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Efficacy of endoscopic stapled transanal rectal resection for the treatment of rectocele

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Abstract. – OBJECTIVE: The objective of the study was to determine the efficacy of endoscopic stapled transanal rectal resection for the treatment of rectocele.

PATIENTS AND METHODS: For this purpose, the data were collected from 61 patients with severe rectocele that underwent endoscopic stapled transanal rectal resection within the time period from April 2010 to April 2012. The pre- and post-operative Longo's obstructed defecation syndrome (ODS) were compared. The reduction of the rectocele was assessed by defecography on visit and from patients' satisfaction obtained through following up.

RESULTS: We found that the postoperative Longo's ODS was significantly lower than the preoperative value ($p < 0.01$); and defecography showed that the rectocele was significantly reduced or disappeared. Furthermore, 57 of the 61 (93.4%) patients expressed their satisfaction at follow up.

CONCLUSIONS: The endoscopic stapled transanal rectal resection can be recommended as the treatment of choice for rectocele since it is an easy-to-perform procedure that has satisfactory short and mid to long-term therapeutic efficacy.

Key Words:
Rectocele, Endoscopic linear stapler, Transanal rectal resection.

Introduction

The endoscopic stapled transanal rectal resection (STARR) was reported initially by Avav et al[1] as an effective treatment procedure for rectocele. This surgery involves resection of the protruded anterior rectal wall by endoscopic linear stapler in order to eliminate the thin region and remove the rectocele. The anterior rectal wall is enhanced with the fibrosis of the surgical trauma and as a result the symptoms of outlet obstruction/constipation gradually disappear. At present, this surgical intervention is not being widely practiced in China and the efficacy of the procedure largely remains unknown. Herein, we present the data regarding 61 endoscopic stapled transanal rectal resection surgeries performed at our department during the time period from April 2010 to April 2012, including 61 cases before April 2012.

Patients and Methods

Patients

The study was approved by the institutional Ethics Committee. All the patients included in this study were female and they met with the following criteria: (1) Rome III diagnostic criteria of functional constipation; (2) defecography showed rectocele of ≥ 3 cm; (3) colonic transit test showed normal result; (4) conservative therapy used for 1-3 months was found to be ineffective; (5) no psychiatric disorders and/or other serious complications were found; (6) willingness to undergo the corrective surgery and signing of infomed consent forms. The mean age of the patients was 51.2 (range: 27-82) years. The mean disease course was 9.6 (range: 1-20) years. With regard to disease type, there were 31 cases of simple rectocele, 4 cases of concurrent mixed hemorrhoid, 17 cases of concurrent incomplete prolapse of rectal mucosa and perineal decline, 2 cases of concurrent sigmoidocele, 5 cases of concurrent puborectalis hypertrophy, and 2 cases of concurrent anal fissure.

Surgical Procedure

The instrument used in this surgical procedure is called linear stapler (6TB45: Johnson & Johnson, Shanghai Medical Equipment Co. Ltd. China). The preoperative preparation was the same as for general intestinal surgery. The patient recumbent in Jackknife position received continuous epidural anesthesia or general anesthesia. Regular disinfection with sterile

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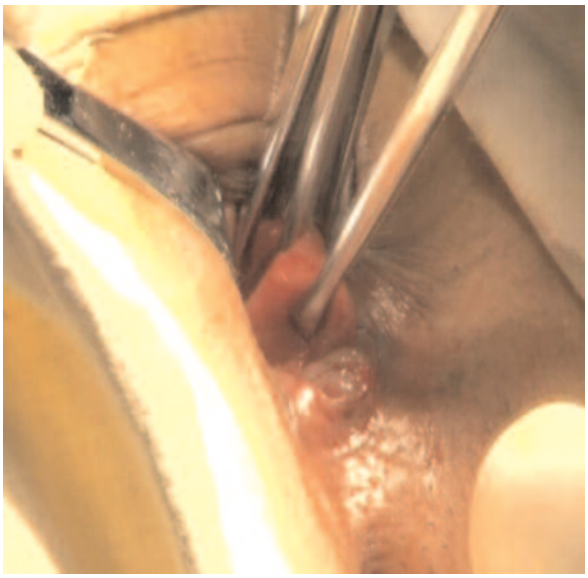

Figure 1. Lifting up of the anterior rectal wall of rectocele is shown.

towels was performed during the operation and the anal canal and inferior rectum were disinfected with 0.5% povidone-iodine tampons. Sufficient anal dilation was performed, followed by palpation to confirm the location of rectocele with fingers. After determining the range of rectocele, the protruded anterior rectal wall was lifted by 2-3 tissue forceps, clamped with endoscopic linear stapler, and removed by 1-2 times. The vaginal palpation was also performed before percussion to prevent any damage to the vaginal wall. The incision was stapled using anastomotic suture by continuous seam reinforcement with 2/0 absorbable suture. Penetration of the vaginal wall was prohibited. Postoperative digital examination was performed to confirm: (1) removal of rectocele; (2) firmness of rectovaginal septum; (3) patency of rectal lumen; and clearance of mucous. Relevant symptomatic treatment was given for any concurrent complications observed. After surgery, the anastomotic stoma was occluded with titanoreine cream and Vaseline gauze stripe. The surgical procedure is illustrated by Figures 1 to 4.

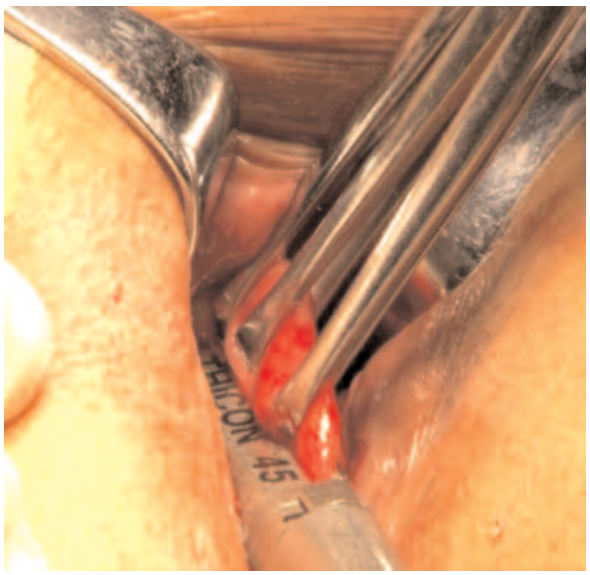

Figure 2. First clamping closure is shown.

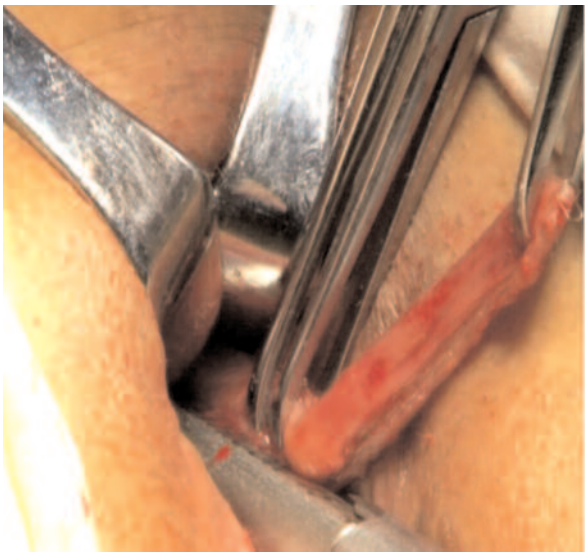

Figure 3. Second clamping closure is shown.

Postoperative Management

The patient began to eat food after anal exhaust the day after surgery and received prophylactic antibiotics, hemostasis and rehydration therapy. The gauze stripe was removed from the anal canal/rectum 1-2 days after surgery. The patient was also given Maren Soft capsules after eating to soften stool. Regular dressing was performed after defecation and 6-month follow up visits were scheduled with the patient after discharge.

Surgical Efficacy, Scoring of Clinical Symptoms, and Follow Up

The surgical indicators included time for surgery, intraoperative blood loss, histological examination of specimen, and postsurgical com-

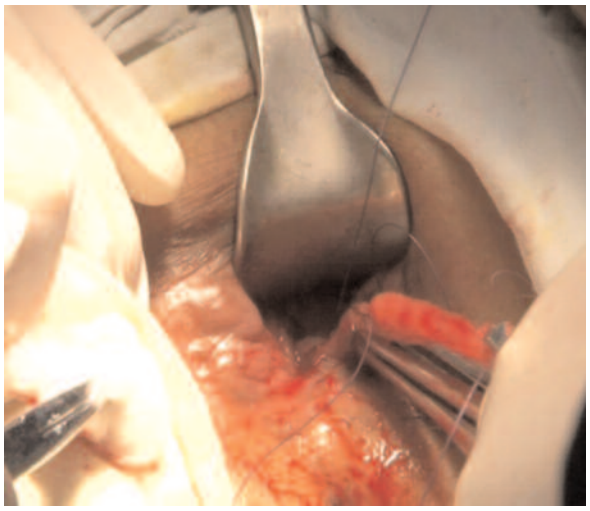

Figure 4. Continuous seam suturing is shown

plications. Perioperative pain was assessed using Visual Analogue Scale (VAS)[2]. The scores of preoperative and postoperative symptoms were according to Longo's obstructed defecation syndrome (ODS) scoring criteria[3]. The anatomical recovery was assessed by defecography performed at the 6-month follow up visit. The patient's satisfaction was assessed through telephonic follow up using VAS method.

Total Efficacy Criteria

Total efficacy criteria used were as recommended by the "Interim criteria for the treatment of constipation" at Shandong Meeting (1999) of the Surgical Branch of Chinese Medical Society: Anorectal Surgery Group.

Statistical Analysis

The data were analyzed using SPSS10.0 statistical software (SPSS Inc., Chicago, IL, USA); comparison of the quantitative integral of preoperative and postoperative symptoms was performed using *t*-test and all p-values < 0.05 were considered statistically significant.

Results

Clinico-Surgical Data

The mean time for surgery was 20 (range: 18-30) min and the mean intraoperative blood loss was 18 (range: 10-30) ml. Mean length of the removed specimen i.e. anterior rectal wall was 6.6 (range: 6.1-7.1) cm (Figure 5A) and the mean width was 3.0 (range: 2.8-3.3) cm (Figure 5B). The histopathological examination showed the involvement of rectal muscle (Figure 6). The mean score of postoperative pain was 4.3. Eleven patients received oral painkillers, 1 tablet at the surgery day; 1 patient received fortanodyn (i.m.) and 100 mg at the surgery day after external hemorrhoidectomy; and 13 patients received retention catheterization due to urinary retention (the catheter was removed the next day and there was no obstructed urination). In two patients, rectal pouch formation at the top of the anastomotic stoma was observed. It was considered to be present due to the downward displacement of whole pelvic floor and the angle formed between the initial portion of anastomotic suture and the longitudinal axis of rectum. Two patients had mild anorectal stenosis and the manual anal dilatation was found to be effective. None of the patient had complications, such as rectovaginal fistula, perianal abscess, postoperative bleeding and incontinence. The patients were discharged after 7 days postoperatively on average.

Pre- and Post-Operative Symptom Scores

The mean postoperative follow-up period was 15.1 (range: 3-26) months. The pre- and post-operative Longo's ODS scores of the 61 patients are presented in Table I. The data show a postoperative decrease in the number of defecations, degree of straining at defecation, and defecation time. Besides, the symptoms of endless defecation and perianal discomfort were relieved. The frequencies of laxatives, enema, and manual auxiliary defecation were also decreased. Overall, the patient's postoperative defecation was re-

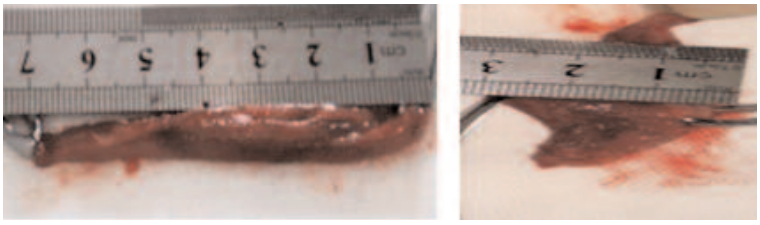

Figure 5. ***(A)*** Length and ***(B)*** width of the removed anterior rectal wall are shown.

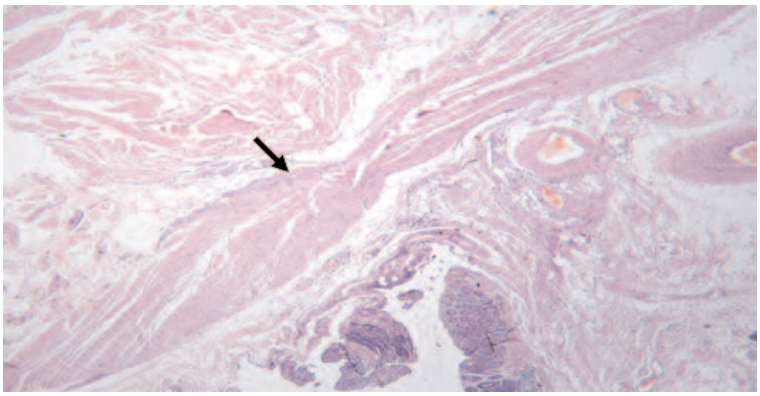

Figure 6. Histopathological examination (H&E staining; Magnification 100X) of the removed anterior rectal wall in a representative specimen reveals the involvement of rectal muscle *(arrow)*.

Table I. Pre- and post-operative Longo's ODS scores of 61 cases

Clinical symptoms	Preoperative	Postoperative	*p*-value
Number of defecations	0.46 ± 0.23	0.00 ± 0.00	<0.01
Degree of defecation straining	1.93 ± 0.10	0.26 ± 0.19	<0.01
Defecating time	1.81 ± 0.19	1.05 ± 0.01	<0.01
Endless defecation	2.97 ± 0.08	0.81 ± 0.27	<0.01
Perianal discomfort	1.90 ± 1.03	0.05 ± 0.01	<0.01
Laxative	4.31 ± 1.11	0.43 ± 0.15	<0.01
Enema	1.05 ± 0.63	0.00 ± 0.00	<0.01
Manual auxiliary defecation	3.30 ± 1.86	0.17 ± 0.02	<0.01
Total scores	18.31 ± 0.91	3.10 ± 0.89	<0.01

markably unobstructed and the differences in the pre- and post-operative Longo's ODS scores were statistically significant. The 33 patients that underwent endoscopic stapled transanal rectal resection during the time period from April 2010 to March 2011 had two follow up visits and Longo's ODS scores of these patients at 8.3 (range: 3-13) and 20.3 (range: 15-26) postoperative

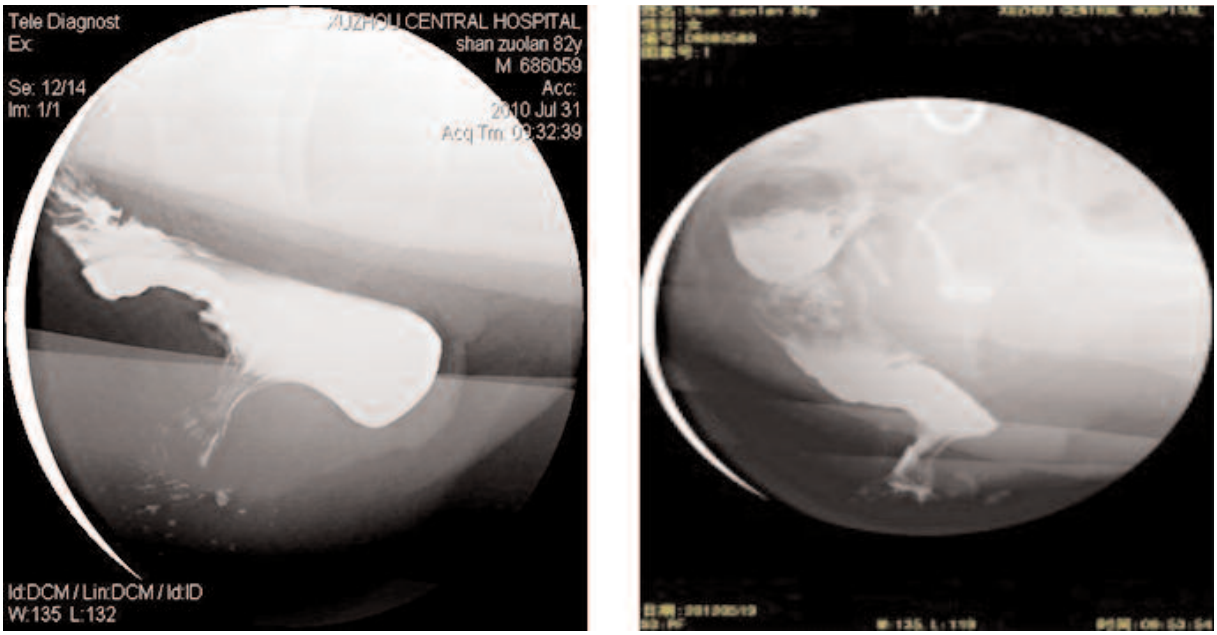

Figure 7. The depth of defecography ***(A)*** (40 mm) before and ***(B)*** (3 mm) 18 months after the surgery is shown.

months are summarized in Table II. The data show that the number of postoperative defecation, degree of defecation straining, defecating time, perianal discomfort, and frequencies of laxative, enema, and manual auxiliary defecation at 20.3 months differed non-significantly from those at 8.3 months postoperatively; however, the symptom of endless defecation was progressively relieved over time.

Re-examination of the defecography after 6 months postoperatively revealed that 44 cases had the depth of rectocele < 5 mm; 13 cases with 12-15 mm; and 4 cases with 8-11 mm. The mean self-score regarding patient's satisfaction of the improved defecation was 8.92.

Total Efficacy

Of the 61 patients, 44 cases (72.1%) were clinically cured; while this surgical intervention was found to be markedly effective in 13 cases (21.3%) and effective in 4 cases (6.6%).

Discussion

Rectocele is a common type of outlet obstructive constipation (OOC)[5] affecting the middle-aged women and multipara[6]. For symptomatic rectocele patients, surgery is considered only as the conservative therapies fail, such as dietary modification and biofeedback. The objective of surgery is to remove the protruded pouch, repair the defect, eliminate the thin region, re-construct the firm anterior rectal wall and restore the normal defecation[7]. In the transanal rectal resection surgery that we performed, compared with conventional rectal mucosa resection, since the deepest removal was throughout the rectal wall, it fortified and fixed the anterior rectal wall and it also decreased the rectal compliance. Previously, Ayav et al[1] showing efficacy of this surgical approach in patients that were followed up for three years reported that the symptoms were improved in 19 (90.5%) patients whereas symptoms were completely resolved in 16 (76.2%) patients. A Chinese study[8] of the 54 patients that were followed up for 14 months reported that symptoms were improved in 45 (83.3%) patients after the surgery. In this study, we followed up 61 patients for 15.1 months and found that symptoms were significantly improved in 57 (93.4%) patients following endoscopic stapled transanal rectal resection, whereas symptoms were completely resolved in 44 (72.1%) patients. Regarding the first 33 patients, Longo's ODS scores of follow up for 8.3 (range: 3-13) months and 20.3 (range: 15-26) months were 3.12 and 3.03, respectively; the difference however was not statistically significant. Overall, the data show reliable middle to long-term efficacy, and the symptom of endless defecation was relieved over time. In performing this corrective surgery for rectocele, we also benefitted from other relevant studies and made the following few modifications: (1) in collaboration with the Center of Colorectal & Anal Surgery at Zhongnan Hospital of Wuhan University, we used anastomotic seam suture in which the distance between needle insertion and needle withdrawal was narrow in the upper part and wide in the lower part. This innovative approach further fortified the anterior rectal wall; and (2) regarding patients with serious prolapse of internal mucosa of the rectum, we performed partial rectectomy 3-4 days after STARR of the posterior rectal wall.

Of note, the following precautions will have to be considered: (1) proper location and strength of forceps holder are important when using ALISS forceps for traction and ensure that the removed rectal wall is semi-circular; (2) the lower pole should be within 1 cm above the dentate line

Table II. Longo's ODS scores at 8.3 months and 20.3 months follow up of 33 cases after surgery

Clinical symptoms	Preoperative	Postoperative	*p*-value
Number of defecations	0.00 ± 0.00	0.00 ± 0.00	>0.05
Degree of defecation straining	0.29 ± 0.20	0.26 ± 0.11	>0.05
Defecating time	1.05 ± 0.01	1.05 ± 0.01	>0.05
Endless defecation	0.82 ± 0.31	0.36 ± 0.18	<0.01
Perianal discomfort	0.06 ± 0.01	0.05 ± 0.01	>0.05
Laxative	0.41 ± 0.16	0.43 ± 0.15	>0.05
Enema	0.00 ± 0.00	0.00 ± 0.00	>0.05
Manual auxiliary defecation	0.18 ± 0.02	0.16 ± 0.02	>0.05
Total scores	3.12 ± 0.93	3.03 ± 0.69	>0.05

while the upper pole should be approximately 2 cm above the upper margin of the anterior rectal wall; (3) sides and head-end of the stapler should be checked before each percussion to ensure the accurate clamping and also perform vaginal palpation to prevent accidental damage to the vaginal wall; (4) suture needle is inserted into the muscular layer when performing anastomotic continuous seam suture but it should not cross the posterior vaginal wall. While enhancing the anterior rectal wall, formation of rectovaginal fistula and rectal accumulation should be avoided, and also ensure the angle between the initial portion of suture and the rectal longitudinal axis is nearly 180 degrees; and (5) the distance between needle insertion and withdrawal should be narrow in the upper part (0.3 cm) and is gradually widened (0.5-1.0 cm) while the distance in the lower portion should be the width of residual rectocele, but no more than 1.5 cm. The most common complication that occurred in our study was Anus Gate Fell Bilges, which was considered due to the irritation by staples. The symptom was relieved by removal of the exposed staple and instructing the patient to exercise the levator ani muscles. No serious complications occurred, such as postoperative anastomotic bleeding or rectovaginal fistula. However, this procedure was found to be relatively expensive due to high cost of the endoscopic linear stapler at present.

Conclusions

Our data show that for the typical rectocele patients, endoscopic stapled transanal rectal resection is a simple, safe, and effective treatment procedure. Nonetheless, further studies involving large-scale, long-term prospective, randomized controlled trials will be required to validate these preliminary findings.

Conflict of Interest

The Authors declare that they have no conflict of interests.

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