Creation of a neovagina in Rokitansky patients with a pelvic kidney: comparison of long-term results of the modified Vecchietti and McIndoe techniques

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Objective: To evaluate perioperative data and long-term results of Rokitansky patients with a pelvic kidney that underwent the McIndoe and modified Vecchietti procedures.
Design: Retrospective descriptive study.
Setting: A tertiary referral center for the study and treatment of Rokitansky syndrome.
Patient(s): Eleven patients with Rokitansky syndrome.
Intervention(s): Two and nine patients, respectively, underwent the McIndoe and Vecchietti modified techniques.
Main Outcome Measure(s): Anatomic success was defined as a neovagina $\geq$6 cm long allowing easy introduction of two fingers within 6 months postoperatively. Functional success was considered achieved when the patient reported satisfactory sexual intercourse starting from 6 months postoperatively.
Result(s): Surgery was performed with no complications in all 11 patients. The mean duration of surgery was 190 $\pm$ 14.1 minutes in the first group and 32 $\pm$ 6.4 minutes in the second group. At 14 years of follow-up, both patients who underwent McIndoe vaginoplasty had a mean $\pm$ SD length and width of 8.2 $\pm$ 0.4 cm and 5 cm and negative Schiller's test 24 months postoperatively. At 4 years of follow-up, eight out of the nine patients who underwent the Vecchietti procedure (89%) had a mean $\pm$ SD length and width of the neovagina of 7.4 $\pm$ 0.6 cm and 4.2 $\pm$ 0.5 cm and iodine-positive vaginal-type epithelium coating 100% of the neovagina 24 months postoperatively.
Conclusion(s): While appearing to be safe, effective, and with optimal functional results, the modified Vecchietti approach also seems to yield good anatomical and aesthetic results along with shorter surgical and hospitalization times. (Fertil Steril® 2010;93:1280–5. ©2010 by American Society for Reproductive Medicine.)

Key Words: Rokitansky syndrome, pelvic kidney, neovagina, McIndoe, Vecchietti

Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome is the second most frequent cause of primary amenorrhea, occurring in 1:4000 to 1:5000 female births (1). Uterovaginal agenesis can be associated in 30%–40% of cases with congenital anomalies of the upper urinary tract, of which the most common are monolateral renal agenesis and the pelvic kidney (2, 3). A pelvic kidney is found opposite the sacrum and distal to the bifurcation of the aorta. The variation in its anatomy is associated with anomalous vascular patterns and altered spatial relations with the adjacent pelvic organs (4). Additionally, owing to the failed ascent, the pelvic kidney remains unrotated and often maintains its fetal vascular supply from the distal aorta or the iliac vessels (5).

Patients with MRKH syndrome and a pelvic kidney, which is almost always associated with a contralateral agenesis, therefore constitute an important surgical challenge as the pelvic anatomy is altered and this renders impractical most of the currently used procedures for creation of a neovagina, that is, intestinal transposition (6–8) and the Davydov technique (9, 10). In 1999, we reported the feasibility of the laparoscopic creation of a neovagina in patients with MRKH syndrome and a pelvic kidney (11). However, despite the prevalence of 11.3%–17% of pelvic kidneys in patients with MRKH syndrome (12, 13), there are still only episodic reports in the scientific literature of these patients undergoing creation of a neovagina.

The objective of this report is to evaluate the perioperative data and the long-term anatomical and functional results of consecutive patients with MRKH syndrome and a pelvic kidney who underwent the modified Vecchietti and the McIndoe procedures.

MATERIALS AND METHODS

In this retrospective descriptive study, we assessed data from 11 patients with MRKH syndrome with a pelvic kidney, of which the first two underwent McIndoe's surgical procedure

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between 1988 and 1993 and the latter nine underwent Vecchietti's modified technique between 1993 and 2003 at our tertiary referral center for the study and treatment of MRKH syndrome. Since 1993, our institute has exclusively adopted the laparoscopic approach for the creation of a neovagina with Vecchietti's and Davydov's modified techniques. The medical records of all patients with MRKH syndrome and a pelvic kidney operated with the McIndoe and modified Vecchietti techniques from 1988 to 1993 were examined, and data were assessed regarding surgery duration and perioperative complications. Data were also analyzed regarding postoperative anatomical and functional results during follow-up examinations at 1, 3, 6, and 12 months postoperatively and twice yearly thereafter. At each follow-up visit, all patients had undergone a gynecologic examination and vaginoscopy with Schiller's test and evaluation of sexual function and satisfaction. All patients were requested to define the degree of satisfaction at sexual intercourse as one of the following: unsatisfactory, moderately unsatisfactory, moderately satisfactory, or satisfactory. The study did not require formal approval from the Institutional Review Board because of the observational nature of the study.

All patients had been diagnosed with MRKH syndrome before surgery. All had a normal female karyotype, amenorrhea, and normal secondary sexual characteristics with the absence of functioning median uterine structures. Of the first two patients who had undergone McIndoe's procedure, one patient had no vaginal fovea, while the other had a 1-cm vaginal dimple. Of the nine patients who underwent the Vecchietti procedure, six had no vaginal fovea and the other three had a 1-cm vaginal dimple. The mean age of the patients was 21.8 years. Ten of the 11 patients had a solitary pelvic kidney, nine of which were on the right; only one patient had a normal contralateral left kidney.

All patients had undergone an abdominal and pelvic ultrasound scan, a pelvic magnetic resonance imaging scan, and a urinary tract sonogram or urography for evaluation of the uterine rudiments, adnexae, and urinary tract.

The first two patients had undergone the McIndoe vaginoplasty (14), while the latter nine had undergone creation of a neovagina according to the modified laparoscopic Vecchietti procedure (15).

The McIndoe Technique

A Foley catheter was inserted into the bladder after the patient was placed in the lithotomy position. A horseshoe-shaped midline incision at the vaginal fovea was made, and a cavity was obtained by blunt digital and scissor dissection in the vesicorectal space that admits two fingers and was about 13 cm in depth (Fig. 1A). A 13 cm × 5 cm split-thickness skin graft from the thigh or gluteal area was harvested. An acrylic mould with multiple openings (i.e., to allow serous and bloody discharge) was wrapped with the skin graft (Fig. 1B and 1C) with its raw surface facing outward and inserted into the neovagina (Fig. 1D). The mould was retained in this position for an average of 14 days, during which the neovagina was irrigated daily with sterile saline solution. After 14 days, the mould was removed and the graft was inspected. Postoperatively, the patients were instructed on the use of vaginal dummies of 11.5 cm × 3 cm in size to be used daily as well as on douching daily with sterile saline solution.

Modified Vecchietti Laparoscopic Technique

The instrumentation required to perform this operation includes the thread-bearing needle, the traction device, and its mobile dummy. The traction device and the acrylic olive originally developed by Vecchietti (G. Cremascoli, Milan, Italy) were used in this group.

After the bladder was emptied by catheterization, adequate pneumoperitoneum was obtained, and a laparoscope was introduced by the transumbilical route. The traction device along with the threads was temporarily placed on the suprapubic region, and the points at which the threads pass were marked on the skin. Adjacent to the markings, two ancillary trocars were introduced to allow accurate exploration of the abdominal and pelvic organs. The peritoneum corresponding to the vesicouterine fold was incised for about 5 mm (Fig. 2A) and lifted from the subperitoneal tissue on both margins (Fig. 2B) to facilitate the lateromedial passage of Vecchietti's thread-bearing needle. The trocars were then removed, and one was replaced by Vecchietti's straight thread-bearing cutting needle, which was passed through the loose subperitoneal connective tissue downward and medially until it reached the fold between the bladder and uterine rudiment (Fig. 3A). Since it is difficult to separate the peritoneum from the rudiment, the thread-bearing needle is brought out of the peritoneal cavity and reinserted in the subperitoneum immediately below the uterine rudiment. At this point, the direction was changed from lateromedial to craniocaudal (Fig. 3B) so that the cutting needle crosses the space between the bladder and rectum and reaches the pseudohymen. Before perforating the pseudohymen, the laparoscopist should guide the tip of the instrument aided by the middle finger inserted in the rectum. Bladder and rectal integrity are immediately checked with a cystoscopic and rectoscopic control. The pseudohymen was perforated centrally, and the threads attached to the mobile dummy were hooked. As the needle was withdrawn, the threads were brought back into the peritoneal cavity (Fig. 4A) and then both brought outward and passed subperitoneally through the abdominal wall (Fig. 4B). Finally, the threads were attached to the traction device and their tension was graduated.

The traction device and mobile dummy were removed after the neovagina had reached at least 7–8 cm in depth, which may be obtained between the sixth and ninth day after surgery. Patients can be discharged from the hospital 48–72 hours after surgery and subsequently seen every 48 hours so as to adjust the thread tension. An adequate oral analgesic therapy is usually necessary before traction regulation. The patient was discharged at removal of the traction device and was instructed to the use of soft and blunt vaginal dilators of 11.5 cm × 3 cm in size.