

Original Article

Total Vaginal Replacement With Sigmoid Colon Experience at Gaza European Hospital

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Abstract:

Absence of the vagina in the pediatric population most commonly results from congenital abnormalities. Vaginal replacement may be achieved by several techniques. We review our experience in the efficacy of using a segment of the sigmoid colon for primary vaginal replacement.

From 2001 to 2005 we evaluated five patients who required vaginal replacement. In 4 patients the abnormality was suspected because of absent menstruation, one patient was discovered after marriage at the initial sexual approach. The diagnoses exclusively was Mayer-Rokitansky syndrome. The vagina was reconstructed using a 14 cm isolated sigmoid segment.

A minimum of 1 year of followup is available. The vagina had a good appearing introitus. Three patients already had an active sexual life (married) all reported to be satisfactory by the husband and wife when asked separately. Stenosis at the mucocutaneous junction in one patient was treated with Y-V plasty.

We conclude that our Experience with this group of patients leads us to believe that isolated sigmoid segments provides a cosmetic, self-lubricating neovagina with low rates of failure and revision, and without the need for routine dilation.

Introduction:

Surgical management of girls with congenital absent vagina continues to be a major technical problem due to a prospective functional and psychological effect of the outcome. The majority of cases of absent vagina result from abnormality results from müllerian duct failure, androgen insensitivity syndrome, gonadal dysgenesis and congenital adrenal hypertrophy. Other indications include congenital defects of the lower segment of the primary intestine, such as persistent cloaca or cloacal exstrophy. Vaginal reconstruction may be also required in patients with extensive resection within the small pelvis, as sometime occurs with rhabdomyosarcoma.

Construction of an artificial vagina has undergone a long evolution of conservative to various surgical methods. In 1938 Frank proposed a nonsurgical approach using various instruments and saddle-like devices that exerted pressure on the vaginal vestibule. Within several months he managed to create an appropriate recess that served as the vagina. This method replaced the technique proposed by Baldwin in 1904, whereby the vagina was reconstructed using an isolated segment of small intestine. However, this procedure was abandoned due to a high complication rate. In 1955 Zangl and Pratt in 1961 proposed use of sigmoid colon in vaginal reconstruction. With the same purpose in mind Turner-Warwick and Kirby used the cecum. Others proposed a dermatome-collected cutaneous graft, mucous membrane flap harvested from the bladder, and peritoneal fragment advanced from the Douglas pouch. Vaginal reconstruction was also performed with skin island flaps created in the perineal and inguinal region.

Materials and Methods:

From 2001 to 2005 we evaluated five patients 16-24 years old (average age 20) who required vaginal replacement. In 4 patients the abnormality was

Suspected because of absent menstruation. One patient was discovered after marriage at the initial sexual approach. Abdominal ultrasound performed preoperatively in all patients, all patients were examined and investigated by experienced gynecologist. The diagnoses exclusively was Mayer-Rokitansky syndrome. Counseling was done for all patients, they were informed truthfully of the anatomical situation and concurrently told what treatment is available. The vagina was reconstructed using a 14-cm isolated sigmoid segment placed between the bladder and rectum and anastomosed to the introitus. The operation was done with patient supine with legs spread and knees slightly bent, using Allen stirrups (Figure 1). This position affords excellent intra-abdominal exposure as well as wide access to the perineum and introitus.

The abdomen was opened through a Pfannenstiel incision with the muscles split in the midline from umbilicus to pubis. A 14 cm. segment of sigmoid colon was isolated with the pedicle on a distal sigmoid artery and vein, preserving the primary vascular arcade. A short distal sigmoid segment is isolated and discarded to provide greater length on the mesenteric vasculature for the neovagina (Figure 2). This change from the original description has been an important addition and allows us to get virtually any sigmoid segment to the perineum with little tension. The proximal portion of the graft was closed in 2 layers with absorbable suture closed and neovagina is rotated to cul de sac (Figure 3).

Bowel continuity was reestablished by a 1-layer anastomosis of continuous 3-zero vicryl sutures. The mesenteric defect was closed with the neovagina and its mesentery at the left side of the field. The region of the vulva was then incised in a cruciate fashion and a tunnel was created bluntly between the bladder and rectum. The peritoneum was incised by pushing a Hegar dilator upward from the perineal introitus and dissection was continued until 2 fingers

were passed from above to the perineum.

The neovagina was pulled through the tunnel using Allis forceps, paying particular attention that the blood supply of the flap was not twisted or under tension. A 1-layer anastomosis was created using interrupted 3-0 vicryl at the vulval region. A few fixation sutures were applied between the neovagina and retroperitoneum to prevent volvulus or prolapse of the flap. No drainage tube was placed. The neovagina was stented with petrolatum gauze for 5 to 7 days to facilitate graft adhesion to the surrounding tissue. (figure 4).

From days 12 to 14 postoperatively the neovagina was calibrated daily, including irrigation to remove mucus. The patients were taught to calibrate and dilate the vagina for approximately 6 months, and to irrigate it for at least 4 months. A set of size 20 to 25 Hegar dilators was used.

Results:

Surgical exploration of the internal genitalia demonstrated an extremely hypoplastic uterus and normal ovaries in all patients. Anatomy of the vulva was normal in all patients and in 2 the vaginal introitus also appeared normal due to the presence of approximately one fifth (2 cm.) of the lower vagina. In the remaining 3 patients the ectodermal distal portion of the vagina was flat and the abnormality was immediately obvious. A minimum of 1 year of followup is available in 3 of the 5 patients (mean of 32 months). Patients treated with sigmoid vaginoplasty had functional neovagina. The vagina had a good appearing introitus. Mucous production significantly decreased 3 to 4 months after the operation. No need for routine dilation. Three patients already had an active sexual life (married) all reported to be satisfactory by the husband and wife when asked separately. Stenosis at the mucocutaneous junction in one patient with a sigmoid vagina was treated with Y-V plasty, after failure of trial of nonoperative perineal self-dilatation,

Discussion:

During fetal development in females, the Mullerian ducts mature into the Fallopian tubes, uterus, cervix, and upper third of the vagina, (the so-called "Mullerian organs"). The lower part of the vagina is derived from a primitive structure called the urogenital sinus, which comes from the perineum. Mullerian duct failure is a rare disorder occurring in 1:6,000 female births that is known as the Mayer-Rokitansky-Kuster-Hauser syndrome. Patients with this syndrome have a 46 XX karyotype, normal female external genitalia, including a normal vulva, the presence of a fifth of the lower vagina, which is of ectodermal origin, and the absence of four-fifths of the upper vagina, which is of mesodermal origin, and the ovaries are normal [8] with normal ovarian function, and an absent or hypoplastic uterus with bilateral noncanalized fibrous cords. Because of the high incidence of associated urinary abnormalities (up to 30 to 40%), such as the absence of 1 kidney, upper and lower urinary tract ultrasound studies are

recommended. manual exploration of the kidneys was performed during surgery in the majority of our patients to rule out gross anomalies. Absent vagina is usually discovered during adolescence because of amenorrhea. Vaginal reconstruction may be performed using numerous techniques, such as non-surgical perineal dilation (the Frank technique), split-thickness skin grafts (the McIndoe operation) and the use of a small bowel or sigmoid colon segment. Pubertal girls with vaginal hypoplasia should not be ignored or deferred. The anomaly usually discovered after or before marriage when the family becomes concerned about absent menstruation. If the anomaly is hidden during the marriage arrangements, the problem becomes dramatically evident after the marriage and the woman may expect a miserable future. Some discover a short vagina through self-examination, and can live in fear and isolation with this secret for many years. This can lead to depression, and prevent normal social development, counseling, with the goal of preventing such occurrences by providing information, should be given near the age of puberty. The girl should be informed truthfully of her anatomical situation and concurrently told what treatment is available.

The techniques for vaginal replacement include the use of split thickness skin, full thickness skin with and without tissue expanders, amnion and bowel. The most popular tissue for vaginal replacement during the last 4 decades has been the split thickness skin graft as described by McIndoe. Despite scattered encouraging reports, this technique usually is hampered by the need for regular and long-term home dilation. There is also a significant incidence of inadequate vaginal length, vaginal stenosis and dyspareunia 9.

For this reason we evaluated the use of isolated bowel segments for vaginal replacement, which was first described by Baldwin in 1904 but not actually performed by him until 1907 3. In that procedure a U-shaped sigmoid segment was anastomosed to the perineum at the first operation, and division of the septum was performed at a second operation 6 weeks later. Experience with the technique was reported in 1940 but efforts were abandoned due to an unacceptably high mortality rate. Attention was refocused on the use of bowel for vaginal replacement in 1972 by Pratt 4 and since then there have been scattered reports in the literature. In a large series Turner-Warwick and Kirby reported their experience with the use of cecum for vaginal reconstruction in a young female patient 10.

The choice of sigmoid colon as a graft for creating a neovagina was effective since sufficient length may be obtained as well as a good blood supply for preventing complications, such as contraction, shrinkage, narrowing or stenosis at the perineal introitus. The thick walls of the colon tolerate trauma better than small bowel or skin grafts. Sigmoid neovaginal creation seems to be the procedure of choice in patients with the Mayer-Rokitansky-Kuster-Hauser syndrome. Postoperatively

management is simple. Mucous production decreases dramatically after 3 to 4 months and in our experience it was never a problem. Calibration, dilation and irrigation are temporary and well tolerated.

Reported Postoperative complications included introital stenosis, mucosal prolapse ,partial small bowel obstruction ,perineal wound hematoma ,superficial wound infection , and vaginal prolapse . None of the complications have affected long-term patency or cosmesis of the neovagina, nor has mucous production significantly affected quality of life.. All adult patients felt that the appropriate time to undergo surgery was in adolescence

Conclusions:

If a girl perceives that she has a short or absent vagina, her conclusion may be that she will be forever ineligible to be anyone's wife. This can lead to depression, and prevent normal social development. Counseling, with the goal of preventing such occurrences by providing information, should be given near the age of puberty. The girl should be informed truthfully of her anatomical situation and concurrently told what treatment is available. Experience with this group of patients leads us to believe that isolated sigmoid

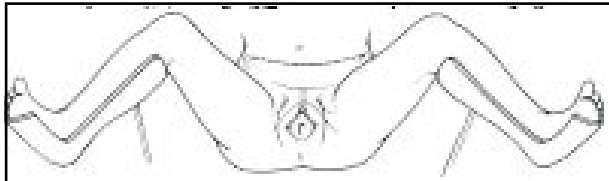


Figure1. Patient in extended lithotomy position with buttocks elevated to provide simultaneous access to pelvis and perineum

segments provides a cosmetic, self-lubricating neovagina with low rates of failure and revision, and without the need for routine dilation Our results would also suggest that sexual activity is more compatible with isolated bowel segments for vaginal replacement than with any of the more traditional methods, such as passive dilations and split thickness skin graft vaginoplasty.

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