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Thirty-six vaginal constructions: Lessons learned

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Abstract *Objectives:* The use of bowel for vaginal construction is a well-established procedure. In this paper, the lessons learned from 36 vaginoplasties over a 34-year period are discussed.

Methods: Between 1980 and 2013, 36 patients between 1 and 21 years of age underwent vaginal construction. In 27 of the 36 patients, an inverted V-shaped perineal skin flap was incorporated into the posterior wall of the neovagina, and, when required, a detubularized pouch was used to avoid traction on the vascular pedicle. In nine patients, the sigmoid colon was anastomosed, in a circumferential manner, to the short blind-ending vaginal dimple.

Results: Two of the nine sigmoid vaginas, where the perineal skin flap was omitted, developed introital stenosis. None of the sigmoid neovaginas that included the perineal flap developed stenosis. One patient with ileal segment vagina, at the onset of puberty, developed introital stenosis after 10 years; this was successfully corrected. Nineteen out of 28 patients available for long-term follow up were sexually active and reported no dyspareunia.

Conclusions: Detubularization and reconfiguration to form a pouch reduces the traction on the mesentery of the bowel segment, which ensures adequate blood supply to the distal entero-cutaneous junction. The inverted V-shaped perineal skin flap should be incorporated in the anastomosis to avoid circumferential suture line and introital stenosis.

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Introduction

The etiology of vaginal absence or insufficiency can be congenital, or acquired after surgery for pelvic tumors. Mullerian agenesis, also referred to as Mayer-Rokitansky-Küster-Hauser (MRKH) syndrome, is the most-common cause of congenital absence or underdevelopment of the vagina; it occurs in one per 4000 to 10 000 females [1]. These patients often present in adolescence, with the chief complaint being primary amenorrhea. The diagnosis can have significant psychological and emotional implications, and intervention to correct the anatomic defects, as well as psychological counseling is warranted [2]. In contrast, congenital anomalies such as exstrophy, microphallus and penile agenesis are recognized at birth and should be corrected as early as possible to ensure development of gender identity [3].

Many surgical and non-surgical techniques have been described for vaginal construction or augmentation and the reported functional outcomes of these techniques vary. One of the most-commonly reported long-term complications is introital stenosis, with rates ranging from 0% to 28% (mean 14.7%) [4–10]. This is problematic because it negatively affects the cosmetic and functional outcomes that the initial surgery set out to achieve. Treatment for introital stenosis can be conservative, with serial self-dilation, or require surgical revision, both of which can be unpleasant options for these patients, the majority of whom are adolescents. In an effort to minimize introital stenosis, a paper by Hanna (1987) [11] reported a modification of the ileal vaginoplasty originally described by Baldwin [12]. As described, the ileal segment was detubularized and fashioned into a pouch and a V-shaped perineal skin flap was incorporated into the posterior wall of the neovagina to avoid a circumferential suture line [11,12]. The segment of bowel used for vaginoplasty has evolved over subsequent years; cecum was reported by Burger et al. [13] and Turner–Warwick & Kirby [14], and then sigmoid was reported by Hensle & Dean [15] and Hitchcock & Malone [16]. In this report, the lessons learned from a single surgeon's 34-years of experience using various vaginoplasty techniques are discussed and evidence that particular modifications are beneficial in preventing introital stenosis is provided.

Materials and methods

Between 1980 and 2013, 36 children and young adults between 1 and 21 years of age underwent vaginal construction. At all follow-up visits, the neovagina were examined for patency and, when age appropriate, patients were questioned on their sexual activity and their satisfaction. No standard questionnaires were used for this assessment.

A pedicled sigmoid segment was used in all of the sigmoid vaginoplasties, as described by Goligher [17]. Briefly, a segment of sigmoid was isolated and the proximal 3–4 cm was discarded, providing a sufficiently long pedicle to allow mobilization to the perineum without tension. Detubularization/pouch technique was advocated in cases where the remaining bowel would have been of insufficient size for a functional neovagina or additional length was needed.

Preoperatively, patients underwent a mechanical bowel preparation with oral neomycin and erythromycin. Postoperatively, patients were kept on bed rest for one week to avoid neovaginal prolapse, and a Penrose drain was left in the neovaginal cavity for one week. Of note: the apex of the neovagina was not 'pexed' due to low concern for mucosal prolapse.

Patients and their parents were discharged with instructions to perform daily saline irrigation to clear vaginal mucus. About four weeks postoperatively the neovagina was examined and calibrated. Further follow-up visits were at three months, then one year. Neovaginal dilation was unnecessary and not routinely performed.

A Fishers Exact Test was utilized to compare outcomes of introital stenosis.

Results

Thirty-six patients underwent vaginoplasty over a 34-year period, 35 of which had a bowel neovagina constructed. The choice of bowel segment used evolved with experience and the details of the surgical techniques have previously been reported [3]. The majority of exstrophy patients from early in the series had ileal vaginoplasties done, where sex was reassigned. Use of large bowel in these patients was avoided to prevent shortening of what was usually an inadequate amount of large bowel. In the MRKH patients, the use of an ileal pouch was abandoned in favor of a straight segment of ileum, which was of better physiological size and more-easily mobilized in the younger patients. With older patients, the use of ileum became problematic because adequate mobilization to reach the perineum was difficult. The sigmoid colon was then used, first as a straight segment exclusively but in some patients a sigmoid pouch was fashioned for reasons mentioned above. After 1996, the sigmoid colon was used exclusively. This was done in cases of MRKH syndrome where there was a vaginal dimple present.

Table 1 shows the diagnosis and bowel segments used. In 13 patients (five ileum and eight sigmoid) the bowel segments were detubularized and reconfigured, which resulted in a pouch formation. The inverted V-shaped perineal skin flap was incorporated into the posterior wall of the neovagina in 27 out of the 36 patients (Fig. 1). In nine patients who underwent sigmoid vaginoplasty, the V-shaped flap was omitted and the colon was anastomosed circumferentially to a short, blind-ending vaginal dimple (see Fig. 2).

The mean age of repair for the entire cohort was 9.6 years. The mean age of repair of the MRKH patients was 14.6 years.

Two patients (5.7%) who underwent sigmoid vaginoplasty experienced early postoperative small bowel obstruction. One of these patients was managed conservatively with a nasogastric tube, and the obstruction resolved. The second failed conservative management and required laparotomy with lysis of adhesions. At the last follow-up within the past year she is doing well and has no residual complications. There were no other complications associated with intestinal surgery in this series. There were no rectal, bladder or urethral injuries; no fistulas or wound infections developed.

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