



Application of anchoring stitch prevents rectal prolapse in laparoscopic assisted anorectal pullthrough[☆]



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ABSTRACT

Background: Rectal prolapse has been reported after laparoscopic assisted anorectal pullthrough in children with anorectal malformation. We report our clinical outcome and study the application of an anchoring stitch to tack the rectum to the presacral fascia and the occurrence of rectal prolapse.

Material and methods: A retrospective review of all children who had undergone laparoscopic assisted anorectal pullthrough for anorectal malformation from 2000 to 2015 was performed. Patients were divided into two groups (group I: with anchoring stitch, group II: without anchoring stitch). Outcome measures including rectal prolapse, soiling, voluntary bowel control, and constipation, and Kelly Score were analyzed.

Results: There were thirty-four patients (group I, n = 20; group II, n = 14) undergoing laparoscopic assisted anorectal pullthrough during the study period. The median follow up duration for group I and group II was 60 months and 168 months, respectively. All patients had stoma performed prior to the operation. Both groups consisted of patients with high type (30% vs 57%, p = 0.12) and intermediate type (70% vs 43%, p = 0.12) anorectal malformation. Seven (35%) patients in group I and 3 (21%) in group II had concomitant vertebral and spinal cord pathologies (p = 0.408). The mean operative time was significantly shorter in group I (193 ± 63 min vs 242 ± 49 min, p = 0.048). Rectal prolapse occurred less in group I, 4 (20%) vs 9 (64%) patients in group II and was statistically significant (p = 0.008). Median time to development of rectal prolapse was 7 months in group I and 5 months in group II (p = 0.767). Mucosectomy was performed in 15% of group I and 36% of group II (p = 0.171). Soiling occurred less in group I (55% vs 79%, p = 0.167). Voluntary bowel control (85% vs 93%, p = 0.499) and constipation (55% vs 64%, p = 0.601) were comparable in both groups. 75% in group I and 71% in group II achieved a Kelly score of 5 or above (p = 0.823).

Conclusions: Our study showed application of anchoring stitch reduces rectal prolapse and soiling in laparoscopic assisted anorectal pullthrough.

Treatment Study–Level III.

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Laparoscopic assisted anorectal pullthrough (LAARP) was first introduced as an alternative to PSARP by Georgeson [1] in 2000. Our center was among one of the first centers to perform LAARP in patients with intermediate or high anorectal malformation. We had previously published favorable results of an earlier return of the rectoanal inhibitory reflex [2], less sphincter asymmetry and perirectal fibrosis on magnetic resonance evaluation [3], and satisfactory defecative function in patients who had undergone LAARP [4].

However there were studies reporting an increase in rectal prolapse after LAARP, with an incidence up to 46%, especially in those patients with rectovesical fistulas [1,5–9]. At present, few studies addressed its

prevention and management [10–13]. We speculated that an anchoring stitch to tack the rectum to the presacral fascia may have a role in preventing this complication. Since 2005, our center had modified our technique in LAARP and applied an anchoring stitch to the presacral fascia. We report our long term functional outcome of LAARP and study the effectiveness of an anchoring stitch in prevention of rectal prolapse.

1. Material and methods

Retrospective review of all children who had undergone laparoscopic assisted anorectal pullthrough for high-/intermediate-type anorectal malformation from 2000 to 2015 was performed. We divided the patients into two groups (group I: with anchoring stitch, group II: without anchoring stitch). To facilitate dissection of the rectum to a precise length that was just enough to be brought down to the anus without redundancy, we evacuated meconium from the sigmoid colon and rectum when the initial colostomy was made, and performed distal loop wash-out to remove any residual stool before LAARP was done. All patients

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followed a standardized anal dilation protocol in our unit: daily dilatation from postoperative day 14, with gradual increment in Hegar dilator size upon weekly review. Any rectal prolapse and the related symptoms, time of development and intervention required were recorded. The Krickenbeck classification [14] and Kelly Score [15] were used to assess functional outcome including soiling, voluntary bowel control, constipation, the need for Malone antegrade continence enema (MACE). Kelly Score [15] was calculated. IBM SPSS Statistics (IBM, USA) was used to perform student t test and fisher's exact test, Pearson's chi-square were used for comparative analysis. A p value of less than 0.05 was considered significant.

1.1. Surgical technique

LAARP was carried out based on Georgeson's description with modifications [1,16]. A 5-mm laparoscope was introduced through an umbilical port, and 2 to 3 additional 3-mm working ports were inserted. The rectum was dissected circumferentially and distally using hook cautery. The rectovesical or rectourethral fistula was transfixed with 4/0 Vicryl stitch and divided. The center of the external sphincter complex was mapped using an electrical muscle stimulator, and a Veress needle was advanced through the center of the external sphincter complex, followed by a STEP trocar (Covidien, Norwalk, CT, USA). The rectum was pulled through and an anastomosis was made between the rectum and the anus. While performing the perineal anastomosis, laparoscopy was done simultaneously to ascertain that a suitable length of rectum was left; further trimming of the rectum from the perineum could be performed. Since 2005, all surgeons in our unit had applied an anchoring stitch to tack the rectum to the presacral fascia with a 4/0 Vicryl stitch. This was done after we had created the neoanus. Fig. 1 showed how the 4/0 Vicryl stitch was applied to the presacral fascia and then applied to the rectal wall to tack the rectum in position. All procedures in this study were performed by the same team of surgeons.

2. Results

Thirty-seven patients had undergone LAARP during our study period. Three patients were lost to follow up immediately after LAARP and were excluded. There was a total of thirty-four patients (group I, n = 20; group II, n = 14) included in our study. The demographics of our patients were summarized in Table 1. The median follow up duration for group I and group II was 60 months and 168 months respectively. All patients had colostomy performed prior to the operation. Both groups consisted of patients with high type (30% vs 57%, p = 0.12) and intermediate type (70% vs 43%, p = 0.12) anorectal malformation. Seven (35%) patients in group I and 3 (21%) in group II had concomitant vertebral and spinal cord pathologies (p = 0.408). The mean operative time was significantly shorter in group I (193 ± 63 min vs 242 ± 49 min, p = 0.048).

Table 1
Patient demographics.

	Group I, N = 20 (%)	Group II, N = 14 (%)	p value
Male	18 (90%)	9 (64%)	0.071
Female	2 (10%)	5 (36%)	0.071
Type of anorectal malformation			
Intermediate	14 (70%)	6 (43%)	0.12
High	6 (30%)	8 (57%)	0.12
VACTERAL	7 (35%)	5 (36%)	0.967
Vertebral–spinal deformity	7 (35%)	3 (21%)	0.408
Chromosomal disorder	2 (10%)	3 (21%)	0.370
Cardiovascular comorbidities	7 (35%)	4 (29%)	0.704
Gastrointestinal comorbidities	0	3 (21%)	0.03
Genitourinary comorbidities	5 (25%)	3 (21%)	0.816
Mean operative time (±SD min)	193 ± 63	242 ± 49	0.048
Median follow up duration (months)	60	168	<0.01

2.1. Complications

Postoperative complications were analyzed in Table 2. Rectal prolapse occurred less in group I, 4 (20%) vs 9 (64%) patients in group II and was statistically significant (p = 0.008). In group II, one (7%) patient presented with bleeding and 2 (14%) patients complained of persistent protrusion, whereas all patients in group I were asymptomatic. Median time to development of rectal prolapse was 7 months in group I and 5 months in group II (p = 0.767). Mucosectomy was performed in 15% of group I and 35% of group II (p = 0.171). Rectal prolapse was not demonstrated to have a statistically significant correlation with high type anorectal malformation or vertebraspinal anomalies.

Anal stricture occurred in 1 (5%) of group I and 1 (7%) of group II. One patient was treated conservatively by anal dilatation while the other patient required a posterior myotomy. Two (14%) patients in group II developed intestinal obstruction. One patient required laparoscopic adhesiolysis 12 years post LAARP. The other patient underwent laparotomy on day 4 post closure of colostomy, and was found to have an anastomotic stenosis. None of our patients complained of urinary symptoms nor were found to have urethral diverticulum.

2.2. Long term functional outcomes

Soiling occurred less in group I (55% vs 79%, p = 0.167) (Table 3). Voluntary bowel control (85% vs 92%, p = 0.499) and constipation (55% vs 64%, p = 0.601) were comparable in both groups. Among those who had constipation, all were grade 2 or below according to the classification by Krickenberk [14]. 75% in group I and 71% in group II achieved a Kelly score of 5 or above (p = 0.823). None of the patients required Malone antegrade continence enema (MACE).

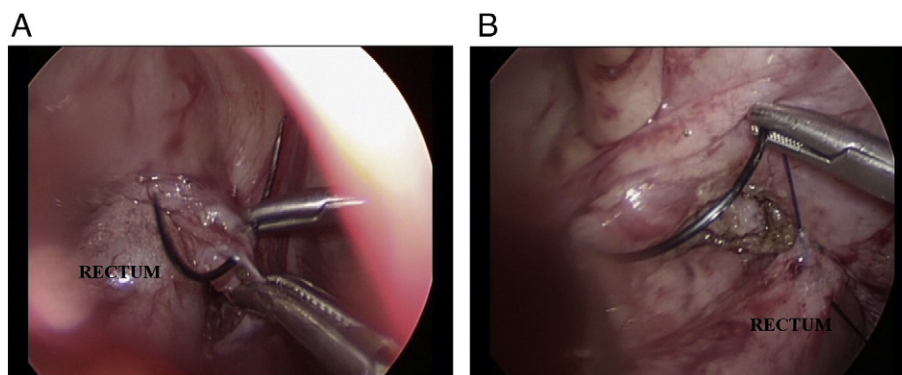


Fig. 1. Intraoperative photo showing how the 4/0 Vicryl stitch was applied to the presacral fascia (A) and then applied to the rectal wall to tack the rectum in position (B).

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