Rectal Prolapse in Women—Outcomes of Perineal and Abdominal Approaches

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Abstract The aim of the study was to assess the clinical and functional results of surgical treatment of female patients with rectal prolapse. In the period of 2003–2010, the group of 86 female patients (mean age of 67 ± 10) underwent surgery due to rectal prolapse. The group of 24 patients (27.9 %) suffered from mild anal incontinence. They were operated on with open sutured rectopexy (18 pts), Altemeier (45 pts) and Delorme procedure (23 pts). Prior to surgery and after operation, clinical and function results were obtained. The follow-up period amounted to 32 ± 11 months. In perineal approaches, we found mortality in one patient (1.4 %, Delorme) and anastomotic leak in four patients (5.9 %). The recurrence rate in the perineal group was 11.8 % (eight patients). We noted one recurrence in the rectopexy group (5.6 %). The Altemeier procedure revealed the most significant impact on the function of the anal sphincter muscles and resting pressures (42 ± 7 vs 53 ± 9 cm H₂O; $p=0.0082$). If anterior levatoroplasty was added, the benefits referred also to squeeze pressures (41 ± 8 vs 58 ± 9 cm H₂O; $p=0.006$ and 42 ± 10 vs 56 ± 9 cm H₂O; $p=0.01$). In the treatment of rectal prolapse, there is still no consensus about the operation of choice. Selection of the appropriate method should be based on clinical findings and patients' comorbidities to obtain maximal benefits and minimize the postoperative risk and failures.

Keywords Rectal prolapse · Surgical treatment · Delorme procedure · Rectopexy · Altemeier procedure · Functional results

Introduction

Rectal prolapse is defined as a complete prolapse of all layers of the rectum and is usually associated with a deep rectovaginal fossa, loose attachment of the rectum to the sacrum, and lax lateral ligaments [1]. The entity seems to be quite common and however many kinds of treatment have been described, there is still no consensus about the operation of choice [2]. The surgeon can choose from two different approaches to treat the patient with rectal prolapse. Some popular surgical techniques with the use of abdominal approach have been aimed to fix the rectum to the sacrum [3]. The results of the treatment with these techniques are more favourable in younger patients in good general condition and/or with some abnormalities in bowel function, mainly constipation. Perineal approaches are considered mainly in elderly patients who suffer from additional comorbidities [4].

Rectal prolapse could occur at every age in women as well as in men; however, women are the main group of patients in the adult population with the peak incidence after the fifth decade of life. Postmenopausal women reveal full-thickness rectal prolapse more often than younger women and men. More than half of these patients have co-existing faecal incontinence, and several percent of patients could suffer from constipation.

One can find some theories describing the aetiology of the entity with that first proposed by Moschcowitsch [5] at the beginning of the twentieth century and later slightly changed and developed by Broden and Snellman [6]. Irrespective of the above-mentioned theories several anatomic features are often associated with rectal prolapse such as an abnormally deep cul-de-sac, atonic anal sphincters, redundant sigmoid colon, or loss of fixation of the rectum. It is still debatable if these findings are a cause or only an effect of the disorder. Nevertheless, most of the surgical procedures have been invented and are used to repair some of these anatomic

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anomalies to reduce the complaints or dysfunctions and the symptoms of rectal prolapse [7].

The surgical procedure is aimed to control some function by improving anal continence and preventing constipation. One can achieve it by resection of redundant large bowel and/or by fixation of the rectum to the sacrum. Better function of pelvic floor may be obtained by anterior levatoroplasty [8, 9].

The aim of the study was to assess and compare the clinical and functional results of surgical treatment of female patients with full-thickness rectal prolapse and to answer the question if it has any impact of surgical technique on anal sphincter muscles.

Material and Methods

In the period of 2003–2010, a group of 86 female patients (mean age of 67 ± 10) underwent surgery due to full-thickness rectal prolapse. All of them had endoscopy to exclude neoplasma or inflammation, and endorectal ultrasound was performed prior to surgery to assess anal sphincter muscles. Anorectal manometry and defecography were performed before surgery and anorectal manometry during the follow-up visit. In the whole group of patients, no disruption of the sphincter muscles was revealed in endorectal ultrasound. The sphincter function was examined by the measurement of resting and squeeze pressure in the anal canal; additionally, reflex pressure was also assessed using cough reflex. The group of 24 patients (27.9 %) suffered from mild anal incontinence without any anal sphincter disruption. In all patients, antibiotic prophylaxis was administered prior to surgery as well as thromboprophylaxis. The patients were operated on with abdominal (sutured rectopexy, 18 pts) and perineal (Altemeier procedure, 45 pts; Delorme procedure, 23 pts) approaches.

Prior to surgery, the surgeon decided about the choice of the procedure. Patients were qualified to the Delorme procedure when in clinical examination they revealed a short segment of full-thickness rectal prolapse shorter than 4 cm in length and suffer from some general comorbidities, mainly cardiovascular and pulmonary, that could increase the risk of general anaesthesia. Patients qualified to the Altemeier operation had rectal prolapse longer than 4 cm. In this group of patients, additional anterior levatoroplasty was made with interrupted sutures if they suffered from the symptoms of incontinence. Open rectopexy was performed with sutures without mesh and without resection of the bowel. Patients without general comorbidities were qualified for open rectopexy. Most of patients [68 (79.1 %)] underwent the perineal approach technique. During hospitalization and during the follow-up visit, the early and late results were assessed, respectively. The follow-up period amounted to 32 ± 11 months.

In our study, quantitative parameters were shown as mean $\pm$ SD. The χ^2 test was used to analyse the association between complications and other features using with categorical covariates. The t test was used to assess differences of means among covariates. The differences were considered as significant at the level of $p < 0.05$.

Results

Comparing the postoperative results of all perineal approaches, we found mortality in one patient (1.4 %) (in the Delorme group) and anastomotic leak in four patients (5.9 %). It was the most common postoperative complication in that group. Two patients required further surgery. The recurrence rate in the perineal group was 11.8 % (eight patients), and it referred to the Altemeier procedure most commonly (14.8 %). All details of complication rates according to surgical approach were shown in Table 1.

The group of six patients with recurrent rectal prolapse was operated on. In five patients, the Altemeier procedure was performed (83 % of all operated recurrences). The Delorme procedure was made only in one patient. Although the recurrence rate was higher in the group of patients operated on with perineal approaches, no statistical significances were found ($p = 0.677$). The overall morbidity was similar in both studied groups ($p = 0.744$).

The rates of anastomotic leak and recurrence were similar in all perineal procedures in our group of patients. In Table 2, we presented early and late results for each surgical type of procedure.

We compared the functional results of surgery, and the Altemeier procedure revealed the most significant impact on the function of the anal sphincter muscles and resting pressures (42 ± 7 vs 53 ± 9 cm H₂O; $p = 0.0082$). If the Altemeier procedure was extended with anterior levatoroplasty, the benefits referred not only to resting but also to squeeze pressures (41 ± 8 vs 58 ± 9 cm H₂O, $p = 0.006$; and 42 ± 10 vs 56 ± 9 cm H₂O, $p = 0.01$). We did not find any significant improvement of sphincter function neither in the Delorme group of patients nor the rectopexy group. All details of manometry findings before and after surgery were shown in Table 3.

Discussion

Rectal prolapse as a disorder occurs in patients at every age. According to the literature and clinical experience, it is more common in women than men with a ratio of 6:1. Women have an increased incidence in elderly age especially in their postmenopausal period; male patients suffer from the entity irrespective of age [4]. In available literature, we did not find any

Table 1 Comparison of mortality and morbidity in abdominal and perineal surgical approaches

	Surgical approach	
	Perineal, <i>n</i> =68 (%)	Abdominal, <i>n</i> =18 (%)
Mortality	1 (1.5)	0
Anastomotic leak	4 (5.9)	0
Bowel obstruction	0	3 (16.7)
Need for reoperation	2 (3)	1 (5.6)
Recurrence*	8 (11.8)	1 (5.6)
All complications**	13 (19.1)	4 (22.2)

* $p=0.677$ (χ^2 test); ** $p=0.744$ (χ^2 test)

studies comparing results of surgical treatment of rectal prolapse in a particular group of postmenopausal women.

The surgical approach to the treatment of patients with rectal prolapse seems to be still controversial. There are many types of operations and still no procedure of choice. Before the operation, many factors must be considered, such as the patient's age, comorbidities, gender and preoperative constipation as well as anal incontinence. Surgical approaches are mainly divided into abdominal and perineal operations [10].

The patients with good general state without serious comorbidities are better candidates to abdominal approaches, but keep in mind the fact that young men after pelvic dissection and rectopexy are at a higher risk of sexual dysfunction [11]. We studied only female patients, and the risk of sexual dysfunction in the rectopexy group was not assessed in our series. Furthermore, the small size of the rectopexy group probably resulted from the fact that the mean age of our patients was quite high and they suffer from some general comorbidities; therefore, the perianal approach was the decision made by the surgeon more often. During the study period, we performed only suture rectopexy without implantation of the mesh neither anteriorly nor posteriorly placed. In our study, only three sutures were used on each side of the rectum to avoid of the narrowing of the bowel. Cutait suggested that implemented material was unnecessary and perhaps might increase the risk

of pelvic sepsis [12]. The abdominal procedures are connected with the risk of some severe complications such as anastomotic leak, in resection procedures, and ileus, and some of these complications might require reoperation. The risk of recurrence in suture rectopexy varied from 0 to 9 % with no mortality but with a morbidity rate of 0–20 % [3, 11, 13, 14]; however, functional results of that treatment are significantly better if the patient suffered from constipation prior to surgery. The recurrence rate in our study was 5.5 %, but the overall morbidity rate was slightly higher than in available literature and accounted to 22 %.

In patients operated on with rectopexy with the used mesh, the risk of recurrence ranges from 2 to 10.5 % and the incidence of morbidity might be higher than in suture rectopexy and accounted from 3 to 52 %. Posterior mesh rectopexy could be connected with a higher rate of overall morbidity [1, 2, 15–18]. Therefore, in our centre, we have chosen suture rectopexy than mesh rectopexy mainly to reduce the risk of postoperative complications.

In a group of patients with constipation as an additional complaint to rectal prolapse, sigmoid resection may be added to rectopexy. Patients with a history of constipation seem to obtain more benefit by adding sigmoid resection of the redundant bowel [10]. We did not report any constipated patients prior to surgery in our small rectopexy group; thus, the procedure of rectopexy did not require additional bowel resection. We realize the limitation of our study especially when it comes to the rectopexy group where no laparoscopic technique was applied. Rectopexy with laparoscopic approach is used routinely in some centres; however, in our department, we apply open abdominal approach suture rectopexy.

Perineal procedures are considered to be more appropriate in elderly patients who have some significant or severe comorbidities. However, in these procedures, the decreased perioperative morbidity could be connected with the increased recurrence rate. There are three most commonly performed procedures: the perineal rectosigmoidectomy (Altemeier procedure), the perineal rectosigmoidectomy with levatoroplasty and the Delorme procedure [4, 10]. In our study, actually we noted higher recurrence rates in overall perineal group of patients but we did not reveal any statistical significance. Furthermore, comparing the morbidity rates, there were similar rates in the study groups as well.

The Delorme procedure remains a good surgical choice for patients with a mucosal or partial thickness rectal prolapse, and it is the best option for patients with only short full-thickness rectal prolapse [8]. In some retrospective studies, mortality rates after the procedure vary from 0 to 4 % [19, 20]. In our study, we reported one patient (4.3 %) who died in postoperative time due to myocardial infarction. The female patient suffered from chronic ischaemic heart disease prior to surgery. After the Delorme procedure, the recurrence rate ranges from 4 to 38 % [19–21]. However, Agachan et al.

Table 2 Early and late results of each type of surgical treatment

Complication	Type of surgery			
	Altemeier procedure <i>n</i> =27 (%)	Altemeier + levatoroplasty <i>n</i> =18 (%)	Delorme procedure <i>n</i> =23 (%)	Rectopexy <i>n</i> =18 (%)
Perioperative mortality	0	0	1 (4.3)	0
Anastomotic leak	1 (3.7)	1 (5.6)	2 (8.6)	0
Bowel obstruction	0	0	0	3 (16.7)
Recurrence	4 (14.8)	2 (11.1)	2 (8.7)	1 (5.6)

Table 3 Function of anal sphincter muscles prior and after surgery

Manometric features	Altemeier, <i>n</i> =27			Altemeier + levatoroplasty, <i>n</i> =18			Delorme, <i>n</i> =23			Rectopexy, <i>n</i> =18		
	Prior	After	<i>p</i> *	Prior	After	<i>p</i> *	Prior	After	<i>p</i> *	Prior	After	<i>p</i> *
Resting pressure mean±SD [cm H ₂ O]	42±7	53±9	0.0082	41±8	58±9	0.006	45±9	51±8	0.09	45±8	52±10	0.12
Squeeze pressure mean±SD [cm H ₂ O]	41±8	44±7	0.11	42±10	56±9	0.01	40±7	43±8	0.28	41±8	44±8	0.23
Reflex pressure mean±SD [cm H ₂ O]	48±8	51±8	0.67	45±7	50±9	0.34	46±6	49±7	0.31	46±8	49±8	0.34

All pressures are presented as relative pressures

**p*<0.05 (*t* test, significant)

[21] reported high recurrence rate that accounted to 38 %, but the group of the studied patients in the paper was very small (8 patients); thus, the real rate seems to be from 4 to 26 % [22]. In our series, the recurrence rate was quite low and it was reported at the level of 8.7 %.

Although Oliver et al. [23] reported a general improvement in continence, likely obtained by the plication of muscularis propria of the rectal wall, we did not assess the clinical severity of incontinence either prior or following surgery, and only in our series, manometric findings revealed no improvement in anal sphincter function in the group.

The Altemeier procedure is used to perform a full-thickness resection of the rectum and a part of the sigmoid colon (perineal rectosigmoidectomy). Additionally, it seems to be the procedure of choice for patients with an incarcerated, gangrenous rectal prolapse and a very good option for patients with a recurrence after the earlier perineal procedure [10, 24]. In our series, all cases were electively operated on, and we used the Altemeier procedure in the majority of our recurrences with good results. The mortality rate after the elective procedure ranges from 0 to 5 % [10, 21, 25]. In our study, no mortality was reported in the Altemeier group. According to the literature, the recurrence rates account to 0–16 % [4, 8, 10]. We noted the recurrence rate at the quite high level of 11.1 % in the Altemeier procedure with levatoroplasty and 14.8 % in only perineal rectosigmoidectomy group.

Adding the levatoroplasty to the Altemeier procedure leads to improvement of continence, and also it improves the short-term recurrence rate compared with the perineal rectosigmoidectomy alone [21]. Of all the perineal procedures, the perineal rectosigmoidectomy with levatoroplasty has been connected with the longest recurrence-free interval, the lowest overall recurrence rate, and the best effects in relation to bowel function—continence as well as constipation [8, 10]. In our study, perineal rectosigmoidectomy alone improved the function of anal sphincter muscles, but levatoroplasty additionally performed influenced the function more significantly by improving either resting or squeeze anal sphincter pressures.

The recurrence rate was also slightly lower in the levatoroplasty group but without any statistical significances. Unfortunately, we did not assess the severity of clinical features of incontinence but the only manometric activity and function were measured. Thus, the comparison of the impact of additional levatoroplasty on clinical complaints of continence was not entirely possible.

In the treatment of rectal prolapse, there is still no consensus about the operation of choice. We stated that the selection of appropriate method should be based on clinical findings and patients' comorbidities to obtain maximal benefits and to minimize the postoperative risk and failures. The abdominal approach should be performed in younger patients with good general health and colon resection added in the group of constipated patients. Perineal rectosigmoidectomy could be chosen in the group of older patients with good late results and a small risk of serious complications. Additional anterior levatoroplasty during the Altemeier procedure should be performed in the group of female patients with co-existing faecal incontinence to improve anal sphincter function.

Conflict of Interest The authors declare no conflict of interests.

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