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Efficacy of Laparoscopic Sacrocervicopexy for Apical Support of Pelvic Organ Prolapse

Maurizio Rosati, MD, Silvia Bramante, MD, Umberto Bracale, MD, Giusto Pignata, MD, Guglielmo Azioni, MD

ABSTRACT

Background and Objectives: To evaluate the efficacy of laparoscopic sacrocervicopexy for apical support in sexually active patients with pelvic organ prolapse.

Methods: One-hundred thirty-five women with symptomatic prolapse of the central compartment (Pelvic Organ Prolapse Quantitative [POP-Q] stage 2) underwent laparoscopic sacrocervicopexy. The operating physicians used synthetic mesh to attach the anterior endopelvic fascia to the anterior longitudinal ligament of the sacral promontory with subtotal hysterectomy. Anterior and posterior colporrhaphy was performed when necessary. The patients returned for follow-up examinations 1 month after surgery and then over subsequent years. On follow-up a physician evaluated each patient for the recurrence of genital prolapse and for recurrent or de novo development of urinary or bowel symptoms. We define "surgical failure" as any grade of recurrent prolapse of stage II or more of the POP-Q test. Patients also gave feedback about their satisfaction with the procedure.

Results: The mean follow-up period was 33 months. The success rate was 98.4% for the central compartment, 94.2% for the anterior compartment, and 99.2% for the posterior compartment. Postoperatively, the percentage of asymptomatic patients (51.6%) increased significantly ($P < .01$), and we observed a statistically significant reduction ($P < .05$) of urinary urge incontinence, recurrent cystitis, pelvic pain, dyspareunia, and discomfort. The present study showed 70.5% of patients stated they were very satisfied with the operation and 18.8% stated high satisfaction.

Conclusion: Laparoscopic sacrocervicopexy is an effective option for sexually active women with pelvic organ prolapse.

Key Words: Laparoscopy, Sacrocervicopexy, Pelvic organ prolapse, Colporrhaphy, Pelvic floor repair, Uterine prolapse.

INTRODUCTION

Pelvic organ prolapse is a common condition and a major cause of gynecological surgery. The lifetime risk of having an operation for prolapse may be 11%.[1–3] The aim of pelvic surgery should be to restore the anatomy of the pelvic floor, thus preserving vaginal axis, length, and function in terms of urologic, bowel, and sexual functions, with the lowest possible morbidity and recurrence rate. There are 3 primary routes of access in reconstructive pelvic surgery (abdominal, vaginal, and laparoscopic) for the repair of pelvic floor disorders.

Hysterectomy is still considered the standard procedure for correcting prolapse.

Vaginal vault prolapse is the main long-term complication of all types of pelvic surgery, including total hysterectomy. The incidence of vaginal vault prolapse is approximately 11.6% when assessed at surgery for prolapse and 1.8% for other benign diseases.[4,5] Hence, it is necessary to perform the vaginal vault suspension procedure during hysterectomy.

Abdominal sacrocolpopexy is associated with a lower rate of recurrent vault prolapse, reduced grade of residual prolapse, longer time to recurrence, and less dyspareunia compared with the vaginal procedures, such as sacrospinous ligament fixation and uterosacral ligament suspension. A recent Cochrane review[6] stated that abdominal sacrocolpopexy is the more effective procedure and is considered by many authors to be the gold standard in the treatment of vaginal vault prolapse. Conversely, vaginal prolapse repairs are often faster and offer patients a shorter recovery time.[6–9]

Laparoscopic sacrocolpopexy aims to bridge the gap between the abdominal and vaginal procedures to provide

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the best outcomes of abdominal sacrocolpopexy with decreased morbidity similar to vaginal procedures.[10]

Although sacrocolpopexy—performed by interposing a synthetic mesh between the vaginal cuff and the bone—is effective, it is associated with a mesh erosion rate between 0.8% and 9%.[7,9–11]

We propose an alternative surgical technique to avoid this complication: the laparoscopic sacrocervicopexy. Sacrocervicopexy is a procedure similar to sacrocolpopexy, in which a graft material is used to suspend the cervix to the anterior longitudinal ligament of the sacrum. Sacrocervicopexy can be performed either with uterine preservation or after supracervical hysterectomy. This procedure definitely avoids the risk of mesh erosion. Moreover, it preserves the integrity of the uterosacral and cardinal ligaments, which are the main supports of the vaginal apex. It may be associated with vaginal surgery (colporraphy) in all cases of concomitant anterior or posterior prolapse. We think that this combined laparoscopic and vaginal approach could be the best option to treat a prolapse of the 3 compartments.

In our study, we evaluated effectiveness of laparoscopic subtotal hysterectomy and sacrocervicopexy, with or without colporraphy, to resolve pelvic organ prolapse and reduce the recurrence rate, mainly of central compartment prolapse. We also evaluated the reduction of prolapse-related symptoms, operative and postoperative complications, and patient satisfaction.

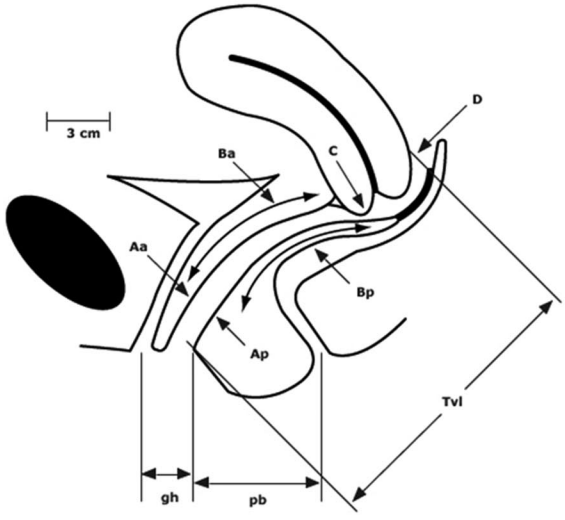
MATERIALS AND METHODS

From January 1999 through December 2009, all patients with symptomatic genital prolapse who were referred to the Department of Obstetrics and Gynaecology of General Hospital "San Camillo" in Trento, Italy, were asked to be enrolled in this study. Institutional review board approval from the hospital board was obtained. All women who entered the study received a clear explanation of the study's purpose, and all provided consent to be included in the study.

Inclusion criteria were age between 35 and 70 years, sexually active, symptomatic prolapse of central compartment with a Pelvic Organ Prolapse Quantitative (POP-Q) stage 2 associated or not with anterior or posterior compartment prolapse (**Figures 1** and **2**), normal Papanicolaou test, no chronic systemic disease, no current pregnancy including ectopic pregnancy, no concurrent use of systemic corticosteroids, and no active pelvic or abdominal infection.

All women wished to restore the anatomic defects as well as to preserve a normal sexual function.

Preoperatively, all patients underwent pelvic organ prolapse quantitative assessment (using the POP-Q Staging), vaginal ultrasonographic examination, and a Papanicolaou test. Other demographic variables like parity, body mass index, menopausal status, hormone replacement therapy use, previous surgical procedures, and prolapsed-related symptoms of each patient were recorded. The hospital administered the following



Point	Description	Range of Values
Aa	Anterior vaginal wall 3 cm proximal to the hymen	-3 cm to +3 cm
Ba	Most distal position of the remaining upper anterior vaginal wall	-3 cm to +tvl
C	Most distal edge of cervix or vaginal cuff scar	
D	Posterior fornix (N/A if post-hysterectomy)	
Ap	Posterior vaginal wall 3 cm proximal to the hymen	-3 cm to +3 cm
Bp	Most distal position of the remaining upper posterior vaginal wall	-3 cm to + tvl

Genital hiatus (gh) – Measured from middle of external urethral meatus to posterior midline hymen
Perineal body (pb) – Measured from posterior margin of gh to middle of anal opening
Total vaginal length (tvl) – Depth of vagina when point D or C is reduced to normal position

Figure 1. A diagrammatic representation of Pelvic Organ Prolapse-Quantitative (POP-Q) staging.

POP-Q Staging Criteria	
Stage 0	Aa, Ap, Ba, Bp = -3 cm and C or D ≤ – (tvl – 2) cm
Stage I	Stage 0 criteria not met and leading edge < -1 cm
Stage II	Leading edge ≥ -1 cm but ≤ +1 cm
Stage III	Leading edge > +1 cm but < + (tvl – 2) cm
Stage IV	Leading edge ≥ + (tvl – 2) cm

Figure 2. Pelvic Organ Prolapse-Quantitative (POP-Q) staging.

questionnaires to assess prolapsed-related symptoms: Cleveland Clinic Constipation Score (CCCS), Cleveland Clinic Incontinence Score (CCIS), Pelvic Organ Prolapse/Urinary Incontinence Sexual Function Questionnaire (PISQ-12), Urogenital Distress Inventory–Short Form (UDI-6), Incontinence Impact Questionnaire–Short Form (IIQ-7), Patient Global Impression of Severity (PGI-S) and of Improvement (PGI-1), constipation scoring system, and the Patient Assessment of Constipation–Quality of Life Questionnaire (PAC-QOL).

Surgical Technique

All of the laparoscopic sacrocervicopexies were performed under general anesthesia. Patients were placed in the semilithotomy position, which allowed both vaginal and laparoscopic access, and a Foley catheter was placed in the bladder. A curette was placed into the uterus and used as a uterine manipulator. The pneumoperitoneum was created using a Veress needle, and a 10-mm trocar was inserted into the umbilicus, two 5-mm trocars were placed lateral to the inferior epigastric vessels, and one 10-mm trocar was placed medially in the suprapubic area. With the patient in the Trendelenburg position, the procedure began with subtotal hysterectomy performed by conventional technique, using bipolar forceps for coagulation and a monopolar hook for cutting. Bilateral salpingo-oophorectomy was performed in patients with menopausal status in those aged between 50 and 65 years for the prevention of ovarian cancer.[12,13]

Unilateral salpingo-oophorectomy was performed in patients discovered to have ovarian cysts. After the morcellation of the uterus (Rotocut G1 Mocellator, size 15 mm, Karl Storz GmbH & Co., Tuttlingen, Germany), the operation continued with anterior or posterior vaginal repair performed by the conventional vaginal technique. Vaginal procedures were avoided only in case of a POP-Q score of 0 for anterior or posterior compartment. Repair of cystocoele and rectocoele should be done initially from below. If sacral cervicopexy is done first, vaginal colporrhaphy will be more difficult later.[14]

The identification of the presacral space, including the common iliac arteries and the middle sacral vessels, was performed. Special attention was paid to identifying the location of the left common iliac vein, which can be more difficult to visualize during laparoscopy because of the effects of the pneumoperitoneum. In addition, the course of the right ureter was identified by its peristalsis. The peritoneum was elevated over the sacral promontory and incised using CO2 laser (Smart Clinic 50w, DEKA, Florence, Italy). The dissection was carried down to the anterior longitudinal ligament of the sacrum (**Figure 3**), with care taken to avoid injury to the middle sacral vessels.

The peritoneal incision began from the cervix and was carried cranially into the pelvis, lateral to the rectosigmoid, and medial to the right uterosacral ligament (**Figure 4**) to avoid injury to the right ureter.

A 10 × 2-cm piece of a wide-pore polypropylene mesh (Gynecare Gynemesh; Ethicon, Somerville, NJ) was introduced through the suprapubic port and secured to the cervix by approximately 5 to 8 staples (Endopath EMS 20, Ethicon) and 2 nonabsorbable, braided, polyester sutures (Ethibond Exel 0RH, Ethicon) using an extracorporeal knot-tying technique (**Figure 5**). The mesh was attached to the anterior longitudinal ligament of the sacral promontory by 2 to 4 staples (Endopath EMS 20, Ethicon) (**Figure 6**) without undue tension on the mesh (**Figure 7**).

After the suspension, the extra mesh was shortened and completely covered by reapproximating the peritoneum

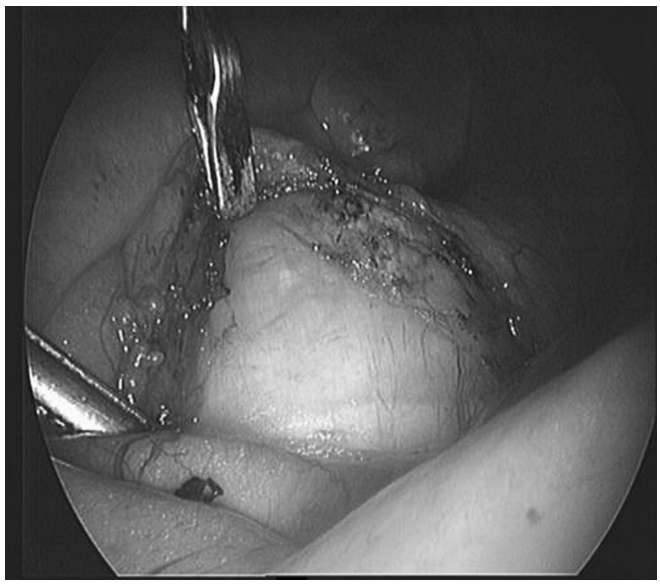


Figure 3. The anterior longitudinal ligament in the presacral space.

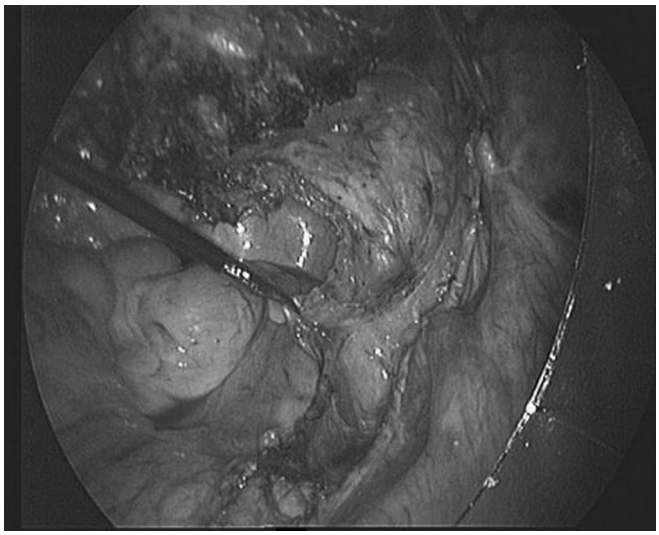


Figure 4. The pelvic peritoneum is opened up to lay the mesh.

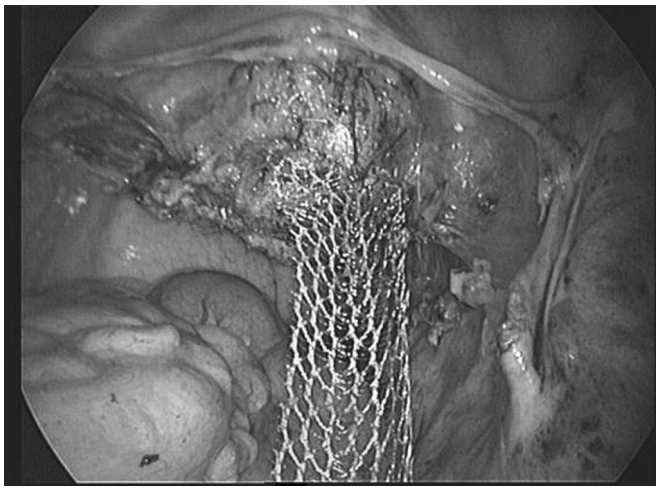


Figure 5. The mesh is secured to the cervix.

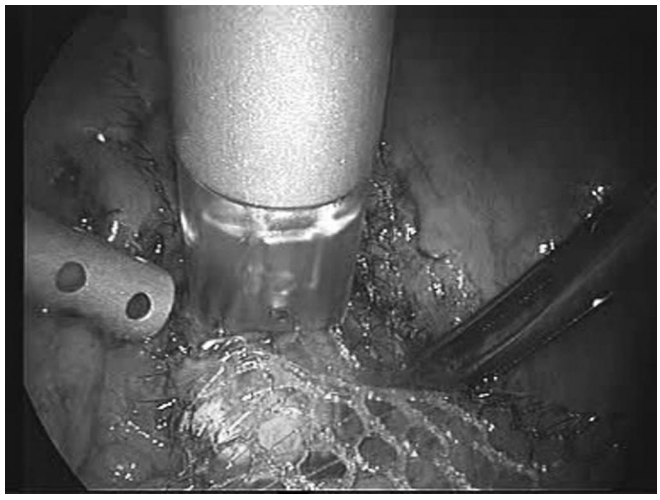


Figure 6. The mesh is secured to the sacral promontory.

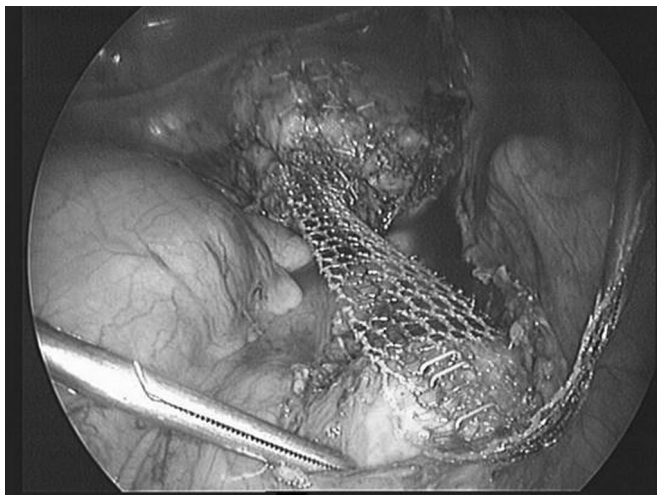


Figure 7. No undue tension in the mesh is noted.

over the mesh with two continuous sutures (**Figure 8**) performed by conventional absorbable polymer sutures (Dexon II 0-V20; Syneture, U.S. Surgical, Norwalk, CT) using an extracorporeal knot-tying technique.

One month after surgery and then each year, all patients were followed up with pelvic examination, including transperineal ultrasonography to evaluate the recurrence of genital prolapse. The follow-up visit was not performed by members of the surgical team. As described in the literature,[15] we consider "surgical failure" to be any grade of recurrent prolapse of stage II or more of the POP-Q test. During these visits, the recurrent or the de novo urinary or bowel symptoms were also evaluated via the same questionnaires previously described (CCCS, CCIS, PISQ-12, UDI-6, IIQ-7, PGI-S, PGI-1, PAC-QOL). Patients were also asked about their level of satisfaction regarding the surgical procedure. Women had to choose between five different assessments of satisfaction: no satisfaction, low satisfaction, moderate satisfaction, high satisfaction, and very high satisfaction). Furthermore, we asked if they would recommend the same surgical procedure to others with apical prolapse.

Three months after surgery, an adjunctive follow-up visit was performed with patients with urinary or bowel symptoms. Patients with urinary symptoms underwent cotton-swab determination of urethral mobility, postvoid residual volume by ultrasonography or catheterization, and urodynamic testing. Patients with stress urinary incontinence

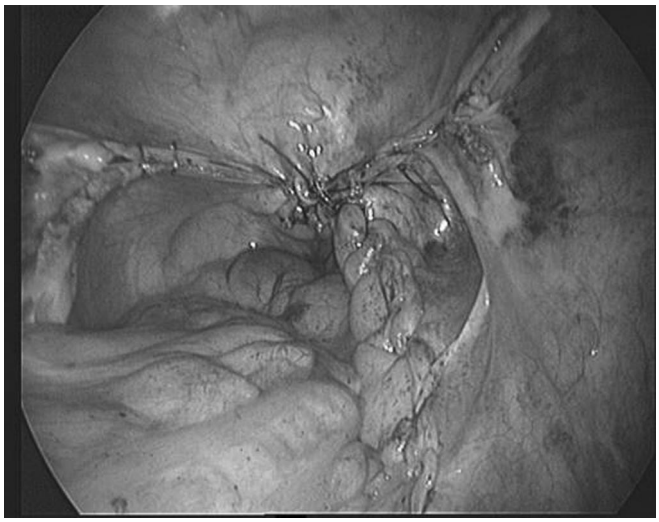


Figure 8. The pelvic peritoneum is reapproximated.

(SUI) during urodynamic testing underwent the tension-free vaginal tape procedure. Patients with bowel symptoms underwent physical examination, anoscopy, endoanal ultrasonography, anorectal manometry, and defecography. Patients with obstructed defecation syndrome underwent stapled transanal rectal resection.

Comparison of preoperative and postoperative POP-Q score in the central, anterior, and posterior compartments was done using the chi-square test comparison of preoperative and postoperative frequency of symptoms, was done using a paired *z*-test (a variant of the Student *t*-test). All *P* values $<.05$ were considered statistically significant.

RESULTS

From January 1999 to December 2009, 136 patients with symptomatic genital prolapse were enrolled. Patients' characteristics, previous surgery, and concomitant pathologic conditions are listed in **Table 1**.

Preoperative prolapse-related symptoms were as follows: SUI (36 cases, 26.5%), urinary urge incontinence (21 cases, 15.4%), urinary retention (4 cases, 2.9%), high urinary frequency (3 cases, 2.2%), recurrent cystitis (9 cases, 6.6%), bowel symptoms (5 cases, 3.7%), pelvic pain (11 cases, 8.1%), dyspareunia (9 cases, 6.6%), and discomfort (72 cases, 52.9%). Twenty-nine women (21.3%) were asymptomatic (**Table 2**). This group of asymptomatic patients refused expectant management and required surgical treatment.

Preoperative prolapse severity graded by the POP-Q stages is shown in **Table 3**.

Table 1.
Patients' Characteristics

Age, y (mean ± SD)	53.4 ± 8 (95% CI 52.07–54.73)
Parity (mean ± SD)	2.02 ± 0.9 (95% CI 1.87–2.17)
BMI (mean ± SD)	24.1 ± 3.3 (95% CI 23.67–24.73)
Smoker (%)	8.1
Menopause (%)	55.9
Hormone replacement therapy use (%)	6.6
Previous abdominal surgery (%)	60.3
Concomitant pathologic conditions (%)	24.3
Fibromatous uterus (%)	5.7
Myomas (%)	11
Metrorrhagia (%)	6.6
Postmenopausal bleeding (%)	2.2
Ovarian cysts (%)	5.1

One patient enrolled in the study was excluded because of impossibility to identify sacral promontory related to the patient's high BMI and to the presence of severe adhesions. She underwent vaginal hysterectomy.

All other patients (135 women) underwent supracervical hysterectomy and sacrocervicopexy. Anterior and/or posterior vaginal repairs were also performed in 118 (87.4%) and 113 (83.7%) patients, respectively. Bilateral salpingo-oophorectomy was performed in 90 patients (66.7%). Three Moschowitz procedures, 2 enucleation of ovarian cysts, 7 unilateral salpingectomy, and 8 unilateral salpingo-oophorectomy procedures were also performed. Hydrosalpinx and ovarian cysts were diagnosed intraoperatively in 2 and 7 cases, respectively.

Mean operative time was 244 minutes (±51 SD; range, 114–425), mean hospitalization length was 5.7 days (±1.2 SD; range, 3–15), and mean hemoglobin level decrease was 2.1 g/dL (±0.8 SD; range, 0.5–4.1) (**Table 4**).

We had 5 patients with a temperature of 38°C, Pneumonia developed in one of these patients, which required a prolonged hospital stay of 15 days. Other complications included two cases of deep vein thrombosis without pulmonary involvement and one case of urinary retention, which was treated with suprapubic catheter placement.

One month after surgery and then subsequently, all patients were interviewed by telephone and were called in

Table 2.
Difference Between Preoperative and Postoperative Findings

	Symptoms (%)									
	No Symptoms	SUI	Urinary Urge Incontinence	Urinary Retention	High Urinary Frequency	Recurrent Cystitis	Bowel Symptoms	Pelvic Pain	Dyspareunia	Discomfort
Preoperative	21.3	26.5	15.4	2.9	2.2	6.6	3.7	8.1	6.6	52.9
Postoperative	51.6	27.9	9.8	3.3	0	0.8	1.6	1.6	0.8	5.7
Z-score	5.110	–0.255	1.364	0.188	1.673	2.451	1.053	2.421	2.451	8.287
P value	<.0001	.5041	.048	.887	.054	.009	.199	.004	.015	<.0001
Significant $\alpha = 0.05$	Yes	No	Yes	No	No	Yes	No	Yes	Yes	Yes

for follow-up evaluation. Among these women, 13 patients were lost during the follow-up stages. The mean follow-up period was 33 months (range, 12–114).

The following data refer to the last follow-up visit of the study group. One-hundred seventeen patients (95.9%) were found to be at POP-Q stage 0 for central compartment, 99 (81.1%) for anterior compartment, and 119 (97.5%) for posterior compartment. Three women (2.5%) were diagnosed with stage I relapse in the central compartment, 16 (13.1%) were diagnosed with stage I relapse in the anterior compartment, and 2 (1.6%) were diagnosed with stage I relapse in the posterior compartment (**Table 3**).

We defined "surgical failure" as any recurrent prolapse of stage II or more of the POP-Q test. Two patients (1.6%) had a stage II central prolapse, 7 patients (5.7%) had a stage II anterior prolapse, and 1 (0.8%) had a stage II posterior prolapse. There were no cases of grade III or IV recurrences. Therefore, the success rate was 98.4% (120 of 122 patients) for the central compartment, 94.2% (115 of 122 patients) for the anterior compartment, and 99.2% (121 of 122 patients) for the posterior compartment.

One of the two patients with stage II recurrence in the central compartment had a detachment of the mesh at the site of the cervical stump. She underwent laparotomy for sacrocervicopexy without any further recurrence. The other woman refused reoperation and has been lost to follow-up. No mesh erosions occurred in our study.

Any improvement about the preoperative complaints was also assessed (**Table 2**). Postoperatively, the percentage of asymptomatic patients (51.6%) increased significantly ($P < .01$), whereas a statistically significant reduction ($P < .05$) of urinary urge incontinence, recurrent cystitis, pelvic pain, dyspareunia, and discomfort was observed.

On the contrary, 34 patients (27.9%) had SUI, but 18 of 34 patients had a de novo SUI. Preoperatively, 36 cases of SUI were observed. After surgery, SUI was resolved in 20 cases and persisted in 16 patients.

When asked about their personal satisfaction, 86 women (70.5%) stated they had very high satisfaction, 23 (18.8%) had high satisfaction, 9 (7.4%) had moderate satisfaction, 3 (2.4%) had low satisfaction (score 2), and only 1 (0.8%) expressed a negative feeling about the operation. Furthermore, when requested if they would recommend the same surgical procedure, 117 women (95.9%) answered "yes" and only 5 (4.1%) answered "no."

Three months after surgery, 34 patients had urinary symptoms and 2 had bowel symptoms. Forty-five patients un-

Table 3.
Preoperative and Postoperative Prolapse Severity Graded by the POP-Q Stages

Compartment	Stage	Preoperative (%)	Postoperative (%)	Chi-square	Statistical Significance
Anterior	0	17 (12.6)	99 (81.1)	145.07	$P < .0001$
	I	14 (10.4)	16 (13.1)	145.07	
	II	39 (28.9)	7 (5.7)	145.07	
	III	64 (47.4)	0	145.07	
	IV	1 (0.7)	0	145.07	
Central	0	0	117 (95.9)	249.22	$P < .0001$
	I	0	3 (2.5)	249.22	
	II	64 (47.4)	2 (1.6)	249.22	
	III	66 (48.9)	0	249.22	
	IV	5 (3.7)	0	249.22	
Posterior	0	21 (15.6)	119 (97.5)	173.75	$P < .0001$
	I	54 (40)	2 (1.6)	173.75	
	II	53 (39.3)	1 (0.8)	173.75	
	III	7 (5.4)	0	173.75	
	IV	0	0	173.75	

Table 4.
Operative Time, Hospitalization, and Hemoglobin Level Decrease

	Median	SD	Range
Operative time (minutes)	244.35	50.69	114–425
Hospitalization (days)	5.72	1.19	3–15
Hemoglobin level decrease (g/dL)	2.12	0.81	0.5–4.1

derwent urodynamic tests. Urinary urge incontinence was diagnosed in 11 women, and SUI was diagnosed in 34 women. Of the patients with SUI, 18 cases were de novo and 16 cases were persistent. Only 10 patients underwent the tension-free vaginal tape procedure because the others did not consider it necessary to treat their urinary symptoms. Only 1 patient underwent proctoscopic examination. No case of obstructed defecation syndrome was confirmed.

DISCUSSION

Surgery for pelvic organ prolapse is associated with an incidence of vaginal vault prolapse significantly higher than surgery for other benign diseases (11. 6% vs 1.8%).[4,5]

Abdominal sacrocolpopexy, performed by interposing a synthetic mesh between the vaginal cuff and the bone, is one of the more effective procedures, and many authors consider it the gold standard in the treatment of vaginal

vault prolapse.[6] However, this procedure is associated with a long operating time, long time to return to activities of daily living, and high cost. A laparoscopic approach to this procedure, described by Nezhat in 1992, has made it possible to avoid these disadvantages.[16,17]

Even if vaginal sacrocolpopexy is highly effective, it is associated with a mesh erosion rate between 0.8% and 9%.[6–8,10] An alternative surgical technique to avoid this complication is laparoscopic sacrocervicopexy.

The sacrocervicopexy, first described in 1976, was never applied routinely because of its imprecise clinical role. Until now, sacrocervicopexy was performed to treat uterovaginal prolapse in women who desired to preserve their uterus and fertility.[18] In 2001, Leron et al described their results from 13 women with symptomatic uterovaginal prolapse treated by sacrohysteropexy. No complications occurred, and only one patient had first-degree uterine prolapse.[19] The study by Rosenblatt et al[18] is a retrospective case series of 40 women with uterine prolapse who underwent sacrohysteropexy. Success was defined in that study as an improvement in point C from the preoperative position, and that point C was above the hymen postoperatively. No patient failed for apical suspension.

In our study, we treated pelvic organ prolapse by sacrocervicopexy after supracervical hysterectomy in patients with other benign diseases (eg, menometrorrhagia, fibromatous uterus, large myomas) or if they wanted the uterus to be removed. We added vaginal repair, anterior colporrhaphy, or posterior colporrhaphy at the same surgery in case of anterior or posterior compartment prolapse.

Until now, most surgeons have not performed supracervical hysterectomy for the theoretical risk of cervical cancer. As reported from a Cochrane review,[20] the true risk of cervical stump carcinoma among women with previously normal Pap smears is approximately 0.3%.[21] That percentage is the same as the risk of vaginal carcinoma after hysterectomy for benign disease.[22] A review of several studies reveals that, when compared with total hysterectomy, subtotal hysterectomy offers no true benefit for urinary, bowel, and sexual function, despite the procedure being significantly faster with a lower blood loss and a reduced postoperative morbidity.[20,23,24]

We performed urodynamic and clinical investigation 3 months after surgery in symptomatic patients. The incidence of postoperative SUI after laparoscopic sacrocolpopexy is 17.8% (range, 2.4%–44%) as reported by a recent review.[10] Postoperative SUI includes de novo and preoperative functionally occult SUI becoming clinically manifest during the postoperative period. One of the main purposes of a clinical and urodynamic examination before surgery is to identify women at risk of postoperative SUI. In these cases, some authors[24–26] suggest that performing an anti-incontinence procedure at the time of the initial surgery may reduce postoperative SUI. Conversely, de novo SUI can also appear after surgery despite a normal previous assessment. Performing an anti-incontinence procedure has been shown to reduce postoperative SUI rates.[27] This approach is not preferable considering that as much as 20% of women who undergo anti-incontinence procedures have complications including difficulty in voiding, urgency, and urge incontinence.[26] Performing urodynamic tests 3 months after surgery allows diagnosis and treatment of both de novo and preoperative functionally occult SUI.

Our technique of supracervical hysterectomy, sacrocervicopexy, anterior colporrhaphy, and posterior colporrhaphy had a 91.8% success rate and a reduced number of recurrence (10 of 122 patients), with recurrence rates of 0.8% in the posterior, 5.7% in the anterior, and 1.6% in the central compartment. In a recent review,[10] it was found that long-term failure rates for abdominal sacrocolpopexy range from 0% to 26%, and laparoscopic sacrocolpopexy has similar rates.

In the present study, we did not have a single incidence of mesh erosion in 135 cases of sacrocervicopexy. The preservation of the cervix allows the surgeon to avoid opening the vagina. During a sacrocolpopexy after a total hysterectomy, the vaginal cuff may have a reduced vascular supply secondary to scar tissue, which can compromise the healing process and lead to erosion. A vaginal repair performed at the same time as an abdominal sacrocolpopexy has been associated with a slightly higher incidence of mesh erosion.[28] In addition, because sacrocervicopexy does not require an anterior extension, less mesh is used compared with sacrocolpopexy. Reduction of mesh load is thought to be a factor in reducing the risk of mesh erosion in pelvic reconstructive surgery.

Our study showed a significant reduction of prolapse-related symptoms and a very low percentage of postoperative complaints. In 9 studies evaluated in a recent review,[10] laparoscopic sacrocolpopexy was found to be associated with postoperative sexual dysfunction (7.8%; range, 0%–47%) and postoperative bowel dysfunction (9.8%; range, 0%–25%), including constipation, anal pain, and 1 case of fecal incontinence. In our study, only 1.6% of patients had bowel symptoms and only 0.8% had dys-

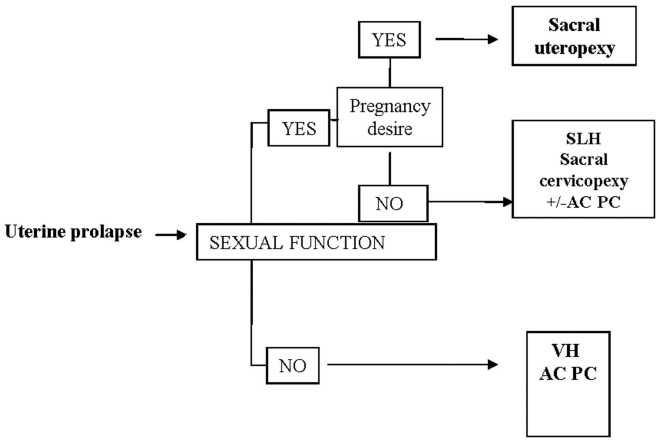


Figure 9. Guidelines. SLH = subtotal laparoscopic hysterectomy; AC = anterior colporrhaphy; PC = posterior colporrhaphy; VH = vaginal hysterectomy.

pareunia (0.8%). The presence of the uterosacral ligaments seems to improve the quality of sexual life.[11,29]

The laparoscopic route has several well-known advantages, such as short hospitalization and low postoperative pain. It is also aesthetically appealing and allows a rapid return to work and normal activities. Laparoscopy also provides a magnification of the surgical field, which might allow a better placement of the stitches, thereby increasing the likelihood of an improved long-term outcome. However, at the beginning this procedure may be time consuming because of its long learning curve.

Vaginal hysterectomy with anterior and posterior colporrhaphy may cause dyspareunia because of the necessity to reduce vaginal size to obtain an optimal suspension of the vaginal vault.[30] For these reasons, in case of severe pelvic prolapse (POP-Q II-IV), we choose vaginal hysterectomy only in women who did not desire normal sexual activity, whereas we prefer laparoscopic sacrocervicopexy in patients who wish to correct their anatomic pelvic floor defects as well as maintain normal sexual function (**Figure 9**).

In conclusion, sacrocervicopexy is an effective technique in the treatment of severe pelvic organ prolapse. The advantages include a low recurrence rate, absence of mesh erosion, preserving an adequate vaginal length, and maintaining the proper physiological vaginal axis.

In our series, preserving the cervix avoided the possibility of mesh erosion, which is a complication that affects sacrocolpopexy. It would be of clinical interest to compare sacrocervicopexy and sacrocolpopexy because there are as yet no prospective, randomized trials comparing the two techniques.

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