

THE USE OF ISOLATED SIGMOID COLON SEGMENT FOR VAGINAL REPLACEMENT IN YOUNG ADULTS

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Objectives Vaginoplasty for congenital atresia, a component of the Mayer-Rokitansky-Kuster syndrome, or for gender confirmation may be achieved by several techniques. This report focuses on the efficacy of rectosigmoid neocolporrhaphy (RSNC) for primary vaginal replacement

Patients and Methods From 1990 to 2002 we evaluated six patients 16 to 33 years old (average age 23 years) who required vaginal replacement. The diagnosis included the Mayer-Rokitansky syndrome in two cases, classic bladder exstrophy in one and male pseudohermaphroditism in three cases. The vagina was reconstructed using a 15-cm isolated sigmoid segment placed between the bladder and the rectum and anastomosed to the introitus in four patients. The Frank procedure was used in two patients.

Results A minimum of one year follow-up (mean: 32 months) was available in 5/6 pa-

tients. The patients treated with sigmoid vaginoplasty had a functional neovagina with excellent cosmetic results and without excessive mucus production or the need for routine dilation. Stenosis at the mucocutaneous junction in one patient with a sigmoid vagina was treated with Y-V plasty. In two patients managed by nonoperative perineal self-dilation, little success could be noted, and they became candidates for surgery.

Conclusion Our limited experience with this group of patients leads us to believe that the isolated sigmoid segment provides a self-lubricating neovagina with a low rate of failure and revision, with very good cosmetic results and without the need for routine dilation.

Key Words: abnormalities, vagina, sigmoid, reconstructive

INTRODUCTION

A neovagina may be constructed for congenital absence of the vagina, congenitally abnormal genitalia or reconstruction after the treatment of pelvic tumors. The most common cause of congenital absence of the vagina is the Mayer-Rokitansky syndrome, estimated to occur in 1/4,000 to 5,000 births.¹ Patients with this syndrome often present as adolescents with a chief complaint of failure to menstruate. Patients with the testicular feminization syndrome similarly present most often during adolescence. In contrast, congenital abnormalities, such as cloacal exstrophy, bladder exstrophy, microphallus and penile agenesis, are readily recognized at birth. In these patients reconstructive surgery should be performed early in life to allow the normal development of gender identity.

Many methods of vaginal construction have been described. Patients with rudimentary vaginas have been treated with serial dilation² or the construction of labial flaps with dilation³. Traditionally, the most common method of vaginal construction has been the split-thickness skin graft, as described by McIndoe and Banister⁴. Others have created neovaginas using peritoneum⁵, bladder mucosa⁵, amnion⁶ and oxidized, regenerated cellulose fabric⁷. These methods require long-term stenting and dilation to prevent canal closure.

The use of isolated bowel segments provides excellent results without the need for prolonged stenting or dilating. This method was first applied in 1907 by Baldwin, who used an isolated loop of ileum but suggested that sigmoid colon may be used as well⁸. In 1911, Wallace reported the successful application of

sigmoid colon in vaginal construction⁹. Subsequently the use of intestine was abandoned in favour of the McIndoe technique. Intestinal reconstruction was not revisited until many years later. In 1983 Goligher described sigmoid vaginal construction in 7 patients. Subsequently Bürger et al.¹¹, and Turner-Warwick and Kirby¹¹ reported the use of the caecum in vaginal construction, while Hitchcock and Malone¹², and Hensle and Dean¹³ described series of sigmoid vaginal substitution.

In Morocco a woman with vaginal agenesis faces a miserable existence as a social outcast. The possibility of surgical vaginal reconstruction without any expense to the patient or family is a great opportunity that may mean an acceptable life.

PATIENTS AND METHODS

From 1990 to 2002 we evaluated 6 patients 16 to 33 years old (average age 23) who required vaginal replacement. Presenting diagnosis included male pseudohermaphrodites in three genetically 46,XY patients who were born with micropenis and impalpable gonads. The microphallus was deemed unsuitable for normal male development and gender conversion was elected. Furthermore indications included müllerian failure (the Mayer-Rokitansky syndrome) in two cases and classic bladder exstrophy in one who had undergone exstrophy repair elsewhere. In four cases the diagnosis was suspected because of absent menstruation. A physician made the diagnosis in the remaining two cases. The patients were evaluated by a gender team which included a psychiatrist, an endocrinologist, a gynaecologist and a urologist. Pre-operative assessment of the patient included sigmoidoscopy, a barium enema and a full hormonal profile. In cases managed by surgery 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. The proximal portion of the isolated segment was closed in two layers with absorbable suture. Bowel continuity was reestablished by a 1-layer anastomosis of interrupted 3-zero polyglactin sutures with the knots inside the lumen. 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 two 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 graft was not twisted or under tension. A one-layer anastomosis was created using 3-zero polyglactin at the vulval region. A few fixation sutures were applied between the neovagina and retroperitoneum to prevent volvulus or prolapse of the graft. 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. From days 10 to 12 postoperatively the neovagina was calibrated daily, including irrigation to remove mucus. Because the surgeon could not perform the early follow-up of the patients, they were taught to calibrate and dilate the neovagina with Hegar dilators (size 20 to 25) for approximately 6 months.

RESULTS

Our patients treated with intestinal vaginoplasty had excellent cosmetic results without the need for routine dilation after 6 months. Mucus secretion decreased in the initial 3 to 6 months, resulting in a self-lubricating vagina without excess mucus production. There were no complications associated with intestinal surgery in this series. None of the patients had urethral or rectal injuries, no fistulae developed, and there were no wound or urinary tract infections. The patients have been followed annually for 1 to 5 years. Three patients already had an active sexual life, which was reported to be satisfactory. None of the patients reported dyspareunia. Introital stenosis developed in one patient with a sigmoid vagina 14 months postoperatively and was treated with Y-V plasty revision of the perineal-based skin flap. She reported a satisfactory sexual function after one year. In the two patients managed by non-operative perineal self-dilation, little success could be noted and both became surgical candidates.

DISCUSSION

Patients who require vaginal construction present with various aetiologies and at different ages. Patients born with cloacal exstrophy¹⁴ and penile agenesis¹⁵ are most appropriately

treated with female gender assignment and vaginal construction. True hermaphrodites should usually be assigned the female gender, especially those with a 46,XX karyotype¹⁶. Patients with microphallus may require reconstructive surgery. In our patients (pseudohermaphrodites) there was such poor phallic development that more conservative measures were not appropriate. Patients with bladder exstrophy usually undergo reconstruction to the male gender. In our patient with bladder exstrophy who had been raised as a female the original surgery had been performed elsewhere and the phallus was removed at that time.

Reconstructive surgery and gender assignment should be performed as early as possible for the psychological well-being of the parents and child. In contrast, patients with the Mayer-Rokitansky and testicular feminization syndromes usually present as adolescents with a well formed female gender identity and a poorly formed vagina.

In all our patients the abnormality was discovered late. In Morocco, the anomaly may be discovered after or just 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. The husband abandons the wife and the original family usually does not accept her because she is unsuitable for marriage and they would then have another person to feed. The non-operative techniques for vaginal dilation, such as that described by Frank, are flawed². In the few published series describing the use of the Frank procedure, results have been satisfactory, although not universally so^{2,17}. In conscientious women with a relatively long rudimentary vagina (3 to 4 cm) there may be adequate results after several months of serial dilation¹⁸. However, in female patients with no vagina or only a dimple discomfort precludes adequate compliance. In addition, the vaginal vault usually appears shallow or flat following this technique¹⁹ compared to the near normal vaginal appearance seen several years after bowel replacement vaginoplasty²⁰. The non-operative approach is appealing but clearly not applicable for most affected individuals. Even in a more recent series when non-operative perineal self-dilation was the primary therapy offered for patients with mullerian failure, there was little success noted, and most of the pa-

tients became surgical candidates²¹. The McIndoe technique using a split-thickness skin graft, which is a common procedure, requires continuous, prolonged dilation and nighttime stenting, and has a high rate of stenosis, graft shortening and dyspareunia.

The choice of sigmoid colon as a graft for creating a neovagina was effective since a 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^{22,23}. The thick walls of the colon tolerate trauma better than small bowel or skin grafts²⁴. Sigmoid neovaginal creation seems to be the procedure of choice in patients with the Mayer-Rokitansky-Kuster-Hauser syndrome in developing countries. The postoperative management is simple. Mucus production decreases dramatically after 3 to 4 months and in our experience it has never been a problem. The daily vaginal douche to evacuate the mucus, as recommended by Filipas et al.²⁵, was unnecessary in the present patients. Calibration, dilation and irrigation are temporary and well tolerated. However the sigmoid segment cannot be used in cases of failed previous surgery resulting in rectovaginal fistulae, traumatic damage to the rectum or permanent colostomy, or in patients requiring a continent sigma-rectum pouch. Previous radiotherapy to the pelvis is a further limitation. The caecal/ascending colonic segment is an alternative to the sigmoid colon and offers some advantages. The length of the segment can be adapted to the local situation. The segment can be better mobilized to the pelvic floor, especially when the mesolic serosa is incised.

In summary, all patients who reported having sexual intercourse declared themselves to be content with the functional and cosmetic results of vaginal reconstruction and did not regret their decision to undergo reconstructive surgery.

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RESUME

L'Utilisation du colon sigmoïde dans le remplacement vaginal chez les jeunes adultes

Objectifs : La vaginoplastie pour atrésie congénitale, un élément du syndrome de Mayer-Rokitansky-Kuster, ou la confirmation du sexe peut être accompli par plusieurs techniques. Cette étude démontre l'efficacité de la neocolporrhaphie du rectosigmoïde première (RSNC) dans le remplacement vaginal.

Patients et Méthodes De 1990 à 2002 nous avons évalué six malades âgés de 16 à 33 ans (âge moyen 23 ans) chez qui on a réalisé un remplacement vaginal. Le diagnostic a inclu le syndrome Mayer-Rokitansky dans deux cas, exstrophie vésicale classique dans un cas et pseudo-hermaphrodisme viril dans trois cas. Le vagin a été reconstruit en utilisant un segment du sigmoïde isolé long de 15 cm placé entre la vessie et le rectum et anastomosé à l'introitus chez quatre patients. La procédure de Frank a été utilisée chez deux patients.

Résultats Un suivi minimum d'un an chez 5 patients a été observé (moyenne de 32 mois). Les patients traités par vaginoplastie sigmoïdienne avaient un neovagin fonctionnel avec d'excellents résultats esthétiques, sans sécrétions muqueuses excessives et ne nécessitant pas de dilatations itératives répétées. Trois cas de sténose de la jonction

mucocutanée ont été traités par plastie Y-V chez un patient et par des autodilatations chez deux patients avec peu de succès et les deux patients sont devenus candidats pour une dilatation chirurgicale. **Conclusion** Notre expérience limitée avec ce groupe nous permet croire que ce procédé de néovaginoplastie sigmoïdienne permet d'avoir un neovagin autolubrifié, un taux d'échec et de révision bas, avec de très bons résultats esthétiques et sans recours aux dilatations.

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