

Original Article

Surgical Treatment for Rectal Prolapse in the Last Decade at Taipei Veterans General Hospital

Chih-Hsien Chang
Yuan-Tzu Lan
Jeng-Kai Jiang
Shih-Ching Chang
Huann-Sheng Wang
Hung-Hsin Lin
Chun-Chi Lin
Sheng-Chieh Huang
Hou-Hsuan Cheng
Jen-Kou Lin
Tzu-Chen Lin
Shung-Haur Yang
Wei-Shone Chen

Taipei Veterans General Hospital, Taipei, Taiwan

Key Words

Rectal prolapse;
Surgery;
Outcome

Purpose. Surgery has been identified as the only curative treatment for rectal prolapse. However, there is yet no consensus on the choice of operative methods. Thus, the aim of this study was to determine the surgical treatment choices for rectal prolapse in a single hospital and the differences between the procedures.

Materials and Methods. Patients who underwent surgical treatment for rectal prolapse at Taipei Veterans General Hospital from 2010 to 2019 were enrolled in this study. Demographic data, surgical procedures, surgical complications, and recurrence were retrospectively collected from medical records and operative notes, and surgical outcomes for the abdominal and perineal approaches were compared.

Results. In total, 79 predominantly female patients were included in this study. Abdominal approach was used in 47 (59.5%) patients, and no significant differences were detected in most characteristics between the two approaches. The American Society of Anesthesiologists scores of III and IV occurred more frequently in patients who underwent the perineal approach ($p = 0.029$).

Postoperative complications were reported in 16 (34.0%) patients who underwent the abdominal approach and 11 (34.4%) patients who underwent the perineal approach. Three patients underwent another operation due to complications after the abdominal approach.

The median follow-up time was 51 and 62 months for the abdominal and perineal approaches respectively. Recurrence rates were similar for two groups (A/P: 14.9%/25.0%, $p = 0.261$). Since 2015, the number of surgeries for rectal prolapse was noted to increase at our hospital. Laparoscopic assist was applied more frequently since 2017.

Conclusion. Rectal prolapse is known to be a relatively rare condition in current practice. The choices of surgical approach should be personalized based on the patients' medical conditions, surgical risks and postoperative complications. Laparoscopic assist is a choice for skilled surgeons.

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Rectal prolapse, which is also referred to as pro-
cidencia, is defined as a protrusion of the rectum
through the anal canal.¹ Although rectal prolapse is a

benign condition, it can often lead to symptoms influ-
encing bowel function and quality of life, including
fecal incontinence, constipation, and discomfort of

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Correspondence to: Dr. CH Chang, Taipei Veterans General Hospital, Taipei, Taiwan. Tel: 886-916698275; E-mail: greencat6182@gmail.com

prolapsing tissue with drainage of mucus or blood.²⁻⁴ The only curative treatment for rectal prolapse is surgery. However, there is yet no consensus concerning the choice of operative methods.⁵ The abdominal approach is advocated for patients with acceptable risk due to the lower recurrence rate^{1,3,6,7} and better functional outcome compared with the perineal approach. However, surgeons prefer the perineal approach for elderly patients.⁴ Recent data from a review of 15 randomized controlled trials showed no differences in the recurrence rates between the two approaches.^{8,9} Bowel resection may help patients with constipation symptoms.^{8,10} Since its first description in 1992, the minimally invasive approach for rectal prolapse has gained popularity because this approach has been associated with less pain, early recovery, and lower morbidity.^{1,11} The 2017 American Society of Colon and Rectal Surgeons practice guidelines for rectal prolapse also recommended the laparoscopic approach by experienced surgeons when deemed technically feasible.^{9,12} The recurrence rate for the laparoscopic approach is equivalent to the recurrence rate for the open approach, according to numerous studies.^{4,7,8,13}

The use of laparoscopic surgery for colorectal disease has seen a steady increase in our hospital from 15% in 2007 to 80% in 2019. Thus, the aim of this study was to elucidate the preference for surgical treatment in a single hospital in an era of laparoscopic surgery.^{1,11} In addition, the differences in recurrence rates between the abdominal approach and the perineal approach were compared.

Materials and Methods

In total, 85 patients underwent surgery for rectal prolapse in Taipei Veterans General Hospital from 2010 to 2019. Four patients who had recurrent rectal prolapse were excluded because the first surgeries for rectal prolapse were performed at a different hospital. The diagnosis of rectal prolapse was made based on a full-thickness rectal wall protruding outside the anus during the physical examination or defecography following symptoms and signs of intussusception. Data were retrospectively collected from the medical re-

ports and operative notes in the medical records system. Demographic data, surgical procedures, surgical complications, and recurrence were also recorded.

Patients were divided into abdominal approach (group A, n = 47) and perineal approach (group P, n = 32) groups based on the method of their first operation. The abdominal approach was performed either laparoscopically (n = 24) or via exploratory laparotomy (n = 23). Both techniques were conducted under general anesthesia. The choice of surgical method, including sigmoidectomy or rectosigmoidectomy (n = 9), rectopexy (n = 11), or combined (n = 28), was made by the surgeon in charge.^{8,11} The rectopexy procedure is known to fix the mobilized rectum to the sacral promontory with suture (n = 11) or mesh (n = 10) to reinforce the strength of the attachment. In our hospital, we only used the Wells procedure when rectopexy with mesh is performed. The non-absorbable mesh was placed on the sacrum hollow and wrapped on the lateral side of the rectum.² The anterior aspect of the rectum was left uncovered.

The perineal approach, including the Altemeier (n = 5) and Delorme (n = 26) procedures, was conducted under different anesthesia methods, including local anesthesia with heavy sedation, spinal anesthesia, or general anesthesia. Only one patient received anal encirclement via the perineal approach under intravenous sedation and local anesthesia, and a subcutaneous suture with a polypropylene mesh was encircled over the anal orifice after rectal prolapse reduction.⁸ The Delorme procedure is also called a perineal mucosal sleeve resection, and only the protruding mucosa layer was removed. Then, the muscle layer was plicated with sutures, followed by anorectal mucosal anastomosis.¹ The Altemeier procedure is also known as a perineal rectosigmoidectomy. An incision was made above the dentate line and the mesentery of the sigmoid colon together with redundant colon loops were pulled out and resected, followed by a coloanal anastomosis.^{1,9}

Surgical outcomes between the two groups were compared. Categorical variables were compared using Chi square tests, Fisher's exact tests. The Shapiro-Wilk test was performed and confirmed that our samples were not normally distributed. Thus the Mann-

Whitney U test was applied for continuous variables, except for body mass index (BMI). BMI exhibited normal distribution, and the Student's t-test was used for comparison. *p*-values less than 0.05 were considered significant. IBM SPSS Statistics 26 was used for all statistical analyses.

Results

In total, 79 patients, who were predominantly female, underwent surgery for rectal prolapse (male/female = 12/67) (Table 1). Five patients (6.3%) were formally diagnosed with psychological disorders. Thirty-five patients (44.3%) had loosened anal tone determined by digital examination. Fifteen patients (19.0%) had neurological diseases, including traumatic or pathological spinal disease, atonic bladder, dementia, seizure, neurosyphilis, parkinsonism, and cerebrovascular accident. Age distribution peaked at 70-79 years old (Fig. 1).

Forty-seven (59.5%) patients were in the A group (Table 2), whereas 32 patients were in the P group. No

differences in gender, age, or BMI were detected between the A and P groups. Patients who underwent the perineal approach had a higher percentage of American Society of Anesthesiology (ASA) scores III and IV compared with the scores of patients who underwent the abdominal approach (46.9% vs. 23.4%, *p* = 0.029). The operative time was significantly longer in the A group compared with the time in the P group (155 min vs. 77 min, *p* < 0.005). The duration of the postoperative hospital stay was also significantly longer in the A group compared with the duration in the P group (8 days vs. 5 days, *p* < 0.005).

Postoperative complications occurred in 16 (34.0%) patients in the A group and 11 (34.4%) patients in the P group (Table 3). The complication rates were not significantly different. Complications in both groups included incontinence, constipation, difficult evacuation, luminal stricture, and delayed bleeding (Table 3). Three patients in the A group underwent a second operation due to complications. One patient got adhesion ileus one month after operation and couldn't resolve under conservative treatment. Enterolysis was done but repeated ileus 1.5 year later and enterolysis was conducted again. One patient got anal incontinence so retrorectal levatorplasty and sphincteroplasty were done to improve symptom. One patient received debridement and wound closure due to umbilical wound poor healing. In the perineal group, anal stenosis occurred in one patient after the Delorme procedure, who required blunt dilatation but resulted in perforation, which led to another segmental colectomy.

Median follow-up times in the A and P groups were 51 and 62 months, respectively (Table 2). Recur-

Table 1. Characteristics of the patients with rectal prolapse

	Number of patients (n = 79)
Gender	
Male	12 (15.2%)
Female	67 (84.8%)
Psychological disorder	5 (6.3%)
Neurological disorder	15 (19.0%)
Loose anal tone by DRE ^a	35 (44.3%)
Abdominal approach (Group A)	47 (59.5%)
Suture rectopexy only	10 (12.7%)
Sigmoidectomy or rectosigmoidectomy	9 (11.4%)
Suture rectopexy with bowel resection	28 (35.4%)
Laparoscopic approach	24 (30.4%)
Applymesh additionally ^b	10 (12.7%)
Perineal approach (Group P)	32 (40.5%)
Altemeier procedure	5 (6.3%)
Delorme procedure	26 (32.9%)
Anal encirclement with mesh	1 (1.3%)
Median follow-up time (months)	60.1

^a DRE: digital rectal exam; loose anal tone is subjective evaluation by doctor in charge.

^b Operators in our hospital only use Wells procedure (posterior sling rectopexy).

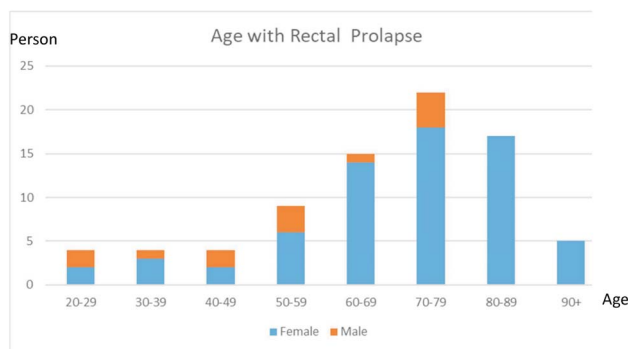


Fig. 1. Age and gender distribution in patients with rectal prolapse.

Table 2. Comparison of abdominal approach and perineal approach

	Group A (n = 47)	Group P (n = 32)	p-value
Gender			0.467
Male	6	6	
Female	41	26	
Age ^a	71.0 (20-93)	73.0 (52-94)	0.523
BMI, mean ± SD ^b	22.9 ± 3.8	23.2 ± 4.1	0.816
ASA			0.029
I + II	36 (76.6%)	17 (53.1%)	
III + IV	11 (23.4%)	15 (46.9%)	
Loose anal tone by DRE ^c	21 (44.7%)	14 (43.8%)	0.935
Operative time (mins) ^a	155 (50-360)	77 (25-150)	< 0.005
Hospital stay after surgery ^a	8 (4-25)	5 (2-10)	< 0.005
Months of follow-up ^a	51 (0-9)	62 (0-9)	0.960
Recurrence	7 (14.9%)	8 (25.0%)	0.203
Median time to recurrence ^a (months)	8 (1-74)	14 (0.5-48)	0.955
Surgery for recurrence	4	8	
Second operation approach			
Abdominal approach	2	5	
Perineal approach	2	3	

^a The variable shows non-normal distribution and is presented as median (range). ^b Standard deviation. ^c DRE: digital rectal exam; loose anal tone is subjective evaluation by doctor in charge.

Table 3. Complication list

	Group A (n = 47)	Group P (n = 32)
Incontinence	1	1
Constipation	1	1
Difficult evacuation	3	1
Anal bleeding	1	1
Anal stenosis	0	2
Chyle leak	2	0
Ileus	4	0
Anastomosis stenosis	2	1
Anal fistula	0	1
Ventral hernia	1	0
Mesh infection	0	1
Urinary infection	1	2
Systemic complication	1	2
Wound complications	3	0
Loss of anal tone (new onset)	1	0
Reoperation for complication	3	0

recurrence rates were 7 (14.9%) and 8 (25%) in the A and P groups but were not significantly different ($p = 0.203$). Among the eight recurrent patients who previously underwent surgery using the perineal approach, all underwent second operations; five (62.5%) underwent surgery using the abdominal approach, and the

other three patients underwent the perineal approach again. Re-recurrence was observed in one patient after two perineal approaches, and the patient underwent surgery using the abdominal approach the third time. Among the seven recurrent patients who underwent the first surgery using the abdominal approach, two underwent surgery with the abdominal approach again and another two underwent surgery using the perineal approach. The other patients were managed conservatively (Table 2).

In our hospital, the case number of rectal prolapse increased since 2015, and surgeons tended to select the abdominal approach since 2017 (Fig. 2). Laparoscopic surgery was performed more frequently since 2017 (Fig. 3). The age distribution between the A and P groups is shown in Fig. 4. All young patients underwent surgery for rectal prolapse using the abdominal approach. For elder patients, the abdominal and perineal approaches were equally chosen.

Discussion

The primary aim of this study was to determine



Fig. 2. Number of cases of rectal prolapse using the abdominal or perineal approach in the past 10 years.

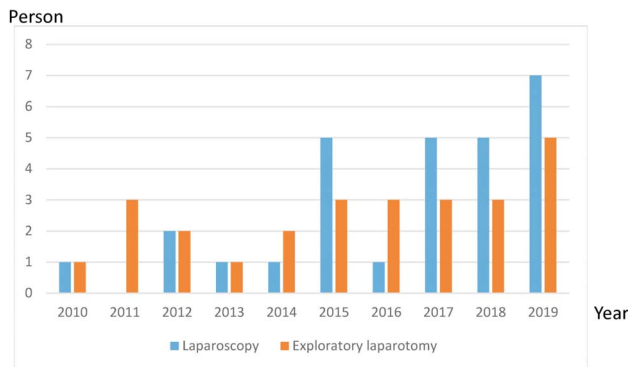


Fig. 3. Number of cases of laparoscopic procedures and exploratory laparotomies in the abdominal approach group.

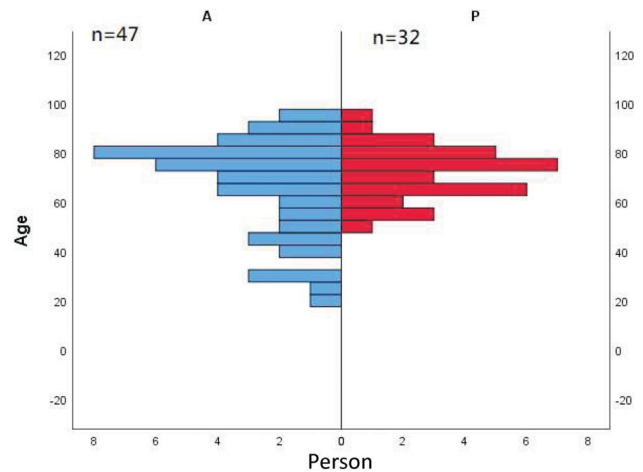


Fig. 4. Age distribution for the abdominal and perineal.

the trends for surgery to correct rectal prolapse at a medical center in Taiwan. The use of the abdominal approach for rectal prolapse started increasing in 2017. Improvements in terms of techniques are thought to be the turning point in the choice of approach. Most surgeons preferred the abdominal approach if a patient was suitable for laparotomy due to improved functional outcomes and lower recurrent risks.¹² However, the abdominal approach is deemed impossible for fragile patients with multiple comorbidities. The abdominal approach via laparoscopy has resulted in lower complication rates,^{1,12-14} shorter recovery times, and no long-term adverse effects.¹³ These advantages may have contributed to the increasing use of the abdominal approach since 2017.

No differences in recurrence rates or complications were detected between the A and P groups. Our

recurrence rate in the P group was 25%, which is within the reported range of recurrence rates of 8%-34%.¹ A review of 15 randomized controlled trials also showed no differences in recurrence or complications between the abdominal and perineal approaches.⁸ However, a lower recurrence rate for laparoscopic procedures compared with perineal procedures was reported in a recent review.¹ Although the recurrence rates were not significantly different between the two groups (25.0% vs. 14.9%) in our study, the difference might be clinically meaningful. Most of our patients (81%) received Delorme procedure when the perineal approach was chosen. A randomized controlled trial (PROSPER) demonstrated no differences in recurrence rates between the Altmeier and Delorme procedures.¹⁵ We could not compare Altmeier and De-

Table 4. Operative method details of patients getting recurrence in A group

Patient	Laparoscopic approach	Rectopexy/bowel resection	Mesh applied	Time to recurrence	2 nd operation
A	No	Both	No	8 months	Mesh ^a
B	Yes	Bowel resection only	No	1 month	-
C	Yes	Both	Yes	51 months	-
D	Yes	Both	No	3 months	Mesh ^a
E	Yes	Both	No	5 months	Delorme
F	Yes	Both	No	6 months	-
G	Yes	Both	No	24 months	Delorme

^a Repeated abdominal approach for mesh appliance (Wells procedure).

lorne procedures due to the limited number of cases.

Among the 7 patients who got recurrence in A group (Table 4), there are 6 patients received laparoscopic surgery, instead of open method, but due to low case number, it is hardly to determine the risk of recurrence or not. Most of patients with recurrence in A group has received suture rectopexy and bowel resection simultaneously, but only one patient received bowel resection alone, and managed with conservative treatment after recurrence. There is only one patient recurred even applied mesh, this patient has not received second operation. Second operation with abdominal approach were done for applying mesh.

To determine if the occurrence of constipation was a problem for either approach, we analyzed the symptoms for each operative method. As per our findings, if patients presented with constipation, the surgeon favored the abdominal approach (61.1%) rather than the perineal approach. However, no correlation with bowel resection was found. Nevertheless, constipation was not mentioned in half of the medical records, and the sample size was too small to conduct a meaningful analysis.

Rectal prolapse is a functional disease related to structure abnormalities, which has no severe consequence unless severe erosion of the prolapsed rectum causes perforation. One patient in this study received an emergent operation for rectal prolapse due to a perforated colon at the level of the rectosigmoid junction.

This study has several limitations. This is a retrospective study. Thus, selection bias could not be avoided. The case number was limited, especially before 2017. Functional preoperative surveys were not included. Sigmoidoscopy or colonoscopy was applied to almost every patient. Patients underwent defeco-

graphy (23.5%) mainly for the internal type, but only 7% of patients underwent anorectal manometry,⁹ and colon transition time was evaluated in only one patient. Differences in anal pressures before and after surgery cannot be determined if different methods are used. Finally, subjective functional evaluations, including constipation or incontinence scores, were found to be lacking, making the benefits of surgery difficult to determine.

Conclusion

Rectal prolapse is rare in current practice. Thus, the choice of surgical approach should be personalized based on the patients' medical condition, surgical risks, and postoperative complications. There is limited difference in recurrence rate, so patient with ASA score more than 3 points may consider perineal approach because general anesthesia is not necessary in this method. Laparoscopic-assisted surgery for rectal prolapse is a current trend.

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原 著

近十年台北榮總對直腸脫垂的外科治療經驗

張智閑 藍苑慈 姜正愷 張世慶 王煥昇 林宏鑫 林春吉
黃聖捷 鄭厚軒 林楨國 林資琛 楊純豪 陳維熊

台北榮民總醫院

直腸脫垂有效的治療方式分為經腹部或經會陰部手術，本篇文章想探討在台北榮總醫院執行兩種手術所產生的差異。我們收集 2010 至 2019 年於台北榮總接受直腸脫垂手術的患者，回顧其病歷並分析。

79 位患者被納入討論，其中女性為主。有 47 (59.5%) 位病人採經腹部手術；其餘的病人採經會陰部手術。兩者之間僅在麻醉風險分數上有差異，三或四分的患者較常接受經會陰手術。經腹部手術及經會陰部手術後發生併發症，並無比例上的差異；且兩組復發比率相似。在我們醫院，自 2015 年後接受直腸脫垂手術的患者人數上升，且於 2017 年後腹腔鏡使用率上升。

臨床上直腸脫垂並不常見，手術治療的選擇應依照病人狀況及手術風險……等作選擇。對於技術純熟的外科醫師來說，腹腔鏡手術亦為一個好選擇。

關鍵詞 直腸脫垂、手術、預後。