

ORIGINAL RESEARCH

Altemeier's Procedure for Complete Rectal Prolapse; Review of Outcome in 20 Patients

¹Dr. J.A. Jayalal, ²Dr. Rajkumar, ³Dr. Selwyn J Kumar, *Dr. J. AjinManovah

¹Professor of Surgery, Kanyakumari Govt Medical College, Asaripallam, Nagercoil, Tamilnadu, India

²Associate Professor of Surgery, Govt Thoothukudi Medical College, Thoothukudi, Tamilnadu, India ³Associate Professor of Surgery, Kanyakumari Govt Medical College, Asaripallam, Nagercoil, Tamilnadu, India

*Corresponding Author

Dr. J. AjinManovah,

Assistant Professor of Surgery, Kanyakumari Govt Medical College, Asaripallam, Nagercoil, Tamilnadu, India

Email: ajinmanovah@gmail.com

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ABSTRACT

Background: Rectal prolapse is a debilitating disorder with multiple modalities and approaches to surgical correction. The proctosigmoidectomy using Altemeier's procedure is an effective surgical option. This study is intended to evaluate the morbidity, mortality, postoperative function, adaptability, learning curve and recurrences in patients treated by Altemeier's proctosigmoidectomy. **Materials & Methods:** 20 patients with complete rectal prolapse are included and perioperative data were collected. The patients were followed up for 6–12 months and changes in pelvic floor function and recurrences were assessed. The Obstructive Defecation Syndrome (ODS) score, Vaizey score, International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) score and urinary retention score were analyzed for all patients. **Results:** One patient developed major postoperative complication due to the concomitant pneumonia, which resulted in respiratory failure. The Patients with a BMI greater than 30, higher age, concomitant disease and a high ASA score have shown no increased evidence of morbidity from this procedure. No postoperative mortality was noted. Two important criteria were used. The Obstructive Defecation Syndrome (ODS) score demonstrates a statistically significant decrease in the long-term follow-up. However, there was no significant improvement in the International Consultation on Incontinence Questionnaire Short Form (ICIQ-SF) score, the Vaizey score or the urinary retention score. Levatorplasty had a significant impact on the ODS score. Four patients, comprising 20% of the total, had shown recurrence of prolapse within the period of one year. With reference to the demographic pattern of age ($p = 0.188$), BMI ($p = 0.864$), recurrent disease ($p = 0.398$), ASA score ($p = 0.433$), the length and level of the resected bowel ($p = 0.126$), with or without levatorplasty ($p = 0.304$) and previous perianal surgeries ($p = 0.705$), all have shown no relation to the recurrence of the disease. The patient profile in terms of satisfaction was much improved. **Conclusions:** Altemeier's procedure is a safe and easy-to-perform surgical option for rectal prolapse. Only 20% recurrence rate in one year, with improved bowel evacuation capacity in patients who had constipation. However, there is not much improvement in faecal and urinary continence.

Key words: Rectal prolapse, Altemeier's procedure, recurrence

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INTRODUCTION

Rectal prolapse, resulting from the protrusion of all layers of the rectum through the anus, is a socially hampering condition. It has an estimated incidence of 2.5 per 100,000 in the general population ⁽¹⁾. It affects patients over 50 years of age, with a female/male ratio of around 10/1. It is a condition known and even described as early as 4000–5000 BC in Egyptian mummies. In the era of Hippocrates, patients with rectal prolapse were treated by hanging them upside down, touching a burning stick to the prolapsed rectal mucosa or by chemical cauterization.

Rectal prolapse is often multifactorial. The weakness of the pelvic floor is due to various conditions ranging

from nutrition to birth injury, chronic constipation, multiple pregnancies, previous pelvic surgery, radiation and an anatomical abnormality in the deep pouch of Douglas ⁽²⁾. Patients with psychiatric and connective tissue disorders have higher chances of getting this condition. The signs and symptoms of rectal prolapse vary, with the common presentations being mass coming through the rectum, incontinence, mucosal discharge, bleeding, incomplete evacuation and constipation. Rectal prolapse is often accompanied by a mixed pattern of functional disorders ranging from the difficulty of passing stool, collectively known as obstructive defecation syndrome (ODS), to various degrees of continence

abnormalities due to the impact of progressive loss of pelvic floor structure function (muscles and ligaments), invoking morphological and functional changes in it.

Occult (asymptomatic) rectal prolapse has been found in 33% of patients with clinically recognized rectoceles and defecatory dysfunction and can easily be detected on physical examination by asking the patient to strain as if to defecate.

In most cases, the rectal prolapse can be reduced, however, surgery is the definitive and curative treatment for the restoration and maintenance of continence, avoiding recurrence and morbidity.

Multiple surgical procedures have been described to correct rectal prolapse. However, no convincing controlled trial or RCT has been conducted to establish the superiority of one procedure over the other. The surgical options are grossly divided into abdominal and perineal procedures. In young patients who are healthy and fit for long surgery, the abdominal procedures are done with the theoretical advantage of lesser recurrence. The penalty for retrorectal dissection done in this procedure causing injury to the presacral nerves shall result in loss of sexual function. The newer, minimally invasive laparoscopic abdominal procedures are described as having fewer complications.

The principles of surgical repair are to reduce the mobility of the rectum and sigmoid colon by fixation with or without removal of the prolapsing rectum and sigmoid colon. The repair must give mechanical support to the sphincters and the pelvic floor⁽²⁾. Despite anatomical correction by surgery, patients frequently complain of persisting pelvic floor symptoms and recurrences.

In 1971, Altemeier popularized the perineal proctosigmoidectomy, which had previously been described by Mikulicz and Miles. The perineal approach can be offered to old, debilitated patients who are unfit for major abdominal procedures under general anesthesia. The perineal procedures are associated with an increased chance of recurrence. Altemeier's procedure, as it removes the prolapse without a pexy and performs only a partial reconstruction of the pouch of Douglas, is said to have caused a relapse of the disease⁽³⁾. However, the addition of levatorplasty has greatly improved the outcome. Thiersch wiring and Delorme's operations are the other perennial procedures.

In the present study, the outcome of Altemeier's procedure was assessed in a sequential series of 20 patients with complete rectal prolapse to assess the rates of early morbidity and mortality, the long-term functions and recurrence.

METHODS

The patients with signs and symptoms of full-thickness rectal prolapse, such as mass coming per rectum, mucosal discharge with soiling of inner wear and constipation were included in the study. Patients who reported in both the emergency room and the regular OPD of the surgical department of Kanyakumari Government Medical College from January 2021 to June 2022 are included in this study.

Demographic Data:

All patients' demographic data, such as age, sex, concomitant diseases, previous history of surgery in the pelvis or perineal region, difficult labor, nature of bowel habits, time spent in the toilet, frequency or urgency, incontinence or initiation of urination, body mass index and height were collected.



Fig. 1: Mass descending per rectum

PERIOPERATIVE DATA

Data on the preoperative preparation schedule, including prophylactic antibiotics, thromboembolic prophylaxis, enema and the type of anesthesia used were collected. Intraoperative details on the duration

of surgery, blood loss, the extent of resection of the intestine, additional procedures done like levatorplasty the time taken for the first bowel movement after the surgery, the length of hospital

stay, complications and the time taken to go back for routine work were obtained.

30TH-DAY POST-OPERATIVE FOLLOW-UP

The Clavien-Dindo classification was used to collect the data on the 30-day morbidity and the 30-day mortality details. Functional results analyzing bowel and urinary functions and patient satisfaction were investigated.

VAIZEY SCORE, ODS SCORE, ICIQ SF SCORE

The Vaizey score is a recognized and validated tool to assess faecal continence. It has two scoring systems, each with a five-point scale to evaluate the type and frequency of solid or liquid stools lost and flatus, incontinence as well as quantify their impact on quality of life ⁽⁴⁾. Vaizey ranges from 0 (normal continence) to 24 (severe incontinence).

Though there are many subjective methods to assess obstructed defecation syndrome (ODS), there is not much objective means to do so. There are not many studies available to evaluate outcomes or compare the efficacy of treatments including surgery. However, there are many scoring systems available to assess the obstructed defecation syndrome. Altomare introduced the obstructed defecation syndrome (ODS) score for quantifying OD symptoms. The score has a scale of 0 to 31 points, and a score on the higher side will indicate a worse OD ⁽⁵⁾. In our study, we used the Altomare score and the collected data.

The urinary function was determined pre- and post-operatively using the validated International Consultation on Incontinence Questionnaire Short Form (ICIQ SF) score (range 0 [normal]–21), and a pre- and post-operative evaluation of the residual urinary volume was made using a four-degree severity score (0 for < 50 mL, 1 for > 50 < 100 mL, 2 for > 100 < 200 mL, 3 for > 200 mL) ^(6,7).

A simple numerical scale with a 0 (not satisfied) to 10 (completely satisfied) score was used to determine the patient satisfaction.

The diagnosis of rectal prolapse was based mainly on the clinical findings and the routine use of endoanal ultrasound (EUS), contrast defecography, magnetic resonance imaging (MRI)–defecography, colonic motility and anorectalmanometric studies were done only in selected patients. The recurrence of the prolapse was analyzed.

STATISTICAL ANALYSIS

The data collected were grouped as parametric and non-parametric. These descriptive data are used to derive the relationship between post-operative complications. The unpaired t-test is used to analyze the effects of age, ASA and BMI on the outcome of the patient following the procedure. However, for the paired data, the paired t-test or Wilcoxon's rank sum test is used to compare the pre-operative and post-operative functional scores.

The data collected on the relationship between changes in the ODS score and Vaizey score with respect to levatorplasty were subjected to an unpaired t-test and the Mann-Whitney U-test and the inference was evaluated.

The Kaplan-Meier method is adopted for determining the probability of recurrence at 24 months. An independent-sample t-test is applied to derive the relationship between recurrence and demographic and treatment patterns like age, BMI, previous rectal prolapse surgery, previous hysterectomy, levatorplasty, length of the resected bowel and gender. Pearson's chi-squared test or Fisher's exact test A p-value of < 0.05 was considered to be statistically significant. To evaluate patient satisfaction regarding recurrence, the Mann-Whitney U-Test was used. Statistical analysis was conducted using SPSS.

ETHICAL CLEARANCE

The study was presented to the institution's ethics committee and approved. All ethical principles were adhered to.

INCLUSION CRITERIA

- All patients with complete prolapse rectum with mass coming down and mucosal wetting
- age group between 18 and 80
- Both sex
- Consent for the study

EXCLUSION CRITERIA

- Concomitant severe disease
- Bleeding disorder
- Malignancy

RESULTS

Twenty patients with signs and symptoms fulfilling the criteria of complete prolapse who underwent Altemeier's proctosigmoidectomy were included in the study.

There were 12 males and 8 females with a mean age (66.4±10 years).

The most common comorbidity was cardiovascular, which 12 patients (60%) had and 6 patients (30%) had psychosocial comorbidities.

A history of previous pelvic surgery was present in seven patients (35%). Three of these patients (15%) had the same surgical correction for the rectal prolapse 2–3 years prior to the current disease. Six of the female patients (30%) were multiparous, with more than four children delivered vaginally, and two (10%) had an associated prolapsed uterus.

The average duration of symptoms was 2 years. The average BMI was 22.2 (± 4.4).

The results of the mean preoperative scores for constipation and incontinence, the ICIQ SF score and the preoperative residual urinary volume score are tabulated and given in Table 1.

Lower pelvic health	Pre-op (Mean ± SD)	Post-op (Mean ± SD)	p-value
ODS score	7.4/5.8	4.2/4.9	0.0004
Vaizey score	8.8/7.2	8.8/7.2	1.0000
ICIQ SF score	4.4/5.7	5.0/6.1	0.0625
Urinary retention	0.1/0.6	0.1/0.2	1.0000

Table 1: Functional scores before and after Altemeier's procedure

SURGERY

Except in emergencies, the patients were investigated with CT and sigmoidoscopy after taking a detailed history. Sphincter tone was assessed by performing a rectal examination. Rectal Prolapse was assessed by simulating defecation at the toilet.

As part of the protocol, complete bowel preparation was done for all the patients and the appropriate prophylactic antibiotics, Cefazolin and Metronidazole were given. The risks for thromboembolism are assessed and thromboembolic prophylaxis (low-molecular-weight heparin) is given to the patients.

Surgery was done under Spinal anesthesia for 16 patients (80%), and the rest 4 patients (20%) had general anesthesia as per the assessment of the anesthesiologist.

The duration of the surgical procedure ranged from 50 to 125 minutes, with a median time of 69 minutes. All patients had a limited proctosigmoidectomy and

coloanal anastomosis using hand sewing. A levatorplasty was also performed in 15 (75%). The total length of bowel resected in surgery varies from 12 to 70 centimetres with a median of 20 cm.

SURGICAL PROCEDURE

The patients are in lithotomy position and catheterized. With an encircling incision 1.5 to 2 cm proximally to the dentate line, up to the serosa of the outer rectum, a space is created. Then the rectum and sigmoid colon were gradually pulled down, ligating and dividing the mesorectum and mesocolon sequentially, till no redundant colon could be pulled out. The peritoneum was opened anteriorly, and after making sure no more colon was redundant, the sigmoid colon was resected with a proctosigmoidectomy. The coloanal anastomosis is done close to the dentate line with 1-0 vicryl in interrupted sutures.



Fig 2: Pre and Post-operative picture

The length of the resected recto-sigmoid colon is measured and its impact on the postoperative outcome is analyzed. If the pelvic floor is found to be weak, an anterior levatorplasty is done. It is preferable to keep a 10 degree head down position for 2 days after surgery. The following day, clear fluids were administered orally in addition to IVF supplementation. No patient received rescue analgesia apart from the scheduled drugs.

Patients have observed their defecation in the postoperative period; the first defecation occurred at 24–48 h in 12 (60%) patients, at 72 h in 5 (25%), and on the fourth–sixth postoperative day in 3 (10%) patients. The mean length of hospital stay was 7 days^[4-9].

Post-operative complications at 30 days occurred in 7 patients (35%); these were classified as Clavien-Dindo grade 1 in 5 patients (70%), grade 2 in 1 patient (15%), grade 3 in zero patients, and grade 4 in only one patient (15%). As per the Clavien-Dindo scale, the patients with grades 1 and 2 were considered to

have minimal anastomotic leakage and all of these patients were successfully treated with conservative methods. Post-operative anemia was noted in 2 patients and blood transfusion was given to one of them. In the postoperative period, four patients had a fever, one patient presented with urinary retention and all were treated conservatively. Grade 4 occurred in a 34-year-old patient with a history of tuberculosis and a mentally disabled patient. There was no postoperative mortality at 30 days.

FOLLOW-UP

The patients were followed up for 6 months to 12 months, no mortality was reported.

There was no difference in the Vaizey, ICIQ SF, or urinary retention scores, with an improvement in the ODS score postoperatively in 12 of the 20 patients. Three patients experienced a worsening, and in five there was no change. The overall mean decrease of 3.2 is noted in the ODS score. There was a statistically significant decrease postoperatively in the mean of the differences of 2.5 ($p < 0.001$) faecal

incontinence improved in 10 patients, worsened in 5 and was unchanged in 5. There was no statistically significant difference in the Vaizey score before and after surgery ($p = 1.000$).

The ICIQ SF score showed that urinary incontinence improved in one patient, worsened in three and in 16 there was no change with a median pre-operative ICIQ SF score of 0 and no difference postoperatively ($p = 0.062$). One patient showed an improvement in urinary retention, but in all other patients, the score was unchanged ($p = 1.000$).

There were statistically significant differences in the ODS score changes between the 15 patients who

underwent a levatorplasty and the 5 who did not, with a median of differences of 0 in the group without plasty and of - 2 in the group with plasty ($p = 0.0156$), while there were no differences in Vaizey score changes ($p = 0.4524$).

There were no statistically significant differences between patients with and without recurrence regarding age ($p = 0.188$), BMI ($p = 0.864$), ASA score ($p = 0.433$), recurrent prolapse ($p = 0.398$), previous hysterectomy ($p = 0.705$), length of resected bowel ($p = 0.126$) and levatorplasty ($p = 0.304$) (Table 2)

	No Recurrence	Recurrence	p-value
Age Years (median,C1)	77.5 (72 to 85)	74.5(68 to 81)	0.188
BMI Kg/m2(median, CI)	20.6 (19.9 to 22,0)	21.2(18.2 to 25.4)	0.864
ASA score (median)	2	2	0.433
Recurrent prolapse (No/Yes)	9/6	3/2	0.398
BMI Kg/m2(median, CI)	20.6 (19.9 to 22,0)	21.2(18.2 to 25.4)	0.864

Table 2: Possible factors related to recurrence

Patient satisfaction showed a mean of 8.8 and 6.4, respectively, in patients without and with recurrences ($p = 0.012$). Only two patients who presented with rectal prolapse recurrence underwent a reoperation, one underwent Altemeier’s procedure and the other underwent Goldberg’s procedure.

DISCUSSION

In this study, we focused on the morbidity, mortality, continence function and recurrence of the prolapse in our patients with complete rectal prolapse who underwent Altemeier’s operation.

Fleming et al. evaluated the perioperative outcome of patients with complete rectal prolapse from the American College of Surgeons' National Surgical Quality Improvement Program (NSQIP) to determine the safety of different surgical approaches (9). In this study by the American College of Surgeons, organ space infection, cardiac derangements, thromboembolic episodes, ventilator dependence, severe pneumonia, revision of the procedure, renal failure and sepsis were considered major complications. The minor complications were a surgical site infection and a urinary tract infection.

They reported the 30-day major and minor complication rate was lower than any abdominal procedure. Compared with only the rectopexy procedure, the resection-rectopexy doubled the rate of complications (8). These findings support the results obtained in the present study, which included a rate of major complications of 5% (one patient), which were not related to the ASA score, BMI, or age, and no 30-day mortality.

The trauma of a laparotomy is avoided, as in Altemeier's procedure and spinal anesthesia is used, resulting in rapid recovery of alimentary function and mobility. This procedure has the advantage of minimal surgical stress, resulting in low postoperative morbidity and mortality. In the literature, morbidity ranges from 3 to 35% and mortality is very rarely reported (Table 3) (10, 11, 12, 13, 14, 15, 16, 17, 18). Abdominal repair in young females has a potential risk of infertility and impotence in males. It also enhances the risk of anastomotic leakage if a resection rectopexy is performed, even though resection is nowadays seldom performed (18) and leads to pelvic adhesion and wound complications.

Study	Number of patients	Morbidity	Mortality	Faecal continence
Kimmins (2001) [10]	63	10%	0	ND
Cirocco (2010) [11]	103	14%	0	Improved
Lee (2010) [12]	143	13.8%	0	ND
Ris (2011) [13]	60	35%	1.6%	62%
Ding (2012) [14]	113	16.8%	ND	ND
Senapati (2013) [15]	102	5%	2%	Improved
Towliat (2013) [16]	26	ND	ND	ND
Kim (2014) [17]	63	3%	1.6%	ND
Elagili(2015) [18]	22	22%	0	Worsened

Mario Trompetto (2019)	43	2.3%	0	No change
Our series Dr.Jayalal et al., 2023	20	4%	0	70%

Table 3: Morbidity and mortality and faecal continence

It is mandatory to do a protocol-based preoperative assessment of the feasibility of the patient's fit for surgery to anticipate and avoid possible postoperative complications⁽¹⁹⁾. Proper recording of fecal incontinence, constipation, dysuria or urinary retention and urinary incontinence should be done to compare the pre- and post-operative outcomes⁽⁶⁾.

The aim of surgical repair is to restore continence and reduce the prolapse to normal anatomical stature with minimal morbidity and mortality^(1, 20). The restoration of the anatomical integrity of the bowel will lead to the relief of alterations in bowel function and restore normalcy⁽²¹⁾.

The literature review shows the data of previous studies on the outcome of Altemeier's operation for rectal prolapse, and their varied data are tabulated in **Table 3.**^(10,11,12,13,14,15,16,17,18). Many comparisons of the perineal and abdominal approaches have stated either the de novo appearance of obstructed defecation or worsening of the symptoms in the case of abdominal surgeries⁽¹⁸⁾. In the perineal approach, as the rectal capacity is reduced and rectal wall compliance increases, the frequency of defecation, urgency and fecal incontinence increases in up to 40% of patients⁽²⁰⁾ and 10% of the patients have constipation⁽²¹⁾.

In our study, after the surgery, a statistically significant reduction in the ODS score was reported by the majority of the patients but there was no change in other bowel and urinary functions.

It is evident from our study that levatorplasty resulted in an improvement in the ODS score while having no discernible effect on the Vaizey score. The most significant impact on the satisfaction reported by the patients is mainly due to the non-recurrence of the disease.

It is also observed that the prolapse itself is not the culprit for the perceived bowel and urinary dysfunction in patients with prolapse. As female patients have additional factors like obstetric trauma, an anatomically wider pelvis with a weaker pelvic floor, age and gender factors may also play a major role in determining bowel and urinary function.

The major disadvantage of the Altemeier's procedure, in relation to the abdominal procedure, was the higher rate of recurrence, which is reported by Elagili F et al⁽¹⁸⁾ to have up to 58% recurrence, but in our study, we had only around 30% cases. However, the number of recurrences is stated to be higher in studies with a longer duration of patient follow-up and the high recurrence rate is due to multifactorial causes.

It is also interesting to note that in our study, the recurrence had no linkage to the age and gender of the patients, body mass index, risk of anesthesia, previous surgery for the prolapse, associated history of previous hysterectomy, the total length of the resected bowel or the addition of a levatorplasty to the repair. However, Ding et al⁽¹⁴⁾, reported a statistically significant association between a second-time Altemeier procedure and higher recurrence. Kim et al⁽¹⁷⁾ have reported that the removal of a shorter specimen was followed by a higher relapse. Ris et al⁽¹³⁾ have reported that, as in our study, there is no association between the length of the resected bowel and recurrence. The literature data on recurrences after Altemeier's procedure are tabulated in Table 4.^(10,11,12,13,14,15,16,17,18,22,23,24,25,26)

Though Altemeier's procedure results in relatively higher recurrence than the abdominal procedures, the minimally invasive character, the lack of need for a laparotomy and the ease of repeating the same procedure are the positive points. It is also noted that the time taken for recurrence is longer. Moreover, as this procedure gives much relief to the obstructive defecation score, it will also provide symptomatic relief to the patients.

The PROSPER randomized study is the largest study on rectal prolapse and the study compared the abdominal and perineal procedures for recurrence rate, incontinence, bowel function, and quality of life (QoL). Patients reported improvement in symptom-specific and overall QoL, which were similar in recurrence (28% vs. 19%; $p=0.2$) and with no significant difference in overall bowel function and QoL⁽¹⁵⁾. The recent Cochrane review has also shown that there is no superiority of transabdominal over perineal procedures.

It is interesting to note that many authors like Young et al., Foucheron and others have reported that laparoscopic ventral rectopexy has comparable morbidity, a lesser incidence of mortality, much improved short-term outcomes and a significantly shorter hospital stay.

The functional outcomes, such as constipation, continence and outlet obstruction are comparable to open abdominal or perineal procedures. With these findings, it is true that there is an increased preference for laparoscopic procedures.

Study	Number of patients	Time to recurrence (years)	Recurrences (%)
Altemeier (1972) ^[22]	106	ND	2.8%
Friedman (1983) ^[23]	27	ND	50%
Gopal (1984) ^[24]	18	ND	5.5%

Williams (1992) ^[25]	114	1	10%
Kimmins (2001) ^[10]	63	2	6.4%
Cirocco (2010) ^[11]	103	ND	0
Lee (2010) ^[12]	143	1	11.4%
Ris (2011) ^[13]	60	4	14% actuarial
Ding (2012) ^[14]	113	ND	18%
Towliat (2013) ^[16]	26	ND	26.9%
Senapati (2013) ^[15]	102	5	41% actuarial
Kim (2014) ^[17]	63	2	13%
Elagili (2015) ^[18]	22	1	9%
Our series, Jayalalatal	20	2	20 % actuarial

Table 4 Recurrences after Altemeier's procedure in literature

LIMITATIONS OF OUR STUDY

- The total number of patients included in this study is less.
- The follow-up period was a maximum of 18 months.
- The patient satisfaction and urinary retention scores used in this study are not validated.

CONCLUSION

Altemeier's procedure is a relatively low-risk treatment for complete rectal prolapse and has the ease of doing the surgery under regional anesthesia with immediate relief for the patient from the prolapse and ensuring early recovery. It is a boon to frail patients with concomitant other diseases. Though the perineal procedures have resultant recurrence as a complication, the ease of doing them, the minimal invasiveness of the procedure, the feasibility of repeating the procedure and the relatively long time taken for the recurrence all make Altemeier's procedure a safer option for the patient with complete rectal prolapse.

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