Original Article

Comparison of the Quality of Life and Female Sexual Function Following Laparoscopic Pectopexy and Laparoscopic Sacrohysteropexy in Apical Prolapse Patients

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Abstract

Objectives: We sought to compare the surgical outcomes, safety, effectiveness, and mid-term outcomes in patients who had undergone laparoscopic hysterosacropexy and laparoscopic pectopexy due to apical prolapse.

Materials and Methods: This prospective randomized study was conducted on a total of 62 women who underwent apical prolapse surgery (32 undergoing a pectopexy and 30 undergoing a sacrohysteropexy) between June 2015 and June 2017. Patients with symptomatic uterine or vaginal vault prolapse with stage 2 or worse were included in the sudy. Before and after the operation, we used the Pelvic Organ Prolapse Quantification System (POP-Q) and questionnaires, which are the Prolapse Quality of Life Questionnaire (P-QOL) and Female Sexual Function Index (FSFI), to evaluated cases. Baseline characteristics, perioperative and postoperative complications, and follow-up results at 12 months were also evaluated.

Results: All domains of POP-Q, P-QOL, and FSFI scores improved significantly after surgery both in pectopexy and sacrohysteropexy group. The postoperative complications of both procedures were similar except for constipation after surgery (3.2% in the pectopexy group and 20% in the hysterosacropexy group [$P = 0.036$]).

Conclusion: Both sacrohysteropexy and pectopexy are effective surgical options for apical prolapse patients. The pectopexy is an acceptable alternative to laparoscopic sacrohysteropexy because of its less complexity and not reducing pelvic space for the rectum to exist. We suggest that the laparoscopic pectopexy may be widely used in clinical routine.

Keywords: Pectopexy, pelvic organ prolapse, quality of life, sacrohysteropexy

Introduction

Pelvic organ prolapse (POP) is the descent from the normal position of one or more pelvic organs such as the uterus, the apex of the vagina, or the bowels resulting from the loss of connective tissue support.[1] The incidence of POP is still rising as a result of aging populations and increasing obesity rates. The lifelong prevalence of POP above the age of 50 years is 30%–50%.[2] Women who live to 80 years old have an 11.1% risk of undergoing an operation for prolapse or urinary incontinence.[3] POP negatively influences women's quality of life and is associated with disability and physical, psychological, and sexual problems.[4]

Loss of apical support is usually present in patients with prolapse, and sufficient support for the vaginal apex is a

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crucial component of an enduring surgical treatment.[5] Laparoscopic sacrocolpopexy and sacrohysteropexy (uterus preserving sacrocolpopexy) have been demonstrated to be effective surgical techniques in apical prolapse treatment.[6] They provide good apical support. These techniques for POP are both safe and effective because of the faster recovery time, shorter operating time, lower blood loss, lower scar tissue, lower pain, and minimally invasive nature compared to the abdominal approaches. Laparoscopic hysterosacropexy has a success rate of 90%.[7-10] However, these procedures have been associated with some complications, and the most common of these complications stress urinary incontinence (SUI) and defecation disorders.[11,12] Furthermore, presacral venous plexus can be injured during the dissection of the pelvic viscera from the sacrum, and this damage may be ended with life-threatening circumstances.[13]

Laparoscopic pectopexy is described as a new method of prolapse surgery, in which the lateral parts of the iliopectineal ligament are used for bilateral mesh fixation of the prolapsed tissues. This procedure also provides many advantages for POP treatment such as postoperative comfort, fast recovery time, low scar tissue, low pain, and a short hospital stay. Especially for obese women or those with other complications such as limited access to the anterior longitudinal ligament or the lesser pelvis, laparoscopic pectopexy should be considered an alternative to sacropexy.[14-16]

The selection of operation depends on several factors, such as the site and severity of the POP, additional symptoms that affect urinary, bowel, or sexual function, the wish to preserve the uterus, and the surgeon's choice and ability.[6] The uterus can be preserved using sacrohysteropexy and pectopexy, and there are numerous understandings for preserving the uterus.[17] As shown in previous studies, preserving the uterus reduces the mesh erosion rate, bypass early and late hysterectomy complications decrease the risk of vault prolapse and the burden of cost.[17,18] From the patient's view, the desire for future fertility, maintaining sexual identity, religious, and cultural considerations can be useful in protecting her uterus.[19]

The present study aimed to evaluate the surgical outcomes, safety, effectiveness, and short-term follow-up results in women who had undergone laparoscopic hysterosacropexy and laparoscopic pectopexy, due to apical prolapse.

Materials and Methods

Population

This study is a prospective randomized study comparing the results of 62 patients who underwent laparoscopic pectopexy (32 patients) and laparoscopic hysterosacropexy (30 patients) from June 2015 to June 2017. The present study was approved by the Ethics Committee of Health Sciences University Gazi Yaşargil Training and Research Hospital (IRB approval date and number: 08.18.2018/132). Informed consent forms were obtained from all participants.

All women presenting with symptoms suggestive of POP such as a sensation of vaginal bulging or protrusion, seeing or feeling a bulge, pelvic, or vaginal pressure, pelvic or low back pain, dyspareunia, and other sexually related problems, and lower urinary tract symptoms including urgency, frequency, and incontinence were undergone bimanual pelvic examination. The patients were examined while resting and straining, both sitting and supine, to reproduce the maximum extent of prolapse that the patient has in her daily routine.[20] POP quantification (POP-Q) system was used to evaluate the presence of POP.[21] The Graves speculum is used to assess the anterior and posterior vaginal descent. Transvaginal ultrasonography and Pap-smear tests were routinely performed before the pelvic examination.

Symptomatic uterine or vaginal vault prolapse patients with POP-Q Stage ≥2 were included in the study. All patients were sexually active and heterosexual. Patients with previous surgery for vaginal prolapse or incontinence correction, the presence of pelvic inflammatory disease, current pregnancy, abnormal Pap-smear results, benign or malignant uterine masses, hypersensitivity to polypropylene material used in the surgery, prior pelvic radiotherapy, previously identified or strongly suspected massive adhesions in the operational area were excluded from the study. Patients who did not want to answer the validated questionnaires and follow-up losses were also excluded.

The POP Quantification System (POP-Q) was used for prolapse quantification. All patients enrolled filled out the Female Sexual Function Index (FSFI) and the Prolapse Quality of Life Questionnaire (P-QOL) before surgery. To assessing sexual dysfunction, a Turkish version of the validated 19-item, self-administered FSFI questionnaire that investigates six domains of sexual desire (questions 1–2), sexual arousal (questions 3–6), lubrication (questions 7–10), orgasm (questions 11–13), satisfaction (questions 14–16), and pain (questions 17–19). The cutoff value of the total FSFI scores for determining sexual dysfunction was <26.55.[22] The P-QOL, which has nine items, is a disease-specific questionnaire comprising a 4-point scoring system for each item, and a total score for each domain of 0–100, applied to all patients. A high total score indicates a more significant impairment of QOL, while a low total score indicates a good QOL.[23]

Patients who were indicated for POP surgery were randomized into two treatment groups using a computer-generated random number. Demographic data such as age, gravida,

parity, body mass index (weight in kilograms divided by the square of the height in meters), perioperative data including the type of the surgical procedure, estimated blood loss, and total operating time was recorded.

Operative procedure

Surgical technique

All patients received antibiotic prophylaxis before the operation with cephazolin sodium with a dose of 2 g for patients under 120 kg and 3 g for patients over 120 kg. The patients were placed in a dorsal lithotomy position under general anesthesia. The surgical field was sterilized with povidone-iodine, and the patient's body was covered with sterile drapes. Then, we positioned a RUMI uterine manipulator (Cooper Surgical, Inc., Trumbull, CT, USA) transvaginally to provide sufficient pelvis exposure. A 10 mm trocar (Ethicon Endo-Surgery, Cincinnati, OH) was inserted from the umbilicus, and a camera was placed in this trocar. Pneumoperitoneum was established, and intra-abdominal pressure of 12–14 mmHg was maintained during the procedure. We inserted three additional 5 mm trocars under the lower quadrant' direct vision, median, right, and left, from 2 cm medial and superior to the anterior superior iliac crest. All trocars were placed within the preperitoneal space. We measured the operation time by the first skin incision to the final skin closure.

Sacrohysteropexy

We used type 1 macroporous, monofilament, nonabsorbable polypropylene mesh (Prolen, Ethicon). We shaped the mesh to form two arms and one tail (Y-shaped). We opened the parietal peritoneum over the sacral promontory and right pelvic sidewall down to the uterosacral ligaments to prepare the cervical attachment area for the mesh. Then, we designed windows in the broad ligament on both sides. We inserted the arms of the mesh through the broad ligament windows. We sutured these arms to the anterior and posterior surface of the cervix with nonabsorbable interrupted 2-0 sutures. The tail of the mesh was secured with nonabsorbable interrupted sutures to the sacral promontory. Then, we completely covered the mesh with parietal peritoneum using 2-0 absorbable sutures.

Pectopexy

We performed the initiation of this procedure, as previously described by Banerjee and Noé.[14] We opened the peritoneal layer along the right round ligament toward the pelvic wall. We started the peritoneum's dissection at the side of the right external iliac vein, and we carried out this incision in the medial and caudal direction under intermittent coagulation. We dissected soft tissue in this field using blunt dissection. Hence, we identified an approximately 5 cm segment of the right Cooper's ligament (iliopectineal ligament) adjacent to the iliopsoas muscle's insertion. We repeated the same steps on the left side of the patient. Then, we opened the peritoneal layers on both sides toward the anterior peritoneum of the uterus, and we prepared the lower anterior segment of the uterus for the mesh fixation. After all these dissections, we performed three stitches to the lower anterior segment of the uterus and one stitch to each iliopectineal ligament with nonabsorbable 2-0 sutures. Unlike Banerjee and Noé, in which polyvinylidene fluoride monofilament mesh was fixed to each iliopectineal ligament with two stitches, we performed all pectopexy operations using nonabsorbable polypropylene monofilament mesh attached to each iliopectineal ligament with one stitch.[14,24] We stabilized the mesh by tension-free technique, and the uterus was provided with a hammock-like fixation. Then, we closed the peritoneal layer with 2-0 absorbable suture material.

A perioperative complication was defined as any complication during surgery or within 10 weeks after the surgery including injury to the vessels, ureters, bladder, bowel, or vagina, lower urinary tract infections, blood transfusions, wound complications, constipation, and ileus. Estimated blood loss was measured by calculating the difference between pre- and post-operative hemoglobin values. We prescribed low-dose vaginal estriol preparation and recommended them to continue for at least 6–8 weeks following the surgery. We also recommended regular pelvic floor exercises to start 8 weeks after the surgery. Patients in both groups were discharged on the 1st postoperative day without any problem and were examined by the primary or assistant surgeon at the postoperative 1st and 12th months.

Twelve months after the operation, all patients assessed *de novo* SUI, apical prolapse recurrence, exacerbation of existing cystocele/rectocele, constipation, *de novo* urgency, and enrolled filled out the FSFI and P-QOL questionnaires. Recurrence of prolapse was described by a composite description including beyond the hymen, or the presence of annoying bulge symptoms within 12 months after the operation.[25] We documented the defecation disorders using the defecation section of the International Consultation on Incontinence Questionnaire. We asked the patients to define their satisfaction degree as follows: totally, moderately, or not satisfied. In cases of moderate or no satisfaction, we asked them to specify the causes.

This study's primary outcome was comparing the improvement in POP-Q and FSFI scores after pectopexy and hysterosacropexy. This study's secondary outcomes were comparing the peri- and post-operative complications of these surgical procedures.

Statistical analysis

The sample size was calculated using the G-Power version 3.1.9.4 (Universität Kiel, Germany), regarding the

values indicated in the previous studies.[26] The minimum number of patients included in the study was 52, with a two-tailed alpha error of 0.05 and a power of 82%.

The statistical evaluation of the study results was performed using SPSS 20 (Statistical Package for the Social Sciences, Chicago, IL, USA). Numerical data were expressed as mean and standard deviation, and categorical data were expressed as frequency and percentage. The comparison of categorical data in the groups was made with Chi-square and Fisher's exact tests, and the results were given as *n* (%). Skewness and Kurtosis tests were used to determine whether the numerical data matched the normality distribution. The Student's *t*-test was used to compare the normally distributed data, while the Mann–Whitney U-test was used to compare the nonnormally distributed data. The level of significance was set at $P < 0.05$.

Results

During the study period, 37 patients underwent sacrohysteropexy, and 37 patients underwent pectopexy operation. Three patients who underwent sacrohysteropexy and two patients who underwent pectopexy were excluded from the study because hysterectomy was performed in the same session. Three patients who underwent sacrohysteropexy and two patients who underwent pectopexy did not come for follow-up. One sacrohysteropexy and one pectopexy patient refused to participate and withdrew from the study.

A total of 62 women were identified (32 undergoing a pectopexy and 30 undergoing a sacrohysteropexy) with a mean age of 41.28 ± 9.162 years (range 26–62 years). There were no differences in terms of preoperative characteristics between study groups [Table 1].

The effectiveness of pectopexy and sacrohysteropexy was evaluated with the POP-Q scores. The pre- and postoperative POP-Q scores of pectopexy and sacrohsyteropexy groups are shown in Table 2. All parameters of POP-Q scores improved significantly after surgery, both pectopexy and sacrohsyteropexy group.

There was no organ injury in the surgical field in all surgeries. None of the patients required blood or blood product transfusion during or after surgery. The pre- and post-operative complications of both procedures were similar, except for constipation after surgery [Table 1]. *De novo* constipation ratio was 3.2% in the pectopexy group and 20% in the sacrohysteropexy group ($P = 0.036$).

The quality of female sexual function and prolapse quality of life were significantly improved after pectopexy and sacrohysteropexy. There was no difference between the two groups concerning FSFI [Table 3] and P-QOL [Table 4] scores.

The satisfaction rates at 1 and 12 months were significantly higher in both groups. Thirty-one patients (96.8%) in the pectopexy group and 29 patients (96.6%) in the sacrohsyteropexy group stated that they were satisfied with the operation at the 6 months ($P = 0.738$). In both surgical methods, no statistical difference existed between the operation times or the amount of blood loss during surgery. One patient who underwent a pectopexy had a recurrence of prolapse, but this was not statistically significant.

Discussion

POP prevalence, which may be associated with urinary, bowel, and sexual symptoms, increases with age and reaches up to 50% of women across all age groups. Moreover, 19.6% of women undergo surgery for POP, and up to 29% undergo reoperation within 3–5 years. There is a growing interest in prolapse procedures that preserve the uterus. Uterine preservation at the time of prolapse repair has evolved from merely a desire to maintain fertility to avoid added surgical risk and the costs of a hysterectomy, and it is a common perception among patients that a hysterectomy may negatively affect sexual function or body image. Therefore, most women with POP prefer laparoscopic uterus preserving methods such as pectopexy and hysterosacropexy. Compared to other techniques, these laparoscopic procedures are associated with less blood loss, shorter stays, and longer operative times.[27-29] Noé *et al*.[30] carried out 43 pectopexies and 40 sacropexies. Both groups had only symptomatic primary vaginal prolapse POP-Q scores ≤2, and they compared results of the laparoscopic pectopexy and sacrocolpopexy. They showed that the average operating time (43.1 min in the pectopexy group and 52.1 min in the sacrocolpopexy group) and blood loss (4.6 mL in the pectopexy group and 15.3 mL in the sacrocolpopexy group) were significantly lower in the pectopexy group ($P < 0.001$).

Sacrohysteropexy is considered the gold-standard method in the treatment of POP.[6] Dal Moro *et al*.[31] performed robotic hysterosacropexy in ten cases and found no cases of intra- or post-operative complications. Liang *et al*.[32] investigated the effect of laparoscopic suture uterosacral ligament hysteropexy or colpopexy for 32 women with uterine prolapse. They found that 23 women had no uterine prolapse symptoms and that seven had no objective evidence of uterine prolapse. Two women presented with the recurrence of uterine prolapse 3 months after the operation. However, some studies have reported that *de novo* SUI rates increased after sacrohysteropexy surgery. Because the sacrum's ventral side is a challenging surgical field and variable surgical difficulties in each patient, many surgeons

Table 1: Patient preoperative characteristics, peri- and post-operative complications in the study groups

	Pectopexy	Sacrohysteropexy	*P*
Number of patients	32	30	
Age mean	41.28±9.16	42.53±8.08	0.571
BMI (kg/m²)	25.3±3.2	24.4±4.3	0.490
Gravidity	5.56±2.14	6.27±2.545	0.242
Parity	4.06±1.79	4.83±2.23	0.138
Operation time (mean) (dk)	88.44±15.42	88.33±14.22	0.978
Estimated blood loss (ml)	80.46±6.4	88.33±2.5	0.987
Lower urinary tract infection (%)	2 (6.3)	2 (6.7)	0.669
De novo stress urinary incontinence (%)	2 (6.3)	3 (10.0)	0.469
Relapse rate (%)	1 (3.2)	0	0.516
Exacerbation of existing cystocele (%)	2 (6.3)	3 (10.0)	0.469
Exacerbation of existing rectocele (%)	3 (9.9)	0	0.131
De novo urgency (%)	2 (6.3)	2 (6.7)	0.669
Constipation after surgery (%)	1 (3.2)	6 (20.0)	0.036

BMI: Body mass index

Table 2: Comparison of values of pre- and post-operative prolapse quality of life questionnaire

Variables	Op	Preoperative		Postoperative		*P*1	*P*2	*P*3
		Mean±SD	Median (minimum–maximum)	Mean±SD	Median (minimum–maximum)			
Aa	Pp	0.67±1.31	1.25 (−1.5-2.0)	−1.51±0.49	−1.50 (−2.5–−1.0)	<0.01	0.971	0.510
	Shp	0.67±1.37	1.00 (−1.5-2.0)	−1.56±0.45	−1.50 (−2.5–−1.0)	<0.01		
D	Pp	0.25±1.05	0.00 (−1.0-2.5)	−6.92±0.69	−7.00 (−8.0–−6.0)	<0.01	0.211	0.976
	Shp	0.59±1.09	0.50 (−1.0-2.0)	−1.01±0.54	−1.00 (−2.0–0.0)	<0.01		
Ap	Pp	0.17±1.13	0.00 (−1.0-2.0)	−1.03±0.62	−1.00 (−2.0–0.0)	<0.01	0.901	0.741
	Shp	0.17±1.12	0.00 (−1.0-2.0)	−1.01±0.54	−1.00 (−2.0–0.0)	<0.01		
Ba	Pp	1.06±0.56	1.00 (0.0-2.0)	−2.32±0.43	−2.00 (−3.0–−2.0)	<0.01	1.000	0.904
	Shp	1.07±0.45	1.00 (0.0-2.0)	−2.32±0.44	−2.00 (−3.0–−2.0)	<0.01		
C	Pp	1.34±0.48	1.00 (1.0-2.0)	−6.66±0.90	−6.50 (−8.0–−5.0)	<0.01	0.473	0.427
	Shp	1.45±0.51	1.00 (1.0-2.0)	−6.83±0.88	−7.00 (−8.0–−6.0)	<0.01		
Bp	Pp	0.11±0.50	0.00 (−1.0-1.0)	−2.89±0.24	−3.00 (−3.0–−2.0)	<0.01	0.398	0.759
	Shp	0.26±0.51	0.00 (−1.0-1.0)	−2.86±0.32	−3.00 (−3.0–−2.0)	<0.01		

Degree of prolapse of anterior vaginal wall (Aa and Ba), posterior vaginal wall (Ap and Bp), and uterus or vaginal vault (C). *P*1: Comparision of preoperatif and postoperatif variables in the same group, *P*2: Comparision of two groups in respect of preopertive variables, *P*3: Comparision of two groups in respect of postoperative variables. Op: Type of operations, Pp: Pectopexy, Shp: Sacrohysteropexy, SD: Standard deviation

fix the mesh to the promontorium. In the study of Leruth *et al*., a positive cough test was observed in 23.6% of patients who underwent sacrohysteropexy.[33] In another research study by Noé *et al*.(a7), patients were divided into two treatment groups: 44 in the pectopexy and 41 in the sacropexy group during long-term follow-up (21.8 months for pectopexy and 19.5 months for sacropexy). They reported that *de novo* SUI rates were 4.8% in pectopexy group and 4.9% in sacropexy group. They suggested that the reason for the low *de novo* SUI rate in the sacropexy group is that the Sacral 2 (S2) level is used as the anchor point. In the case of the anatomic difficulties, considering that this ratio may increase in sacrohysteropexy surgery, pectopexy can be recommended instead of this procedure. However, there was no significant difference between pectopexy and sacropexy groups in our study in terms of *de novo* SUI rates (6.3% and 6.7%, respectively, $P = 0.669$).

The sacrocolpopexy reduces the space of the pelvis for the rectum to exist.[15] There is also a risk of hypogastric nerve injury in sacrocolpopexy.[34] As a result of these two reasons, in many studies, *de novo* defecation problems were reported after sacrocolpopexy. In the study by Noé *et al*., after a long-term follow-up, a clear difference was found regarding *de novo* defecation disorders (0% in the pectopexy group and19.5% in the sacropexy group). Noé *et al*. stated that laparoscopic pectopexy is a novel method of vaginal prolapse therapy that offers clear practical advantages compared with laparoscopic sacropexy. Because laparoscopic pectopexy does not reduce the pelvic space, it results in no defecation disorders.[15] In this study, the constipation rate was 3.2% in the pectopexy group and 20.0% in the sacrohysteropexy group. This difference was statistically significant ($P = 0.036$).

Table 3: Female sexual function index scores

Variables	Op	Preoperative		Postoperative		*P*1	*P*2	*P*3
		Mean±SD	Median (minimum–maximum)	Mean±SD	Median (minimum–maximum)			
Desire	Pp	2.76±0.49	3.00 (2.0-5.0)	4.1±0.90	4.00 (3.0-5.0)	<0.01	0.558	0.862
	Shp	2.70±0.46	3.00 (2.0-3.5)	4.18±0.90	4.00 (3.0-5.0)	<0.01		
Arousal	Pp	2.91±0.46	3.00 (2.0-4.0)	4.14±0.81	4.00 (3.0-5.0)	<0.01	0.752	0.893
	Shp	2.95±0.51	3.00 (2.0-4.0)	4.12±0.78	4.00 (3.0-5.0)	<0.01		
Lubrication	Pp	2.76±0.49	3.00 (2.0-3.5)	3.98±0.84	4.00 (3.0-5.0)	<0.01	0.558	0.766
	Shp	2.70±0.46	3.00 (2.0-3.5)	4.05±0.87	4.00 (3.0-5.0)	<0.01		
Orgasm	Pp	2.44±0.50	2.25 (2.0-3.5)	3.80±0.78	4.00 (3.0-5.0)	<0.01	0.952	0.638
	Shp	2.43±0.46	2.50 (2.0-3.5)	3.85±0.63	4.00 (3.0-5.0)	<0.01		
Satisfaction	Pp	2.95±0.49	3.00 (2.0-4.0)	4.11±0.66	4.00 (3.0-5.0)	<0.01	0.640	0.822
	Shp	3.00±0.52	3.00 (2.0-4.0)	4.07±0.65	4.00 (3.0-5.0)	<0.01		
Pain	Pp	3.40±0.64	3.50 (2.0-4.0)	3.90±0.73	4.00 (3.0-5.0)	<0.01	0.945	0.908
	Shp	3.41±0.63	3.50 (2.0-4.0)	3.88±0.66	4.00 (3.0-5.0)	0.014		
Total score	Pp	17.11±1.57	17.00 (14.0-21.0)	24.01±3.86	24.00 (18.0-30.0)	<0.01	0.876	0.560
	Shp	17.20±1.67	17.00 (14.0-21.0)	24.35±3.31	24.50 (18.0-30.0)	<0.01		

Op: Type of operations, Pp: Pectopexy, Shp: Sacrohysteropexy, *P*1: Comparision of preoperatif and postoperatif variables in the same group, *P*2: Comparision of two groups in respect of preopertive variables, *P*3: Comparision of two groups in respect of postoperative variables. SD: Standard deviation

Table 4: Outcomes for prolapse quality of life questionnaire

Variables	Op	Preoperative		Postoperative		*P*1	*P*2	*P*3
		Mean±SD	Median (minimum–maximum)	Mean±SD	Median (minimum–maximum)			
GHP	Pp	5.85±0.59	6.00 (4.0-7.0)	3.22±0.37	3.25 (2.5-2.5)	<0.01	0.503	0.924
	Shp	5.96±0.52	6.00 (4.0-7.0)	3.20±0.40	3.50 (2.5-3.5)	<0.01		
PI	Pp	23.51±1.43	23.75 (21.0-26.0)	8.24±0.53	8.10 (7.5-9.0)	<0.01	0.937	0.760
	Shp	23.56±1.30	23.50 (21.0-26.0)	8.20±0.55	8.00 (7.5-9.0)	<0.01		
RL	Pp	2.70±0.42	3.00 (2.0-3.0)	1.43±0.41	1.30 (1.0-2.0)	<0.01	0.662	0.744
	Shp	2.73±0.45	3.00 (2.0-3.0)	1.41±0.41	1.30 (1.0-2.0)	<0.01		
PL	Pp	4.51±0.74	4.50 (3.0-6.0)	1.74±0.53	1.60 (1.0-2.5)	<0.01	0.793	0.760
	Shp	4.48±0.75	4.50 (3.0-6.0)	1.41±0.41	1.30 (1.0-2.0)	<0.01		
SL	Pp	3.36±0.44	3.50 (2.0-4.5)	1.48±0.40	1.50 (1.0-2.0)	<0.01	0.781	0.766
	Shp	3.37±0.45	3.50 (2.0-4.5)	1.51±0.42	1.50 (1.0-2.0)	<0.01		
PR	Pp	5.79±0.44	6.00 (5.0-6.5)	1.62±0.40	1.55 (1.0-2.0)	<0.01	0.599	0.702
	Shp	5.84±0.43	6.00 (5.0-6.5)	1.66±0.40	2.00 (1.0-2.0)	<0.01		
EM	Pp	6.05±0.64	6.00 (4.5-7.5)	3.01±0.80	3.00 (2.0-4.0)	<0.01	0.880	0.923
	Shp	6.04±0.71	6.00 (4.5-7.5)	3.03±0.85	3.00 (2.0-4.0)	<0.01		
SE	Pp	2.63±0.56	2.50 (1.5-4.0)	1.33±0.23	1.50 (1.0-1.5)	<0.01	0.625	0.866
	Shp	2.60±0.59	2.50 (1.5-4.0)	1.30±0.24	1.50 (1.0-1.5)	<0.01		
SM	Pp	6.44±0.51	6.50 (5.0-7.0)	2.00±0.81	2.00 (1.0-3.0)	<0.01	0.959	0.870
	Shp	6.43±0.53	6.50 (5.0-7.0)	2.03±0.85	2.00 (1.0-3.0)	<0.01		
GS	Pp	60.96±2.87	61.10 (55.5-65.5)	24.24±2.39	25.30 (19.5-27.8)	<0.01	0.800	0.849
	Shp	61.10±2.79	61.35 (55.5-65.5)	24.14±2.69	25.65 (19.0-27.8)	<0.01		

Pp: Pectopexy, Shp: Sacrohysteropexy, GHP: General health perceptions, PI: Prolapse impact, RL: Role limitations, PL: Physical limitations, SL: Social limitations, PR: Personal relationships, EM :Emotions, SE: Sleep/energy, SM: Severitymeasures, GS: General score, SD: Standard deviation, *P*1:Comparision of preoperatif and postoperatif variables in the same group, *P*2: Comparision of two groups in respect of preopertive variables, *P*3: Comparision of two groups in respect of postoperative variables

Kale *et al*. showed that *de novo* apical prolapse, *de novo* urgency, *de novo* constipation, SUI, anterior and lateral defective cystoceles, and rectoceles did not occur in any of the patients who underwent the laparoscopic pectopexy procedures during a 6-month follow-up period.[35] In our study, the relapse ratio, exacerbation of existing cystocele ratio, exacerbation of existing rectocele ratio, and *de novo* urgency ratio were 3.2%, 6.3%, 9.9%, and 6.3%, respectively. These ratios were statistically similar to those in the sacrohysteropexy group.

Tahaoglu *et al*. examined the early outcomes of laparoscopic pectopexy in 22 patients who had POP-Q scores ≤2 for

prolapse, and they evaluated female sexual function and quality of life.[24] They found no evidence of recurrent prolapse or constipation. The percentages of exacerbation of cystocele, rectocele, *de novo* SUI, and *de novo* urgency were 4.5%, 9.0%, 4.5%, and 4.5%, respectively (mean follow-up of 10.41 months). The FSFI and P-QOL scores improved significantly ($P < 0.05$) postoperatively. In this study, postoperative POP-Q, P-QOL, and FSFI scores of patients who underwent pectopexy improved significantly. This improvement was statistically similar to patients who underwent sacrohysteropexy. This shows that pectopexy is as effective as sacrohysteropexy.

This study has some limitations such as a small patient group and a lack of long-term follow-up. We examined outcomes of the operations for 12 months postoperatively, and the complications such as recurrence of POP, *de novo* SUI, or mesh erosion may require more than 12 months to occur.

The major strength of this study is that uterus preserving surgery was performed in all patients, and the results were compared. Furthermore, few studies are comparing the results of pectopexy and sacrohysteropexy in the literature. One of the most exciting aspects of this study is the availability of findings on this subject. Another strength of this study is that the surgeries' effectiveness was evaluated with POP-Q, P-QOL, and FSFI scores.

Conclusion

Both sacrohysteropexy and pectopexy are effective surgical options for apical prolapse patients. Laparoscopic pectopexy provides another tool for surgeons to offer to patients desiring uterine sparing who may have difficulties accessing the sacrum, or baseline constipation or defecatory issues. However, there is no doubt that these procedures still require more comparative studies to show long-term effectiveness.

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Conflicts of interest

There are no conflicts of interest.

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