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Laparoscopic Lateral Hysteropexy versus Hysterosacropexy in Women with Stage III Uterine Prolapse

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Rezumat

Histeropexia laterală laparoscopică versus histerosacropexia la pacientele cu prolaps uterin în stadiul III

Introducere: Tehnicile minim invazive în patologia ginecologică au beneficii multiple, „standardul de aur" al prolapsului uterin fiind gestionat în prezent laparoscopic. Histeropexia laterală laparoscopică şi histerosacropexia sunt tehnici chirurgicale care pot fi efectuate pentru prolapsul uterin. Managementul laparoscopic al unor astfel de cazuri este recomandat, dar necesită echipe bine pregătite în chirurgia minim invazivă.
Metodă: Acest studiu este o analiză prospectivă a pacientelor care au necesitat tratament chirurgical pentru prolapsul uterin în stadiul III, internate în Secția de Chirurgie a Spitalului Județean Constanța, la care s-a efectuat histeropexia laterală laparoscopică sau histerosacropexia laparoscopică.
Rezultate: În perioada 2016-2020, 61 de paciente au fost internate cu prolaps uterin în stadiul III care a necesitat intervenție chirurgicală. Toate pacientele au fost operate pe cale laparoscopică. Simptomatologia a fost dominată de incontinență urinară (50%, 44,89%) şi constipatie (16,66%, 18,36%). Complicațiile intraoperatorii au fost întâlnite la 33,3% dintre cazurile supuse histerosacropexiei laparoscopice şi în 8,16% la histeropexie laterală laparoscopică. La un an, rata de recurență a fost de 2,04% pentru pacientele care au suferit histeropexie laterală şi de 8,33% pentru pacientele care au suferit histeropexie. Nici o pacientă nu a avut o recidivă la vizita de 3 ani.
Concluzii: Histeropexia laterală laparoscopică se conturează ca o procedură adecvată, sigură şi eficientă pentru tratarea prolapsului uterin, care necesită atenție şi dezvoltare clinică suplimentară pentru a înțelege pe deplin locul său chirurgical în tratamentul defectelor pelvine.

Cuvinte cheie: laparoscopie, histeropexie laterală, histerosacropexie, complicații, urmărire post-operatorie

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Abstract

Background: Minimally invasive techniques in gynecological pathology have well-known benefits, the "gold standard" of uterine prolapse being currently managed laparoscopically. Laparoscopic lateral hysteropexy and hysterosacropexy are surgical techniques that can be performed for uterine prolapse. Laparoscopic management of such cases is recommended, but requires well-trained teams in laparoscopic surgery.

Methods: This study is a prospective analysis of patients who required surgical treatment for stage III uterine prolapse, hospitalized in the Surgery Department of Constanta County Hospital, for which laparoscopic lateral hysteropexy or laparoscopic hysterosacropexy was performed.

Results: Between 2016-2020, 61 patients were hospitalized with stage III uterine prolapse that required surgery. All patients underwent laparoscopic surgery. Symptomatology was dominated by urinary incontinence (50%, 44.89%) and obstructive defecation (16.66%, 18.36%). Intraoperative complications were encountered in 33.3% of cases undergoing laparoscopic hysterosacropexy and in 8.16% undergoing laparoscopic lateral hysteropexy. At one year, the recurrence rate was 2.04% for patients who underwent lateral hysteropexy and 8.33% for patients who underwent hysterosacropexy. No patient had a recurrence at the 3-year visit.

Conclusions: Laparoscopic lateral hysteropexy is emerging as an appropriate, safe, and effective procedure to treat advanced apical prolapse that requires further clinical attention and development to fully understand its surgical place in the treatment of pelvic defects.

Key words: laparoscopy, lateral hysteropexy, hysterosacropexy, complications, follow-up

Introduction

The incidence of pelvic static disorders is reported in the specialized literature in percentages between 11% and 19% and the number of women who benefit from a surgical intervention to correct them varies between 1.9 and 4.9/1000 women per year (1). There is no consensus regarding the terminology, but the specialized literature constantly uses two terms that are essential for understanding this condition: pelvic statics and pelvic floor (2). Guidelines for pelvic organ prolapse are therefore ambiguous, resulting in variations in the means of diagnosis and of treatment, so that each surgical team manages in its own way, personalizing the surgical treatment according to the specifics of each patient (3).

Also, there is no consensus regarding the optimal treatment of pelvic static disorders, the reconstruction techniques being extremely numerous, from the classic techniques, which use the patients' own tissues to the laparoscopic techniques and those that use alloplastic materials (4,5).

Hysterectomy with suspension of the uterine ligaments can be an accepted treatment modality for uterine prolapse (6).

Minimally invasive techniques have gained a vast and growing area in recent years, becoming a "gold standard" for most surgical interventions, even for gynecological ones (7). The immediate recovery, the reduction of perioperative complications and the short and long-term benefits have made the laparoscopic technique a mandatory treatment modality (8). The benefits of minimally invasive techniques compared to open surgical interventions are already well known and exemplified in the specialized literature (9). The diversity of surgical techniques for the pathology of uterine prolapse made us study the clinico-pathological differences, postoperative complications and recurrence between two minimally invasive techniques that we routinely perform: laparoscopic lateral hysteropexy and laparoscopic hysterosacropexy.

Material and Methods

Study Group

From January 2016 to December 2020, a total of 61 patients underwent surgery for POP-Q stage III uterine prolapse, by the same surgical team.

Inclusion Criteria

1) uterine prolapse stage III 2) laparoscopic surgery; 2) elective case.

Exclusion Criteria

1) patients with oncological history; 2) previous surgical intervention for uterine prolapse; 3) open surgical interventions. Patients who met the inclusion criteria, were divided into two groups, Group I: patients who underwent laparoscopic hysterosacropexy (12 patients), Group II: patients

who underwent laparoscopic lateral hysteropexy (49 patients); the two groups were compared in terms of clinical and biological characteristics, regarding postoperative complications and the degree of recurrence. All patients were followed up postoperatively and clinically evaluated every 3 months.

Surgical Technique

All patients received the same preoperative management and postoperative treatment regardless of the associated comorbidities. A general clinical examination followed by a genital clinical examination was performed. The vaginal clinical examination was performed with an empty bladder and a full bladder, in the supine position and in the upright position, and consisted of: abdominal examination, pelvic examination, vaginal palpation, valve examination, rectal palpation and urinary incontinence evaluation tests. All three compartments of the pelvic floor were evaluated to identify structural changes. To evaluate uterine prolapse, we used the International Pelvic Organ Prolapse Quantification System (POP-Q) (10).

Paraclinical Investigations

1. Laboratory analyses: complete blood count, coagulation (aPTT, PT, INR, Fibrinogen), urea, creatinine, uric acid, serum ionogram (Na+, K+), blood glucose, transaminases, cholesterol, C-reactive protein, erythrocyte sedimentation rate, urine summary, urine culture);
2. Vaginal discharge examination;
3. Babeş-Papanicolau cytological test;
4. Fractional bioptic curettage in all pre- and postmenopausal patients to exclude cervical and endometrial neoplasms;
5. Abdominal ultrasound and with a vaginal probe to quantify the voiding residue.

Urodynamics: because our hospital is not equipped with equipment to perform urodynamic studies, they were performed in private clinics, with considerable costs. As a consequence, these urodynamic studies were performed pre- and postoperatively only in patients who presented urinary urgency or nocturia and in patients with bladder evacuation disorders.

For all patients, anti-infectious prophylaxis was performed by administering third-generation cephalosporins preoperatively and postoperatively at 12 and 24 h.

Antithrombotic prophylaxis was also performed by applying external compression cuffs and heparin in the first 24 hours post-operatively.

Surgical interventions include similar steps: with patient in Trendelenburg position and a urethro-vesical catheter is inserted, pneumoperitoneum is performed on Veress needle. Fitting the trocars: optical trocar – umbilical; working trocars: one suprapubic trocar and one trocar in each flank. Cranial mobilization of intestinal loops.

The surgical intervention of laparoscopic hysterosacropexy had the following operative steps: dissection in the pauci-vascular area of the broad ligaments, near the cervical-isthmic junction, anteriorly by sectioning the peritoneum of the vesico-uterine pouch, followed by sectioning the posterior parietal peritoneum, from the bottom of the Douglas sac to the promontory. The two ends of the polypropylene mesh are inserted through the two gaps created in the broad ligaments and are fixed anteriorly to the cervix with non-absorbable threads and posteriorly the mesh is fixed with titanium clips to the anterior longitudinal ligament of the promontory, ascending the uterine body. The mesh is covered by suture of the peritoneum with slow resorbable thread.

The surgical intervention of laparoscopic lateral hysteropexy had the following operative steps: dissection of the vesico-vaginal peritoneum near the cervical-isthmic junction, descending anteriorly in case of the existence of a cystocele. A polypropylene strip is inserted that is fixed with sutures on the anterior face of the uterine isthmus, and laterally this mesh is pulled bilaterally with forceps inserted through the inguinal canal following the path of the round ligaments and fixed to the aponeurosis of the anterolateral muscles of the abdomen. The mesh is covered by suture of the peritoneum with slow resorbable thread. No postoperative drains were used.

Study Endpoints

Primary Endpoint

The primary endpoint is to determine the lower rate of postoperative complications depending on the type of surgical procedure.

Secondary Endpoints

- Evaluation of the risk of distant recurrence according to each type of surgical procedure;
- Identification of the advantages and disadvantages of each type of surgical procedure in patients with the same symptomatology and disease stage.

Ethical Approval

The study was carried out in accordance with the Declaration of Helsinki on experimentation with human subjects and was approved by the Local Ethics Committee for the Approval of Clinical and Research Developmental Studies (No 7/2016). Informed consent was obtained from all patients, at the time of enrolment.

Statistical Analysis

For statistical analysis, SPSS version 28 (IBM Corp.; Armonk, NY, USA) was used. Results are presented as mean ± standard deviation or medians with range. Statistical significance was evaluated using Fisher's exact tests and Mann-Whitney U tests to compare proportions and continuous variables between the groups. We used paired sample t tests to compare mean continuous data within groups. A p-value < 0.05 was considered an indication of statistical significance.

Results

Included for analysis were 61 patients with 12 patients in the Group I (patients who underwent laparoscopic hysterosacropexy) and 49 patients in the Group II (patients who underwent laparoscopic lateral hysteropexy). Baseline parameters of the two groups are shown in *Table 1*. Patients with uterine hysterosacropexy were age-matched (within 5 years) with hysteropexy participants. The mean age of the patients with hysterosacropexy was 53.47±9.66

Table 1. Baseline comparisons of clinical and demography characteristics of patients with laparoscopic hysterosacropexy and laparoscopic lateral hysteropexy

Feature	Group I	Group II (n=12)	p-value (n=49)	
Age*(y)	53.47±9.66 (39-68)	56.19±8.84 (38-62)	0.193	
Environment				0.044
Urban	5 (41.66)	27 (55.10)		
Rural	7 (58.34)	22 (44.89)		
Behavior				
Tobacco				
• Never smoker		8 (66.66)	42 (67.74)	
• Former smoker		3 (25)	15 (24.19)	
• Current smoker		1 (8.33)	5 (8.08)	
Alcohol				
• Never consumer		11(91.66)	39 (79.59)	
• Moderate consumption		1 (8.33)	8 (16.32)	
• Binge drinking		0	2 (4.81)	
• Heavy alcohol use		0	0	
ACCI			0.013	
0-1		7 (58.33)	31 (63.26)	
2-3		4 (33.3)	8 (16.32)	
4-5		1 (8.33)	9 (18.36)	
≥ 6		0	1 (2.04)	
Comorbidities				
Cardiovascular Disease		1 (8.33)	9 (18.36)	
Diabetes Mellitus		2 (16.66)	6 (12.24)	
Respiratory Disease		0	1 (2.04)	
BMI *		28.9±4.7 (17-39.1)	27.3±3.6 (17.4-41.7)	0.039
Obesity III		0	1 (2.04)	
Obesity II		1 (8.33)	3 (6.12)	
Obesity I		1 (8.33)	7 (14.28)	
Overweight		6 (50)	24 (48.97)	
Normal		3 (33.3)	12 (24.48)	
Underweight		1 (8.33)	2 (4.08)	
No of vaginal deliveries*		2.1±0.4 (0-4)	2.9±1.1 (0-5)	0.041
No of caesarean deliveries*		1.4±0.5 (0-3)	1.8±0.7 (0-3)	0.028

Y: years; ACCI: Age-adjusted Charlson Comorbidity Index; BMI: Body Mass Index.
With percentages in parentheses unless indicated otherwise;
*Values are mean (standard deviation) (range).

Table 2. Comparisons of the patients regarding the symptoms before and 3 months after the surgical intervention

Symptoms	Before surgery			After surgery		
	Group I (n=12)	Group II (n=49)	p-value	Group I (n=12)	Group II (n=49)	p-value
Urogenital distress inventory						
Overactive bladder	5 (41.66)	13 (26.53)	0.039	0	1 (2.04)	0.089
Urinary incontinence	6 (50)	22 (44.89)	0.007	0	0	-
Obstructive micturition	2 (16.66)	9 (18.36)	0.361	1 (8.33)	0	0.432
Pain	3 (25)	8 (16.32)	0.077	1 (8.33)	2 (4.08)	0.264
Defecatory distress inventory						
Obstipation	1 (8.33)	3 (6.12)	0.244	0	0	-
Obstructive defecation	2 (16.66)	9 (18.36)	0.081	0	0	-
Pain	1 (8.33)	11 (22.44)	0.042	1 (8.33)	1 (2.04)	0.247
Incontinence	1 (8.33)	1 (2.04)	0.211	0	0	-
Flatus	1 (8.33)	5 (10.20)	0.372	0	1 (2.04)	0.074
Mental health	3 (25)	15 (30.61)	0.058	1 (8.33)	2 (4.08)	0.172

With percentages in parentheses

years (range: 39-68), 58.33% of patients had an ACCI (Adjusted Age-Adjusted Charlson Comorbidity Index) score of ≤1 and 8.33% had an ACCI score ≥4. The average age of the lateral hysteropexy group was 56.19±8.84 years (range: 38-62), 63.26% of patients had an ACCI score ≤1 and 20.4% had an ACCI score ≥4. One of the most important comorbidities of the patients in the first group was diabetes mellitus (16.66%), and cardiovascular disease (18.36%) in Group II. Most of the patients in the study were classified as overweight (Group I: 50%; Group II: 28.1±4.97). There were significant statistical differences between the two groups regarding: the environment (p=0.044), comorbidities (ACCI, p=0.013), BMI (p=0.039) and type of deliveries (vaginal, p=0.041; caesarean, p=0.028).

The symptoms of the patients before and 3 months after the surgical intervention are shown in *Table 2*. Regarding the urogenital symptomatology, most of the patients complained of urinary incontinence (Group 1: 50%, Group II: 44.89%), followed by overactive bladder (Group I: 41.66%; Group II: 26.53%), and regarding digestive problems, most of the patients complained of obstructive defecation (Group I: 16.66%; Group II: 18.36%) and pain (Group I: 8.33; Group II: 22.44%). One in 4 patients suffered psychologically because of the disease. At the 3-month postoperative check up, only one patient with hysterosacropexy complained of pain, and two of the patients with hysteropexy.

Regarding the surgical intervention, 33.3% of the patients who underwent laparoscopic hysterosacropexy had a history of abdominal surgery and 14.28% of the patients with lateral hysteropexy (*Table 3*). There were significant

Table 3. Comparison of operative and postoperative outcomes between the two groups of patients

Variables	Group I (n=12)	Group II (n=49)	p-value
Abdominal operation history	4 (33.3)	7 (14.28)	0.241
Operation time (min)*	131.56±9.53 (90-150)	92.81± 27.46 (60-150)	0.018
Clavien-Dindo classification			
Grade I	1 (8.33)	2 (4.08)	
Grade II	2 (16.66)	1 (2.04)	
Grade IIIA	1 (8.33)	1 (2.04)	
≥ Grade IIIB	0	0	
Postoperative hospital stay*	4.52±1.15 (2-7)	3.11±1.59 (2-7)	0.017
Surgical failure			
3 months	0	0	-
6 months	0	0	-
12 months	1 (8.33)	1 (2.04)	0.047
18 months	0	0	-
24 months	0	0	-
36 months	0	0	-

With percentages in parentheses unless indicated otherwise, *Values are mean (standard deviation) (range).

statistical differences regarding the duration of the surgical intervention (Group I: 131.56 ± 9.53; Group II: 92.81± 27.46; p= 0.018) and the duration of hospitalization (Group I: 4.52 ± 1.15; Group II: 3.11 ± 1.59; p= 0.017).

The postoperative complications of patients are depicted in *Table 3*. The occurrence of post-operative complications was lower in hysteropexy group compared with hysterosacropexy group. The major complication rate among hysterosacropexy group was 8.33% (n=1). In lateral hysteropexy group grade IIIB Clavien-Dindo rate was nil. The minor complication rate was 25% for hysterosacropexy group, lateral hysteropexy group exhibited a minor complication rate of 6.12%. The postoperative recurrence rate was recorded at the 12-month evaluation for a patient with hysterosacropexy (8.33%) and for a patient with lateral hysteropexy (2.04%).

Discussions

Lateral laparoscopic hysteropexy represents a significant advancement in surgery for pelvic static disorders offering an alternative to laparoscopic hysterosacropexy, but continued research is needed to perfect and improve the procedure, to improve outcomes and to better define its indications (11,12). The "Delphi project" (13) highlights some important points regarding the technique and indications of laparoscopic lateral hysteropexy as a surgical procedure for the treatment of pelvic organ prolapse.

Laparoscopic lateral hysteropexy is an extraordinary method, with numerous well-known advantages and exemplified in the specialized literature, which can be used to treat advanced prolapse of the pelvic organs (11). This is particularly important, because it increases the variety of therapeutic possibilities and can offer the option to better adapt the type of suspension (sacral vs. lateral) according to the type of prolapse (14). Based on the experience of participants in the Delphi study, laparoscopic lateral suspension is more effective in correcting advanced anterior prolapse compared with laparoscopic hysterosacropexy (13).

Thus, if confirmed by future studies, laparoscopic lateral hysteropexy may not simply represent a simple alternative to laparoscopic hysterosacropexy, but rather a preferential procedure for apical/ anterior defects, while LSCP may be more appropriate for defect management apical/ posterior prolapses or of the 3 compartments (15-17). In the present study, the advantages of the hysteropexy technique by lateral fixation of the ligaments compared to hysterosacropexy, showed its benefits by reducing the operating time, post-operative complications, implicitly by reducing the number of days of hospitalization and by a significantly lower percentage of postoperative recurrence.

A benefit in performing the two techniques would be that the surgical skills required to perform laparoscopic lateral hysteropexy are simpler than those required to perform laparoscopic hysterosacropexy. This results in faster acquisition of experience and potential wider diffusion of the procedure, therefore a potential advantage that valuable and effective surgery could be made available to more patients (18-20).

The limitations of this study are related to the limited number of cases. Further studies are needed to validate our findings. More trials comparing other uterus preserving surgical techniques are needed to compare efficacy and safety of the different procedures.

Conclusions

Lateral laparoscopic hysteropexy is an effective method of resolving uterine prolapse for stage III patients, with a lower complication and recurrence rate compared to patients who underwent laparoscopic hysterosacropexy.

Conflicts of Interests

The authors declared no potential conflicts of interest.

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