Transanal rectopexy for external rectal prolapse

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Purpose: The surgical management of patients with full-thickness rectal prolapse (FTRP) continues to remain a challenge in the laparoscopic era. This study retrospectively assesses a cohort of patients undergoing a transanal suture sacro recto-pexy supported by sclerosant injection into the presacral space under ultrasound guidance.
Methods: Patients with FTRP underwent a sutured transrectal presacral fixation of 2/3 of the circumference of the rectum from the third sacral vertebra to the sacrococcygeal junction through a side-viewing operating proctoscope. The procedure was supplemented by ultrasound-guided injection into the retrorectal space of a 2 mL solution of sodium tetradecyl sulfate/polidocanol mixed with air. Patients were functionally assessed before and 6 months after surgery with the Agachan constipation score and the Pescatori incontinence score.
Results: There were 36 adult patients (26 males; the range of age, 23–92 years). The mean operative time was 27 minutes (range, 23–50 minutes) with no recorded perioperative morbidity. The median follow-up was 66 months (range, 48–84 months) with 1 (2.8%) recurrence presenting 18 months after surgery. There were 19 patients (52.8%) who presented with incontinence before surgery with 17 out of 19 (89.5%) reporting improvement in their Pescatori score (P < 0.001). No patient had worsening incontinence and there were no *de novo* incontinence cases. Constipation scores improved in 23 out of 36 patients (63.9%) with a mean score reduction difference of 7.91 (P = 0.001).
Conclusion: Transanal sutured sacral rectopexy with supplemental presacral sclerosant injection is safe and effective in the management of FTRP with sustained improvement in bowel function.

Keywords: Full-thickness rectal prolapse; Sutured transanal sacral rectopexy; Presacral hemorrhage

INTRODUCTION

Full-thickness rectal prolapse (FTRP) has been shown to be initiated by a process of recto-rectal intussusception [1] and is accompanied by a collection of intraoperative findings which include a lack of adherence of the rectum to the sacrum, diastasis of the levator musculature, a deep pouch of Douglas and an elongated mesorectum. In those who present with anal incontinence supervening on FTRP, there is a multifactorial etiology which includes distraction and damage to the anal sphincters, alteration of recto-anal inhibition, the mass effect of the prolapse with attendant prolapse waves, disturbances in propulsive rectoanal coordination, and associated pudendal neuropathy from excessive straining [2]. In some cases where there is familial clustering of varicose veins, joint hypermobility and FTRP, a primary collagen disorder has been suggested [3].

The fact that there are more than 145 different procedures which have been described for the surgical management of FTRP is an indication of the level of controversy and the lack of consensus on the best approach [4]. Regardless of technique, the view advanced by Ripstein and Lanter [5] that FTRP primarily results from rectal intussusception with a loss of rectal attachment suggests a benefit in some form of sacral fixation or rectopexy [6]. This consideration was historically part of the original Orr-Loygue procedure which involved an initial complete circumferential mobilization of the rectum down to the levator floor with subsequent anterior and posterior rectal fixation [7]. Even with this approach, there is still debate that revolves around whether

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the procedure is best performed open or laparoscopically [4, 8] is completed with sutures or mesh [9-11] and benefits from selective rectal resection [12, 13].

Perineal procedures are often reserved for those patients presenting with FTRP who are elderly or who have significant comorbidities [14]. Alternative approaches have included the Delorme mucosectomy, Altemeier's perineal rectosigmoidectomy, and more recently, stapled prolapse resection [15-17]. We report the outcomes of a cohort of patients presenting with FTRP who were managed with a transanal sacral rectopexy supplemented by ultrasonographically-guided sclerosant (sodium tetradecyl sulfate plus polidocanol) injected into the retrorectal space.

METHODS

This study was approved by the Ethics Committee of Jeevan Jyot Hospital in Thane, India (research registry No. 870). Patients were identified from a dedicated database including all cases presenting with FTRP who were managed by transanal suture rectopexy. The period of the study was between December 2009 and December 2015 of surgeries conducted at the colorectal unit of a dedicated tertiary referral coloproctology center (Jeevan Jyot Hospital) in Thane, Maharashtra India. Those patients where there was rectal wall edema, those with an irreducible prolapse, solitary rectal ulcer or FTRP-associated inflammatory bowel disease, anorectal malignancy, and anal stenosis were excluded from analysis (8 cases with severe rectal wall edema and ulceration and 3 patients with prior intraabdominal tuberculosis). Patients underwent a detailed clinical history and examination with confirmation of FTRP with some patients able to record evidence of prolapse on their mobile phones and all cases confirmed on defecating video-proctography. All patients were assessed preoperatively with the Agachan constipation score [18] and the Pescatori incontinence score [19].

Assessments for comparison were made at 6 postoperative months. Initial permission was obtained for the performance of a combined transanal suture rectopexy with retrorectal sclerosant instillation for 6 patients of American Society of Anesthesiologists (ASA) physical status (PS) classification IV who were operated upon in 2009 for preliminary experience. Following the preliminary experience, there was an extension of the study with these initial patients included in this analysis. The operation was devised in accordance with the Helsinki guidelines for research on human subjects and all patients provided informed consent for the procedure after explanation.

Surgical technique

Patients remained on clear fluids the day before the procedure with 3 preoperative doses of the osmotic cathartic lactitol at 4-hour intervals. Metronidazole, ceftriaxone, and sulbactam were administered intravenously on induction. Patients were operated under regional anesthesia and positioned in steep Trendelenburg. The rectal prolapse was confirmed with the apex marked with a suture (Fig. 1). After prolapse reduction and irrigation of the rectum with normal saline, a side-view, wide operating proctoscope (20 cm in length and 4 cm in diameter with a 2.8-cm wide side window) was introduced (Fig. 2). In most cases because of anal laxity, there was no need for gentle anal dilatation to introduce the operating proctoscope. The prolapsed rectum was repositioned so that the operation could be performed through the side window of the instrument. The tip of the proctoscope was pushed backward to abut against the sacrum with a PDS No. 1 suture (40-mm round body needle; Merial, Vapi, India) inserted through the upper right-hand edge of the window across the rectum. The first needle was placed as high as possible against the sacrum at a minimum lateral distance of 3 cm from the midline, deemed the upper margin of a triangle of vascular safety just below the sacroiliac joint as described by Baqué et al. [20].

Once this needle was correctly inserted it was brought to an identical position on the other side of the sacrum by passing in direct contact with the bone in order to avoid a presacral venous injury. The needle was then turned back and grasped through the left edge of the rectal wall so that 2/3 of the circumference of the
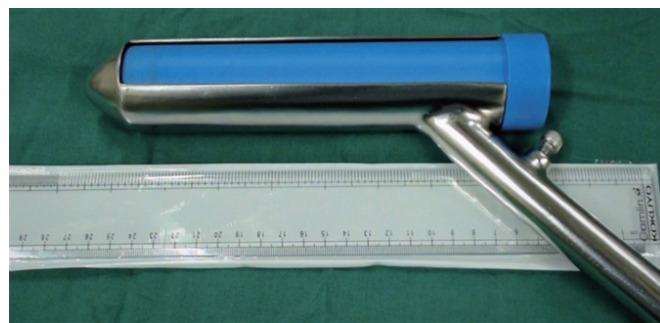

Fig. 1. Marking stitch at the apex of rectal prolapse.

Fig. 2. Self-illuminating proctoscope.

rectal wall was incorporated into the presacral fascia. The position and security of the stitch were confirmed by pulling the suture downwards and ensuring that the rectum remained fixated at that point (Fig. 3). Rectal fixation was performed from approximately the 3rd sacral vertebra to the sacrococcygeal joint with typically 4 to 5 sutures being required (Figs. 4, 5). Each suture was tied using a laparoscopy knot pusher (Om Medical, Mumbai, India). The lax part of the posterior rectal wall was elevated with Babcock forceps and a 20 cm long 20-gage needle was inserted through the rectal wall into the presacral space with the position of the needle confirmed with transrectal ultrasound (BK Medical, Herlev, Denmark). A 2-mL solution of sodium tetradecyl sulfate/polidocanol (30 mg/mL) is mixed with 8 mL of air and shaken into a foam for injection under endosonographic guidance (Figs. 6, 7).

Patients were continued on antibiotics for 5 postoperative days and provided oral analgesia as required. All patients were kept in bed in a slight Trendelenburg position with a postoperative urinary catheter for 4 days and managed with low dose heparin and antiembolic stockings. Typically, patients were managed with liquids only until the 5th postoperative day with conversion to a normal diet and the use of lactulose as required. On discharge, pa-

Fig. 4. Transanal serial sutures to fix rectum to the presacral fascia.
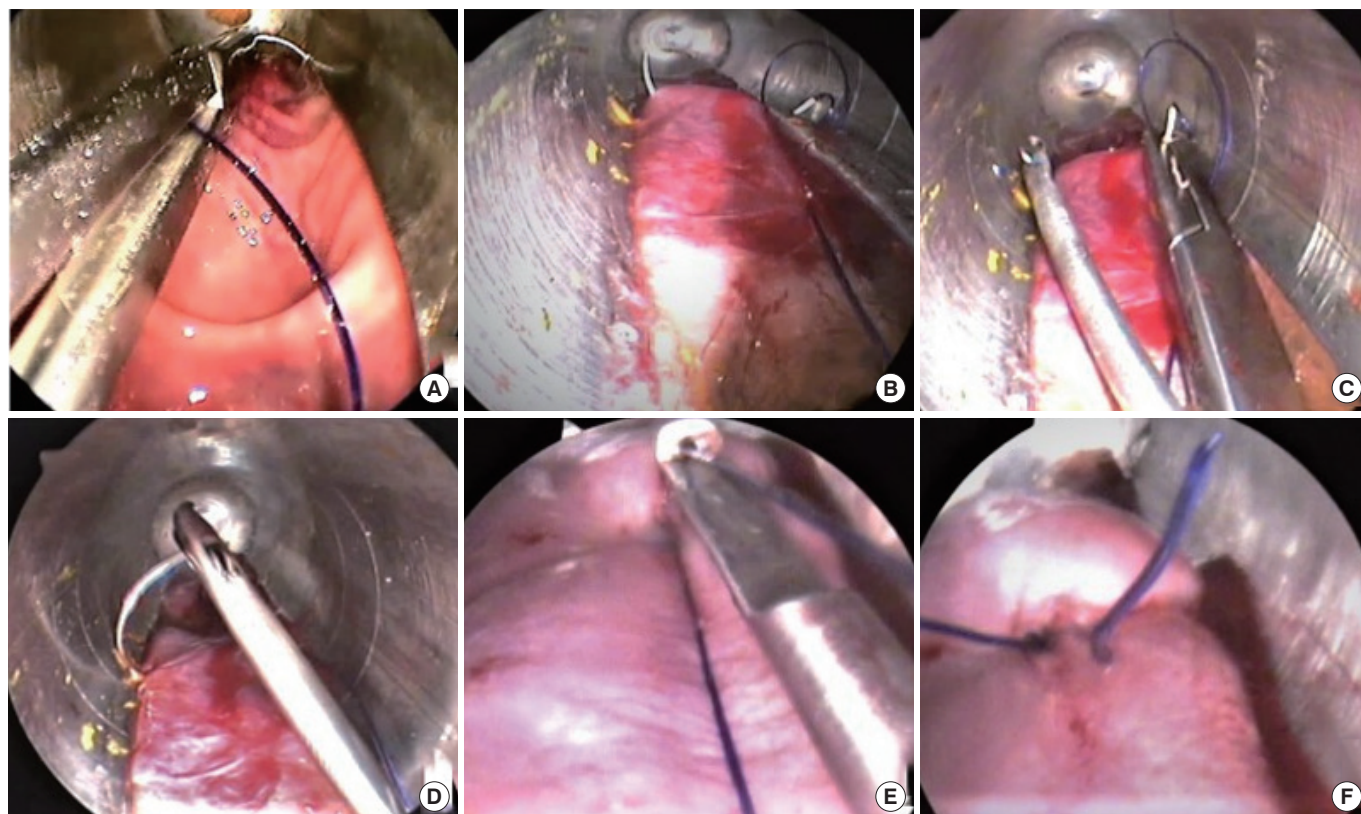

Fig. 3. Technique of transanal suturing. (A) A needle is passed in the rectal wall from the right margin of the window in the proctoscope. (B) A needle pushed by rotation movement to the left margin of the window of the proctoscope. (C) Tip of the needle at left margin stabilized by laparoscopy needle holder. (D) A needle pulled with rotational movement by laparoscopy needle holder. (E) Knot tighten with laparoscopy knot pusher. (F) Knot tied.
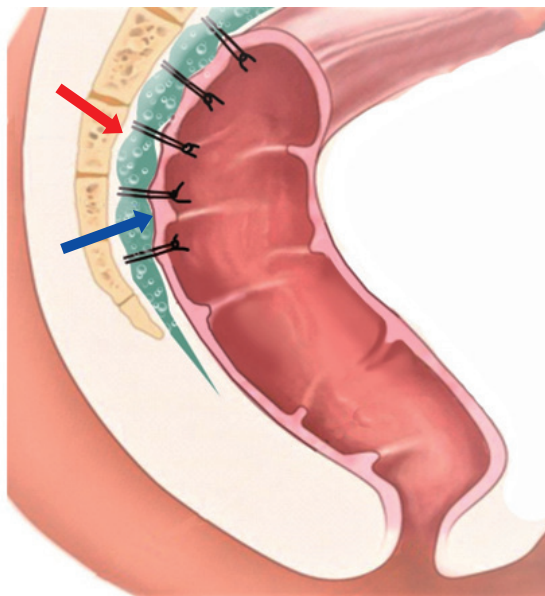
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Fig. 5. Pictorial presentation of procedure lateral view. Red arrow, retrorectal space with sclerosant foam; blue arrow, stitches through rectum and presacral fascia.

tients were advised against excessive straining at stool and encouraged to drink plenty of fluids, to eat a diet with a high leafy green vegetable content and where possible to practice Yoga and mindfulness strategies. After hospital discharge, patients were assessed weekly for the first month, then monthly for a further 4 postoperative months, and 6 monthly thereafter. For the purposes of final analysis, all patients were communicated with by telephone.

Statistical analysis

Analysis was performed using the IBM SPSS Statistics ver. 23.0 (IBM Corp., Armonk, NY, USA). Categorical data were analyzed using the chi-square test or Fisher exact test where appropriate with comparisons between groups made with the Student t-test. The P-values of < 0.05 were considered significant.

RESULTS

A retrospective analysis was performed on 36 adult patients including 26 males (mean age, 42 years; range, 23–88 years) and 10 females (mean age, 62 years; range, 49–92 years) identified through the database. The age deciles for the patient cohort are presented in Table 1 with 8 of 26 males (30.8%) and 8 of 10 females (80.0%) aged > 50 years. Nine patients out of 36 (25.0%) cases had ASA PS classification III or IV. The mean operative time was 27 minutes (range, 23–50 minutes). There were no cases of intra- or postoperative hemorrhage (confirmed by transrectal sonography) and there was no recorded perioperative morbidity in the patient cohort. The median follow-up was 66 months (range, 48–84 months) with no patient lost to follow up and with

Fig. 6. Deployment of a needle in the retrorectal space under transrectal sonography.
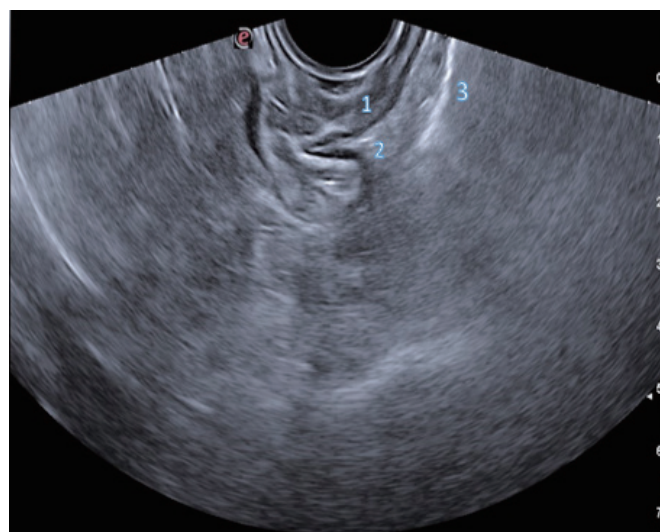

Fig. 7. Transrectal sonography. 1, Rectal lumen; 2, rectal wall; 3, retrorectal foam sclerosant.

1 full-thickness prolapse recurrence (2.8%) presenting 18 months after surgery. The recurrence was treated with transanal suture sacral rectopexy. Fig. 8 shows the pre- and postoperative Pescatori incontinence scores for the 19 patients (52.8%) where incontinence was present before surgery. Following surgery, there were no patients who developed worsening incontinence and there were no *de novo* incontinence cases. This represented a significant improvement in continence overall ($P < 0.001$) with 17 of 19 (89.5%) reporting lower Pescatori scores after surgery. There were 2 patients with preoperative incontinence for solid stool where the Pescatori score was unchanged by surgery (preoperative Pescatori
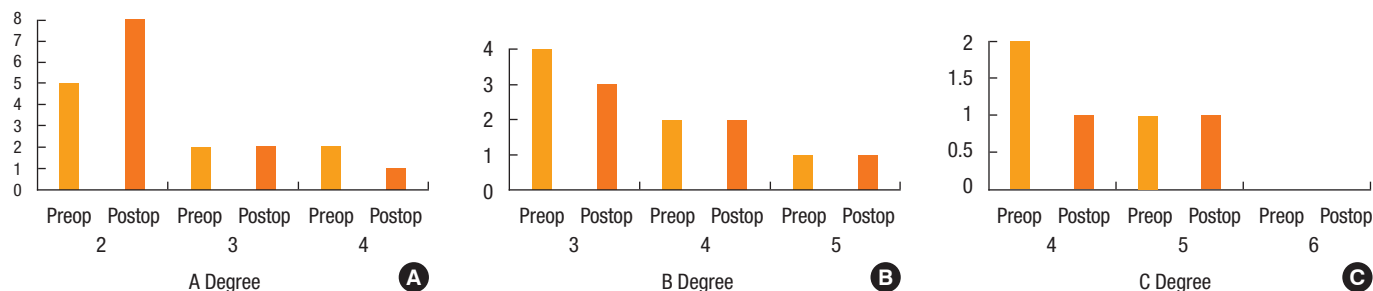
Fig. 8. Changes in Pescatori incontinence scores for the different degrees (preoperative [Preop] vs. postoperative [Postop]). (A) Degree A, (B) degree B, (C) degree C.

Table 1. Age and sex ratio and ASA PS classification of the cohort undergoing prolapse surgery (n = 36)

Patient	Age group decile (yr)						
	21–30	31–40	41–50	51–60	61–70	71–80	81–92
Male (n = 26)	1 (3.8)	8 (30.8)	9 (34.6)	6 (23.1)	1 (3.8)	1 (3.8)	0 (0)
ASA PS grade III/IV	0 (0)	0 (0)	0 (0)	2	1	1	
Female (n = 10)	0 (0)	0 (0)	2 (20.0)	3 (30.0)	2 (20.0)	2 (20.0)	1 (10.0)
ASA PS grade III/IV	NA	NA	NA	1	1	2	1

Values are presented as number (%) or number only.
ASA, American Society of Anesthesiologists; PS, physical status; NA, not applicable.

Table 2. Pre- and postoperative constipation scoring (Agachan score)

Constipation score	Preoperative case (n = 36)	Postoperative case (n = 36)
Total	15.77 ± 9.43	7.86 ± 4.81[a]
Range		
0–6	13 (36.1)	24 (66.7)
7–12	4 (11.1)	8 (22.2)
13–18	3 (8.3)	3 (8.3)
19–24	4 (11.1)	0 (0)
25–30	12 (33.3)	1 (2.8)

Values are presented as mean ± standard deviation or number (%).
Agachan score: Bowel movement, frequency (0–4); difficulty, painful evacuation effort-frequency (0–4); completeness, feeling of incomplete evacuation-frequency (0–4); abdominal pain, never vs. frequency (0–4); time, minutes in lavatory per attempt (0–4; 0 to >30 minutes); assistance, type (0–2; 0 = no assistance, 1 = stimulative laxatives, 2 = digital assistance or enema); failure, unsuccessful evacuation attempts per 24 hours (0–4; 0 = never, 4 = >9 times); history, duration of constipation in years (0–4; 1 = 0, 5 = ≥ 20 years); total score, 0–30.
[a]P = 0.001.

Fig. 9. Agachan constipation score (preoperative vs. postoperative).

scores 5 or 6). There was an improvement in constipation scoring after surgery in 23 of 36 cases (63.9%). Table 2 shows the pre- and postoperative constipation scoring ranges for the operated cohort which is also graphically represented in Fig. 9. The graph shows significant improvement in most cases and in those patients where there was no effect, constipation did not worsen. There was an overall significant shift of more severe constipation cases toward the lower ranges of the scale with a mean difference of 7.91 (P = 0.001) There was no patient who complained of *de novo* uri-
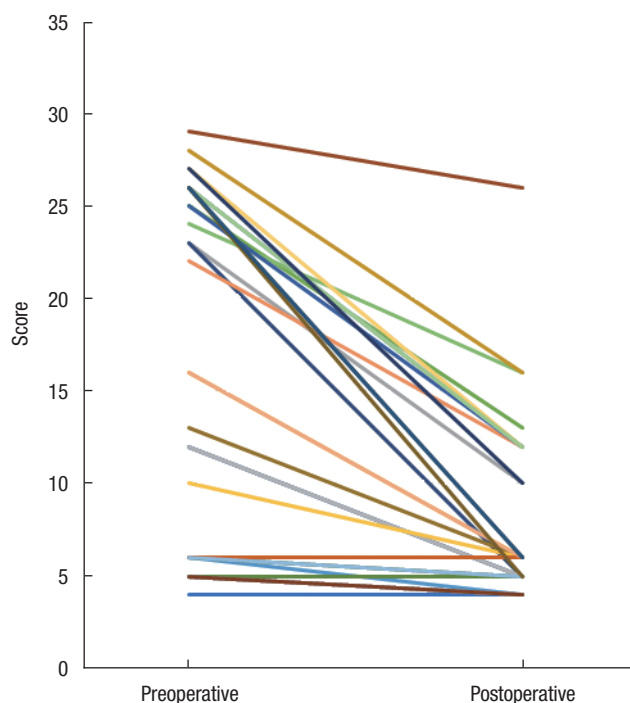
nary dysfunction and none of the younger males who were sexually active complained of any changes in their sexual functioning.

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DISCUSSION

A small series is presented of patients with FTRP who underwent transanal rectosacropexy at a single institution performed by a single surgeon over a 6-year period with a medium-term follow-up. There was no significant morbidity, no patient with deterioration in continence or *de novo* incontinence, and in those constipated cases there was a 63.9% improvement by an average of 7.91 points on a Cleveland Clinic questionnaire. Recurrence occurred in 1 case (2.8%) at 18 postoperative months.

There are many procedures which have been described as successfully managing FTRP with a recent emphasis on laparoscopic ventral rectopexy [4, 21, 22]. Older reports comparing abdominal and perineal procedures have generally shown a higher overall recurrence rate with perineal surgery but with less morbidity and mortality particularly in elderly cases with coincident comorbidities and more advanced ASA PS classification [23-25]. These studies are difficult to interpret because of their retrospective design and comparisons with historical cohorts where there is often idiosyncratic surgical decision making and patient selection regarding the indications and contraindications for some of the more advanced procedures. In general, once recurrence has occurred there is no clear evidence which favors the ultimate success for one of these approaches over the other [26].

Our experience in some ways may be unique with the Indian diet rich in fiber but where the tradition is for people to use their bowels before a morning bath, often resulting in excessive straining. In this respect, in India FTRP is in many regions' commoner in young males than in older females who normally form the bulk of patients in Western reports [27]. The mean age of our patients was lower than that reported by other groups concentrating on perineal approaches [6, 14, 15, 28]. One-quarter of our patients had a high (III/IV) ASA PS classification although there was a very low perioperative morbidity and a low recurrence rate [29]. By comparison, recurrence rates for the Delorme procedure have been published at between 6.8% and 22%. In a recent study by Plaskett et al. [30], there was no apparent effect of surgical volume on recurrence with the median time to recurrence of 2 years. Equally, there is a wide range of reported recurrence following an Altemeier procedure at between 0% and 16% [31]. Recent data from Ram et al. [32] assessing the longer-term outcomes of elderly patients undergoing perineal stapled prolapsectomy showed that although the operative times were short with relatively extensive lengths of rectal resection, there was still a 20% recurrence rate. In their study, most recurrences occurred within the first postoperative year but this did not preclude a successful repeat stapled excision.

Our procedure did not compromise continence. Our data show a consistent improvement in bowel function in those patients presenting with incontinence before surgery, a finding that compares favorably with a recent systematic comparison by Tsunoda [4] of perineal and laparoscopic procedures. This study showed a 63% improvement in incontinence with the 2 most commonly performed perineal operations (the Delorme and the Altemeier procedures). We were also able to demonstrate a significant improvement in constipation after surgery. Before surgery 44.4% of patients presented with an Agachan score of ≥19 with a reduction in those with this score after surgery to only 2.8% of the cases. It is likely that any procedure which successfully reduces the prolapse will ameliorate incontinence symptoms by eliminating a mass effect within the rectum, abrogating massive prolapse pressure waves, reducing sphincteric fatigue, diminishing mucus discharge, and restoring the coordination of rectoanal propulsion during defecation attempts [33]. *De novo* onset of constipation is more a feature of abdominal surgery, particularly when a more extensive distal rectal dissection is performed where there is the potential for rectal denervation [34].

Our technique shows some similarity with that described by Fernandes and Rossi [35] who reported 12 cases of transanal rectopexy where the presacral sutures were placed under vision after dissecting through the posterior wall of the rectum. In this small group incontinence improved although reported constipation did not. One patient had a postoperative rectal wall hematoma where the downside of this approach is the need for formal rectal wall closure.

Although there was no case of presacral hemorrhage with our technique, it is appreciated that this is real potential risk. The presacral sutures were placed as laterally as possible taking into account that the venous connections between the lateral and median sacral veins are usually constructed as a stair-like ladder of anastomotic channels [20]. This permits the use of the corners of a square which is 3 cm lateral to the sacral meridian as a safe suture zone with the anterior surface of the sacrum just below the first sacral vertebra also deemed a nonvascular safe zone [36].

There are several limitations of this study. It is a retrospective series of a small number of patients with only a medium-term clinical follow-up and with no assessment of specific health-related quality of life measures. It is further accepted that the technique has the potential for serious presacral hemorrhage if the landmarks of vascular safety are not strictly adhered to, although this problem did not occur in our series. Further advantages of our technique include its short operative time, rapid learning curve, and low cost. In summary, transanal rectopexy with presacral sclerosant injection can be safely performed in frail patients with FTRP. The procedure is preferred to the abdominal approach due to abdominal procedure requires more fitness than the transanal suture rectopexy. Dissection in the pelvic cavity may cause injuries to pelvic nerves result in neo constipation, urinary and sexual dysfunction. Technically more demanding all core factors required for abdominal suture rectopexy are addressed dissection in the pelvic cavity to create raw surface and fibrosis later on in transanal suture sacral rectopexy the sclerosant foam is injected into the retrorectal space which creates instant fibrosis reduction of prolapse is done and rectum is sutured to the presacral fascia.

Similarly, suturing is done through the rectum in the new procedure. The sclerosants are used in children for the treatment of rectal prolapse [37]. There is a low recurrence rate over a medium- to long-term follow-up which is accompanied by significant functional improvements in reported continence and constipation severity.

CONFLICT OF INTEREST

FUNDING

ACKNOWLEDGMENTS

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