

Surgical Correction Is Ineffective for Improvement of Dyssynergic Defecation in Patients With Rectal Prolapse

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Background/Aims

The patients with rectal prolapse suffer from not only a prolapse rectum but also associated dysfunction. However, most surgical techniques are successful regarding the prolapse, but either do not solve or even worsen defecation dysfunction. The purpose of this study was to investigate the functional and physiological results after surgical correction in patients with rectal prolapse.

Methods

This study is a retrospective review of a single-institution experience. Patients with rectal prolapse who underwent anorectal manometry before and after Delorme's procedure were included. The primary outcomes measured were improvement of clinical symptoms and physiologic study.

Results

Consecutive 19 patients with rectal prolapse (17 females, mean age of 68.1 ± 10.8 years) underwent anorectal manometry before and after Delorme's procedure. The two most prevalent symptoms before operation were rectal tenesmus (15/19, 78.9%) and excessive straining (13/19, 68.4%). The two most prevalent symptoms after operation were rectal tenesmus (14/19, 73.6%) and excessive straining (13/19, 68.4%). No significant differences in resting anal pressure, squeezing anal pressure, defecation index, and rectal sense were found postoperatively. However, vector asymmetry index before surgery was higher than that after surgery (35.0 vs. 32.0, $P = 0.018$). Ten patients (52.5%) had type I dyssynergic defecation before surgery. No improvement of dyssynergic pattern occurred after surgery.

Conclusions

In conclusion, dyssynergic defecation was not improved after reduction of rectal prolapse in patients with rectal prolapse. Further study about combination treatment with biofeedback therapy in these subgroups may be necessary.

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Key Words

Defecation; Manometry; Rectal prolapse

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Introduction

Complete or full-thickness rectal prolapse is the protrusion of the entire rectal wall through the anal canal; if the rectal wall has prolapsed but does not protrude through the anus, it is called an occult (internal) rectal prolapse or a rectal intussusception.¹ The patients with rectal prolapse suffer from not only a prolapsed rectum but also associated defecation dysfunction. More than 50% of the patients suffer from fecal incontinence. Fifteen to 65% of the patients have constipation, and excessive pushing during defecation induces injury of the mucosa of the rectal anterior wall, so the patient may also present with a solitary rectal ulcer. The etiology of this condition is still unknown; it may be possible to prolapsed rectum to block the passage of stool through the anal canal and to induce muscle dysfunction, spasm and hypertrophy of puborectalis muscles.² And also, patients with rectal prolapse hesitate or avoid to exert adequate abdominal pushing force during defecation because it may get worse during defecation. So, we hypothesized that anatomical restoration of prolapsed rectum may lead to functional improvement of defecation. Numerous types of surgeries have still been introduced and attempted, both through the abdominal and perineal routes. Most surgical techniques are successful regarding the prolapse, but either do not solve or even worsen defecation dysfunction.³⁻⁵ The purpose of this study was to investigate the functional and physiological results after surgical correction in patients with rectal prolapse.

Materials and Methods

Subjects

A total of 19 patients with complete rectal prolapse undergoing anorectal manometry before and after Delorme's procedure were studied from July 2008 to August 2011. Abdominal and anorectal symptoms including obstructed defecation and fecal incontinence were evaluated using a structured questionnaire. The questionnaire about symptom was taken from all patients. The degree of patient self-assessed clinical symptom was assessed using a 4-point scale (0, nil; 1, mild; 2, moderate; 3, severe). The Institutional Review Board at Chonnam National University Hospital approved this study.

Anorectal Manometry

Anorectal manometry was performed before and 3 months

after operation in all patients. Before anorectal manometry, patients were asked to empty their bowels. To measure resting and maximal anal sphincter pressure, a radial 8-channel anorectal water-perfused catheter was placed into the rectum at the level of 6 cm above the anal verge and automatically pulled by a catheter-pulling system at the rate of 1 cm/sec. The catheter was connected to a Mui 8-channel water perfusion system (Medtronic Inc., Minneapolis, MN, USA), and the anal sphincter pressure was measured 3 times. Next, a spiral 8-channel anorectal water-perfused catheter with a balloon was placed in the anal canal and both resting pressure and squeezing pressure were measured again. After the balloon on the tip of the catheter was gradually inflated by 10 mL of air, the recto-anal inhibitory reflex, the minimal volume for desire to defecate, the urgency volume, and the maximal tolerable volume were measured. POLYGRAM NET[®] software (Medtronic Inc., Minneapolis, MN, USA) was used to analyze anorectal manometry. Manometric results from all patients were reviewed and dyssynergic patterns were categorized as follows: type I dyssynergia, the subjects can generate an adequate propulsive force (rise in intrarectal pressure ≥ 40 mmHg) along with paradoxical increase in anal sphincter pressure; type II dyssynergia, the subjects is unable to generate an adequate propulsive force; additionally there is paradoxical anal contraction; type III dyssynergia, the subjects can generate an adequate propulsive force but there is either absent relaxation or incomplete ($\leq 20\%$) relaxation of anal sphincter; type IV dyssynergia, the subjects is unable to generate an adequate propulsive force together with an absent or incomplete relaxation of anal sphincter.^{3,6} To provide an overall index of the changes in the rectal and anal pressure during simulated defecation, we calculated a defecation index = maximum rectal pressure when straining \div minimal anal residual pressure when straining.⁷ The balloon expulsion test was conducted using a balloon catheter with spirally arranged eight channels. About 50 mL of warm water was placed in the balloon and the patient was requested to evacuate the balloon.^{8,9} Expulsion of the balloon within 5 minutes was defined as successful. Asymmetric patient was defined as a vector asymmetric index $> 20\%$, whereas in non-asymmetric patients, the vector asymmetric index was $< 20\%$.

Delorme's Procedure

The procedure was in all patients performed by the same surgical team, which was mainly devoted to colorectal surgery. Mechanical bowel preparation, preoperative prophylactic antibiotics, and deep venous thrombosis prophylaxis were used

routinely. General, regional, and monitored anesthesia cares were all used. All patients were positioned in the prone jackknife position. Transanal suture of rectoanal mucosa was performed by using Eisenhammer's anal retractor.

Statistical Methods

The manometric data are expressed as median value (quartile). The categorical variables of each group were compared employing the Chi-square test or Fisher's exact test. The Wilcoxon signed-rank test was used to assess the effects of operation on each of the manometric parameters and clinical symptoms. A P -value < 0.05 was regarded as statistically significant. All analyses were performed using SPSS version 19.0 for Window (SPSS Inc., Chicago, IL, USA).

Results

Demographics

The mean period of follow-up was 20.2 months (range 8.0-46.0 months). Nineteen patients (17 female and 2 male) with rectal prolapse were identified. The mean age of the study group was 68.1 ± 10.8 years. All patients had complete rectal prolapse. Twelve patients (63.1%) had fecal incontinence before operation. The 2 most prevalent symptoms before operation were incomplete emptying (15/19, 78.9%) and excessive straining (13/19, 68.4%). The 2 most prevalent symptoms after operation were incomplete emptying (14/19, 73.6%) and excessive straining (13/19, 68.4%). Two patients (2/19, 10.5%) showed improvement of incomplete emptying after operation. Six patients (6/19, 31.5%) rather showed aggravation of incomplete emptying after operation. There was no significant improvement of clinical symptoms using 4-point scale between preoperative and postoperative period (Fig. 1). The overall recurrence rate was 21.0% (4 of 19). The mean time to recurrence was 17.8 months, with a broad range from 7 to 24 months.

Balloon Expulsion Test

Ten patients (52.6%) were able to expel the balloon before surgery and 12 patients (63.2%) were able to expel the balloon after operation. There was no significant improvement of ability to expel the balloon after surgery ($P = 0.480$) (Table).

Anorectal Manometry

Anorectal manometry data before and after surgery are listed in Table. Following surgery, the resting anal pressure and sus-

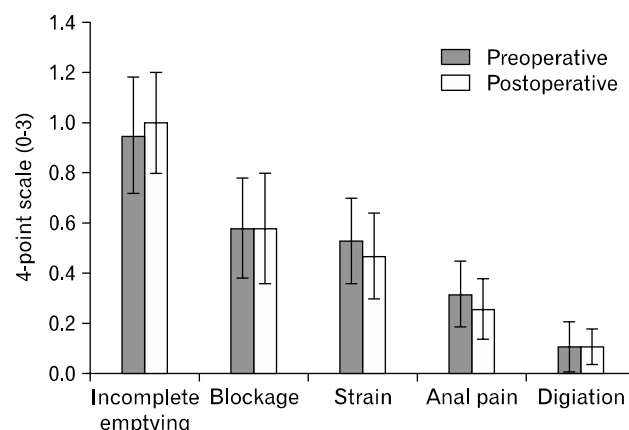


Figure 1. Comparison of preoperative and postoperative symptoms using a 4-point scale. There was no significant improvement of clinical symptoms using 4-point scale between preoperative and postoperative period (Wilcoxon signed-rank test).

tained squeezing pressure was not improved ($P > 0.05$). There was no significant difference between the preoperative and postoperative testing in the volumes for inducing a first sensation, desire to defecate, and urge to defecate. Rectoanal inhibitory reflex was normal in 11 patients, and indefinite in 6 patients due to low resting anal sphincter. No rectoanal inhibitory reflex changes occurred after surgery. Asymmetry index value in the preoperative group (median value, 35.0%) was higher than that in the preoperative group (median value, 32.0%; $P = 0.018$) (Table).

Dyssynergic Patterns

Types of dyssynergic defecation are as follows; there were 11 patients (57.8%) with type I dyssynergic defecation, 5 patients with type II, 1 patient with type III and 1 patient with type IV before surgery. Ten patients with paradoxical increase of anal sphincter before surgery still showed paradoxical increase of anal sphincter after surgery (Fig. 2). No improvement of dyssynergic pattern occurred after surgery.

Rectal Sensation

There was a decrease in the volume for urgency sensation after operation, but it was not statistically significant ($P > 0.05$) (Table).

Discussion

Surgical correction of rectal prolapse is the mainstay of therapy. Two approaches are commonly considered, transabdominal and transperineal. Transabdominal approaches have been

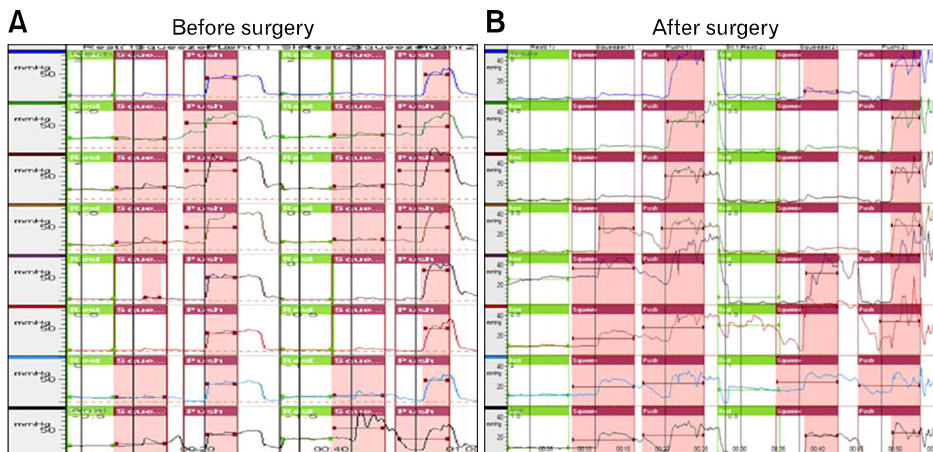


Figure 2. (A) Manometric findings of a 70-year old woman show adequate propulsive force (rise in intrarectal pressure ≥ 40 mmHg) along with paradoxical increase in anal sphincter pressure; paradoxical increase. (B) Follow-up manometric features (after surgery) show still paradoxical increase in anal sphincter pressure.

Table. Results of Manometric Findings and Balloon Expulsion Test Before and After Operation

	Preoperative (n = 19)	Postoperative (n = 19)	P-value
Anal sphincter length (cm [median])	3.0 (2.1-3.8)	2.9 (2.2-3.3)	0.444
Resting anal squeezing pressure (mmHg [median])	40.0 (22.0-50.0)	30.0 (15.0-50.0)	0.521
Squeezing anal sphincter pressure (mmHg [median])	65.0 (40.0-88.0)	65.0 (35.0-110.0)	0.918
Asymmetry values at rest (% [median])	35.0 (30.7-39.8)	32.0 (27.0-35.4)	0.018
Rectal sensation (mL [median])			
Minimal volume for sense	40 (20-50)	40 (20-50)	0.804
Volume for desire to defecate	80 (50-100)	80 (50-90)	0.141
Volume for urgency sensation	120 (100-150)	90 (50-130)	0.142
Success rate of balloon expulsion test (n [%])	10.0 (52.6)	12.0 (63.2)	0.480
Defecation index (median)	1.25 (0.75-1.70)	1.00 (0.91-1.55)	0.463

associated with lower recurrence rates, but some patients with significant comorbidities are better served by a transperineal approach. Common transperineal approaches include a transanal proctectomy (Altmeier procedure), mucosal proctectomy (Delorme's procedure) or placement of a Tirsch wire encircling the anus. The goal of the transperineal approach is to remove the redundant rectosigmoid colon.¹⁰

Increased awareness of the functional abnormalities associated with rectal prolapse has resulted in the realization that appropriate surgery should not also be directed only at a reduction of the prolapse but also improve the functional abnormalities associated with rectal prolapse.¹¹ Fecal incontinence occurs in about 70% case,¹² difficulty with evacuation of the rectum in 50%¹³ and constipation in up to 28%.¹⁴ Difficulty in defecation and constipation can occur after abdominal rectopexy with a reported incidence ranging from 27-47%.^{6,15} However, most study report not extremely low constipation rate after Delorme's procedure, ranging between 0% and 16%.¹⁶ Most previous studies did not

show the improvement of physiologic study. Actually, in the present study, the proportion of patients who had sense of incomplete evacuation increased after surgery although the proportion of patients who had normal balloon expulsion test increased. And, physiologic study of anorectal manometry during attempted defecation did not show improvement of dyssynergic defecation and still showed paradoxical contraction of anal sphincter. In the present study, 62.9% of patients with paradoxical increase or inadequate relaxation of anal sphincter before surgery still showed dyssynergic defecation in the physiologic study. Among the patients, 26.3% showed inadequate pushing force during attempted defecation before and after surgery. These patients actually hesitated or avoided to exert adequate abdominal pushing force during defecation because they thought that increased abdominal pressure might get worse during defecation. However, they did not complain of defecation difficulty due to relatively lower anal sphincter pressure.

The most recent series of the Delorme's procedure report a

variable recurrence rate of 5 to 22 percent. In our study, the result was disappointing with a 21.0% recurrence rate. Factors that may contribute to recurrence after a perineal repair include inadequate or incomplete mucosal dissection, failure to correct pelvic floor and outlet defects, a mucosa to mucosa only repair, and length of follow-up.¹⁷ In connection with difficulty in defecation and constipation, continuous straining may lead to further pelvic floor weakness from stretch injury to the pelvic floor and predispose to recurrent prolapse. Therefore, the role of biofeedback after surgery needs to be investigated for improvement of dyssynergic defecation.

Evaluation of perioperative physiological changes remains to be established in patients with Delorme's procedure. Two previous studies, on the basis of manometric evaluation before and after Delorme's procedure, reported an improvement in rectal sensation.^{3,5} On the other hand, Türkün,⁵ did not show an improvement in rectal sensation after Delorme's procedure in accordance with ours.

Results regarding perioperative anal resting pressure and anal squeezing pressure are inconsistent cross series.^{4,5} In some studies, as in the present study, sphincter pressures remain unchanged, but parameters of sphincter pressure increase in other studies.³ The explanation for these differing results is not obvious. This may be related to variation in case mix and patient selection or because of a pudendal neuropathy or, to some degree, perirectal supra-elevator fibrosis following a subclinical anastomotic dehiscence, if any, with consequent impairment of rectal sensation. Furthermore, this may be because of the difference in the postoperative time of physiology study.

This study is limited by its retrospective nature and the limited number of subjects.

In conclusion, dyssynergic defecation was not improved after reduction of rectal prolapse in patients with rectal prolapse. Further study about combination treatment with biofeedback therapy in these subgroups may be necessary.

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