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CLINICAL ARTICLE

The laparoscopic Vecchietti technique for vaginal agenesis

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Abstract

Objective: To evaluate surgical, long-term anatomic and functional results of the laparoscopic Vecchietti procedure to treat women with vaginal agenesis. *Methods:* Retrospective analysis of 86 women treated at the Department of Gynecology and Obstetrics at the University of Verona, Italy. Data were analyzed based on surgical results and postoperative sexual satisfaction. Depth and diameter of the neo-vagina was determined. The characteristics of the neo-vaginal mucosa were investigated by vaginoscopy. Patients reported frequency, satisfaction, and any difficulties found at intercourse. *Results:* Functional success was obtained in 98.1% and anatomic success in 100%. In all patients, at 1 year, the mucosa was pink, trophic, and moist. Two fingers were introduced easily into the neo-vagina in all cases. All patients, which decided to have sexual intercourse, defined these as satisfying within 6 months. *Conclusions:* Laparoscopic procedure used in this study is simple, safe, and effective. Anatomical and functional results obtained suggest this laparoscopic procedure as the treatment of choice for this syndrome.

1. Introduction

Vaginal agenesis is a rare congenital anomaly of the female genital tract with a prevalence of 1 in 5000 female newborns and is the result of an alteration occurring during the embryonic development of the female internal genitalia [1-13].

A standardized treatment does not yet exist, but numerous techniques to create a neo-vagina have been proposed in the past. Most methods for the treatment of aplasia or atresia of the vagina can be considered non-surgical, such as progressive dilatation [14], or surgical, such as skin transplants [15], intestinal transplants [16], or

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epithelialization from the outer skin layer (the Vecchietti method) [17].

In Europe during the last 30 years, the most commonly used method for the creation of a neo-vagina has been that proposed by Vecchietti [1] in 1965, which combines surgical and functional connotations. This procedure can be considered as a surgical version of Frank's method [14]. Instead of applying pressure from below, constant traction is exerted from above to an acrylic olive, which is pulled upward, causing a deep invagination in the vesicorectal space, usually in 7–8 days. The constructed neo-vagina must be maintained by daily application of artificial dilators.

In 1994 a laparoscopic version of the Vecchietti method that has proved safe and effective was described [18]. Other investigators have proposed various laparoscopic modifications of the Vecchietti operation, but with small series. The aim of our investigation was to assess clinical and surgical results as well as anatomical and functional outcomes after a laparoscopic Vecchietti procedure with a follow-up of 2–10 years.

2. Materials and methods

Between 1993 and 2004, 86 patients aged between 16 and 34 with vaginal agenesis were observed at the Verona University Hospital for diagnosis and treatment with the laparoscopic Vecchietti technique.

All patients were post-pubertal with primary amenorrhea. They had a diagnosis of vaginal agenesis made by physical examination. Criteria for the diagnosis of this syndrome were normal external genitalia, pubic and axillary hair, absence of vagina, the presence of ovaries, tubes and rudimentary horns of uterus documented by pelvic ultrasound in genotypic females.

Each patient underwent pelvic ultrasound, karyotyping, and ultrasonographic examination of the urinary system.

2.1. Technique: the laparoscopic Vecchietti procedure [18]

The principle of this technique is to create a neo-vagina by gradual stretching of the patient's own vaginal skin placing 2 threads that course subperitoneally, cross the vesicorectal space, and connect a traction device placed suprapubically. This involves placing an olive-like bead onto vaginal dimple, which is pulled up gradually by threads that run through the olive from the peritoneum into the pelvis and out through the abdomen, where they are attached to the traction device. The bladder has to be catheterized, and a pneumoperitoneum achieved via transumbilical approach; then a 10-mm laparoscope and two 5-mm trocars are laterally inserted. A probe is inserted into the rectum to outline it. The vesicorectal space is then dissected and the bladder reflected anteriorly. Under direct vision, the Vecchietti straight thread-bearing cutting needle is introduced and passed subperitoneally until reaching the presumed vesicorectal space, which is noted by the probe into the rectum and the tube into the bladder. The olive bead is threaded on the perineal side to sit on the vaginal dimple externally, while the other ends of the thread are inserted again into the Vecchietti straight needle and slowly brought back through the abdominal wall. Once in position the threads are pulled gently before attaching them to the traction device that sits on the abdomen. The peritoneum is then closed with absorbable suture and a cystoscopy performed to ensure that the bladder has not been perforated (Fig. 1).

Patients were discharged from the hospital 48–72 h postoperatively, and progressive traction was done at the outpatient department every 48 h to adjust the tension of the traction sutures. The dilating olive and the Vecchietti traction device were removed after the neo-vagina had progressed to at least 7–8 cm in depth.

After this initial phase, all women were instructed to use a dilator and to keep it inserted in the neo-vagina for approximately 8–10 h per day during the first month. The decision to progress to a larger dilator was made by the physician at the follow-up examination so as to obtain homogeneous use of the different sizes by all patients. If patients experienced discomfort related to size progression, they were advised to alternate two consecutive sizes for a few days. After the first month and the start of sexual activity, the use of dilators was recommended for shorter periods of time, taking into consideration the frequency of intercourse.

The dilators were made of soft latex, measured 10 cm long, and came in three sizes of 1.5, 2, and 2.5 cm in diameter. Intercourse was generally allowed 20 days after removal of the acrylic olive. Follow-up consisted in a postoperative examination at 1, 3, 6 months, 1 year, and then once every year and in a detailed sexual history. At each follow-up visit the physician assessed symptoms, evaluated the patient's quality of sexual life and carried out vaginal and rectal examinations, vaginoscopy with Schiller test and vagnal cytology with microbiologic testing. All patients were requested to define the degree of sexual satisfaction by choosing one of the following: unsatisfactory intercourse, less satisfactory intercourse, moderately satisfactory intercourse, or satisfactory intercourse.

Anatomic success was defined as a neo-vagina $\geq$6 cm long allowing easy introduction of two fingers within 6 months after corrective surgery. Functional success was defined if the patient reported satisfactory sexual intercourse, with low use of lubricating gel and achieved orgasm.

In the post-operative period, the period of time was evaluated during which discomfort or pain required the use of analgesic drugs (< or more than 10 days), as well as whether neo-vaginal depth, degree of lubrication/use of lubricant gel and regular sexual intercourse were good predictors of sexual satisfaction.

The Schiller test was performed in all patients using a colposcope to evaluate the epithelialization of the neo-vagina; acetic acid 3% solution was used for about one minute to cleanse the mucosa and to give the epithelium a bright pink color. A small swab drenched in an iodo–iodine solution was then passed on the vaginal mucosa, with the vaginal epithelium gaining a yellow-brown color.

Mean follow-up time for patients was 42 months (range, 34–64 months). Continuous data were analyzed using Student's *t*-test, and category data were analyzed using Fisher's exact test, with a significant *p* value less than 0.01.

3. Results

The procedure was completed successfully in all patients. There were no complications with the laparoscopic technique.

The operating time for surgical procedure was 18–30 min (mean time = 22 min). The neo-vaginal depth in all patients ranged from 60 to 90 mm, with a mean (SD) of 74.9 ± 7.9 mm. An adequate length of the neo-vagina was achieved in all patients except for 2 within 8 days after surgery ($p<0.01$).