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The impact of anismus on the clinical outcome of rectocele repair

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Abstract. There are doubts as to whether rectocele repair (RR) is beneficial for patients with concomitant anismus. The aim of this prospective study was to evaluate the effect of anismus on the clinical outcome of RR. In 71 out of 75 patients who underwent RR evacuation proctography (EP) was performed. Electromyography (EMG) of the pelvic floor and balloon expulsion test (BET) were carried out in 61 and 35 patients respectively. On EP, measuring the central anorectal angle (CARA) and the posterior anorectal angle (PARA), signs of anismus were found in 34 and 28 percent of the patients respectively. EMG and BET revealed anismus in 39 and 71 percent of the patients respectively. These results showed poor agreement. RR was successful in 53 (71%) out of 75 patients (follow up 14–74 months). No differences were found in clinical outcome in patients with and without signs of anismus. In conclusion, RR is beneficial for patients with obstructed defecation, and signs of anismus do not appear to be a contraindication for RR.

Résumé. Il existe un doute quant à savoir si la cure chirurgicale d'une rectocèle (RR) est bénéfique pour des patients qui présentent simultanément un anisme. Le but de cette étude prospective est d'évaluer l'effet de l'anisme sur le résultat clinique des corrections chirurgicales des rectocèles. Des défécographies ont été réalisées chez 71 patients sur un total de 75 qui ont subi une cure chirurgicale de rectocèle. Une électromyographie du plancher pelvien et un test d'expulsion d'un ballonnet ont été réalisés chez respectivement 61 et 35 patients. Sur la défécographie, l'angle ano-rectal central a été mesuré ainsi que l'angle ano-rectal postérieur; des signes d'anisme ont été retrouvés respectivement chez 34 et 28 patients. L'électromyographie et le test d'expulsion du ballonnet ont démontré un anisme chez, respectivement, 39 et 71% des patients. Ces résultats montrent peu de concordance. La réparation de la rectocèle a été conduite avec succès chez 53 (71%) des 75 patients (un follow-up de 14 à 74 mois). Aucune différence n'a été retrouvée dans le devenir clinique chez les patients avec et sans signes d'anisme. En conclusion, la réparation d'une rectocèle est bénéfique chez des patients présentant une dyschésie, des signes d'anisme ne semblent pas être une contre-indication à la cure chirurgicale.

Anismus, also known as non-relaxing puborectalis syndrome or spastic pelvic floor syndrome, is considered to be a major cause of obstructed defecation [1–4]. This phenomenon is characterised by contraction of the pelvic floor during attempted defecation. Evacuation proctography (EP), electromyography (EMG) of the pelvic floor, and balloon expulsion test (BET) are most commonly used to diagnose anismus, though in general, EMG is regarded as "the gold standard" [5]. Since anismus is a functional disorder, therapy consists of biofeedback training of the pelvic floor [6, 7].

Rectoceles can also give rise to defecatory difficulties. It has been reported that rectocele repair is beneficial for 50 to 70 per cent of the patients with obstructed defecation [8–17]. Despite this successful outcome several authors still debate the importance of rectoceles in causing obstructed defecation and even suggest that anismus is a causative factor in the formation of a rectocele [18]. A controversial category of patients with obstructed defecation therefore, are those with a rectocele and concomitant anismus. It is stated that rectocele repair in these patients can not be successful, since the underlying cause for obstructed defecation persists [18]. Because precise data on this issue are lacking, we performed a prospective study in 75 consecutive patients. The prevalence of anismus in patients with symptomatic rectocele was evaluated using EP, EMG and BET, and the impact of this phenomenon on the outcome of rectocele repair was investigated.

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Patients and methods

Patients

Between January 1988 and January 1994, 180 women with anorectal outlet obstruction were analysed. In the patients with a rectocele of more than three cm on evacuation proctography, the rectocele was considered as the principal cause of symptoms and these patients (75 women, median age at presentation 54 years, range 35–78 years) were enrolled in the study. The median age at onset of obstructed defecation was 48 years (range 20–77 years), and the median duration of symptoms was 5 years (range 1–30). The symptoms at the time of presentation are listed in Table 1. Of these women, all but one had had one or more vaginal deliveries. In 45 women previous hysterectomy had been performed, and in 35 patients (47%) the evacuation difficulties were reported to have started shortly after hysterectomy. Nineteen patients had had previous transvaginal prolapse repair (8 anterior, 3 posterior and 8 combined repairs). Two patients had undergone a transrectal rectocele repair previously. The minimal duration of follow-up after rectocele repair was 14 months (median 49, range 14–74 months).

Methods

Evacuation proctography. In 71 patients evacuation proctography (EP) was performed as described by Ginai [19]. In four patients EP was performed in another hospital but since video recordings were lacking, the results were not used. With the patient in left lateral position, thickened barium sulphate was injected into the rectum, under fluoroscopic control. The vaginal wall was coated utilising a contrast-soaked tampon, which was removed before starting EP. The commode was fixed onto the fluoroscopy table and prior to the examination the table was brought upright with the patient in the sitting position. A video recording was obtained in all patients. Spot films were also taken at rest, during defecation and at the end of straining efforts. The anorectal angle was measured in two ways. The posterior anorectal angle (PARA) was defined as the angle between the axis of the anal canal and the tangential line drawn along the posterior wall of the distal part of the rectum. The central anorectal angle (CARA) was represented by the angle between the central axis of the anal canal and the central axis of the distal part of the rectum. Both angles were measured at rest and at the end of maximal straining effort. Anismus was defined as a decrease or insufficient increase (<5%) of the anorectal angle despite an adequate straining effort, represented by sufficient perineal descent.

Table 1. Symptoms at time of presentation of 75 patients who subsequently underwent rectocele repair. The five most frequent symptoms (in italics) were used for the scoring system to evaluate the clinical outcome of rectocele repair

Symptoms	No. pts	[%]
Excessive straining	71	95
Manual assistance	68	91
Vaginal digitalisation	25	33
Anal digitalisation	23	31
Perineal support	20	27
Incomplete evacuation	67	89
Sense of fullness	60	80
Constipation (Freq < 2/week)	53	71
Abdominal pain	26	35
Pelvic pressure	14	19
Bloody discharge	9	12
Mucous discharge	7	9
Faecal incontinence	5	7

Electromyography. EMG of the pelvic floor was introduced in a later phase of the study and performed in 61 patients. With the patient lying on her left side, a conventional concentric bipolar needle electrode was introduced in the midline behind the anal verge and directed slightly anteriorly. A standard EMG apparatus (Nicolet Viking) was used to amplify and display the recordings, which were made with the patient at rest and while straining. The measurements were repeated three times in the same sitting. Electromyographic evidence of anismus was considered as a lack of decrease of activity during a maximal straining effort.

Balloon expulsion test. In the last 35 patients BET was performed. With the patient lying on her left side, a lubricated latex balloon attached to a latex catheter was inserted into the rectal ampulla. The balloon was inflated with air until an urge to defecate was experienced. The patient was asked to strain and expel the balloon. If the efforts to expel the balloon were not successful, this manoeuvre was repeated up to three times. Failure to expel the balloon was considered as a criterion for anismus.

Surgical technique

Preoperative bowel preparation consisted of the use of the laxative Klean-prep (Helsinn Birex Pharmaceuticals Ltd Dublin, Ireland) the day before operation. At induction and five days postoperatively, Cefuroxime and Metronidazole were administered parenterally. First, a posterior colporrhaphy was performed by the gynaecologist. A transverse incision was made at the junction of skin and vaginal mucosa. A mucosal flap was dissected from the underlying tissue. When the highest point of dissection was reached, the fascia of the rectovaginal septum was identified by lateral preparation. The edges of the rectovaginal septum were approximated with interrupted Vicryl 0 sutures. The left and right part of the puborectal muscle were approximated with Vicryl 1 sutures. The number of these sutures was determined by measuring the opening of the vaginal outlet. Introduction of two fingers had to be possible without applying pressure. If necessary, one or more sutures were removed. Reconstruction of the perineal body, if necessary, was performed by placing interrupted Vicryl 3-0 sutures including the lower margins of the bulbocavernosus and the transverse perinei muscles, thus supporting the levator hiatus. The procedure was ended by closing the vaginal mucosa with a running Vicryl 3-0 suture, which was continued over the perineum as a subcuticular stitch. Then the patient was placed in prone jack-knife position. An anal retractor was inserted to expose the anterior half of the circumference of the anal canal. A transverse incision was made at the dentate line. Two vertical incisions were made at either end and extended proximally for a distance of about 7 cm. A mucosal flap was lifted from the underlying internal sphincter and excised. Interrupted transverse sutures of Vicryl 2-0 were placed to plicate the anterior rectal wall and caudally the internal anal sphincter. Finally the mucosal defect was closed with interrupted Vicryl 3-0 sutures.

Postoperative evaluation

Following rectocele repair, the patients were seen on a regular basis. In the first two years the clinical outcome was evaluated by the surgeon and the gynaecologist every six months. At end evaluation (median duration 49 months, range 14–74 months) the clinical outcome was evaluated by an independent observer. This final evaluation of the functional outcome was based on the five most common symptoms at time of presentation (Table 1). Each symptom equalled one point. The outcome was considered ‘excellent’ or ‘good’ when the score was 0 or 1 respectively. The outcome was considered ‘poor’ when the total score was 2 or more. Using this scoring-system, 68 patients (91%) had a total score of 4 or 5 preoperatively. Evacuation proctography was performed six months after operation.

Statistical analysis

Fisher's exact test was used to compare the differences in percentage outcome of surgical treatment in patients according to the signs of anismus using the different tests. $P<0.05$ (two sided) was considered statistically significant. The agreement between the various tests was assessed using Kappa statistics [20]. A Kappa of one indicates perfect agreement and a Kappa of zero no agreement. Values above 0.6 are usually taken to indicate good agreement.

Results

Symptomatic improvement

At end evaluation a successful outcome was observed in 53 of the 75 patients (71%). There was no correlation between the size of the rectocele and results of surgery ($P = 0.48$). The most frequent complication in the postoperative period was a urinary tract infection (15 patients). In four patients an indwelling catheter had to be placed because of urinary retention. Four patients developed a wound abscess, in all these patients the abscess drained spontaneously. In three patients a perianal fistula had to be excised. The outcome of rectocele repair was not influenced by these complications. None of the patients developed a rectovaginal fistula. In the first postoperative year, vaginal tightness and pain during sexual intercourse occurred in 18 patients. Three patients experienced faecal soiling. Two other patients presented with faecal incontinence requiring an anterior anal repair.

Evacuation proctography

Measuring PARA and CARA in 71 subjects, anismus was diagnosed in 24 patients (34%) and 20 patients (28%) respectively. The outcome of rectocele repair in patients with radiological signs of anismus did not differ from that in patients without such signs as shown in Table 2. After rectocele repair EP showed no persistent or recurrent rectoceles.

Electromyography

EMG of the pelvic floor revealed anismus in 29 out of 61 patients (47%). As shown in Table 3, the clinical outcome was not significantly different from patients in whom the puborectalis muscle showed relaxation during straining.

Balloon expulsion

Twenty-five of the 35 patients in whom BET was performed, were unable to expel a balloon (71%). This sign of anismus did not influence the results of rectocele repair (Table 4).

Except for CARA vs PARA, the different tests showed a poor agreement (Table 5). There were 34 patients in which all tests (EP, EMG, BET) had been performed. There was no significant relation between the outcome of operation and the number of tests positive for anismus (Table 6).

Table 2. The influence of anismus (A), defined by radiological criteria, on the clinical outcome of rectocele repair in 71 patients. CARA represents the Central AnoRectal Angle and PARA the Posterior AnoRectal Angle

	No. pts. A+	Success-rate A+	No. pts. A–	Success-rate A–	*P**
CARA	24	67%	47	72%	0.78
PARA	20	60%	51	75%	0.26

(*A**, Signs of anismus; *A*–, no signs of animus; *P**, significance of difference (A+ vs A–)

Table 3. The influence of anismus, defined by EMG criteria, on the clinical outcome of rectocele repair in 61 patients

	No. pts. A+	Success-rate A+	No. pts. A–	Success-rate A–	*P**
EMG	29	76%	32	66%	0.41

*P**, Significance of difference (A+ vs A–). *A*+, signs of anismus; *A*–, no signs of anismus

Table 4. The influence of anismus, defined by BET criteria, on the clinical outcome of rectocele repair in 35 patients. BET represents the Balloon Expulsion Test

	No. pts. A+	Success-rate A+	No. pts. A–	Success-rate A–	*P**
BET	25	64%	10	60%	1.00

*P**, Significance of difference (A+ vs A–). *A*+, signs of anismus; *A*–, no signs of anismus

Table 5. Agreement between the various tests used to diagnose anismus

Combination of tests	No. pts.[a]	Observed agreement	Kappa-value
CARA vs PARA	71	83%	0.61
CARA vs EMG	58	62%	0.23
PARA vs EMG	58	55%	0.09
CARA vs BET	34	41%	0.00
PARA vs BET	34	47%	0.09
EMG vs BET	35	60%	0.25

[a] Number of patients in whom both tests were performed

Table 6. Relationship between the number of tests positive for anismus and the outcome of rectocele repair in 34 patients. Using evacuation proctography (EP), anismus was diagnosed when there was a decrease or insufficient increase of the anorectal angle either using CARA and/or using PARA

	Number of tests positive for anismus			
	0	1	2	3
No. pts.	5	12	12	5
No. pts. with success	2 (40%)	9 (75%)	7 (58%)	4 (80%)

* Significance: $P = 0.48$

Discussion

Obstructed defecation is a common symptom in every day medical practice, particularly in elderly people. Since the publication of Redding in 1965, it has become obvious that a rectocele can give rise not only to gynaecological symptoms, but also to obstructed defecation [21]. Most often the evacuation difficulties arise during the fourth or fifth decade of life, when progressive weakening of the supportive tissues occurs [22]. On radiological examination small rectoceles have been shown in 10–50 percent of healthy women with a normal defecation pattern [23–28]. Larger rectoceles are more likely to be associated with disordered defecation and these rectoceles are usually nominated as "symptomatic". The symptoms are probably caused by stool being trapped in the sacculation.

In patients with a symptomatic rectocele, anismus appears to be a frequent finding as has been reported by other authors [18, 28–31]. The impact of anismus on rectocele repair however has not been evaluated by these authors and it has been suggested that anismus might be a causative factor in the formation of the rectocele [30]. Recently Johansson et al. stated that rectocele repair in patients with anismus is not advocated because of the dissatisfying results [18]. However, prospective studies on this issue are lacking. Our study is the first one in which the influence of anismus on the clinical outcome of surgical treatment of symptomatic rectocele is evaluated. It shows that results of rectocele repair in patients with signs of anismus are similar to those obtained in patients without evidence of anismus. This finding is irrespective to the method of diagnosing anismus.

Recently, doubt has been raised upon the clinical significance of anismus [32]. EMG signs of anismus have been found not only in patients with obstructed defecation, but also in patients with colonic inertia, faecal incontinence and even in control subjects [29, 31–37]. On evacuation proctography, the angle between the anal canal and the rectal ampulla depends on the tone of the puborectalis muscle. To define the anorectal angle, CARA, and PARA are used. During attempted defecation, flattening of the anorectal angle occurs, due to relaxation of the puborectalis muscle. Absence of this flattening on straining is considered to be an important radiological sign of anismus [3, 38–40]. In control subjects, lack of increase in anorectal angle was observed in 5 to 50% [22, 25–27, 38, 41–43]. Comparing data of EMG and EP techniques, in most studies a poor correlation is found [5, 39, 40, 44, 45]. This finding has been confirmed in our study. Preston and Lennard-Jones developed a balloon model for the investigation of obstructed defecation [2]. They observed that severely constipated patients were unable to expel a balloon. However, several studies have shown a poor correlation of BET with EMG, as has been confirmed in our study [4, 42, 43, 45]. It has been stated that using EMG, BET and EP, the true incidence of anismus is overestimated, because these tests poorly represent the natural physiology of defecation [2, 31, 42]. It has been suggested that artificially false-positive results may ensue from the patient's fear of evacuating in front of other people, resulting in overdiagnosis of anismus [29, 31, 33]. Considering the lack of agreement between the different diagnostic tests and the prevalence of anismus in healthy subjects, the question arises to whether anismus is indeed a distinct pathologic entity or merely a coincidental finding with no clinical relevance.

We conclude that rectocele repair is beneficial for patients with obstructed defecation and anismus should not be considered a contraindication for surgical treatment of patients with symptomatic rectocele.

References

1. Wasserman IF (1964) Puborectalis syndrome (rectal stenosis due to anorectal spasm). Dis Colon Rectum 7: 87–98
2. Preston DM, Lennard-Jones JE (1985) Anismus in chronic constipation. Dig Dis Sci 30: 413–418
3. Kuijpers HC, Bleijenberg G (1985) The spastic pelvic floor syndrome. A cause of constipation. Dis Colon Rectum 28: 669–672
4. Fleshman JW, Dreznik Z, Cohen E, Fry RD, Kodner IJ (1992) Balloon expulsion test facilitates diagnosis of pelvic floor outlet obstruction due to nonrelaxing puborectalis muscle. Dis Colon Rectum 35: 1019–1025
5. Miller R, Duthie GS, Bartolo DCC, Roe AM, Locke-Edmunds J, Mortensen NJ (1991) Anismus in patients with normal and slow transit constipation. Br J Surg 78: 690–692
6. Enck P (1993) Biofeedback training in disordered defecation. A critical review. Dig Dis Sci 38: 1953–1960
7. Papachrysostomou M, Smith AN (1994) Effects of biofeedback on obstructive defecation – reconditioning of the defecation reflex? Gut 35: 252–256
8. Pitchford CA (1967) Rectocele: a cause of anorectal pathologic changes in women. Dis Colon Rectum 10: 464–467
9. Sullivan ES, Leaverton GH, Hardwick CE (1968) Transrectal perineal repair: an adjunct to improved function after anorectal surgery. Dis Colon Rectum 11: 106–114
10. Capps WF (1975) Rectoplasty and perineoplasty for the symptomatic rectocele: a report of fifty cases. Dis Colon Rectum 18: 237–244
11. Khubchandani IT, Sheets JA, Stasik JJ, Hakki AR (1983) Endorectal repair of recto cele. Dis Colon Rectum 26: 792–796
12. Sehapayak S (1985) Transrectal repair of rectocele: an extended armamentarium of colorectal surgeons. A report of 355 cases. Dis Colon Rectum 28: 422–433
13. Block IR (1986) Transrectal repair of rectocele using obliterative sutures. Dis Colon Rectum 29: 707–711
14. Sarles JC, Arnaud A, Selezneff I, Olivier S (1989) Endo-rectal repair of rectocele. Int J Colorect Dis 4: 167–171
15. Arnold MW, Stewart WRC, Aguilar PS (1990) Rectocele repair. Four year experience. Dis Colon Rectum 33: 684–687
16. Janssen LWM, Dijke CF van (1994) Selection criteria for anterior rectal wall repair in symptomatic rectocele and anterior rectal wall prolapse. Dis Colon Rectum 37: 1100–1107
17. Mellgren A, Anzen B, Nilsson BY, Johansson C, Dolk A, Gillgren P, Bremmer S, Holmstrom B (1995) Results of rectocele repair. A prospective study. Dis Colon Rectum 38: 7–13
18. Johansson C, Nilsson BY, Holmstrom B, Dolk A, Melgren A (1992) Association between rectocele and paradoxical sphincter response. Dis Colon Rectum 35: 503–509
19. Ginai AZ (1990) Technical report: evacuation proctography (defecography) a new seat and method of examination. Clin Rad 42: 214–216
20. Altman DG (1991) Practical statistics for medical research. Chapman & Hall, London, pp 403–405
21. Redding MD (1965) The relaxed perineum and anorectal disease. Dis Colon Rectum 28: 279–282
22. Cali LR, Christensen MA, Blatchford GJ, Thorson AG (1992) Rectoceles. Sem Coloc Rectal Surg 3: 132–137
23. Shorvon PJ, McHugh S, Diamant NE, Somers S, Stevenson GW (1989) Defecography in normal volunteers: results and implications. Gut 30: 1737–1749

24. Selvaggi F, Pesce G, Scotto di Carlo E, Maffetoni V, Canonico S (1990) Evaluation of normal subjects by defecographic technique. Dis Colon Rectum 33: 698 – 702
25. Goei R, Engelshoven J van, Schouten H, Baeten C, Stassen C (1989) Anorectal function: defecographic measurement in asymptomatic subjects. Radiology 173: 137 – 141
26. Forenames MG, Walled A, Careen B, Badman DH (1991) Evacuation proctography in normal volunteers. Invest Rad 26: 581 – 585
27. Trundle GK, Barroom CHI, Lennard-Jones JE (1988) Radiologic studies of rectal evacuation in adults with idiopathic constipation. Dis Colon Rectum 31: 190 – 197
28. Johansson C, Nilsson BY, Mellgren A, Dolk A, Holmstrom B (1992) Paradoxical sphincter reaction and associated colorectal disorders. Int J Colorect Dis 7: 89 – 94
29. Jones PN, Lubowski DZ, Swash M, Path MRC, Henry MM (1987) Is paradoxical contraction of puborectalis muscle of functional importance? Dis Colon Rectum 30: 667 – 670
30. Johansson C, Ihre T, Holmstrom B, Nordstrom E, Dolk A, Broden G (1990) A combined electromyographic and cineroradiologic investigation in patients with defecation disorders. Dis Colon Rectum 33: 1009 – 1013
31. Barnes PRH, Lennard-Jones JE (1988) Function of the striated anal sphincter during straining in control subjects and constipated patients with a radiologically normal rectum or idiopathic megacolon. Int J Colorect Dis 3: 207 – 209
32. Schouten WR, Gosselink M, Briel JW, Auwerda JJA (1995) Anismus: fact or fiction? Dis Colon Rectum 38: 22
33. Duthie GS, Bartolo DCC (1992) Anismus: the cause of constipation? Results of investigation and treatment. World J Surg 16: 831 – 835
34. Wexner SD, Marchetti F, Salanga VD (1991) Neurophysiologic assessment of the anal sphincters. Dis Colon Rectum 34: 606 – 612
35. Rutter KRP (1974) Electromyographic changes in certain pelvic floor abnormalities. Proc R Soc Med 67: 53 – 56
36. Pemberton FH, Rath DM, Ilstrup DM (1991) Evaluation and surgical treatment of severe chronic constipation. Ann Surg 214: 403 – 413
37. Pezim ME, Pemberton JH, Levin KE, Litchy WJ, Phillips SF (1993) Parameters of anorectal and colonic motility in health and severe constipation. Dis Colon Rectum 36: 484 – 491
38. Barroom CHI, Trundle GK, Lennard-Jones JE (1988) Evacuation proctography: an investigation of rectal expulsion in 20 subjects without defecatory disturbance. Gastrointest Radiol 13: 72 – 80
39. Fink RL, Roberts LJ, Scott M (1991) The role of manometry, electromyography and radiology in the assessment of intractable constipation. Aust NZ J Surg 61: 959 – 964
40. Jorge JMN, Wexner SD, Ger GC, Salanga VD, Nogueras JJ, Jagelman DG (1993) Cinedefecography and electromyography in the diagnosis of nonrelaxing pubo rectalis syndrome. Dis Colon Rectum 36: 668 – 676
41. Bartolo DCC, Roe AM, Virjee J, Mortensen NJ, Locke-Edmunds JC (1988) An analysis of rectal morphology in obstructed defecation. Int J Colorect Dis 3: 17 – 22
42. Read NW, Timms JM, Barfield LJ (1986) Impairment of defecation in young women with severe constipation. Gastroenterol 90: 53 – 60
43. Roe AM, Bartolo DCC, Mortensen NJMcC (1988) Slow transit constipation. Comparison between patients with or without previous hysterectomy. Dig Dis Sci 33: 1159 – 1163
44. Lubowski DZ, King DW, Finlay IG (1992) Electromyography of the pubococcygeus muscles in patients with obstructed defecation. Int J Colorect Dis 7: 184 – 187
45. Dahl J, Lindquist BL, Tysk C, Leissner P, Philipson L, Jarnerot G (1991) Behavioural medicine treatment in chronic constipation with paradoxical anal sphincter contraction. Dis Colon Rectum 34: 769 – 776