

# Creation of a Neovagina by the Vecchietti Procedure in a Patient with Corrected High Imperforate Anus

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## ABSTRACT

**Background:** Vaginal atresia is often associated with high imperforate anus. Because the commonly used methods of surgical vaginal creation (eg, McIndoe, intestinal segment interposition) may adversely affect urinary and fecal continence, the less-invasive Vecchietti procedure was selected for a young adult with a successfully corrected high imperforate anus.

**Methods:** A 21-year-old was born with a high imperforate anus, vaginal atresia, right hemi-uterus, and left renal agenesis. A colostomy was done at birth, a pull-through procedure at 9 months, and a stoma closure 3 months later. At age 13, an obstructed and dilated right hemi-uterus and fallopian tube were resected. A laparoscopic version of the Vecchietti procedure was used for creation of a neovagina.

**Results:** After the patient had been in the hospital for 2 days, traction was gradually advanced every other day in the office. At 2 weeks postoperatively, the bead was removed revealing a 7-cm vagina. Further elongation was achieved using the Frank method, while continence remained intact.

**Conclusion:** The Vecchietti procedure is an attractive, minimally invasive alternative for creation of a neovagina in patients at risk for compromise to their vesico-anorectal continence.

**Key Words:** Vaginal atresia, Vecchietti procedure, Neovagina.

## INTRODUCTION

Müllerian agenesis, also known as Mayer-Rokitansky-Küster-Hauser syndrome, affects 1 in 4 000 to 1 in 10 000 women, and involves congenital absence of the vagina with either rudimentary or no uterine and tubal structures, normal ovaries, and normal secondary sexual characteristics.<sup>1,2</sup> Women affected by this disorder often have accompanying renal, skeletal, and other anomalies. Various techniques have been described for creation of a neovagina in these patients, including nonoperative ones using dilators and either intermittent pressure by the patient (Frank method), or passive pressure applied by a bicycle seat beneath the perineum (Ingram method).<sup>3,4</sup> Operative techniques include interposition of intestinal segments, such as ileum or sigmoid,<sup>5,6</sup> myocutaneous flaps,<sup>7-9</sup> grafts of skin,<sup>10</sup> peritoneum,<sup>11</sup> or amnion,<sup>12</sup> and even use of synthetic absorbable membranes, such as oxidized regenerated cellulose (Interceed, Ethicon Endo-Surgery, Cincinnati, OH) to simulate vaginal mucosa.<sup>13</sup> In general, nonoperative techniques require a great deal of patient motivation and participation, with functional success achieved after many months of effort. Operative techniques hold the distinct advantage of being faster, but most require hospitalization and significant risk for perioperative morbidity, such as infection and graft rejection.

A unique hybrid of surgical and nonsurgical techniques is the Vecchietti procedure, introduced in the medical literature in 1965, then later modified via a laparoscopic approach and first described in 1992.<sup>14-16</sup> It involves continuous upward traction on a bead placed in the vaginal dimple that is attached to sutures that pass through the vesicorectal space into the abdominal cavity, through the extraperitoneal space, and later traverse the anterior abdominal wall with attachment to a traction device (Marina Medical, Sunrise, FL). Continuous upward pressure on the vaginal vestibule stretches the mucosa, leading to elongation of the cavity to a more normal depth, typically 7cm to 10cm, after several weeks. The procedure can be accomplished in less than one hour with excellent anatomical and functional results to follow.<sup>17</sup>

The case presented below involves a young woman born with vaginal agenesis and several anomalies that were surgically corrected in the past that could potentially be

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damaged by further pelvic floor surgery. In an effort to create a functional, copulatory vagina with minimal disruption of surrounding structures, a laparoscopic Vecchiatti procedure was chosen.

## MATERIALS AND METHODS

The patient is a 21-year-old, single, Hispanic woman born with a high imperforate anus, vaginal aplasia, right hemiuterus, and left renal agenesis. She underwent surgery for creation of a colostomy in the early neonatal period, with a later pull-through procedure performed using the technique of Peña.<sup>18</sup> At the age of 12 months, her stoma was closed and complete fecal continence achieved.

At age 13, she began having cyclic, monthly pelvic pain in her suprapubic region with subsequent imaging revealing a unicornuate uterus with functional endometrial tissue. She underwent an uncomplicated abdominal hysterectomy with resolution of pain symptoms. She continued to do well until the age of 17 when she presented with lower abdominal pain due to an inguinal hernia that was repaired shortly thereafter.

She presented to the author (PM) desirous of a functional vagina. On presenting examination, a 1-cm vaginal dimple was present with otherwise normal female external genitalia. The patient was counseled as to options for creation of a neovagina, with an impending move to another region of the country heavily influencing her decision to proceed with a surgical form of therapy. Several weeks after her initial consultation, laparoscopic creation of a neovagina was accomplished using the Vecchiatti technique.<sup>19</sup>

In short, under laparoscopic guidance, 2 monofilament sutures attached to an acrylic bead were passed through the vaginal vestibule into the peritoneal cavity. Correct positioning of the sutures was ascertained by using cystoscopy and a digital rectal examination. Two grasping instruments were then inserted through ancillary abdominal ports on both sides of the rectus abdominis muscles and tunneled through the extraperitoneal space down to the level of suture entry into the pelvis. The sutures were withdrawn through the port incisions and attached to a specially designed traction device where they were tightened, creating upward tension on the bead. The sutures were tightened daily during the patient's 2-day hospital stay and every other day for 2 weeks in the surgeon's office following discharge. Oral analgesic tablets containing either naproxen or hydrocodone with ibuprofen were

prescribed for the patient and were taken as needed prior to suture tightening.

Upon removal, the patient was noted to have a vaginal length of 7cm with intact mucous membranes lining the newly created cavity. She was instructed in the use of vaginal dilators to maintain vaginal length and patency until a future time when she would become sexually active. One month following surgery, the patient reported normal urinary and fecal continence with ongoing successful use of vaginal dilators.

## DISCUSSION

To the best of our knowledge, this is the first case of a woman with previous pelvic and anorectal surgery undergoing a laparoscopic Vecchiatti procedure to treat vaginal agenesis. This procedure has well-recognized benefits compared with alternatives, including minimal scarring, shorter hospitalization, elimination of graft harvesting, and the presence of a stratified squamous epithelium similar to a normal vagina. Further virtues and comparisons to other techniques have been well-described in previous reviews.<sup>17,20</sup> In the largest published case series to date by Fedele and colleagues<sup>21</sup> in which 110 consecutive cases were followed prospectively, 98% of patients achieved anatomic success, defined as a functional vagina within 6 months of surgery 6cm or more in length and 2 fingerbreadths in width. Moreover, 97% of patients reported satisfactory sexual intercourse with no differences in functional results, such as arousal, lubrication, and orgasm when compared with age-matched peers.

In this case, the tenuous nature of the patient's continence mechanism made this minimally invasive approach especially attractive. It also mandated meticulous cystoscopic examination of the bladder and inspection of the rectum intraoperatively to verify proper placement of the sutures through the vesicorectal space. Of course, maintenance and elongation of the neovagina still requires nightly insertion of a dilator until such time that regular intercourse ensues, but should not require the 6 months to 12 months of dilator use that is typical for the Frank and Ingram methods. With regular use of oral analgesics, our patient found that the discomfort and inconvenience of office visits at 48-hour intervals for 2 weeks was acceptable and preferable compared with other alternatives. Long-term follow-up will be necessary before concluding whether this patient achieves a functional level of success.

## CONCLUSION

Given the collective experience reported here and elsewhere, creation of a neovagina via a modified Vecchiatti technique should be considered by an experienced laparoscopist for patients with prior correction of anorectal malformations.

## References:

1. Evans TN, Poland ML, Boving RL. Vaginal malformations. *Am J Obstet Gynecol.* 1981;141:910–920.
2. Fedele L, Bianchi S, Frontino G, Ciappina N, Fontana E, Borruto F. Laparoscopic findings and pelvic anatomy in Mayer-Rokitansky-Küster-Hauser syndrome. *Obstet Gynecol.* 2007;109:1111–1115.
3. Frank RT. The formation of an artificial vagina without operation. *Am J Obstet Gynecol.* 1938;35:1053–1057.
4. Ingram JM. The bicycle seat stool in the treatment of vaginal agenesis and stenosis: a preliminary report. *Am J Obstet Gynecol.* 1981;140:867–873.
5. Baldwin JF. The formation of an artificial vagina by intestinal transplantation. *Ann Surg.* 1904;40:398–404.
6. Freundt I, Toolenaar TAM, Huiheshoven FJM, Drogendijk AC, Jeekel H. A modified technique to create a neovagina with an isolated segment of sigmoid colon. *Surg Gynecol Obstet.* 1992;174:11–16.
7. McGraw J, Kemp G, Given F, Horton CE. Correction of high pelvic defects with the inferiorly based rectus abdominis myocutaneous flap. *Clin Plast Surg.* 1988;15:449–454.
8. Kee JTK, Joseph VT. A new technique of vaginal reconstruction using neurovascular pudendal-thigh flaps: a preliminary report. *Plast Reconstr Surg.* 1989;83:701–709.
9. Chen ZJ, Chen MY, Chen C, Wu N. Vaginal reconstruction with an axial subcutaneous pedicle flap from the inferior abdominal wall: a new method. *Plast Reconstr Surg.* 1989;83:1005–1012.
10. McIndoe AH, Banister JB. An operation for the cure of congenital absence of the vagina. *J Obstet Gynaecol Br Emp.* 1938;45:490–494.
11. Davydov SN. 12 Jahre erfahrung mit der Kolpopoiesis unter Verwendung von Peritoneum. *Gynakologe.* 1980;13:120–121.
12. Dhall K. Amnion graft for treatment of congenital absence of the vagina. *Br J Obstet Gynaecol.* 1984;91:279–282.
13. Jackson ND, Rosenblatt PL. Use of an Interceed absorbable adhesion barrier for vaginoplasty. *Obstet Gynecol.* 1994;84:1048–1050.
14. Vecchiatti G. Neovagina nella syndrome di in Rokitanski-Kuster-Hauser. *Attualita Obstet Ginecol.* 1965;11:131–147.
15. Gauwerky JFH, Wallwiener D, Bastert G. An endoscopically assisted technique for construction of a neovagina. *Arch Gynecol Obstet.* 1992;252:59–63.
16. Popp LW, Ghirardini G. Creation of a neovagina by pelviscopy. *J Laparoendosc Surg.* 1992;2:165–173.
17. Fedele L, Bianchi S, Zanconato G, Raffaelli R. Laparoscopic creation of a neovagina in patients with Rokitansky syndrome: analysis of 52 cases. *Fertil Steril.* 2000;74:384–389.
18. Peña A, deVries PA. Posterior sagittal anorectoplasty: important technical considerations and new applications. *J Pediatr Surg.* 1982;17:796–811.
19. Fedele L, Busacca M, Candiani M, Vignali M. Laparoscopic creation of a neovagina in Mayer-Rokitansky-Kuster-Hauser syndrome by modification of Vecchiatti's operation. *Am J Obstet Gynecol.* 1994;171:268–269.
20. Brun JL, Belleannée G, Grafeille N, Aslan AF, Brun GH. Long-term results after neovagina creation in Mayer-Rokitansky-Kuster-Hauser syndrome by Vecchiatti's operation.
21. Fedele L, Bianchi S, Frontino G, Fontana E, Restelli E, Bruni V. The laparoscopic Vecchiatti's modified technique in Rokitansky syndrome: anatomic, functional, and sexual long-term results. *Am J Obstet Gynecol.* 2008;198:377.e1–377.e6.