Laparoscopic or transanal approach: which is better for the management of obstructed defecation?

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Received: 29 November 2021
Revised: 02 January 2022
Accepted: 09 January 2022
Published: 10 October 2022

The Egyptian Journal of Surgery 2022, 41:327–334

Background
Obstructed-defecation syndrome (ODS) is a condition characterized by the inability to completely evacuate or expel a fecal bolus in the presence of the urge to defecate. A series of mechanical lesions may cause OD, including rectocele, rectoanal intussusception, and rectal prolapse, which may be a cause or an end result of obstruction and chronic straining. The problem with OD, is mainly the difficulty in diagnosis and selection of cases, which could benefit from surgery. Moreover, it is very difficult to determine the suitable surgical technique for each individual case, that is, tailoring of cases.

Aim
Many surgical techniques have been established either through transanal or laparoscopic approach. Each of these techniques has its benefits and its hazards. Most of the studies in the literature focus on advocating or criticizing a specific surgical technique. This study, however, aims at comparing the results of different surgical techniques through laparoscopic (posterior rectopexy, ventral mesh rectopexy) or transanal (Altemeier's, Delorme's, stapled transanal rectal resection) approach in order to answer a simple question: which approach should be the default and when to use the other?

Patients and methods
A sample of 28 cases of OD was studied, 14 of which were done through laparoscopic and 14 through transanal approach. Comparison was based on the postoperative hospital stay, complications, and the change in OD score using the 'Altomare ODS questionnaire, 2008.'

Results
Bleeding was more in laparoscopic techniques, occurring in two (14.3%) of the patients, versus one patient (7.1%) only of those done transanally. Incontinence was more among the transanal group as it occurred in three (21.4%) patients, versus one (7.1%) patient only done laparoscopically. Only one (7.1%) patient done transanally (Delorme's technique), had postoperative anal stenosis requiring anal-dilation sessions. Besides, one (7.1%) of the female patients done through transanal approach, developed rectovaginal fistula. Two of the male patients done by laparoscopic posterior rectopexy developed erectile dysfunction. Laparoscopic techniques had more drop in the ODS score than transanal techniques with a mean of 9.5±6 versus 4.64±5.31, respectively, and a *P* value of statistical significance (*P*=0.042).

Conclusions
Laparoscopic approach is superior to transanal approach as regards improvement of OD manifestations, and thus should be the default, yet the techniques that involve dissection along the posterior rectal wall (posterior mesh rectopexy) are not recommended for males, especially adults.

Keywords:
laparoscopic approach, obstructed defecation, rectal prolapse, rectocele, transanal approach

Egyptian J Surgery 2022, 41:327–334

1110-1121

Introduction

Obstructed defecation (OD) is a term applied to cases that suffer from difficulty in evacuation as a result of functional (neuromuscular) causes, including anismus or rectal hyposensitivity, or organic causes, including rectocele, intussusception, and rectal prolapse. The symptoms of OD are very common among patients referred to colorectal surgeons, occurring in 20% of women [1], especially multiparous ones and representing about 30–50% of all constipated patients [2].

The symptoms include straining at defecation, fragmented stools, sense of incomplete evacuation, tenesmus, urgency, pelvic heaviness, and digital manipulation [3].

The severity of OD may vary according to the underlying causes and the manifestations could be so annoying to the extent that interferes with the patient's lifestyle.

OD needs thorough examination and investigations because apart from the obvious organic lesion, the associated occult abnormalities are often present 'obstructed-defecation syndrome (ODS) is an iceberg syndrome.' These occult lesions are often missed and may lead to postoperative persistence of symptoms and eventually, patient dissatisfaction.

Although there are no available parameters or guidelines for the management of ODS, it was found that surgery should be avoided, except after thorough selection of patients and after conservative treatment has failed. Several surgical techniques have been established to correct the anatomical deformities associated with ODS; however, many studies showed that surgical correction of structural abnormalities did not yield satisfactory functional results [4].

Conservative treatment includes several modalities that should be established, whenever possible, before applying any surgical treatment. Fiber diet, bulking laxatives, and increasing water intake are the most frequently used conservative measures [5]. Chocolate and other foods, which increase stool viscosity making stool expulsion – in one shot – more difficult, should be avoided [6].

Anismus may be also treated with yoga exercises [7] and injection of botulinum toxin A (50 U) in the puborectalis muscle, with about 50% short-term cure rate and minor or rare side effects, such as transient anal incontinence [8].

Rectocele and recto-rectal intussusception, despite being organic lesions, may be successfully treated with biofeedback therapy and pelvic floor rehabilitation, provided that they are not long standing. When these lesions become larger and more significant, they may require surgery [9].

In a recent study, Mario Pescatori stated that two-thirds of the patients with ODS suffer from anxiety and/or depression and that this has to be diagnosed by the surgeon before surgical intervention. He also noted that, as interesting as it may seem, almost all the patients whose surgical treatment of ODS had failed in their unit, had refused psychological therapy inspite of their evident mental distress [10]. Psychological counseling is helpful in patients with either depression, anxiety, or both [11].

For patients who are unwilling to have formal psychotherapy, simple pelvic floor and abdominal muscle relaxation exercises taught by a psychologist may be useful to improve evacuation [12].

After thorough diagnostic workout, including anorectal manometry and magnetic resonance (MR) defecography, some patients are selected as candidates for surgery. There are many operative techniques to treat patients with ODS. According to the surgeon's preference, the approach can be transvaginal, transanal, transperineal, or transabdominal. Each technique has its advantages and its disadvantages; thus, offering a tailored approach to each individual patient is the only means to achieve satisfying functional outcomes [13].

Patients and methods

This study was designed as a longitudinal cohort study including 28 patients, all of which suffered from OD due to different degrees of rectal prolapse, including rectal intussusception. Some cases had associated rectocele. This research was performed at the Department of General Surgery, Assuit University Hospitals. Ethical Committee approval was established and informed consent was obtained from participants.

The study represents a comparative study between the two main surgical approaches for OD, laparoscopy versus transanal. It was established in Assiut University Hospital and Cairo University (Kasr Al Ainy) Hospital in the period between September 2017 and September 2021. The study sample included 28 cases divided into two groups (14 patients each), each of which represents one of the surgical approaches: laparoscopic versus transanal.

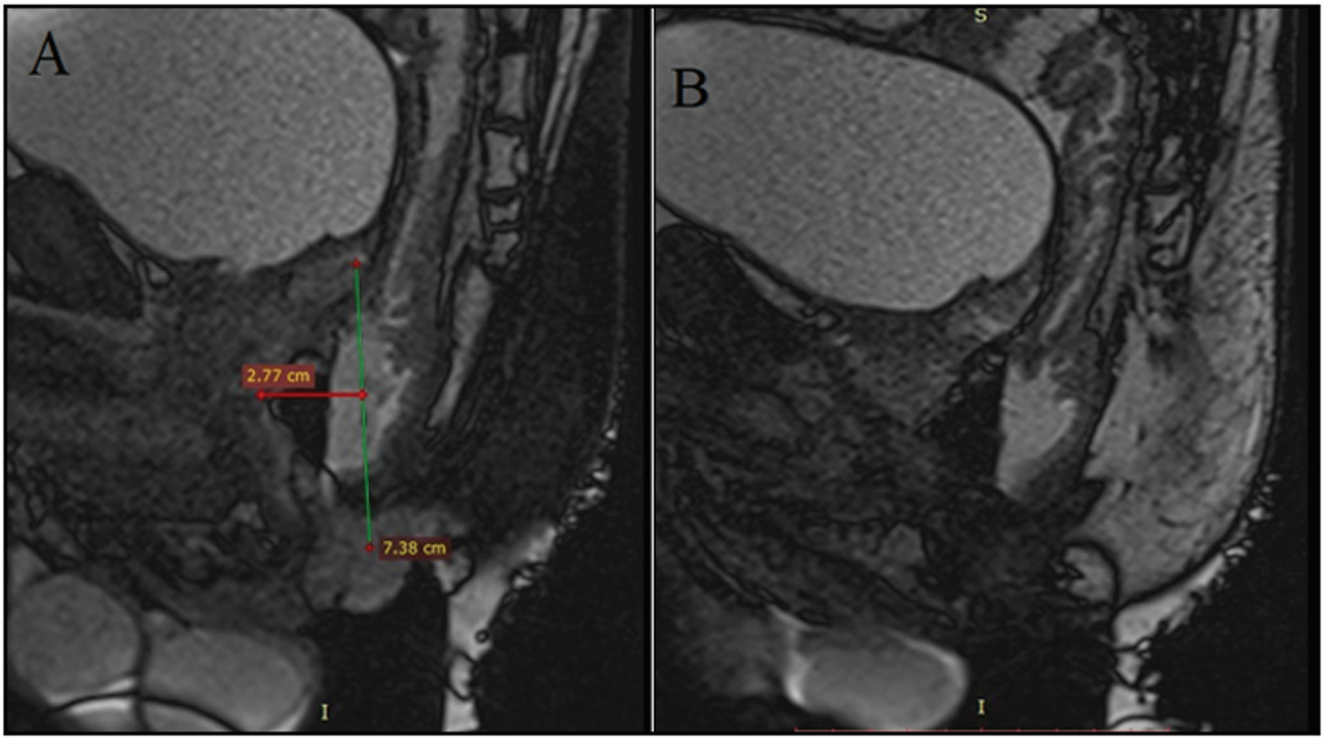
Inclusion criteria

Patients with clinical and/or radiological evidence of ODS for which medical treatment has failed, that is, patients suffering from manifestations of OD either due to overt rectal prolapse or internal causes (rectocele, rectal intussusception) for which medical treatment has failed (bulk-forming laxatives, fiber diet, and biofeedback therapy).

Exclusion criteria

(1) Patients with OD due to functional causes (anismus, paradoxical contraction of puborectalis muscle) without any associated organic lesion, which usually responds to conservative management.

Figure 1



MR defecography of one of our patients showing (a) anorectal descent and moderate anterior rectocele, (b) intrarectal intussusception. MR, magnetic resonance.

(2) Patients with complex pelvic floor pathology (associated with cystocele, urinary incontinence).
(3) Patients aged below 10 years or above 70 years old were excluded.
(4) Patients unfit for surgery.
(5) Patients unwilling or unable to provide consent for the procedures.

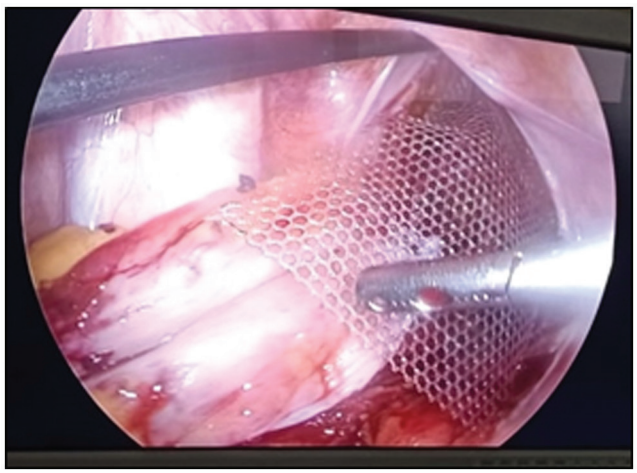
Among the 28 patients in our study, 18 (64.3%) patients were males, while 10 (35.7%) were females. The mean age in the studied sample was 32 years with 75% of patients less than 40 and 25% of patients more than 40 years old.

As for the presentation, 19 (67.9%) patients had overt rectal prolapse, and seven (25%) patients had intussusception (internal prolapse). Among these, two (7.1%) patients had associated anterior rectocele.

Dynamic MR defecography was established for patients having ODS without clinical evidence of overt rectal prolapse or any other clinically obvious lesion, mainly for detection of hidden causes of ODS (rectocele, rectal intussusception) (Fig. 1).

Anorectal manometry was done for selected patients, namely those without a clinically evident (overt) rectal prolapse and whose MR defecography showed mild abnormalities that are not going with their 'exaggerated' complaint, to exclude anismus.

Figure 2



Laparoscopic ventral mesh rectopexy.

The laparoscopic-approach group contained a sum of 14 cases. Of these cases, six were done by laparoscopic posterior rectopexy (four by stitches and two by mesh) and eight cases were done by laparoscopic ventral mesh rectopexy (Fig. 2).

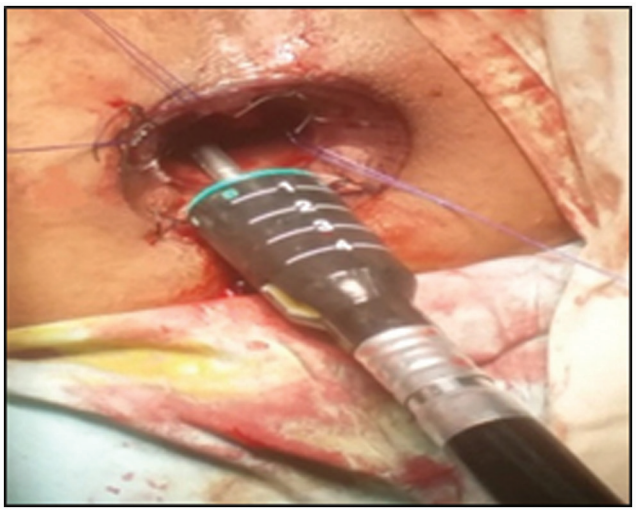
The transanal/perineal group contained 14 cases, of which five were done by perineal rectosigmoidectomy (Altemeier) (Fig. 3).

In total, four cases by Delorme procedure and five cases by stapled transanal rectal resection (STARR) (Fig. 4). Among the four cases of Delorme procedure, two

Figure 3

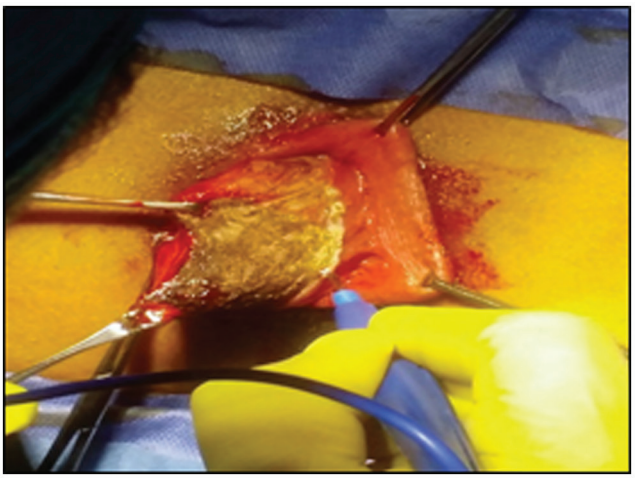
Altemeier technique.

Figure 4



STARR technique. STARR, stapled transanal rectal resection.

Figure 5



Modified Delorme technique.

cases were established by modified Delorme technique, where rectal mucosa was removed by electrocautery instead of mucosal stripping (Fig. 5).

Patients were compared according to the 'Altomare ODS questionnaire 2008' to determine the change in ODS score preoperatively and postoperatively at 1, 3, 6, 9, and 12 months after surgery (Table 1).

The results were also compared according to postoperative hospital stay and complications, including bleeding, incontinence, anal stenosis, fistula, persistence or recurrence of ODS after improvement, and erectile dysfunction in males.

Statistical analysis

All data were collected and cleaned by Excel program, then were analyzed with SPSS software (Statistical Package for the Social Sciences; SPSS Inc., Chicago, Illinois, USA), version 20 for Windows. The results were expressed as mean±SD; the difference between pretreatment and posttreatment data was analyzed by means of a *t* test. The difference was considered statistically significant for *P* values lower than 0.05.

Results

Comparing the duration of postoperative hospital stay in each approach revealed that patients operated laparoscopically, had a longer duration than those done transanally. Nevertheless, the difference was not statistically significant (*P*=0.093) (Table 2).

Follow-up of the studied patients revealed that bleeding occurred more in laparoscopic techniques, occurring in two (14.3%) of the patients, versus one (7.1%) patient only of those done transanally. Incontinence was more among the transanal group as it occurred in three (21.4%) patients, versus one (7.1%) patient only done laparoscopically. Only one (7.1%) patient done transanally (Delorme's technique), had postoperative anal stenosis requiring anal-dilation sessions. Also, one female patient done by STARR technique developed

Table 1 Demographic characteristics and laboratory parameters in the differentiation of simple appendicitis and complicated appendicitis

Variables	Simple appendicitis (*N*=713)	Complicated appendicitis (*N*=65)	*P*
Age (years)	35.33 ± 13.52	46.80 ± 18.20	<0.001
Male sex [*n* (%)]	442 (62)	44 (67.7)	0.364
Laboratory blood values			
White blood cell count	14.23 ± 4.52	14.32 ± 4.41	0.747
Neutrophil	11.10 ± 4.51	11.52 ± 4.13	0.339
Lymphocyte	2.02 ± 0.81	1.62 ± 0.67	<0.001
C-reactive protein (IQR) [*n* (%)]	17.6 (49)	79.5 (160)	<0.001
LCR	0.44 ± 1.07	0.11 ± 0.31	<0.001
NCR	2.44 ± 5.54	0.65 ± 1.65	<0.001
NLR	6.97 ± 5.51	8.61 ± 5.29	0.001

IQR, interquartile range; LCR, lymphocyte-to-C-reactive protein ratio; NCR, neutrophil-to-C-reactive protein ratio; NLR, neutrophil-to-lymphocyte ratio.

Table 2 Postoperative hospital stay according to approach

Postoperative hospital stay (days)	Approach		*P* value
	Transanal (*N*=14)	Laparoscopic (*N*=14)	
Mean±SD	3.00 ± 1.80	3.57 ± 2.79	0.0925
Median (range)	3.0 (1.0–7.0)	2.5 (1.0–10.0)	

rectovaginal fistula. Two of the male patients done by laparoscopic posterior rectopexy developed erectile dysfunction (Table 3, Fig. 6).

Comparing the 'ODS change' among the two approaches revealed that laparoscopic techniques had more drop in the ODS score than transanal techniques, with a mean of 9.5 ± 6 versus 4.64 ± 5.31, respectively, and a *P* value of statistical significance (*P*=0.042) (Table 4).

These results show that persistence of OD manifestations and recurrence of prolapse were less evident in cases done through laparoscopic approach in comparison with transanal techniques. As for complications like erectile dysfunction, they were more evident with laparoscopic techniques as a result of injury to the hypogastric plexus, which occurs specifically in techniques that involve dissection along the posterior wall of the rectum.

Discussion

ODS is a subset of chronic constipation that dramatically affects the patients' lifestyle. ODS has been defined by National Institute for Health and Clinical Excellence (NICE) as the inability to completely evacuate or expel fecal bolus in the presence of the urge to defecate [14,15].

In patients who are candidates for surgical management, it is very important to exclude slow-transit constipation prior to surgery, which may be the reason for persistence of postoperative constipation resulting in patient dissatisfaction.

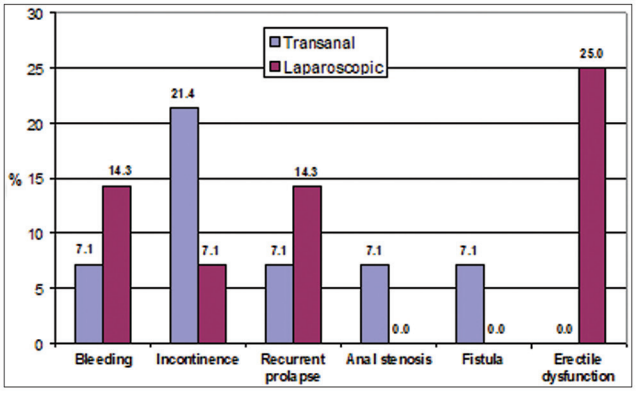
Also, psychological disturbances should be excluded. Psychopathology is often an association with ODS, it could be a causation or a consequence. Whatsoever the case, psychotherapy is useful in cases of ODS with psychological disturbances and should be established

Table 3 Postoperative complications

Complications	Approach				*P* value
	Transanal (*N*=14)		Laparoscopic (*N*=14)		
	n	%	*n*	%	
Bleeding	1	7.1	2	14.3	1.000
Incontinence	3	21.4	1	7.1	0.596
Recurrent prolapse	1	7.1	2	14.3	1.000
Anal stenosis	1	7.1	0	0.0	1.000
Fistula	1	7.1	0	0.0	1.000
Erectile dysfunction	0	0.0	2	25.0*	0.183

*Among the eight male patients in the laparoscopic group.

Figure 6



Postoperative complications according to the approach.

Table 4 Obstructed defecation syndrome change

ODS change	Approach		*P* value
	Transanal (*N*=14)	Laparoscopic (*N*=14)	
Mean±SD	4.64 ± 5.31	9.50 ± 6.00	0.042*
Median (range)	4.0 (–2.0–16.0)	9.5 (0.0–18.0)	

ODS, obstructed defecation syndrome. *Comparing the 'ODS change' among the two approaches revealed that laparoscopic techniques had more drop in the ODS score (improvement) than transanal techniques, with a mean of 9.5 ± 6 versus 4.64 ± 5.31, respectively, and a *P* value of statistical significance (*P* = 0.042).

either prior to or simultaneously with other treatment modalities (biofeedback/surgery). Two of the patients in our study, both of which are females, had psychological disturbances, including bipolar personality disorder, anxiety disorders, and delusions of persecution, one of whom had suicidal attempts. Ira Kodner, one of the past presidents of the American Society of Colon and Rectal Surgeons, wrote that 'he never performed surgery in a patient with recto-rectal intussusception prior to a psychological consultation' [16].

About 68% of patients in our study had overt rectal prolapse. These cases, in spite of being clinically obvious, may harbor other associated hidden causes of ODS, for example, rectocele, anismus, or pelvic dyssynergy. Thus, claiming that overt rectal prolapse is diagnosed only clinically and needs no further investigations, is a misconception. Whenever available, MR defecography, anorectal manometry, and EMG should eventually be done for these patients to exclude other hidden (functional or organic) abnormalities that are often the cause of persistence or recurrence of symptoms of ODS postoperatively. This is the reason why ODS is referred to as an 'iceberg syndrome.' Dynamic MRI showed that 25% of patients in our study sample had intussusception of different degrees (intrarectal or rectoanal) and 7% had anterior rectocele.

In his recent study about the iceberg syndrome, Mario Pescatori stated that anismus is present in 44% of cases of ODS, which is quite a high percentage. Nevertheless, it is neglected by most general surgeons. In addition, he stated that recto-rectal intussusception is present in 40% of nonconstipated patients who undergo defecography. This means that intussusception – if present – does not necessarily require surgical correction [10].

Surgery for OD can be done via laparoscopic or transanal approach.

This study focuses on comparing these two approaches, in order to detect which of them should be default and on which conditions should we resort to the other.

Using the Altomare ODS score 2008, laparoscopic techniques showed more decrease in postoperative ODS score (improvement) than transanal techniques with a difference of statistical significance (P=0.042), that is, patients done laparoscopically had higher satisfaction regarding OD manifestations. This indicates superiority of laparoscopic techniques regarding postoperative patient satisfaction. The reason for that is probably 'rectopexy,' that is, fixation of the rectum, which helps to avoid distortion of the anorectal angle during defecation. The best postoperative ODS score improvements were achieved with ventral mesh rectopexy (VMR).

Our results concerning the change in ODS score are going with those of some studies in the literature. For example, Altomare *et al*. [17], in their study published in January 2018 comparing the pelvic floor function following VMR versus STARR techniques, found that the postoperative ODS score decreased from 16 to 12 in the STARR group (P=0.02) versus 19 to 9 (P=0.001) in the VMR group.

As for morbidity, there are several complications that could develop after ODS surgery. The incidence of these complications may vary not only according to the approach, but also according to the specific technique.

In our study, persistence or recurrence of ODS symptoms, including tenesmus and straining for defecation, were higher with transanal techniques, probably due to the thorough dissection and pull on the rectal wall transanally, which stretches the muscles and anal sphincters, and requires a period of time to recover either spontaneously or with the help of biofeedback. Anal stenosis was also more in transanal techniques in comparison with laparoscopic ones (7.1 vs. 0%, respectively). One of our patients developed anal stenosis, requiring anal-dilation sessions after Delorme's technique. Incontinence was higher with transanal techniques (21.4%) in comparison with laparoscopic techniques (7.1%), but was transient, occurring specially within the first 2 months after surgery. However, some patients had persistence of soiling even up to 9 months after surgery. This may be due to direct injury to the sphincters or traction of the prolapsed rectal wall in transanal techniques, resulting in pudendal neuropathy.

Bleeding was more with techniques that involve resection (e.g. Altemeier, resection–rectopexy). However, in general, it was transient and recovered spontaneously.

Two male patients done by posterior mesh rectopexy, developed erectile dysfunction. Dissection along the posterior wall of the rectum carries the risk of injury to the hypogastric plexus with subsequent loss of erection. VMR avoids that risk, which makes it a perfect option for males with rectal prolapse.

Revision of the literature regarding postoperative complications, shows that transanal techniques for ODS have varying success rates, some of which are relevant to the results of our study. Arnold *et al*. [18] reported poor postoperative results as 54% of patients still complained about constipation. The authors pointed

out that the disappointing results were probably due to a relatively unselective approach. Roman and Michot [19] revealed that functional outcome decreased with increased length of follow-up, reaching a recurrence rate of 50% at 5.5 years. In addition, new onset of anal incontinence occurred in nearly one-third of female patients.

In contrast, Murthy *et al*. [20] found excellent results after transanal rectocele repair by operating on patients only with defined criteria: sensation of vaginal mass requiring digital support for defecation, contrast retention on defecography, and the presence of a large rectocele.

Inspite of the nonencouraging results of transanal techniques in our study, especially concerning the change in ODS score and persistence of OD manifestations, some studies do actually advocate these techniques under the condition of optimal patient selection. Lee and colleagues stated that the advantages of the Delorme's procedure versus abdominal techniques include: (a) low morbidity and mortality, (b) no risk of impotence, unlike abdominal rectopexy where pelvic nerves (erection problems) or hypogastric nerves (ejaculation problems) may be damaged, (c) the feasibility of using spinal anesthesia, (d) short hospital stay, (e) early oral feeding (depending on the patients' associated conditions), and (f) patient comfort, with little or no postoperative pain [21]. Watts and Thompson [22] recommend the Delorme's procedure for young, adult males to prevent potential impotence and for weakened or elderly patients. Also, Jordán *et al*. [23] stated that the Delorme's procedure may be indicated as emergency surgery for strangulated rectal prolapse, with satisfactory results.

Concerning the STARR technique, two of our patients had postoperative persistence of manifestations of OD, with no significant improvement after an average of 7 months of follow-up. One of these patients, who was preoperatively suffering from mucous discharge, had persistence of that manifestation after STARR technique. Also, one of the female patients developed rectovaginal fistula.

Nevertheless, some previous studies had encouraging results after STARR. Almost 3000 patients were recruited from three countries in the period between 2006 and 2008 by the European STARR Registry [5]. There was significant reduction in OD and symptom-severity scores together with improved quality of life. As with other studies [24], continence improved. Nevertheless, complications were reported in 36%, which included pain (7.1%), urinary retention (6.9%), bleeding (5%), sepsis (4.4%), and staple-line complications (3.5%). Postoperative urgency was recorded in 27% of patients at 12 months with fecal incontinence occurring in 1.8%. The final report, which contained 12-month follow-up data, concluded that STARR was safe and effective with significant improvements in ODS and quality of life [25]. Recurrence of rectocele has been noted in up to 33% at 1 year. Rectovaginal fistulas also have been reported in the literature [26].

The frustrating results following STARR in our study could be related to technical issues or to the lack of postoperative biofeedback.

The literature review concerning laparoscopic techniques is also – to some extent – relevant to the results of our study, especially those of VMR technique. Several centers reported promising functional outcomes with a significant reduction of ODS and a low morbidity rate [27–29]. Moreover, in contrast to transanal procedures, laparoscopic VMR is unlikely to impair fecal continence [13]. Nevertheless, long-term data are still lacking and late mesh-related complications may increase with longer follow-up periods. In addition, laparoscopic VMR seems to have a considerable learning curve if it is not taught in a mentored environment [30].

There are several previous studies that also focused on comparing the results of laparoscopic and transanal techniques. Yakut *et al*. [31] evaluated their results in 94 patients where they compared the results of the Delorme procedure and of abdominal resection with or without rectopexy. They noted that the most important complications were sexual problems in male patients who underwent posterior rectopexy procedures. They concluded that both procedures were effective for treatment of rectal prolapse, but extensive pelvic dissection during the posterior rectopexy might create serious sexual dysfunction in male patients.

Conclusions

In general, laparoscopic approach is superior to transanal approach as regards improvement of OD manifestations, therefore, it should be the default, yet the techniques that involve dissection along the posterior rectal wall (posterior mesh rectopexy) are not recommended for males, especially adults.

Our recommendations are to undergo thorough investigations for every patient, including MR defecography and manometry to exclude occult lesions and functional (neuromuscular) abnormalities. We also

advise to offer every patient a chance for conservative therapy, including biofeedback and fiber diet, and to undergo a thorough psychological analysis prior to any surgical intervention. Surgery should be the last resort. Surgical techniques cannot be standardized, that is, tailoring of management for each individual case is recommended to achieve the best possible outcomes. It is also recommended for patients to continue on fiber-diet regimen after surgery. Postoperative biofeedback is also recommended to retrain patients for healthy defecation.

ODS remains a subject of interest that requires more research at wider scopes in order to achieve more optimum management modalities.

Financial support and sponsorship
Nil.

Conflicts of interest
No conflict of interest.

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