occurrence of rectovaginal or urethrovaginal fistulas is another troublesome complication associated with vaginoplasty. They occur due to rectal or urethral injury during the procedure and may require second surgeries for repair.

The risk of fistulas is considered to be low, provided the surgeon is sufficiently skilled. There may be a vaginal odor or discharge due to bacterial overgrowth or colonization. This may require antibiotics or antifungal treatment in addition to regular douching.

Dissatisfaction: One final risk remains to be discussed, which is dissatisfaction with the outcome of the surgery. This is usually due to excessive laxity or tightness of the new vagina. The former may be disappointing to the patient in search of cosmetic improvement, while the latter may interfere with the use of tampons or with intercourse. The need for secondary or revision procedures is another major complication of vaginoplasty. Many of these risks are averted by a full and honest discussion by the surgeon detailing the procedure, the recovery, and the final outcome as well as the possible risks and complications.

Post operative Treatment:

After the operation, the artificial vagina required a vaginal mold and was washed once with clear water every other day. Routine post-operative care included fushing around the anus twice a day. Prior to the recovery of intestinal function, the patient received intravenous nutrition support. After the passage of gas by anus, the diet of the patient gradually transitioned from a liquid to a semiliquid diet. The patient was given prophylactic antibiotics, and any changes in abdominal signs were closely observed.

Follow up:

For the first month after the operation, the patient was followed up once per week by using questionnaire and telephone interview. During the second month after the operation, the follow-up period was once every 2 weeks. Three months after the operation, the patient returned to the hospital outpatient department for a face-to-face visit. During the consultation, patient underwent specialized gynecological examination and acquired medical tips and life advice. Thereafter, patient returned to the hospital regularly every 3 months. One year after the operation, the follow-up period was once every 6 months. The follow-up included assessments of vaginal size, volume, length, and color, as well as vaginal discharge and secretions. The patient got married and she had sexual partner. she was also questioned about aspects of her sex live.

Results.

We analyzed the patient with MRKH syndrome admitted to our hospital for one year. All the procedures were successfully performed with no intra-operative morbidity and no conversion to open surgery. The laparoscopic sigmoid colon vaginal replacement patient, the average operative time was 165 min, and the average amount of bleeding was 95 ml. There were no other major intra-operative complications and wasn't converted to open surgery. The prognosis of the patient was good. The perioperative complication included an umbilical incision infection. The hospital stay was 7 days. A functioning vagina was created. The mean length of the neovagina was 14 cm, and the mean width was 4 cm before discharge. No length shrinkage was observed during post-operative follow-up. patient had subsequent sexual activity. The interval between the operation and first intercourse was 6 months. Patient was satisfied with

Table 2. *FSFI questionnaire.*

Female Sexual Function Index	
Question	**Response Options**
Q1: Over the past 4 weeks, how **often** did you feel sexual desire or interest?	1. = Almost always or always 2. = Most times (more than half the time) 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q2: Over the past 4 weeks, how would you interest?	1. = Very high rate your **level** 2. = High 3. = Moderate 4. = Low 5. = Very low or none at all
Q3: Over the past 4 weeks, how **often** did sexual activity or intercourse?	0. = No sexual activity 1. = Almost always or always 2. = Most times (more than half the time) 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q4: Over the past 4 weeks, how would you during sexual activity or intercourse?	0. = No sexual activity rate your level of sexual arousal (“turn on”) 1. = Very high 2. = High 3. = Moderate 4. = Low 5. = Very low or none at all
Q5: Over the past 4 weeks, how confident were you about becoming sexually aroused during sexual activity or intercourse?	0. = No sexual activity 1. = Very high confidence 2. = High confidence 3. = Moderate confidence 4. = Low confidence 5. = Very low or no confidence
Q6: Over the past 4 weeks, how often have you been satisfied with your arousal (excitement) during sexual activity or intercourse?	0. = No sexual activity 1. = Almost always or always 2. = Most times (more than half the time) 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q10: Over the past 4 weeks, how difficult was it to maintain your lubrication (“wetness”) until completion of sexual activity or intercourse?	0. = No sexual activity 1. = Extremely difficult orimpossible 2. = Very difficult 3. = Difficult 4. = Slightly difficult 5. = Not difficult
Q11: Over the past 4 weeks, when you had sexual stimulation or intercourse, how often did you reach orgasm (climax)?	0. = No sexual activity 1. = Almost always or always 2. = Most times 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q12: Over the past 4 weeks, when you had sexual stimulation or intercourse, how difficult was it for you to reach orgasm (climax)?	0. = No sexual activity 1. = Extremely difficult or impossible 2. = Very difficult 3. = Difficult 4. = Slightly difficult 5. = Not difficult
Q13: Over the past 4 weeks, how satisfied were you with your ability to reach orgasm (climax) during sexual activity or intercourse?	0. = No sexual activity 1. = Very satisfied 2. = Moderately satisfied 3. = About equally satisfied and dissatisfied 4. = Moderately dissatisfied 5. = Very dissatisfied

Q14: Over the past 4 weeks, how satisfied have you been with the amount of emotional closeness during sexual activity between you and your partner?	0. = No sexual activity 1. = Very satisfied 2. = Moderately satisfied 3. = About equally satisfied and dissatisfied 4. = Moderately dissatisfied 5. = Very dissatisfied
Q15: Over the past 4 weeks, how satisfied have you been with your sexual relationship with your partner?	0. = No sexual activity 1. = Very satisfied 2. = Moderately satisfied 3. = About equally satisfied and dissatisfied 4. = Moderately dissatisfied 5. = Very dissatisfied
Q16: Over the past 4 weeks, how satisfied have you been with your overall sexual life?	0. = No sexual activity 1. = Very satisfied 2. = Moderately satisfied 3. = About equally satisfied and dissatisfied 4. = Moderately dissatisfied 5. = Very dissatisfied
Q17: Over the past 4 weeks, how often did you experience discomfort or pain during vaginal penetration?	0. = Did not attempt intercourse 1. = Almost always or always 2. = Most times (more than half the time) 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q18: Over the past 4 weeks, how often did you experience discomfort or pain following vaginal penetration?	0. = Did not attempt intercourse 1. = Almost always or always 2. = Most times (more than half the time) 3. = Sometimes (about half the time) 4. = A few times (less than half the time) 5. = Almost never or never
Q19: Over the past 4 weeks, how would you rate your level (degree) of discomfort or pain during or following vaginal penetration?	0. = Did not attempt intercourse 1. = Very high 2. = High 3. = Moderate 4. = Low 5. =Very low or none at all

Table 3. *The individual domain scores and full-scale score of the FSFI are derived by the computational formula.*

Domain	Questions	Score	range Factor	Minimum score	Maximum score
Desire	1, 2	1-5	0.6	1.2	6.0
Arousal	3, 4, 5, 6	0-5	0.3	0	6.0
Lubrication	7, 8, 9, 10	0-5	0.3	0	6.0
Orgasm	11, 12, 13	0-5	0.4	0	6.0
Satisfaction	14, 15, 16	0 (or 1)-5	0.4	0	6.0
Pain	17,18,19	0-5	0.4	0	6.0
Full Scale Score Range				2.0	36

their body image. From interviews, none developed vaginal stenosis due to the contracture causing painful intercourse or had spontaneous bleeding from the vagina. Before she got marriage, she required a vaginal stent every night because had no sexual partner. After sexually active she answered the FSFI questionnaire and completed all items: patient answered during her outpatient follow-up visit and by telephone reported satisfaction with her post-operative sexual intercourse. The mean desire, arousal, lubrication, orgasm, satisfaction, and pain scores were good. The mean total score was 27.±0.63 (Table 2).

Scoring System:

The individual domain scores and full-scale score of the FSFI are derived by the computational formula outlined in the table below. Individual domain scores are obtained by adding the scores of the individual items that comprise the domain and multiplying the sum by the domain factor (see below). The full-scale score is obtained by adding the six domain scores. It should be noted that within the individual domains, a domain score of zero indicates that no sexual activity was reported during the past month (Table 3).

Discussion.

Mayer–Rokitansky–Kuster–Hauser syndrome is a rare congenital condition affecting females with normal female karyotype and typical secondary sex characteristics. the most common disease in the congenital absence of a vagina, whereas androgen insensitivity syndrome is less common. Patients with

MRKH syndrome have normal genotype, endocrine status, and ovarian function. Severe dysplasia of the paramesonephric duct is often accompanied by urinary tract malformation. Primary amenorrhea is the absence of menstrual periods by the age of 16 in females who have otherwise undergone normal pubertal development. In this case, the patient had never experienced menstruation, which is a hallmark feature of MRKH syndrome. Upon physical examination, it was observed that the patient had no vagina, meaning there was no discernible vaginal orifice. This condition is consistent with the vaginal aplasia characteristic of MRKH syndrome. Imaging studies, including pelvic MRI, revealed the presence of aplasia uterus in the patient. A uterus is underdeveloped in size and may have an incomplete formation of the uterine cavity and myometrium. The absence of a functional vagina significantly impacted the patient's quality of life, leading to difficulties with sexual intercourse. This symptom underscores the physical and emotional challenges faced by individuals with MRKH syndrome. The patient experienced psychological distress related to her inability to conceive due to the reproductive anomalies associated with MRKH syndrome. The presented case exemplifies the intricate management required for MRKH syndrome, underscoring the importance of a multidisciplinary approach, focusing on interventions such as vaginoplasty and assisted reproductive techniques. MRKH syndrome poses significant challenges in terms of both physical and psychological well-being for affected individuals. For instance, a study reported case report of MRKH syndrome, emphasizing the diversity of associated anomalies and the need for tailored treatment approaches. This analyse aid clinicians in tailoring interventions to maximize patient outcomes and satisfaction.

Pre-operative chromosome examination should be performed, and a sex hormone test is recommended to understand endocrine function simultaneously. It is best to perform heart and urinary examination before surgery to determine if there is any developmental abnormality to facilitate the diagnosis and classification of the disease. Proper diagnosis of the underlying disease is important, and these associated deformities should be excluded pre-operatively to avoid surgical injury. Although the incidence of MRKH is not high, it seriously affects the psychological and social status of patients. The treatment should focus both on the vagina reconstruction and on the function to improve the psychological status of patients. For patients with MRKH syndrome, the treatment methods include non-operative pressure method and surgical treatment, and individual selection should be made according to the patient's age and needs. The nonsurgical method involves gradual dilatation of the vaginal dimple at the introitus. This requires time and strong patient motivation. As the procedure is painful and self-administered, compliance is usually very poor [6,7]. Surgical treatment is the main method. The development of artificial vaginoplasty has taken more than 100 years, with various procedures, including the amniotic method, the sigmoid vaginoplasty [6,7], the peritoneal vaginoplasty, and the vestibular mucosal levitation vaginoplasty [6,8]. These surgical methods have their characteristics and some disadvantages, such as long mucosal formation, long-term vaginal mold use, hair growth, skin flap prolapse, and an obvious scar in the donor area. The sigmoid vagina replacement is a good choice for vaginoplasty, its advantages include little narrowing after vaginal formation, no need to wear a mold for a long time, the intestinal mucus can play a lubricating role, and the appearance and organizational structure are close to the normal vagina [9]. However, the disadvantages of traditional open sigmoid vaginal replacement surgery limit its extensive development. The most important disadvantages are long operation time, great interference with the abdominal and intestinal tract, gastric tube placement to prevent intestinal obstruction, slow post-operative recovery, and a long hospital stay [10]. In addition, the larger post-operative surgical scar on the abdomen affects the appearance and causes an unnecessary psychological burden to the patients. Laparoscopic surgery significantly reduces the above disadvantages. With the application of an ultrasonic knife, updated endoscopic instruments, and increasingly improved surgical techniques, laparoscopic sigmoid vaginal replacement surgery has gradually replaced the traditional open surgery. At present, the operating technology of sigmoid vaginoplasty has been mature, and the average operation time, blood loss, complications, and post-operative complications reported in the literature are low, so it is a good surgical method [11,12]. Selecting the grafted intestinal segment with sufficient length and a good blood supply is necessary, and the end-to-end anastomosis of the sigmoid colon under laparoscopy is of great concern. The traditional sigmoid colon anastomosis method is to pull the sigmoid colon out from the abdominal or vaginal cavity. Before that, we need to test the mesenteric vascular tension of the descending colon distal end to pull the descending colon distal end smoothly. We need to fully open the peritoneum of the sigmoid colon as far as possible so as to free the inferior mesenteric vessels and to facilitate pulling the distal end without tension. However, sometimes, even if the submesenteric blood vessels are fully dissociated, it is still difficult to pull the distal end of the descending colon out of the cavitation, so it is necessary to pull it out of the abdominal wall incision to avoid injury. In our hospital, the sigmoid colon was pulled out of the abdominal wall for anastomosis at an early stage. The right lower abdominal incision was required to be extended by 2.5–3 cm. In a recent case of sigmoid transvaginal surgery, we optimized the laparoscopic incision so that the abdominal incision was no longer lengthened. Still, instead, the drill was inserted through the vaginal cavitation. The drill was inserted into the broken end of the intestine under the laparoscope and sutured, all other steps being the same as in traditional surgery, further reducing the risk of traction. What needs to be improved is the technique of laparoscopy. Nowadays, with the improvement of laparoscopic technology, this does not prolong the operation time or increase the risk of infection, so it is worth popularizing. Some hospitals have started to use the single-hole operation, which requires further equipment, with single-hole instruments, single-hole endoscopic techniques, and surgical techniques, and there is still a risk of poor navel healing [13]. Our optimization of this operation is based on the incision of the traditional laparoscopic surgery, which no longer lengthens the incision, does not need training in the single-hole technique, makes full use of the natural cavity and vaginal cavity to achieve the same surgical effect, and does not increase the operative time with the skilful operation and suturing skills required for

laparoscopic surgery. The sexual life of the neovagina after the operation is a key problem that deserves our attention. Our post-operative follow-up found that married patients or those with sexual partners reported high sexual satisfaction, good lubrication with drainage, and an acceptable odor range. Considering each mean domain score, those women with MRKH syndrome treated by laparoscopic sigmoid vaginoplasty (and completing the FSFI questionnaire) could be considered "normal" in terms of desire, arousal, lubrication, orgasm, and global sexual satisfaction. Other studies have also reported that sigmoid colonic vaginal replacement is associated with better sexual satisfaction [6,7,14]. Although overall satisfaction with sexual activity was high, there were limitations because the scores of various indicators for women in sexual activity were not separately listed and compared. For vaginal replacement surgery, in addition to the sigmoid colon method, peritoneal vaginal replacement is also a common way of operation [2,14]. Still, it takes a long time to use the vaginal mold after the operation. The width and depth of the artificial vagina are not enough, which may affect sexual satisfaction. There is also a risk of bladder or rectal injury and rectal–vaginal fistula [15]. Davydov's laparoscopic neo-vaginoplasty is also an alternative way to treat MRKH. It showed a shorter operation time with relatively more postoperative complications (19.0%) [2]. Robotics-assisted surgery is also feasible [16], but it increases the economic burden of patients, and it is not conducive to the promotion of its wide use in hospitals. In recent years, vaginoplasty using biological mesh [17-19] has also appeared. However, the high price of biological mesh limits its wide use, and its long-term efficacy and mesh-related complications still need to be further tracked.

In addition to MRKH syndrome, laparoscopic sigmoid vaginoplasty should also be used in international sex-change surgery and has received satisfying results [20]. At present, most literature indicates that patients' sexual satisfaction and sexual life index scores after sigmoid vaginoplasty are better than those after use of other surgical methods [6,7,14]. The sigmoid vaginal replacement method reported by our center had no intra-operative or post-operative complications, and the patients who were followed up showed that the surgical effect was also highly satisfactory. We believe that laparoscopic sigmoid vaginoplasty conducted by skilled surgeons in an endoscopic center is worthy of further promotion.

Conclusion.

Laparoscopic sigmoid vaginoplasty can achieve the goal of making a functional neovagina. The main advantages of this surgical technique are that it is minimally invasive and has fewer complications post-operation. It is a good procedure for patients with MRKH syndrome. This case highlights the importance of tailored treatment approaches and comprehensive care to address both the physical and psychosocial aspects of MRKH syndrome. Moreover, using minimally invasive techniques exemplifies the evolving landscape of surgical interventions, leading to improved outcomes and patient satisfaction. Continuing research and collaborative efforts are essential to further enhance our understanding of MRKH syndrome and optimize therapeutic strategies, ensuring holistic and effective care for affected individuals.

Data Availability: All data generated or analyzed during this case report are included in this article.

Declarations: Consent Written informed consent was obtained from the patient for publication.

Details of Ethics Approval: This case report, that has been approved by the Ethics Committee of Ltd. Vian Clinic "Caraps Medline" Georgia, Tbilisi. 48 Lubliana str, 0159. Protocol Number TMH-24-EC-0711 Request for Approval TMH-24-RL-2710

Conflicts of Interest: None.

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