

Could the results of posterior colporrhaphy and levatoroplasty be improved by abdominal sacrocolporectomy?



Ann. Ital. Chir., 2020 91, 2: 220-224
pii: S0003469X20030055

Natalia V. Oleynik, Vladimir F. Kulikovskiy, Ahmed Abulatifa, Arina P. Krivchikova,
Natalia N. Bratisheva, Marina S. Alenicheva, Dmitry A. Storozhilov, Andrey V. Naumov

Surgery and Coloproctology Department, Belgorod State National Research University, Belgorod, Russia

Could the results of posterior colporrhaphy and levatoroplasty be improved by abdominal sacrocolporectomy?

AIM: *The aim of our study was to improve poor results of preliminary colporrhaphy and anterior levatoroplasty performed for patients with low and middle rectocele.*

MATERIAL OF STUDY: *55 patients who had undergone colporrhaphy and anterior levatoroplasty for rectocele in 2012-2015 and contacted the clinic with complaints of ongoing obstructive defecation were included in this investigation. They had a comprehensive medical examination using defecography, ultrasound, magnetic resonance imaging, anorectal functional tests. This study revealed perineum descending in 20 patients, apical prolapse 23 patients, and 12 patients demonstrated simultaneous pathology. All these patients were performed additional abdominal sacrocolporectomy in 2015-2017 and results were estimated.*

RESULTS: *Abdominal sacrocolporectomy significantly improved anatomical and functional results of previous surgery which was confirmed by the listed methods of research. The average location of the anorectal area and utero-cervical zone became higher. So, perineum descendents and apical prolapsed were improved.*

DISCUSSION: *Sacrocolporectomy is often used for surgical treatment of pelvic organ prolapse. Our study shows its efficiency in patients with perineum descending and upper rectocele.*

CONCLUSIONS: *Abdominal sacrocolporectomy is an effective method of surgical correction of relapses and unsatisfactory results of treatment of patients with pelvic prolapse, manifested by perineum body descending and apical prolapse.*

KEY WORDS: Apical prolapse, Levatoroplasty, Perineum descending, Rectocele, Sacrocolporectomy

Introduction

Prolapse of pelvic organs can be isolated or combined with the descending of the perineum¹. Pelvic prolapse is a leading health problem affecting women of all ages. The prevalence of this pathology increases with age and makes 40% in women of 50-60 years and 50-70% in women over 60 years². Prolapse of the posterior seg-

ment of the pelvic floor is the cause of difficult defecation, so-called obstructive defecation. The syndrome of perineum descending was described a few decades ago by A. Parks, but it is still not always diagnosed and is difficult to treat³. For the correction of rectocele is proposed and widely used anterior levatoroplasty. However, the literature notes their insufficient effectiveness and a short relapse-free period⁴. In recent years abdominal sacrocolporectomy is widely used for surgical treatment of full rectal and uteri prolapsed^{5,6}. Although, data on its use for correction of rectocele and perineum descending are not available in the literature. Until now, there is no effective method of surgical correction of perineal prolapse and rectocele available on its background, and there are no guidelines for the treatment of these disorders.

Pervenuto in Redazione Dicembre 2018. Accettato per la pubblicazione Gennaio 2019

Correspondence to: Natalia V. Oleynik, Surgery Coloproctology Department, Belgorod State National Research University, 85 Podedy Str, Belgorod, 308015, Russia (e-mail: oleynik_nv@mail.ru)

Material and Methods

55 patients who had undergone posterior colporrhaphy and anterior levatoroplasty for rectocele in 2012-2015 and contacted Surgery and Coloproctology Department of Belgorod State National Research University in 2016-2017 with complaints of ongoing obstructive defecation were included in this study. The other patients with low transit constipation were not included in this investigation. All included patients had intact uterus. The patients had the following demographic indicators: all were white race, mean age was 57.6 ± 6.8 years, body mass index (kg/m^2) was 27.4 ± 3.5 , mean parity 2.4 ± 0.7 , menopausal were 39 (70.9%), 12 of 39 patients used estrogen therapy, smoker were 14 of 55 patients (25.4%); comorbidity included obstructive pulmonary disease in 11 (20%), coronary heart disease - 17 (30.9%), diabetes mellitus - 7 (12.7%). Clinical examination included digital, rectal and vaginal, to estimate rectocele relapse and to exclude concomitant pathology such as tumors. For the same purpose endoscopic procedures were performed. Ultrasound examination was carried out to exclude concomitant pathology of the pelvic organs. Defecography was performed to study the reasons for the preservation of obstructive defecation. Magnetic resonance imaging used for visualization of pelvic organs and pelvic floor at once and for diagnostic of apical prolapse using criteria of the uterine-cervical segment (UCS) location in relation to the pubo-coccygeal line (PCL). These criteria in the normal's were developed in our Department and represented in the rest 28.7 ± 1.6 mm and 16.8 ± 1.7 mm in straining. Mobility in norm should not exceed 10 mm. Increased mobility was considered a sign of weakness of the utero-sacral ligaments and was assessed as apical prolapse. Also, using MRI we determined the effectiveness of levatoroplasty in the absence of diastase between muscles levator ani. Using these methods of investigation it has been determined that no one patient had rectocele relapse, 20 patients had perineum descending, 23 patients had upper rectocele and apical prolapse, and 12 patients had both pathology. Retrospective data previously to colporrhaphy and levatoroplasty have shown that they hadn't had such simultaneous pathology before. Functional anorectal test and anorectal manometry using Poligraf ID device were performed to confirm patients' subjective sensations. To improve the results abdominal sacrocolporectopexy using mesh implant was done. Given the previous levatoroplasty, sacrocolporectopexy was performed in a simplified version. There was no need for dissection of the entire rectovaginal septum up to the anal sphincter. We fixed the mesh only in the area of its upper third to the vagina and rectum. All patients were examined 12 months after the operation using the above-mentioned methods. Statistical processing of the results obtained was carried out on a personal computer using the statistical program Biostatistics. The distribution of the studied features was

indicated as "mean value \pm standard deviation" ($\bar{x} \pm \sigma$), n - sample size, i.e. group size. For comparison of mean values was used one factory dispersion analysis according to Newman-Kales criterion. Differences were considered significant at $p < 0.05$.

Results

We did not notice any serious complications during the operation and in the postoperative period. We did not observe such intraoperative complications as damage of the presacral venous plexus vessels, rectum wall or ureters. The average blood loss was 225 ± 18.7 ml. The average duration of the surgery was 65 ± 7.8 min. There were no significant septic complications in the postoperative period. Purulent complications noted from the laparotomy wounds in two patients were treated successfully by drainage and use of local antibacterial agents. The frequency of postoperative complications associated with mesh implantation was low. Vaginal erosion was observed only in 1 (1.8%) patient. In this patient with erosion, a local excision of the mesh area was made, after which the erosion was epithelialized.

All patients noted improvement of emptying function after surgery in long follow-up. Digital examination of the rectum in the postoperative period did not reveal rectocele in any patient. Defecography showed improvement of anatomical and functional results in patients in the postoperative period. As a result of surgical treatment, the level of perineum against PCL in patients rose to an almost normal level of -3.5 ± 0.7 cm in the rest in comparison with the preoperative value -5.1 ± 0.8 cm ($P = 0.032$). In straining these value were -8.4 ± 0.9 cm before operation and -6.1 ± 0.7 cm after operation ($P = 0.039$). The value of the posterior anorectal angle (ARA) at rest before surgery was much higher than normal, amounting to $105.8^\circ \pm 2.6^\circ$, after operation it became $95.8^\circ \pm 1.5^\circ$ ($P = 0.000$). In straining the values were $151.9^\circ \pm 4.1^\circ$ and $135.9^\circ \pm 3.8^\circ$ accordingly ($P = 0.010$).

Before surgical treatment, there was a decrease in evacuation function in patients, the speed of barium evacuation from the rectum was 3.4 ± 0.5 g/sec. 12 months after surgery, this indicator was better: 5.3 ± 0.5 g / sec ($P = 0.011$). The percentage of barium suspension remaining after emptying in the rectum before surgery exceeded the normal values by 2 times, amounting to $39.7\% \pm 5.8\%$. After the operation, the percentage of barium remaining after emptying practically corresponded to the norm, amounting to $19.2\% \pm 4.9\%$ ($P = 0.000$). Key indicators of defecography characterizing the anatomy and functions of pelvic floor in patients before sacrocolporectopexy and in postoperative period are presented in Table I. The magnitude of the normal indicators is presented according to the data of our clinic patients with undisturbed functions of the pelvic floor.

Prior to surgical treatment in patients with apical pro-

TABLE I - Key indicators of defecography characterizing the anatomy and functions of pelvic floor in patients before sacrocolporectomy and in postoperative period

Accessed indications	Normal n=50	Before operation n=32	After operation n=32	p-value
Level of anorectal junction against PCL (cm)				
At rest	-2.9±0.9	-5.1±0.8	-3.5±0.7	0.032
At straining	-5.6±1.0	-8.4±0.9	-6.1±0.7	0.039
Posterior ARA (degrees)				
At rest	92°±1.5°	105.8°±2.6°	95.8°±1.5°	0.000
At straining	137°±1.5°	151.9°±4.1°	135.9°±3.8°	0.010
Barium evacuation speed (g/sec)	5.6±0.9	3.4±0.5	5.3±0.5	0.011
Residual barium content (%)	16.5±5.3	39.7±5.8	19.2±4.9	0.000

TABLE II - Results of apical prolapse correction in patients according to MRI data

Accessed indications	Normal n=50	Before operation n=35	After operation n=35	p-value
UCS area location (mm)				
At rest	28.7±1.6	12.5±1.1	-2.9±0.3	0.000
At straining	16.8±1.7	31.6±1.4	18.8±0.9	0.000
Mobility of UCS at straining (mm)	9.2±0.8	17.5±1.7	8.5±0.7	0.000

TABLE III - Assessment of reflex function of the rectum before and after surgery

Accessed indications	Normal n=52	Before operation n=55	After operation n=55	p-value
Sensitivity threshold (ml)	18.7±5.1	33.2±4.9	21.9±4.1	0.080
Volume causing the urge to defecate (ml)	72.3±3.1	83.2±5.4	68.3±5.1	0.047
Amplitude of the recto-anal inhibitory reflex (mm Hg)	32.8±2.6	48.4±6.3	33.9±5.8	0.054
Duration of the recto-anal inhibitory reflex (sec)	15.1±1.9	29.4±5.6	16.2±1.7	0.026

lapse, the UCS area was located at rest at 12.5±1.1 mm from PCL, in straining -2.9±0.3 mm, the mobility of the UCS was 17.5±1.7 mm. After surgical treatment, normalization of the position of UCS relative to PCL was noted. After 12 months, its value was 31.6±1.4 mm (P=0.000) at rest and 18.8±0.9 mm (P=0.225) at straining, the mobility of UCS at straining was 8.5±0.7 mm (P=0.752) (Table II). Also, MRI showed that the levator diastasis after levatoroplasty were not in any patient. Studies have shown that 12 months after surgery, the reflex function of the rectum improved in patients. Before the operation, the sensitivity threshold in the study group was 33.2±4.9 ml. 12 months after the operation, there was a significant decrease in the threshold of sensitivity in patients to 21.9±4.1 ml (P=0.080). The volume causing the urge to defecate before surgery exceeded the normal values of this indicator, amounting to 83.2±5.4 ml. After surgical treatment, this indicator improved to 68.3±5.1 ml (P=0.047). Also, studies have shown a decrease in the amplitude of the recto-anal

inhibitory reflex from 48.4±6.3 mm Hg till 33.9±5.8 mm Hg (P=0.054), and its duration from 29.4±5.6 sec till 16.2±1.7 sec (P=0.026) (Table III). Test results with ejection balloon also confirmed the improvement of the function of emptying the rectum. Prior to the operation, 19 (34.5%) of 55 patients were pushed out of the 50 ml balloon within 1 minute. After the operation, the same balloon without difficulty pushed all the patients.

Discussion and Comments

Rectocele is the protrusion of the anterior wall of the rectum into the vagina and the most common pathology of the pelvic floor ⁷. Most often, rectocele is manifested by obstructive defecation, which is characterized by the need for strong straining during defecation, a feeling of incomplete emptying of the rectum during defecation, the need for manual assistance ⁸. There is an opinion, that in some cases, rectocele is a consequence,

but not a cause of defecation⁹. Perhaps this was the reason for the unsatisfactory results of posterior colporrhaphy and levatoroplasty in patients who applied to our clinic. This is confirmed by the fact that before the operation they had no perineal prolapse and apical prolapse. On the other hand, pelvic prolapse is rarely found in an isolated form, more often it is a combined pathology. Often, the correction of one anatomical disorder compensatory develops another¹⁰.

With the advent of the Prolift system (Gynecare, Pelvic Floor Repair System, Johnson & Johnson comp. US) in 2004, we used it to reconstruct the pelvic floor. Our research and studies of other authors have shown that the fixation of mesh sleeves to the pelvic tissues over a great length allows you to correct the position of not only the pelvic organs, including apical prolapsed, but also the level of the perineum location¹¹. However, a large number of complications associated with the mesh of large sizes and warnings of the FDA in their use forced us to abandon this technique¹². Since then we went back to the plastic rectocele with own tissues of the patient using posterior colporrhaphy and anterior levatoroplasty. Especially since there are results of studies on transvaginal mesh installation, which indicate the absence of postoperative differences with regards to the symptoms of prolapse, and the anatomical results are even worse than in plastic surgery with native tissues¹³. Although M. Karram and C. Maher (2013) concluded that the most effective method of rectocele correction is posterior colporrhaphy, since there is a high incidence of dyspareunia after levatoroplasty, our patients did not observe it¹⁴.

It is believed that surgical treatment of pelvic organ prolapse can be performed by perineal or abdominal access. These methods have their own advantages and disadvantages¹⁵. However, perineal approach using native tissues was ineffective in patients who came to our clinic again. One of the most important advances in the surgical treatment of pelvic organ prolapse in recent years has been the conclusion that apical support is the key to achieving successful prolapse reconstruction^{16,17}. We agree that the reason for the preservation of obstructive defecation in some of our patients was the absence of apical support. Other authors also note that only 30-40% of women in need receive apical support¹⁸. This indicates that the apical prolapse is not always diagnosed in time. Our medical center has recently developed a method of MRI diagnosis of apical prolapse in the early stages of development or predisposition to it. Increased mobility of the uterine-cervical segment indicates weakness of the utero-sacral ligaments and gradually leads to apical prolapse.

Therefore, to correct the results of treatment, we decided to use sacrocolporectopexy with abdominal access. It is concluded that sacrocolporectopexy has better anatomical results and a smaller percentage of relapses¹⁹. Although in the literature we have found no results of

its use for the correction of the perineum level. Performed postoperative defecography showed that sacrocolporectopexy allows correcting the position of the perineum at rest and at straining.

The question of whether the use of mesh in sacrocolporectopexy is also debatable. It is believed that the use of the mesh reduces the percentage of recurrences²⁰. However, the percentage of erosion and exposure of the mesh is high and ranges from 2% to 10%²¹. Although we cannot compare the results of the use of previous generations of meshes with modern, lighter and more porous. As recommended by other surgeons, we used the mesh of I type²². The risk of erosion of the mesh also depends on the type of suture material with which it is fixed. Traditionally, with open sacrocolporectopexy, the mesh is fixed by non-absorbable sutures. But many surgeons recently began to give preference to long-absorbable suture material. In a retrospective study, comparing the non-absorbable and long-absorbable monofilament suture material, it was shown that the use of the latter allowed reducing the percentage of grid erosion: 3.7% and 0%, respectively²³. We also used a long-term absorbable suture material, and erosion of the mesh was observed in only one patient, which was 1.8%. Thus, the problem of treatment of rectocele has not yet been completely solved. The problem of choosing an effective and safe surgical method of rectocele correction remains relevant.

Conclusions

Our study showed that rectocele correction by posterior colporrhaphy and anterior levatoroplasty is an effective method of treatment of this pathology. However, these results may deteriorate over time. In some patients with persisting constipation perineum prolapse and apical prolapse gradually develop. Abdominal sacrocolporectopexy is an effective method of surgical correction of relapses and unsatisfactory results of treatment of patients with pelvic prolapse, manifested by perineum body descending and apical prolapse.

Riassunto

SCOPO DEL LAVORO: Lo scopo del nostro studio è stato quello di migliorare i risultati scarsi di colporrafia preliminare e levatoroplastica anteriore eseguite per pazienti con rectocele basso e medio.

MATERIALE E METODI: 55 pazienti che erano stati sottoposti a colporrafia e levatoroplastica anteriore per rectocele nel 2012-2015 e hanno contattato la clinica con problemi di defecazione ostruttiva in atto e sono stati inclusi in questa indagine. Hanno fatto una visita medica completa usando defecografia, ecografia, risonanza magnetica, test funzionali anorettali. Questo studio ha

rivelato una diminuzione del perineo in 20 pazienti, prolasso apicale in 23 pazienti e 12 pazienti hanno mostrato altra patologia contemporanea. Tutti questi pazienti sono stati sottoposti ad ulteriore sacrocolporectopessia addominale nel 2015-2017 e controllati nei risultati.

RISULTATI: La sacrocolporectopessia addominale ha migliorato significativamente i risultati anatomici e funzionali di un precedente intervento chirurgico, come confermato dai metodi di controllo utilizzati ed elencati. La posizione media della zona ano-rettale e della zona utero-cervicale si è spostata più in alta, migliorando quindi l'abbassamento del perineo e migliorando il prolasso apicale.

DISCUSSIONE: La sacrocolporectopessia è spesso usata per il trattamento chirurgico del prolasso degli organi pelvici. Il nostro studio mostra la sua efficienza in pazienti con perineum discendente e rettocele superiore.

CONCLUSIONE: la sacrocolporectopessia addominale è un metodo efficace di correzione chirurgica delle recidive e risultati insoddisfacenti del trattamento di pazienti con prolasso pelvico, che si manifesta con prolasso del corpo perineo discendente e apicale.

References

- Petros PP, Inoue H: *Transvaginal perineal body repair for low rectocele*. Tech Coloproctol, 2013; 17: 449-54.
- Chaudhry Z, Tarnay C: *Descending perineum syndrome: a review of the presentation, diagnosis, and management*. Int. Urogynecology Journal, 2016; 27: 1149-156.
- Parks AG, Porter NH, Hardcastl J: *The syndrome of descending perineum*. Proceeding of the Royal Society of Medicine, 1966; 59: 477-82.
- Zimmermann EF, Richard RS, Daniels IR et al.: *Transperineal rectocele repair: A systematic review*. ANZ J of Surgery, 2017; 87: 773-79.
- Consten EC, van Iersel JJ, Verheijen PM, Broeders IA, Wolthuis AM, D'Hoore A: *Long-term outcome after laparoscopic ventral mesh rectopexy: an observational study of 919 consecutive patients*. Ann Surg, 2015; 262:742-47.
- Riss S, Winstanley J, Collie M: *Laparoscopic ventral mesh rectopexy for obstructive defecation syndrome: Still the way to go?* International Urogynecology Journal, 2017; 28: 979-81.
- Mustain WC: *Functional disorders: Rectocele*. Clin Colon Rectal Surg, 2017; 30: 63-75.
- Ellis CN, Essani R: *Treatment of obstructed defecation*. Clin Colon Rectal Surg, 2012; 25: 24-33.
- Hicks CW, Weinstein M, Wakamatsu M, Pulliam: *Are rectocele the cause or the result of obstructed defaecation syndrome? A prospective anorectal physiology study*. Colorectal Dis, 2013; 15: 993-99.
- Costa J, Towobola B, McDowel C, Ashe R: *Recurrent pelvic organ prolapse (POP) following traditional vaginal hysterectomy with or without colporrhaphy in an Irish population*. Ulster Med J, 2014; 83: 16-21.
- Meyer I, Mc Gwin G, Swain TA, Alvarez MD, et al.: *Synthetic graft augmentation in vaginal prolapse surgery: Long-term objective and subjective outcomes*. J Minim Invasive Gynecol, 2016; 23: 614-21.
- FDA: *Urogynecologic surgical mesh: update on the safety and effectiveness of transvaginal mesh placement for pelvic organ prolapse*. US Food and Drug Administration; 2011. [accessed March 20, 2017]. Available at: <http://bit.ly/2oHG72C>.
- Sung VW, Rardin CR, Raker CA, Lasala CA, Myers DL: *Porcine subintestinal submucosal graft augmentation for rectocele repair: A randomized controlled trial*. Obstet Gynecol, 2012; 119: 125-33.
- Karram M, Maher C: *Surgery for posterior vaginal wall prolapse*. Int Urogynecol J, 2013; 24:1835-841.
- Barber MD, Maher C: *Epidemiology and outcome assessment of pelvic organ prolapse*. Int Urogynecol J, 2013; 24:1783-790.
- Summers A, Winkel LA, Hussain HK, DeLancey JO: *The relationship between anterior and apical compartment support*. Am J Obstet Gynecol, 2006; 194:438-43.
- Alas AN, Bresee C, Toubi K, Rasid R: *Measuring the quality of care provided to women with pelvic organ prolapsed*. Am J Obstet Gynecol, 2015; 212:471-79.
- Stewart JR, Hamner JJ, Heit MN: *Thirty years of cystocele/rectocele repair in the United States*. Female Pelvic Med Reconstr Surg, 2016; 22:243-47.
- Maher C, Feiner B, Baessler K, Schmid C: *Surgical management of pelvic organ prolapse in women*. Cochrane Database of Systematic Reviews, 2013; 4; available at <https://onlinelibrary.wiley.com/doi/10.1002/14651858.CD004014.pub5/refere>
- Maher CF, Qatawneh AM, Dwyer PL, Carey MP, et al.: *Abdominal sacral colpopexy or vaginal sacrospinous colpopexy for vaginal vault prolapse: A prospective randomized study*. Am J Obstet Gynecol, 2004; 190: 20-26.
- Cundiff GW, Varner E, Visco AG, Zyczynski HM, et al.: *Risk factors for mesh/suture erosion following sacral colpopexy*. Am J Obstet Gynecol, 2008; 199:688-92.
- Nygaard I, Brubaker L, Zyczynski HM, et al.: *Long-term outcomes following abdominal sacrocolpopexy for pelvic organ prolapsed*. JAMA, 2013; 309:2016-2024.
- Shepherd JP, Higdon HL, Stanford EJ, Mattox T: *Effect of suture selection on the rate of suture or mesh erosion and surgery failure in abdominal sacrocolpopexy*. Female Pelvic Med Reconstr Surg, 2010; 16: 229-33.