Construction of an artificial vagina with sigmoid colon in vaginal agenesis

T.S. Ghosh and E.Y. Kwawukume

Department of Obstetrics and Gynecology, Korle Bu Hospital, University of Ghana Medical School, Accra (Ghana)

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Abstract

OBJECTIVES: The study of 15 cases of colonic reconstruction for absent vagina. The outcome in cases of reconstruction of an artificial vagina using the colon is evaluated. METHODS: Fifteen female patients with congenital absence of vagina who were evaluated and treated with sigmoid colonic reconstruction at the Korle-Bu Teaching Hospital in Accra, Ghana were studied. RESULTS: This reconstructive method is successful in patients having a functioning vagina without progressive shrinkage or other symptoms. Disfigurement of the thighs and labia are avoided as is the need for active manipulation. CONCLUSION: Sigmoid colonic reconstruction for vaginal agenesis is an acceptable method especially in the developing world.

Keywords: Artificial vagina; Sigmoid colon.

Introduction

The construction of an artificial vagina has undergone various ingenious methods, both non-surgical and surgical. The non-surgical method dates from 1938 when Robert Frank [1,2] described a method of formation of an artificial vagina without an operation. He reported eight cases with satisfactory results.

Rock and associates [3] at the Johns Hopkins Hospital reported that an initial trial of vaginal dilatation was successful in 9 out of 21 patients. Other workers reported various successes [4,5] and the main advantage of dilatation is the simplicity of the method [4], but this technique requires active manipulation by the patient or the obstetrician.

The most popular operation today for creating a new vagina is the split-thickness skin graft procedure for creating the vagina that was developed by Abbe, Wharton and McIndoe [6,7–9]. However, there is the need for continuous and prolonged dilatation during the contractile phase of healing [6] to prevent constriction of the dissected space between the rectum and the bladder. Williams vulvovaginoplasty [10] had been tried since 1964 with successes [11]. This method has not been popular with our patients because micturition presents an anatomical problem, and coitus was not wholly satisfactory because of the alteration in the vaginal axis with the copulating pouch facing upwards.

The method of using the sigmoid colon in the reconstruction of an artificial vagina has been in use in Korle-Bu Teaching Hospital since 1984 and this paper reviews the 15 cases which were treated up to 1992.

Patients and methods

Fifteen female patients with congenital absence of the vagina had reconstructive surgery for vagina between January 1984 and December 1992 at Korle-Bu Teaching Hospi-
tal, Accra, Ghana. Before each operation, a full clinical history and complete clinical examination including gynecological examination was undertaken. Preoperatively, the patients had intravenous urography to evaluate urologic abnormalities. They also had bowel preparation using both antibiotics and mechanical cleansing. The patients were placed on a liquid diet for 48 h before the operation. In the evening of the first day, 60 ml of castor oil was given with a cleansing enema the following day after the patient moved her bowel. This was repeated after 12 h. Intravenous metronidazole 500 mg q8h was started 2 days prior to the operation. Patients omitted the evening meal before the day of operation and intravenous infusion of 5% dextrose was set up. A pre-anesthetic evaluation was done by the anesthetist before surgery.

Operative technique

All patients received general anesthesia. They were placed in the dorsal lithotomy position and cleaned with sterile betadine solution. Sterile towels were positioned to leave only the operating areas exposed. A urethral catheter was passed and retained to decompress the bladder and minimize its inadvertent injury.

A transverse incision was made through the mucosa of the vaginal vestibule. The space between the urethra and bladder anteriorly and the rectum posteriorly was dissected until the peritoneum was reached. Hemostasis was meticulously maintained and the space packed with a tonsil swab.

The abdomen was entered through a subumbilical midline incision and the sigmoid colon spread out and its vascular supply inspected. An estimate was made of the length of the sigmoid colon to be taken usually from 8–12 cm with its blood supply intact (Fig. 1).

Before cutting, the segment (A) was folded to see if (B) could be easily anastomosed (C).

The colon was cut at the rectosigmoid junction between clamps. The upper end of the segment to be isolated was similarly cut off between clamps.

The descending colon (B) was then anastomosed end to end to the rectum (C) behind the isolated segment using 2/0 silk suture for the first and second layers of the sigmoid colon (Fig. 2).

The assistant then went to the perineal area, removed the tonsil swab and cut the peritoneum under direct vision of the surgeon.

The lower end of the isolated sigmoid was closed in two layers using 2/0 silk suture. The closed end was secured to the sacral promontory with 2/0 silk. The upper end was swung down, grasped by a curved sponge holding forceps and pulled to reach the perineum without tension. It was then fixed into posi-

Fig. 1. Sigmoid colon, usually 8–12 cm taken with blood supply. Before cutting, the segment (A) is folded to see if (B) could be easily anastomosed (C).
tion by suturing the peritoneum of the cul-de-sac around it with 2/0 silk suture.

Finally, the open end of the colon was stitched to the perineum with interrupted 2/0 dexon suture material. Simultaneously, the abdominal incision was closed by the assistant.

The perineal sutured line was dressed with betadine solution.

During the postoperative period, the perineal area was kept clean with dry dressing. The neovagina was not washed.

The urethral catheter was removed on the seventh postoperative day and the patients were usually discharged 21 days after the operation.

Results

Table 1 shows the relevant history of the patients. The mean age of the patients was $17 \pm 1.2$ years. These operations were all primary operations.

Table 1. Clinical experience.

<table>
<thead>
<tr>
<th>Initial</th>
<th>Age (years)</th>
<th>Karyotype</th>
<th>Pathology</th>
<th>Result</th>
<th>Marital status</th>
<th>Follow-up (years)</th>
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<tr>
<td>MI</td>
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<td>XX</td>
<td>Ut, Ov</td>
<td>Success</td>
<td>Married</td>
<td>9</td>
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<td>XX</td>
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<td>Single</td>
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<tr>
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<td>No ut, Ov</td>
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<td>MA</td>
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<td>ZD</td>
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<td>Single</td>
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Ut, uterus present; Ov, ovary present; T, testis present; E-cli, enlarged clitoris; Pel-K, pelvic kidney. All of the patients had absent vagina.
The last patient (PB) presented with an abdominal mass and laparoscopy revealed a pelvic kidney. The remainder of the patients did not have any urologic abnormalities. Out of the 15 patients who had artificial vaginal construction utilizing the sigmoid colon, 12 patients had the anatomic formation of a new vaginal canal successfully accomplished (a success rate of 80%). There was no postoperative mortality.

The patients who were successful had minimal blood loss at operation, there were no deaths, and they were all discharged home on the 21st postoperative day. Vaginal discharge was marked during the first 5 days postoperatively but tailed off and there was no excessive discharge before the patients were discharged from the hospital. The failures were mainly due to misjudgment of the segments isolated. These isolated segments were less than 7–8 cm in length and could not be pulled without tension to the new introitus. An attempt was made to stitch the end of the isolated end of the sigmoid colon to the space created between the bladder and the rectum. The distance short of the sigmoid colon to the introitus was about 1.5–2.0 cm. This distance closed after healing and the patency of the rectovesical space was not established.

The first patient (MI) who had a uterus present at the initial time of the operation has now developed uterine leiomyomata after 8 years of follow-up. Five of the patients are married and reported satisfactory sexual activities. They do not have any problems with mucus discharge or dyspareunia.

Fig. 3 shows the introitus of one of the patients after the operation.

Discussion

Gynecologists with an interest in bowel surgery have devised many different methods for the construction of an artificial vagina. This dates to 1904 when Baldwin [12] used a double loop of ileum and pulled it down with its mesentery to the perineum through a dissected space. This method became unpopular owing to the high mortality rate [13].

Impressive reports using the colon in the construction of the vagina were reported by Gigovskij and Alexandrov [14]; the latter reported 195 cases with 1.7% mortality and the former, 110 cases with one death due to the separation of the colocolonic anastomosis. We did not have any mortalities.

Pratt and associates [7] performed 14 reconstructions of the vagina utilizing single barrel segments of sigmoid and reported functioning vaginas for these patients. We had three failures from misjudgment of the isolated sigmoid colon. However, they reported bowel obstruction at the colocolonic anastomosis 20 months postoperatively in one patient. This required resection of the anastomosis and a temporary colostomy. We did not experience any major complications. Four of their operations were secondary procedures following failures of primary McIndoe type operations, and two of these patients had a rectovaginal fistula. Our operations were primary procedures and the tissues were healthy. Pratt reported a 12-year-old who had a uterus and is now menstruating regularly. Our 27-year-old who has a uterus has developed uterine fibroids after 9 years of follow-up. She menstruates regularly. The use of the sigmoid colon in the reconstruction of the vagina has many advantages over other surgical methods. Some of these are:
Within 4–6 weeks, a functioning vagina requiring very little attention is obtained.

The use of dilators and molds as required in operations using skin grafts are not necessary.

Progressive shrinkage of the newly formed vagina does not occur.

There is no disfigurement of the thighs or labia as in cases where skin grafts are taken from these places.

The colon secretes a minimal amount of non-irritating mucus that resembles the natural lubricants provided by the cervix and the vagina.

It is our hope that more gynecologists, especially in the developing world, adopt this method with more success.

References


Address for reprints:
E.Y. Kwawukume
Department of Obstetrics and Gynecology
Korle Bu Hospital
University of Ghana Medical School
Accra
Ghana

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