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Research Letter

Single-incision mesh repair for the treatment of neovaginal prolapse

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The Mayer–Rokitansky–Küster–Hauser syndrome is a congenital disorder characterized by the absence of the uterus and the upper two thirds of the vagina, but with normal ovarian function and karyotype. The incidence rate of this disorder is estimated to be one in 4000–5000 female live births [1]. These patients present with primary amenorrhea and seek medical consultation when they become adolescents. At present, nonsurgical vaginal dilator therapy is the treatment of choice recommended by the American College of Obstetricians and Gynecologists. The treatment has a reported success rate of approximately 86% in creating a functional vagina [2]. Several surgical techniques have been developed for patients who had unsuccessful passive vaginal dilatation. Some of the surgical procedures useful in this regard are the surgical creation of a neovaginal space, vulvovaginoplasty, bowel vaginoplasty, and the Vecchietti operation. However, whether a neovagina is created by passive dilatation or surgery, it is not apically or laterally suspended by endopelvic fascial attachments. The absence of these anatomical supports, or a defect in their normal functioning, increases the risk of prolapse.

The Anterior Elevate system (American Medical Systems, Minnetonka, MN, USA) is one of the single-incision mesh kits available, and is reported to have favorable outcomes and acceptable adverse events for the treatment of prolapse [3,4]. To eliminate the recurrence of prolapse and reinforce the weakness of the native tissue, the mesh is put in place for the correction of cystocele and rectocele. Because of its efficacy and efficiency, synthetic meshes are being increasingly used worldwide. To date, very limited data are available on the treatment of neovaginal prolapse. We herein report the first case of neovaginal prolapse that was successfully treated by single-incision mesh repair using the Anterior Elevate system. The current case is helpful in providing an overview of a new surgical management technique for treating this rare form of prolapse.

A 36-year-old female presented with a 1-year history of symptomatic vaginal prolapse. The patient had primary amenorrhea and had been married for 5 years. She also had difficulties with sexual intercourse. She was diagnosed as having Mayer–Rokitansky–Küster–Hauser syndrome 1 year before our meeting and was referred for the treatment of neovaginal prolapse. The neovagina was created by passive vaginal dilatation, and regular sexual intercourse was recommended for vaginal dilation. She worked as a caregiver supporting the needs of a bed-ridden patient who required assistance. This type of job required frequent and heavy lifting. Upon pelvic examination, a vaginal pouch was observed. The pouch protruded 6 cm beyond the hymen during maximal straining (Fig. 1). The patient had normal secondary sexual characteristics and karyotype. After receiving appropriate counseling, the patient underwent pelvic reconstruction surgery by single-incision mesh repair. The first surgical step was to landmark the neovaginal apex. After adequate hydrodistention, a vertical anterior vaginal wall incision from the level of the bladder neck to the apex was made. Careful full-thickness dissection was made laterally and apically to the ischial spines and to the sacrospinous ligaments bilaterally. Dissection of the proper plane was difficult due to the lack of a normal anatomy. A polypropylene strip with a fixation tip was anchored to each sacrospinous ligament. The mesh was loaded onto the strips through the open eyelets and locked in place. The distal arms of the mesh were attached to the obturator internus muscle by self-fixating tips. The excess mesh was trimmed to fit the neovaginal length. After the mesh was placed, without tension or folding, the neovaginal wall was closed using an absorbable suture without trimming. The estimated blood loss was 150 mL. She was discharged and a good recovery was noted. There were no surgical complications. Preoperative and postoperative sexual functions were evaluated using a valid short-form Chinese version of the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire [5]. One year after the procedure, the patient had good vaginal function without the recurrence of prolapse. Her sexual function also improved after this surgery.

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Fig. 1. Prolapse of a neovagina.

The actual incidence of neovaginal prolapse remains unclear. Only one review reported 5% subsequent neovaginal prolapse after bowel vaginoplasty [1]. According to the currently available literature, only 11 cases of neovaginal prolapse have been reported and all were treated by different methods such as abdominal sacral colpopexy, sacrospinous ligament suspension, or fascia lata colpopexy to the sacrospinous ligament [6–13]. Of these patients, 10 underwent repair surgeries through the abdominal route [6–11]. Three patients failed surgery and recurrence of prolapse occurred soon afterwards [7,10]. To overcome the weakness of traditional repair with native tissue, mesh repair was therefore performed through the abdominal route in two patients with satisfactory outcomes [10]. There was only one patient who underwent fixation surgery through the vaginal route [12]. It was difficult to perform vaginal fixation because the neovaginal length was short. Therefore, in that patient, prolapse surgery was postponed and the dilator program was continued to elongate the vaginal length [12]. Another way to overcome the short length of the vagina is to use a fascia lata allograft to bridge the distance between the vaginal apex and the sacrospinous ligament [13]. However, this also carried the risk of rejection and transmission of an infectious disease.

Our patient is the first case of neovaginal prolapse who was treated by a single-incision mesh repair that was anchored apically to the sacrospinous ligaments by two mesh arms. These mesh arms provided strong support without tension and overcame the issue of insufficient vaginal length. In addition, it was less invasive than the transabdominal repair procedure. Based on the anatomic aspects of DeLancey [14], a neovagina lacks level I and II support. Level I support is the upper one third of the vagina suspended by the cardinal ligament, whereas level II support is the middle one third of the vagina attached laterally to the arcus tendineus and the fascia. The single-incision mesh repair provides both apical and lateral support to restore the level I and II support, indicating that there is a strong support to prevent a recurrence of anterior compartment prolapse. With regard to the patient's job, the requirement of frequent heavy lifting raised concerns about the recurrence of prolapse. As a result, surgical treatment with the Anterior Elevate system was considered after the patient was consulted on related options and possible outcomes. For this patient, a good recovery was noted and there were no mesh-related complications. After 1 year of follow up, the patient was satisfied with the surgical outcome, and had improved sexual function. Nevertheless, long-term follow up is needed because some complications related to the use of mesh have been reported [3,4].

Mesh repair through the vaginal route has some disadvantages that are worth noting. One is the level of difficulty in performing the surgical techniques. Dissection of a proper plane to put the mesh in place is challenging, especially for patients who have an abnormal anatomy. Therefore, it was important to dissect along the full thickness of the neovaginal wall to ensure that there was adequate surgical space to place the mesh in a tension-free manner without folding, which also depended on the surgeon's dexterity. Therefore, such arduous surgical procedures should be performed by a specialist who is familiar with female pelvic anatomy. In addition, patients with a neovagina created by bowel vaginoplasty are not suitable candidates for mesh repair. Because of the rarity of neovaginal prolapse, only limited knowledge is available on the surgical treatment. Owing to the congenital lack of anatomical support and recurrent prolapse after traditional repair, single-incision mesh repair is a new surgical option that can be considered in patients with neovaginal prolapse. This current case presents our findings that single-incision mesh repair can correct neovaginal prolapse with a favorable outcome.

Conflicts of interest

The authors have no conflicts of interest relevant to this article.

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Professor T.H.S. was responsible for case management and surgery; H.W. and H.-H.L. wrote the paper.

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