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Case Report

New modified laparoscopic Davydov's method using the rudimentary uterus

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ABSTRACT

Among surgical procedures of Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome, the laparoscopic Davydov's technique seems to offer the most feasible and effective approach for creating a neovagina. Several reports have pointed at the necessity for mobilization of the peritoneum to obtain a longer neovagina and have reported a modified laparoscopic Davydov's method. A new method was performed for a 24- and an 18-year-old patient. The most significant method in present procedure was to leave the thickened tissue that connects both rudimentary uteruses. The advantages of present procedure are physiological, creating a longer neovagina. Furthermore, this approach may help prevent prolapse of pelvic organs by leaving the thickened tissue as a ceiling.

Keywords: Laparoscopic Davydov's method, Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome, Neovagina, Rudimentary uterus

INTRODUCTION

Mayer-Rokitansky-Kuster-Hauser (MRKH) syndrome is a malformation complex defined by the absence of the vagina and uterus. The condition presents as primary amenorrhea, with normal ovarian function, female karyotype, and secondary sexual characteristics. Anomalies of the urinary tract and skeletal system are variably associated with MRKH syndrome. The exact incidence of this syndrome is unknown, although the most recent epidemiologic study estimated the incidence as 1:1500 to 1:4000 live-born female infants.¹

Numerous surgical and nonsurgical procedures have been described, all of which have aimed at creating a neovagina of adequate size and physiologic condition to permit normal sexual intercourse. Several methods to create a neovagina have been reported, including a nonsurgical technique (Frank's method) and numerous

surgical techniques (Vecchietti's method, McIndoe's method, Ruge's method, Davydov's method and their modifications). No consensus has been reached regarding the best option for surgical correction of the vaginal agenesis associated with MRKH syndrome.²

Among these methods, Davydov's laparoscopic method seems to be the most feasible and effective approach for creating a neovagina.³ To obtain and transfer adequate peritoneum to cover the walls of the neovagina, the laparoscopic Davydov's method requires mobilization of a relatively large portion of pelvic peritoneum, via various methods. This peritoneal mobilization and the associated "pull-down" technique are complicated and difficult to perform.⁴ However, mobilization of peritoneum is needed to obtain a longer neovagina. This report demonstrated a new modified laparoscopic Davydov's method that uses rudimentary uterus for MRKH syndrome due to obtain a longer neovagina.

CASE REPORT

Authors performed a new method for two patients. The first case involved a 24-year-old patient with no complications. She visited a nearby clinic due to primary amenorrhea in high school. She was diagnosed with MRKH syndrome and was introduced to our hospital for surgery at 23 years old. The labia majora and minora appeared normal. The vagina showed a blind ending with a length of about 5 mm.

The second case involved an 18-year-old patient. She underwent two operations for inguinal hernia at 2 and 5 years old and was introduced to our hospital due to primary amenorrhea. Authors investigated the amenorrhea in detail and diagnosed MRKH syndrome. The labia majora and minora appeared normal. The vagina showed a blind ending and was about 5 mm long. She and her family hoped for surgical treatment. Before surgery, both patients had undergone pelvic and abdominal ultrasonography, pelvic magnetic resonance imaging, and karyotyping.

Diagnostic criteria for MRKH syndrome were primary amenorrhea, vaginal agenesis, absence of the uterus, normal external genitalia, and a normal female karyotype (46, XX). Presence of a pelvic kidney was considered a contraindication for our procedure. Authors performed the new modified laparoscopic Davydov's method using the rudimentary uteruses. Both surgeries proceeded as follows.

The new modified laparoscopic Davydov's technique involves laparoscopic steps, followed by a vaginal approach. Authors first incise the vaginal end crosswise and peel bluntly, taking care to avoid bladder and rectal damage. After peeling until reaching under the peritoneum, we incise the vesicouterine/Douglas' pouch peritoneum transversely so as to leave the thickened tissue that connects both rudimentary uteruses (Figure 1a, b). Authors peel the vesicouterine peritoneum from the bladder and Douglas' pouch peritoneum from the rectum. We pull down the vesicouterine/Douglas' pouch peritoneum respectively to the vaginal inlet and fix using 3-0 absorbable suture.

The vesicouterine/Douglas' pouch peritoneum will form the anterior and posterior walls of the vagina, respectively. Authors insert a prosthesis into the neovagina to maintain vaginal length at about 7 cm and fix the vesicouterine/Douglas' pouch peritoneum and thickened tissue that connects both rudimentary uteruses using 1-0 absorbable suture (Figure 1c, d). The operation is completed with the prosthesis left in the neovagina. Postoperatively, we provide guidance to enable self-detachment of the prosthesis.

The results of the first case were: operation time, 3 h 55 min; blood loss, 5 ml; postoperative vaginal length, 7 cm; duration of retaining self-detachable prosthesis, 5 days;

and postoperative duration until sexual intercourse, 13 months. The results of the second case were: operation time, 2 h 26 min; blood loss, 20 ml; postoperative vaginal length, 7 cm; duration of retaining self-detachable prosthesis, 5 days; and postoperative duration until sexual intercourse, 5 months. We provided instruction on self-detachment of the prosthesis after postoperative day 3. The patient was discharged from hospital once they could perform self-detachment of the prosthesis. After leaving hospital, they were instructed to continue using the prosthesis. Neither patient complained of problems with sexual intercourse and no vaginal stenosis was recognized.

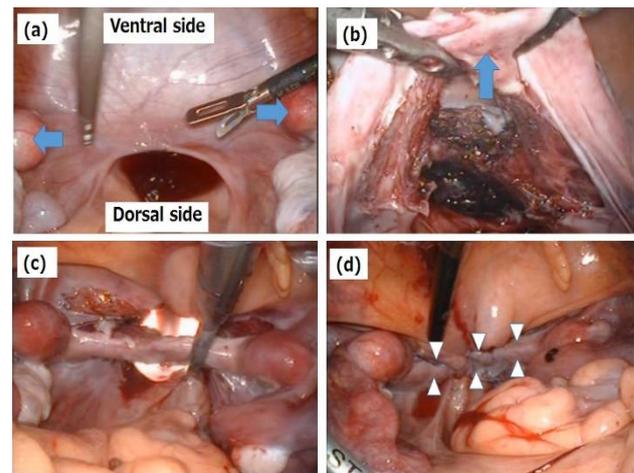


Figure 1: a) Thickened tissue connecting both rudimentary uteruses; b) Thickened tissue connecting both rudimentary uteruses. The vesicouterine/Douglas' pouch peritoneum is transversely incised, leaving the thickened tissue; c) A prosthesis is inserted into the neovagina to maintain vaginal length at about 7 cm; d) The vesicouterine/Douglas' pouch peritoneum is fixed, and thickened tissue shows the thickening after suturing.

DISCUSSION

Disadvantages of laparoscopic Davydov's method such as neovaginal stenosis, poor lubrication, scarring, contracture, and dyspareunia have prevailed even with the most popular techniques.⁵ To improve these shortcomings of the laparoscopic Davydov's method, authors performed a new modified method that used the rudimentary uteruses in two patients.

The most significant method of our procedure was to leave the thickened tissue that connects both rudimentary uteruses. This procedure is more physiological and useful in obtaining a longer neovagina. Authors also have not encountered any complaints of problems with sexual intercourse, scarring or contracture of the neovagina.

In terms of other surgical treatments, the most widely used method of surgical skin graft is the McIndoe method, involving a split-thickness skin graft inserted

into a space created between the bladder and rectum and maintained in position by a stent. Anatomical and functional success rates of 57-91% and 81-100%, respectively, have been described for this method.⁵

However, disadvantages of this technique include a high rate of graft shrinkage, dyspareunia, and stenosis. On the other hand, sigmoid grafting is a method of vaginal construction that offers adequate length, natural lubrication, low risk of stenosis at the perineal introitus, and early coitus. Moreover, shrinkage in length and width is minimal. Nevertheless, this method is performed by laparotomy, representing a major surgical procedure associated with the usual risks of bowel surgery, including rectal or colonic perforation in 1–3% of cases.⁵

Among these surgical procedures, the laparoscopic Davydov's method seems the most feasible and effective approach for creating a neovagina. The traditional laparoscopic Davydov's method is as follows:

- 1) create a vaginal tunnel by peeling off vaginal ending with a finger
- 2) incise the pelvic peritoneum and expand the vaginal canal and
- 3) suture the peritoneum and vaginal inlet.³

The laparoscopic Davydov's method offers many advantages and does not carry risks of peritoneal flap necrosis or development of a rejection reaction, which are potential problems with other transferred grafts.¹

In terms of one difficulty for laparoscopic Davydov's method, Fedele et al. pointed out the importance of peritoneal mobilization to obtain a longer neovagina. In their report, peritoneal mobilization was performed prior to sectioning of the round ligaments and posterolateral incisions of the peritoneal leaf along the infundibulopelvic ligaments, after which the final mean neovaginal length was increased from 6 to 8.5 cm after their modified procedure.¹

Zhao et al. also reported a laparoscopic vaginoplasty technique using a single peritoneal flap to obtain a longer neovagina.⁴ In the present report, authors demonstrated a new surgical procedure that uses the rudimentary uterus to obtain a longer neovagina. Authors kept peritoneal mobilization to leave the thickened tissue connecting both rudimentary uteruses between the vesicouterine pouch and Douglas' pouch. Authors therefore do not have to extensively peel off the peritoneum. Authors consider that this procedure is more physiological and useful for obtaining a longer neovagina. Authors have not recognized any vaginal stenosis, scarring or contracture in either of our cases.

Adamyam et al. have pointed out that the pelvic peritoneum has great regenerative power and can undergo squamous metaplasia when exposed to the external environment.⁶ Templeman et al. also reported that the

Davydov procedure allows spontaneous squamous epithelization of the neovagina within 6 months postoperatively. The reason for this rapid transformation is unclear, although we might hypothesize that, despite the dislocated peritoneum, the original vascularization is preserved and thus represents an easy substrate for epithelization.⁷

The present procedure also recognized spontaneous squamous epithelization of the neovagina all around, despite covering the anterior and posterior vaginal walls by 3 months postoperatively. Covering the entire neovagina with peritoneum might thus be unnecessary.

Zhao et al. reported that cutting bilateral round ligaments may not have maintained the position of the pelvic cavity and prevented prolapse.⁴ Authors considered that the thickened tissue connecting both rudimentary uteruses between the vesicouterine pouch and Douglas' pouch will reinforce the pelvic floor as the ceiling of the neovagina. The present procedure thus may prevent prolapse of pelvic organs in the future.

CONCLUSION

Authors showed a new modified laparoscopic Davydov's method that uses the rudimentary uteruses for MRKH syndrome. The advantages of present procedure are more physiological results, and a longer neovagina. Furthermore, this method may help prevent prolapse of pelvic organs. Although the long-term results remain unclear, this method appears useful. More cases must be accumulated to clarify the efficiency of this method.

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Ethical approval: Not required

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