

Continence in Patients Who Undergo Posterior Rectal Flap Anorectoplasty

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Purpose: The authors report the postoperative follow-up results of patients who underwent posterior rectal flap anorectoplasty (PRFA), with emphasis in fecal continence. Variables considered on each patient were sex, presence of fistula, location of the fistula, severity of the defect during the correction, sacral condition, dysraphism, and age at surgery.

Methods: Continence was rated using the Peña method and defecogram. The authors studied 20 patients (17 boys and three girls).

Results: Postoperatively, normal continence was found in 18 patients. Of the two remaining (boys), one had grade II spotting (sacrum agenesis and urethrobulbar fistula) and the other had grade II staining; this patient had the most severe

malformation requiring an abdominoperineal approach. All of the defecograms showed complete emptying of the rectum. No recurrent fistulas occurred.

Conclusions: The posterior rectal flap anorectoplasty is a new technique that takes into consideration all known factors that contribute to continence. This initial report confirms that this technique results in excellent continence for patients with imperforate anus.

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INDEX WORDS: Anal continence, anorectal malformation, posterior rectal flap, fecal continence, fecal incontinence.

ALL AVAILABLE TECHNIQUES to repair imperforate anus include a dissection of the rectum, separation from the urinary tract, and mobilization of the rectum to pull it down and place it within the limits of the sphincter mechanism.¹⁻⁴ That basic maneuver has some potential risk of denervating the urinary tract and the genitalia tract as well as denervating the rectum. With the purpose of avoiding that potential risk, a new maneuver has been designed called *posterior rectal flap anorectoplasty*.⁵

The objectives of the treatment of patients with malformations in the anorectal region are (1) to achieve continuity through pull-through of the distal intestine to the perineal region, making a new anorectum; (2) to close the fistula, avoiding the dissection between the rectum and the bladder, which could create long-term complications; and (3) to obtain a normal mechanism of defecation and continence.

All these objectives could be reached with a combination of the posterior sagittal approach and posterior flap

of rectal wall. The posterior sagittal approach allows a direct exposure; the posterior rectal flap minimizes dissection around the rectum, avoiding the denervation.

MATERIALS AND METHODS

We conducted a prospective study in those patients who had a diagnosis of anorectal malformation (ARM) during a period of 6 years (from January 1989 to February 1995). These patients presented several varieties of ARM. Patients who had anal membrane, cutaneous agenesis, anal stenosis, those considered low anorectal malformations, and girls with vestibular fistula were excluded.

All patients underwent descending colostomy except for one who was treated with a primary anorectoplasty without colostomy. All the patients underwent posterior rectal flap anorectoplasty. We used a posterior sagittal approach; we located the blind rectal end (Fig 1A), and made a posterior rectal flap (Fig 1B; lateral view, Figs 1C, through D). When the patients have a fistula, we identify it when the flaps are extended (Fig 2). The technique for the closure of the fistula is as follows: we locate the site and put stick suture around the fistula (Fig 2) and with fine-needle electrocautery we dissect around it until a small tube is formed through which with a stiletto we can locate the urinary catheter within the urethra (Fig 3). Next we perform two lateral incisions to create two flaps: one that will be the inferior half and the other superior. The inferior flap is cut at its base and sutured, and the superior flap is transposed and sutured. Next the muscular layers are sutured followed by the mucousal layer, which has been slid over the previous layer to cover it. The mucousa is sutured at a distal site (Fig 4A through F). Finally the anorectoplasty is sutured in the traditional form (Figs 5 and 6).

The patients underwent follow-up in the anorectal malformation clinic. Protocol included anal dilatation and a distal colostogram and urethrocytogram before closure of colostomy. Periodical evaluation of the fecal continence was performed using the Peña method⁶ and defecogram. Patients who did not have their colostomy closed were excluded.

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All the patients were studied using the following variables: age, sex, presence of the fistula, place and type of the fistula, extent of the defect when it was corrected, evaluation of the sacral, dysraphism, results of defecogram and urethroctogram, and the patient's age at operation.

RESULTS

Twenty patients underwent surgical correction through a anorectoplasty with posterior rectal flap anorectoplasty; 17 of these were boys and three were girls. Almost all patients were operated on during the first year of life, with an average age of 3 months. Currently, these patients are from 4 to 9 years of age (average age, 5 years). Seven patients didn't have a fistula. Seven of the male patients

had rectobulbar fistula, two had a rectoprostatic fistula, and one patient had rectovesical fistula. Among the girls, two patients had low rectovaginal fistulae, and one had a high rectovaginal fistula (Table 1). The exact location of the rectal end was recorded during the operation as measured from the skin level. They ranged between 20 mm, which was classified lowest, up to 35 mm, the highest. Only one patient had a high rectovesical fistula, which required an abdominoperineal approach. Eighteen patients had a normal sacrum and only two showed on incomplete sacrum.

Eighteen (90%) patients achieved normal continence,

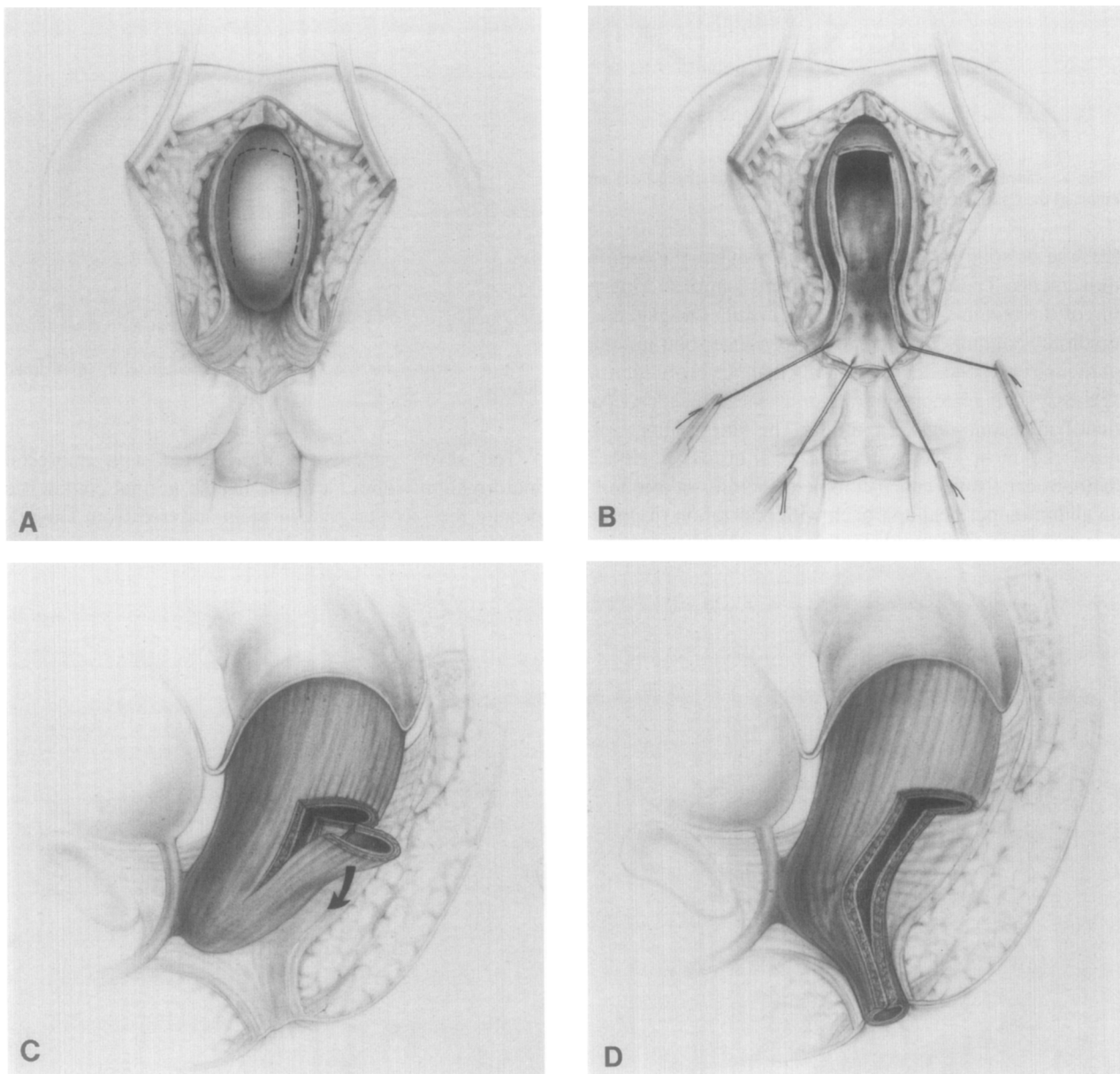


Fig 1. (A) Adequate exposure of blind rectal end. (B) Posterior rectal flap spread out. (C) Posterior rectal flap. (D) Posterior rectal flap lateral view.

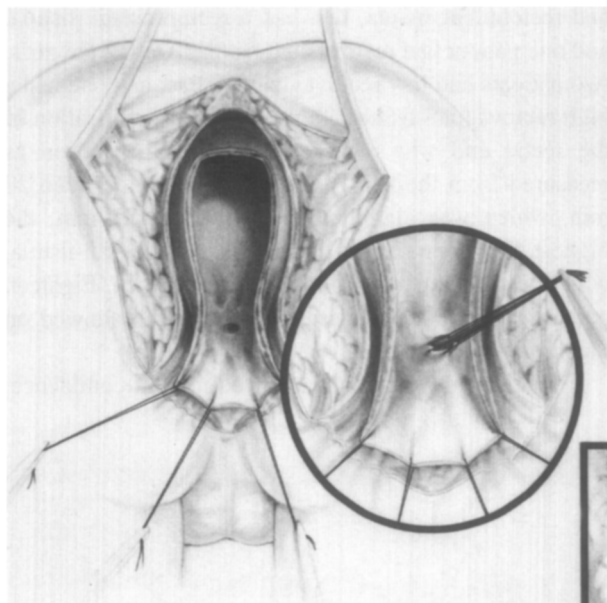


Fig 2. Identification of urinary fistula. Sutures placed around edges of the fistula (insert).

are free of spotting, and experience voluntary intestinal movements. The defecograms showed complete emptying of the rectum. No recurrence of fistula was noted on urethrocytogram. Two patients experience spotting; one of them has second-degree spotting that presented sacrum agenesis with rectoprostatic fistula, and the second patient had second-degree spotting. The latter patient suffered the most severe anorectal malformation with a rectovesical fistula and incomplete sacrum; he required an abdominoperineal approach with realization of posterior rectal flap anorectoplasty.

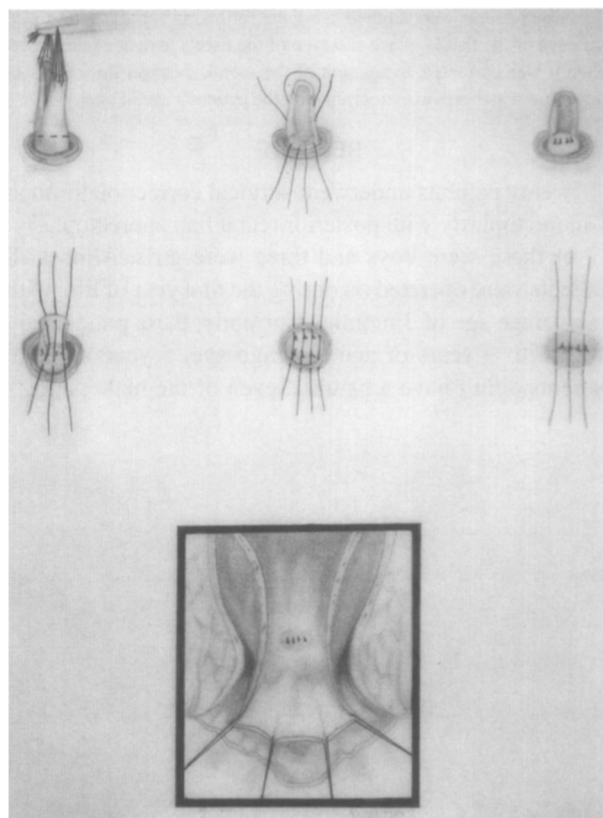


Fig 4. Technic for the closure of the fistula with interrupted sutures.

The seven patients who presented with anorectal malformation without a fistula have a normal continence despite the fact that four of them suffered from Down's syndrome. Four patients suffered transitory constipation,

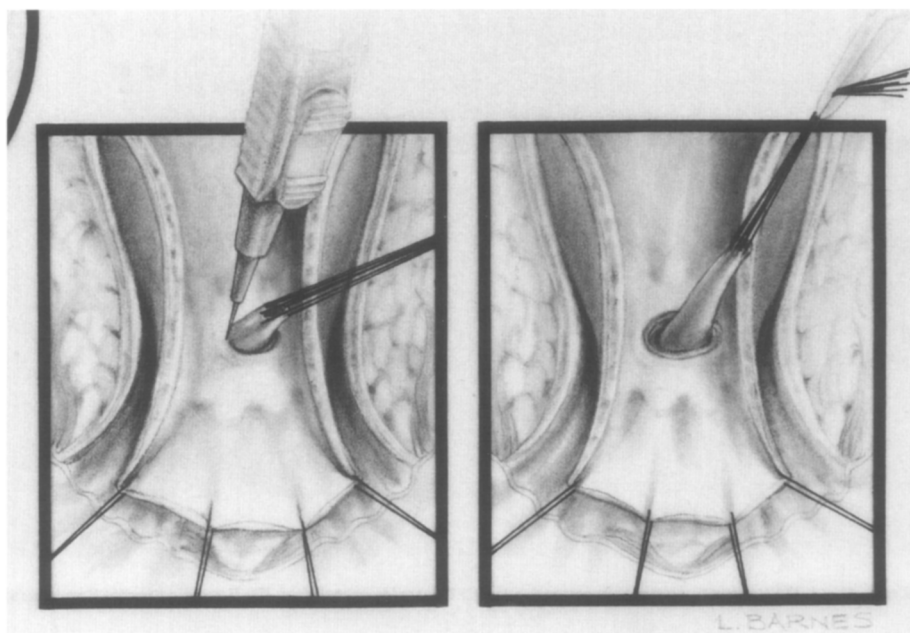


Fig 3. Dissection around the fistula using traction sutures and electrocautery.

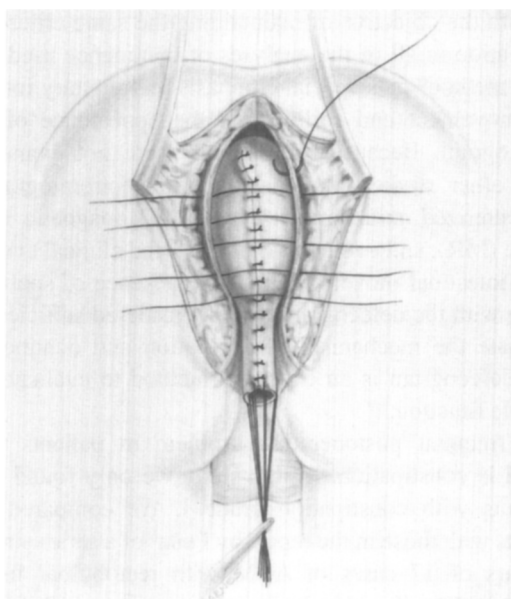


Fig 5. Suture of the rectal flap.

which resolved within 6 months after the operation. Unlike some other reports, a neurogenic bladder developed in none of our patients.^{6,7}

DISCUSSION

The problem in treating ARM continues to be achieving patient continence. With traditional techniques, rates of continence have been reported around 40.8%.^{6,7} Undoubtedly the technique currently most used is that of Peña and De Vries,¹ which reports good results from the cosmetic view point, but the continence is not better.^{4,7} All these techniques¹⁻⁴ do not take into consideration known factors of continence like the preservation of the

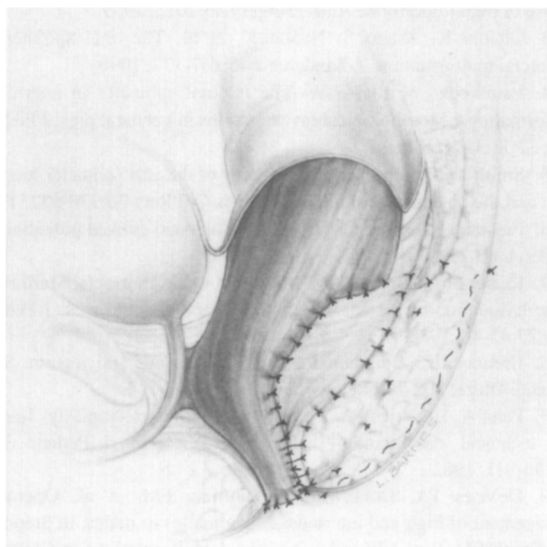


Fig 6. Adequate placing within muscle complex.

Table 1. Results

Date of Birth	Sex	Variety of Arm	Malformation Associated	Age at Surgery	Continence (%)	Age Today
2/6/89	M	ARM ØF	Down's syndrome	5 mo	100	9 yr
11/2/89	M	ARM ØF	Down's syndrome	2 mo	100	9 yr
10/25/89	M	ARM ØF	Down's syndrome	1 yr	100	9 yr
2/16/91	M	ARM F RV	Incomplete sacro	3 mo	Spotting GII	7 yr
6/1/91	M	ARM F RUB	Agenesis sacro	3 mo	Spotting GII	6 yr
6/28/91	M	ARM F RUB	None	4 mo	100	6 yr
5/8/91	M	ARM F RUB	None	11 mo	100	6 yr
9/17/91	M	ARM F RUB	None	1 mo	100	6 yr
5/24/92	M	ARM F RUB	None	1 mo	100	4 yr
1/1/92	M	ARM ØF	Down's syndrome hypothyroidism	3 yr	100	5 yr
1/31/93	M	ARM F RUB	None	3 mo	100	5 yr
8/30/92	F	ARM F RVA	Ninguna	11 mo	100	5 yr
9/17/93	M	ARM ØF	Down's syndrome	5 mo	100	4 yr
2/21/94	F	ARM F RVB	None	1 d	100	4 yr
5/27/93	M	ARM F RUP	None	1 yr	100	4 yr
12/7/93	M	ARM F RUP	None	5 mo	100	5 yr
8/10/94	M	ARM F RUB	Dysmorphic syndrome	1 d	100	3 yr
2/17/94	M	ARM ØF	None	2 mo	100	4 yr
12/10/91	F	ARM F RVB	None	3 yr	100	6 yr
4/27/95	M	ARM ØF	None	4 mo	100	2 yr

Abbreviations: ØF, without fistula; F, with fistula; RV, rectovesical; RUB, rectourethral; RUP, rectourethral; HRV, high rectovaginal; LRV, low rectovaginal.

internal anal sphincter⁸ and the transitional epithelium of the anal canal,⁹ nor does it avoid perirectal dissection, factors essential to continence. Therefore, normal continence cannot be expected.

Advances in the knowledge of anatomy and physiology have revealed several factors that pediatric surgeons should consider to make patients with an anorectal malformation reach normal continence. These factors are: (1) choosing the least aggressive surgical approach, which allows the pediatric surgeon to see and evaluate all the anatomic structures of the area^{1,10}; (2) dissecting the end of the rectum as little as possible to preserve the perirectal and vesical innervation as much as possible^{11,12}; (3) preserving the anal internal sphincter and its remains, which is very important anatomically and functionally for continence^{7-9,13,14}; (4) closing the fistula, being careful with the dissection between the rectum and the bladder to avoid irreversible damage to the function of these organs^{5,8,11,12,15}; and (5) preserving the transitional epithelium of the anal tub, which contains sensorial endings useful in the control the motor function.^{9,16}

Some of these factors could be corrected or preserved

through several surgical procedures. However, the presence of spinal malformations as well as the site of these malformations are factors that can preclude good continence.¹⁷⁻¹⁹ These anatomic factors may not be modified by any surgical technique. Accordingly the ideal surgical technique is the one that helps establish and preserve most of the factors that are important for continence.

Recently, the standard procedure has been the posterior sagittal anorectoplasty described by Peña and De Vries in 1982.^{1,16} This approach is very effective to close the fistula into the urinal tract, vagina, or the vestibule; it creates good aesthetic and functional results; and results in a 40.8% rate of continence.^{6,7} Unfortunately, this procedure, as well as some other procedures, eliminate the fibers of the internal anal sphincter, and they cause the loss of the transitional epithelium of the anus, which are anatomic structures essential for continence.^{9,13,14,16}

Advantages of the posterior rectal flap anorectoplasty^{5,20} technique are obtaining sufficient length of the rectum to accomplish the pull-through; avoiding the dissection of the anterior face of the rectum, perirectal, and posterolateral wall of the bladder; preserving the internal anal sphincter; and doubling the length of the internal sphincter. The mucosa at the end of the blind rectum is preserved to have the sensorial function important for continence.^{9,16} With the PRFA, we assure the placing of the rectum inside the elevator and the muscular complex, which are favorable factors for achieving continence. All of this lays the foundation for good results in the current study, namely a 90% rate of continence.

With the objective of maintaining the same criteria of evaluation in all of the analyses of continence used, the Peña method⁶ puts special emphasis in voluntary intestinal movement and soiling and the appearance of the defecogram. Because the patients were not examined with other studies like manometry, electromiography, computerized axial tomography (CAT), magnetic resonance (MR), and evoked potentials,¹⁶ the clinical evaluation (intestinal movements and the absence of spotting) along with the defecogram, were considered sufficient to evaluate the mechanism of defecation and continence. The defecogram is an excellent method to evaluate the muscle function.^{6,9}

A frequent postoperative problem in patients with ARM is constipation. In this study we only found four patients with constipation grade I. We compared our results with those in the report by Peña⁶ of a series similar to ours of 17 cases of ARM with rectobulbar fistula without a sacral malformation. In this group, 12 did not have voluntary intestinal movements, 12 had low-grade spotting, and seven had constipation (three with diarrhea). In our series, six patients with the same characteristics, all had voluntary intestinal movements, none spotted, and only one had transitory constipation.

The results of continence in our patients until this moment are excellent and better than those of other series, even though the number of patients is small. To conclude that the technique of PRFA with posterior sagittal approach is the ideal technique to maintain continence, we need more patients to continue with this longitudinal study.

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