

Comparison of the modified McIndoe and modified laparoscopic Vecchietti techniques for the creation of a neovagina in Rokitansky syndrome

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Abstract The aim of this retrospective clinical study was to compare the effectiveness and long-term anatomic and functional results of the modified laparoscopic Vecchietti and modified McIndoe techniques used to treat Rokitansky syndrome. Neovaginas were created either with the modified laparoscopic Vecchietti technique or with the modified McIndoe technique in 21 patients with Rokitansky syndrome aged between 17 and 40 years (mean 23 years) who wished to begin sexual intercourse. Anatomic success was defined as a neovagina longer than 6 cm and the easy introduction of two fingers. Functional success was achieved if the patient reported satisfactory sexual intercourse starting from 6 months after surgery. The performance of both techniques was efficacious. However, the postoperative hospital stay and operation times of the modified laparoscopic Vecchietti technique were shorter than those of the modified McIndoe technique and the modified laparoscopic Vecchietti technique was less painful than the modified McIndoe technique.

Keywords Rokitansky · Neovagina · Modified laparoscopic Vecchietti technique · McIndoe technique

Introduction

Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is the most common congenital absence of the vagina and is

characterized by a rudimentary uterus and normal fallopian tubes and ovaries. Its prevalence is 1 in 5,000 female newborns [1]. It has no standardized treatment yet, but many techniques for creating a neovagina have been proposed in the past. The most widely used method has been the one described by McIndoe and Bannister in 1938 [2], in which a split-thickness skin graft is used to cover a mold inserted into a surgically created space between the bladder and the rectum.

On the other hand, during the last 30 years in Europe, the most commonly used method for the creation of a neovagina has been the one proposed by Vecchietti in 1965 [3]. In 1994, Fedele et al. described a laparoscopic version of the Vecchietti method that has been proven to be safe and effective [4].

Both techniques' effectiveness and practicability were compared in this study.

Materials and methods

From April 2002 to July 2006, 21 patients with MRKH syndrome were surgically treated. The study was approved by the university's ethical committee and an informed consent was signed by all patients.

The age of the patients ranged between 17 and 40 years, with a mean of 23 years. Patients below 17 years of age and those with chromosome anomaly were not included in the study.

Routine abdominal and rectal ultrasounds were performed on all patients for pelvic organ (uterus, ovaries, bladder) localizations. Ovaries were in their normal anatomical positions in all patients. Routine intravenous pyelogram (IVP) was performed on all patients to check for ureter and renal anomalies. Five patients had an ectopic

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Fig. 1 The new bean

kidney. One patient did not have a fifth finger on her left hand. Karyotype analysis was performed on all patients.

All patients' main complaint was primary amenorrhea and being unable to have intercourse. MRKH syndrome's diagnostic criteria are normal secondary sex characteristics, normal external genitalia, blind vaginal pouch and absent uterus, and the presence of normal tubes and ovaries. All patients' karyotype was 46 XX.

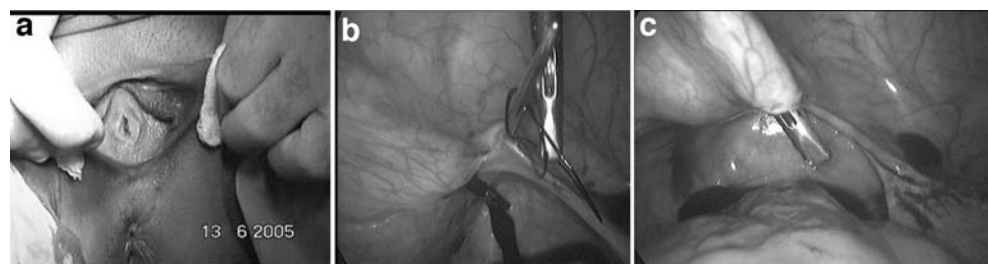
Non-surgical methods like the Frank method are not used in our clinic. Each operation was performed by the same team experienced with each technique (gynecologist/oncologist and plastic surgeon for the modified McIndoe technique and a laparoscopic surgeon for the Vecchietti technique). Each team performed the operation that they are experienced in on the patients they examined. Each team was consulting on different days in the polyclinic; therefore, the allocation of patients to a specific team depended on the team which was on duty that day. Since all procedures were performed by surgeons experienced in each technique, any possible complication difference was not due to the experience of the surgeon, but to the operation technique itself. An informed consent was signed by all patients. The modified laparoscopic Vecchietti operation was performed on 10 patients (Group 1) and the modified McIndoe operation on 11 patients (Group 2).

For the modified laparoscopic Vecchietti technique, a bean more suitable to the anatomy of the vagina was created (Fig. 1). For the performance of this technique (Group 1), the bladder was emptied by metal catheterization, adequate pneumoperitoneum was obtained, and a

laparoscope was introduced by the transumbilical route. Two 5-mm trocars were introduced into the suprapubic region to allow an accurate exploration of the abdominal and pelvic organs. Traction sutures connected to the acrylic bean were inserted into the suture carrier needle. The needle then centrally perforated the blind vaginal pouch through the space between the bladder and rectum into the abdominal cavity until it reached the level of the fibrous tissue (uterine rudiment), replacing the uterus. Atraumatic grasping forceps were introduced under the parietal peritoneum from the 5-mm trocars towards the fibrous tissue and the peritoneum was then perforated. The threads at the end of the needle were withdrawn from under the parietal peritoneum at the sacro-uterine level to above the suprapubic region with grasping forceps (Fig. 2). After gentle traction, the two sutures were tied on sponges at the midline on the suprapubic region. A traction device was not used. Subsequent traction was gradual and progressive, as excessive traction causes necrosis of the foveal epithelium. The suture was lifted by adding sponges to cause traction of approximately 1 cm every day until a 7–8-cm-long neo-vagina was achieved in, on average, 7–8 days. All patients were then discharged with a dilator 10-cm long and 2.5-cm wide [5], which they used during 8 h every day for 6 months.

In the McIndoe technique (Group 2), a graft was taken from the thigh or the scalp. The patient was placed in the lithotomy position and a transverse incision was made through the mucosa of the vaginal vestibule. The space between the urethra and bladder was anteriorly dissected and the rectum was posteriorly dissected until the under-surface of the peritoneum was reached. A plastic surgeon spread the split-thickness skin graft on a multiholed rigid plastic mold, covered the skin graft with fibringlue, and inserted it into the dissected space. The skin graft was sutured to the hymenal skin. In the ten days following the surgery, at least two dressings were done under general anesthesia by irrigation with Batticon solution. Antibiotic cream (Furacin; Eczacıbaşı, Turkey) and estrogen cream (Ovestin) was spread on the mold before replacing it. A semisolid silicone mold 2.5-cm wide and 12-cm long, which remained in place 24 h a day for at least 6 months after the operation, was used by the patient [6]. The mold could be removed for sexual intercourse. Antibiotic cream

Fig. 2 a–c The modified laparoscopic Vecchietti technique. **a** Examination of the patient before surgery: a 2-cm-long closed vagina is present. **b** The needle passing through the perineum. **c** The grasping forceps passing below the peritoneum



(Furacin; Eczacıbaşı, Turkey) and estrogen cream (Ovestin) were spread on the mold before inseting it into the vagina. The patients were allowed to start sexual intercourse 1 month after hospital discharge.

Clinical follow-up was planned at 1, 3, 6, and 12 months after the operations and every 6 months thereafter. At each visit, the patients were questioned about the quality of their sexual life and about vaginal discharge. Vaginal and rectal examinations, vaginal cytology, and microbiology tests were performed. Postoperative neovaginal depth was measured by inserting molds of various lengths into the vagina. The criteria for anatomic success was a neovagina greater than 6 cm long and the easy introduction of two fingers within 6 months of corrective surgery.

Statistical analysis

Data analysis was performed using the SPSS package program version 14.0. All parameters are shown as the mean. The Mann-Whitney U- and the Chi-square tests were used. $p < 0.005$ was considered to be statistically significant.

Results

The average blind vaginal pouch was similar in both groups ($p > 0.005$).

The mean operation time was 40 min for the modified laparoscopic Vecchietti technique and 95 min for the McIndoe technique ($p < 0.005$) (Table 1).

The average retrieval time of the bean was 8 (6–10) days. The mean hospital stay was 8 days in Group 1 and 19 days in Group 2 ($p > 0.005$). Most patients used their dilators in the first two months, but some who had regular intercourse did not. Because they were single, two patients were required to use their dilators as prescribed until starting sexual intercourse. There were hairs on the squamous epithelium of one neovagina of Group 2, but this did not cause any inconvenience during intercourse.

In Group 2, three patients had a postoperative infection in the neovagina and this was supported by microbiologic cultures ($p > 0.005$).

Table 1 Analysis of all cases

	Group 1	Group 2
Number of patients	10	11
Age	17–35	18–40
Karyotype	XX	XX
Abnormal IVP	3	2
Secondary sex characteristics	Normal	Normal
Number of married patients	9	9
Position of ovaries	Normal	Normal

Table 2 Comparison between both procedures

	Group 1	Group 2	<i>p</i>
No. of patients	10	11	–
Operation time	40 min	95 min	<0.001
Hemoglobin fall (gr/dl)	None	2	<0.001
Hospital stay	8 days	19 days	0.146
Follow-up period		8 months	
11 months	0.015		
Postoperative analgesy needed	2.5 days	8 days	<0.001
Infection	None	3	0.119
Complications	None	3	0.497
Approximate cost	\$800.00	\$1,600.00	<0.001

Both procedures were completed successfully, except for one major complication in Group 2, in which a bladder injury occurred and was repaired during the surgery ($p > 0.005$) (Table 2). All patients' neovagina lengths were satisfactory for anatomic and functional success.

The intensity of postoperative pain was assessed by the completion of a universal pain assessment tool on the day of surgery (Fig. 3).

Discussion

After the diagnosis of Rokitansky syndrome, usually during adolescent years, the creation of a neovagina should be delayed until the time of planned sexual intercourse due to the psychological and sociological problems caused by the use of molds in women not having sexual intercourse. In their study, Buss and Lee [7] had two rectovaginal fistulas and one graft failure after performing the McIndoe vaginoplasty, and five patients required additional reconstructive vaginal surgery. In 1996, Alessandrescu et al. [6] included 201 cases in their study. They reported no mortality, two rectal perforations (1%), eight graft infec-

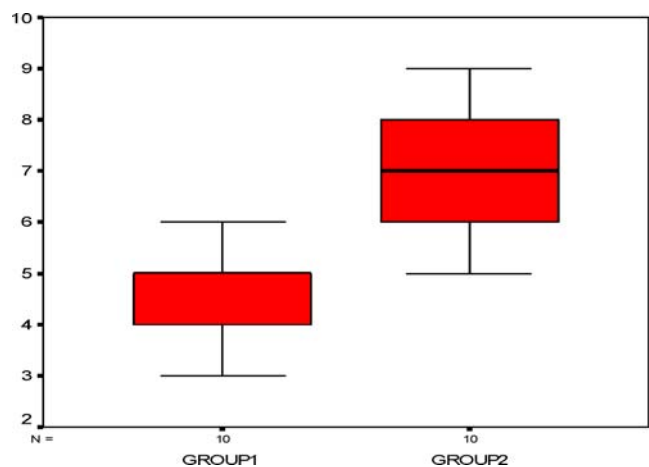


Fig. 3 This graph summarizes the pain assessment results of the two groups

tions (4%), and 11 infections of graft site origin (5.5%). They concluded that the McIndoe procedure is simple and has low morbidity and high success. The patients in Roberts et al.'s [8] study underwent a McIndoe vaginoplasty, after which, all neovaginal creations were successful. They also concluded that the McIndoe procedure has proved to be an excellent option for patients in whom conservative dilatation techniques failed and in patients who refused to attempt any dilatation. Højsgaard et al.'s [9] study reported complications such as the lack of skin graft take, bleeding, urethrovaginal fistula, perforation of the rectum, rectovaginal fistula, and vaginal stricture, which were treated to lead to satisfactory final results. Except for the bladder perforation, such serious complications were not encountered in the present study, which was, perhaps, due to the low number of cases.

According to Fedele et al. [10], the laparoscopic Vecchietti technique has numerous advantages. First, there is no need to dissect the vesicorectal space; a surgical step that carries some risks and complications. Second, the procedure does not cause any scars such as those associated with the technique of skin grafting. Third, the procedure is quick and does not require plastic surgery. Finally, the neovagina becomes coated with an iodine-positive stratified squamous epithelium similar to that of a normal vagina.

In this study, almost twice the amount of time was required to carry out the McIndoe procedure. Patients in Group 2 also received anesthesia for the dressings and required more analgesia during the postoperative period.

Hairs were found in the neovagina of one patient in Group 2. It is thought that the cause of this was that the graft, which was taken from the scalp, must have been full-thickness instead of split-thickness. The hairs eventually fell off. In addition, postoperative vaginal infection, which was treated by serum and Batticon antiseptic solution (polyvinylpyrrolidone–iodine complex; Adeka, Turkey), irrigation, and local and systemic antibiotics, was observed in Group 2.

In the modified McIndoe group, 27.3% of patients assessed their pain as moderate and 72.7% assessed it as severe. In the Vecchietti group, all patients assessed their pain as moderate.

The longer hospital stay in Group 2 was due to the fact that at least two dressings were done under general anesthesia by the surgeon him/herself to see whether neovascularization had taken place and to teach the patient sterile dressing techniques.

The cost of performing the modified McIndoe technique was twice as much as the modified Vecchietti technique because it involves three departments (anesthesiology, plastic surgery, gynecology) as opposed to two (anesthesiology, gynecology), requires more surgical interventions for the graft, is a longer operation, and requires more analgesia and a longer hospitalization.

The lengths of the neovaginas were almost the same in both groups. Anatomic success was defined as a neovagina longer than 6 cm and the easy introduction of two fingers [5].

In conclusion, the modified laparoscopic Vecchietti technique is more cost-effective and less painful than the McIndoe technique. Because of its low morbidity and high effectiveness, the modified laparoscopic Vecchietti technique is concluded to be the more suitable technique for creating neovaginas in women with MRKH syndrome.

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