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Comparison of the Results of Sacrospinous Fixation and Abdominal Sacrocolpopexy Surgery

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ABSTRACT

The present study aims to compare the objective and subjective success rates, perioperative and postoperative complications, and results of abdominal sacral colpopexy (SP) and sacrospinous fixation (SSF) operations applied in the treatment of apical pelvic organ prolapse.

Between November 2007 and April 2013, among the patients with the apical organ prolapse, 34 patients who underwent abdominal sacral colpopexy (SP) and 39 patients who underwent vaginal sacrospinous fixation (SSF) were included in the study. The physical examination, sonographic evaluation, stress test and urodynamic test had been performed preoperatively. The patients were assessed average 35 month after abdominal sacral colpopexy and average 8 month after sacrospinous fixation, all parameters were compared with preoperative values. We compared objective and subjective success rate, operating time, inpatient day, return to activities of daily living and complication of abdominal and vaginal groups.

Mean follow-up time was 35 months for abdominal group and 8 months for vaginal group. Objective anatomic success rate was 76,9% in the vaginal group and 85,3% in the abdominal group(p=0,365); Subjective success rate was 84,62% in the vaginal group and 91,18% in the abdominal group(p=0,395). There was no major complication perioperatively in both groups.

Abdominal sacrocolpopexy and sacrospinous fixation are the surgical procedures in the treatment of apical pelvic organ prolapsus which have high success rate and low complication rate.

Keywords: Abdominal sacrocolpopexy, sacrospinous fixation, apical pelvic organ prolapse

Introduction

Pelvic organ prolapses (POP), defined as the protruding of the organs in the pelvis towards the vagina due to the weakening of the pelvic floor tissue, include disorders related to voiding, defecation, and sexual intercourse.

POP, which is one of the most common causes of hysterectomy, is an important health problem affecting many women, and the probability of a woman's lifetime surgery due to prolapse was found to be 11% (1). The most important risk factors increasing the frequency of POP are increasing age and trauma in the pelvic floor muscles due to birth (1). Increasing BMI and postmenopausal status also play a major role in the development of POP.

The 'Pelvic Organ Prolapse Quantification' (POPQ) classification system was developed by the International Continence Society (ICS) in 1996 to define the prolapsus and standardize clinical evaluation (2) and was updated in 2002 (3).

The treatment of apical prolapse is depending on the age, fertility expectation, patient's co-morbidities, most importantly the severity of the prolapse and the patient's complaint. Sacrospinous fixation (SSF) and Sacrocolpopexy (SP) operations are surgical procedures with high success rates in apical POP. SSF is performed with a vaginal approach. While SP can be performed abdominally, laparoscopic and robotic sacrocolpopexy has become widespread recently.

In SSF, the vaginal cuff is suspended to the sacrospinous ligament with a vaginal approach, while in abdominal SP, it is suspended to the sacrum with the help of synthetic mesh. Studies have suggested that both surgical methods improve patients' quality of life and are highly effective methods in vaginal vault prolapse surgery (4).

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Our study aims to compare the objective and subjective success rates, perioperative and postoperative complications, and results of abdominal SP and SSF operations applied in the treatment of POP in our clinic.

Materials and Methods

The records of 114 patients who underwent abdominal SP and SSF operations due to apical pelvic organ prolapse between November 2007 and April 2013 were evaluated. 41 out of 114 patients were excluded from the study because they did not have postoperative follow-up. Seventy-three patients were analyzed in two groups as SP or SSF groups according to the surgical procedure applied. In the SP group, 31 out of 34 patients underwent sacrocolpopexy, and 3 underwent sacrocervicopexy. There were 39 cases in the SSF group. All SSF and abdominal SP operations were performed by people with 5 years of experience in this field. All patients' preoperative and postoperative early results and the type of surgery performed were retrospectively scanned from hospital records. The patients were interviewed and re-examined, and urinary incontinence and satisfaction with the surgical procedure were questioned in detail.

The age of the patient, body mass index (BMI), obstetric history, previous urogynecological and gynecological operations, menopausal status, use of hormone replacement treatment, and smoking history were questioned in the anamnesis. Preoperative and postoperative complaints (vaginal palpable mass, stress/urge urinary incontinence, urinary retention, polyuria/nocturia, constipation, decreased sexual activity, and dyspareunia) and the duration of these complaints were questioned.

In the pelvic examination, in order to determine which part of the vagina was prolapsed, the anterior, posterior, and lateral vaginal walls were excluded, respectively, with the help of a speculum, and the prolapsed parts were determined. In the gynecological examination performed under the Valsalva maneuver, the location of 6 anatomical regions in the vagina was determined by taking the hymen as a reference point. The Pelvic Organ Prolapse Quantification (POP-Q) system was used to grade POP. The total vaginal length was recorded. The volume and position of the uterus were evaluated. The patient was coughed and observed whether there was urine leakage in the lithotomy position (Stress test). In terms of the need for additional surgical intervention, urodynamics was performed in all patients preoperatively (it was evaluated whether there was latent stress incontinence).

Ethics committee approval was obtained for the study on the 8th of November in 2013 with a decision number 6, and informed consent was obtained from all patients for participation in the study. Preoperatively, two grams of Cefuroxime sodium antibiotic prophylaxis was administered to all patients.

Sacropexy operation was performed in the lithotomy position, with a Pfannenstiel incision, and prolene mesh was used as the material. After abdominal hysterectomy was performed in menopausal patients with uterine prolapse or uterine pathology, the arms of the Y-shaped prolene mesh were fixed to the anterior and posterior wall of the vagina at 2-3 points with 2/0 prolene sutures. The same procedure was applied after vaginal deperitonization in cases with cuff prolapse. In three patients in the reproductive period, the same procedure was performed with the suspension of the mesh arms to the cervical attachment areas of both sacrouterine ligaments. In all cases, the leg part of the Y mesh was suspended to the anterior longitudinal ligament from 2-3 places with 2/0 prolene sutures after opening the peritoneum from a suitable area between the 3rd sacral vertebra and the promontorium. During these procedures, the mesh was placed in the retroperitoneal area by either opening the peritoneum covering the Douglas or creating a tunnel.

Sacrospinous ligament fixation was performed in the lithotomy position (after vaginal hysterectomy). After an incision on the right wall of the vagina, by the blunt dissection in the rectovaginal space the right ischial spine and the sacrospinous ligament was palpated. The vaginal apex was suspended to the sacrospinous ligament with two zero-numbered non-absorbable sutures.

The duration of the operation, other simultaneous operations, the amount of bleeding, and complications that occurred during the operation (bladder, ureter and rectum injuries, bleeding requiring transfusion) were recorded by examining the patients' files.

Postoperative complications (urinary tract infection, post-op fever, wound infection, opening at the incision), gluteal pain, dyspareunia, decreased sexual activity, length of hospitalization, and return to daily activities were recorded. The patients were called for monthly follow-up, and their complaints were questioned and examined.

Statistical Analysis: This study performed statistical analyses with the NCSS (Number Cruncher Statistical System) 2007 Statistical Software (Utah, USA) package program. In addition to descriptive statistical methods (mean, standard deviation) in the data evaluation, independent t-test, paired t-test, and qualitative data were used to compare paired groups. Chi-square and Fisher reality tests were used in comparisons. The results were evaluated at the significance level of $p<0.05$.

Results

Demographic features of 73 patients who underwent one of the abdominal SP and SSF operations due to apical pelvic prolapse between November 2007 and April 2013 are shown in Table 1.

The preoperative and postoperative symptoms are shown in Table 2. The operations of the patients who did not have complaints of tissue protruding from the vagina in the postoperative period were considered subjectively successful. The subjective success rate of the operation was detected respectively 84.62% and 91.18% in the SSF and SP groups.

There was not significant difference in terms of urinary incontinence, difficulty in defecation and complaint of urinary retention between the pre- and postoperative distribution of in the SSF and SP groups ($p>0.05$). The rates of occult stress urinary incontinence (the rates of patients who did not have preoperative stress urinary incontinence but occurred post-operatively after reduction of the prolapsus) are 13.3% (2/15) in the SSF group and 14.3% in the CP group (1/7).

In the present study, most of the sexually active patients (37.5% in the SSF group and 65.5% in the SP group) did not engage in sexual activity before the operation due to reasons such as dyspareunia, fear of urinary incontinence during intercourse, the presence of prolapse outside the vagina, and the feeling of embarrassment. The rate of decreased sexual activity in the SSF group did not change in the pre-and postoperative period. After the operation, there was a significant improvement in the rate of decrease in sexual activity in the SP group compared to the SSF group ($p=0.046$). The rate of dyspareunia in the postoperative period in the SSF group (41.7%) was significantly higher than in the SP group (17.7%) ($p=0.049$).

The surgery and postoperative information are shown in Table 3. The mean operation time was respectively 143 minutes and 121 minutes in the SSF and SP groups. Contrary to the information in the literature, in our study, the mean operation time in the SSF group was significantly higher than in the SP group ($p=0.003$). In our study, it was thought that the reason for the longer operation times in the SSF group was that other simultaneous operations were performed. Surgical procedures performed simultaneously in both groups are shown in Table 4.

Duration of hospitalization was found to be significantly shorter in the SSF group (4.15 days) compared to the SP group (5.35 days).

The amount of bleeding in the operation was evaluated by looking at the preoperative and postoperative hemoglobin values. Decrease in hemoglobin value was similar between the two groups in the ($p=0.123$).

The patients' total vaginal length (TVL) in the postoperative period was measured with the help of a sterile instrument such as a vaginal dilator with measurements in centimeters. The patient files were scanned, but since the total vaginal length information was missing in some patients before the operation, the values before and after the operation could not be compared. How much shortening in the vaginal length could not be determined. However, in the postoperative period, a statistically significant shortness was observed in the mean TVL in the SSF group (7.38cm), compared to the SP group (7.97cm) ($p=0.014$).

Pre-post operative POP-Q stage distributions between the SP and SSF groups were similar ($p>0.05$) (Table 5).

The objective anatomical success was calculated based on the National Institutes of Health (NIH) 2001 terminology. Accordingly, patients with stage 2, 3, and 4 POP-Q were defined as unsuccessful treatment (recurrence), and patients with stage 0 and 1 POP-Q were defined as the optimal and satisfactory anatomical outcome (successful surgical treatment). The recurrence rates were respectively 14.7% and 23% in the SP and SSF groups (Table 6). According to these values, the objective success rate was 85.3% in the SP group and 76.9% in the SSF group. However, this difference was not statistically significant. (p: 0.365).

There was a statistically significant difference in patient satisfaction with the treatment in the two groups ($p=0.017$) (Table 7). It was observed that

Table 1: Demographic Features of Patients in SSF and SP Groups

	SSF (n:39)	SP (n:34)	P value
Age	57.54±9.76	55.68±8.06	0.381*
Parity	4.23±2.05	3.79±1.94	0.354*
BMI	27.48±4.94	27.24±2.77	0.803*
Follow-up time	8.30±2.40	35.31±14.79	0.0001*
History of gynecological operation	7 (17.9%)	12 (35.2%)	

Values are presented as mean± standard deviation and as counts (percentage)
*Independent t-test
Bold values denote statistical significance at the p<o.o5 level

Table 2: Preoperative and Postoperative Symptoms in SSF and SP Groups

		SSF (n:39)	SP (n:34)	P value
	Pre-operative	24 (61.54%)	27 (79.41%)	0.097†
Urinary incontinence	Post-operative	7 (17.95%)	3 (8.82%)	0.258†
	p value	0.001†	0.001†	
	Pre-operative	18 (46.15%)	19 (55.88%)	0.407†
Urinary retention	Post-operative	4 (10.26%)	1 (2.94%)	0.217†
	p value	0.0001†	0.001†	
	Pre-operative	16 (41.03%)	23 (67.65%)	0.023†
Nocturia/Polyuria	Post-operative	13 (33.33%)	13 (38.24%)	0.663†
	p value	0.375†	0.013†	
	Pre-operative	10 (25.64%)	2 (5.88%)	0.023†
Constipation	Post-operative	13 (33.33%)	4 (11.76%)	0.03†
	p value	0.250†	0.500†	
	Pre-operative	39 (100.00%)	34 (100.00%)	-
Tissue protruding from vagina	Post-operative	6 (15.38%)	3 (8.82%)	0.395†
	Pre-operative	9 (37.50%)	19 (65.50%)	0.042†
Decreased sexual activity	Post-operative	9 (37.50%)	4 (13.80%)	0.046†
	p value	0.998†	0.001†	
	Pre-operative	7 (29.20%)	13 (44.80%)	0.242†
Dysparonia	Post-operative	10 (41.70%)	5 (17.70%)	0.049†
	p value	0.607†	0.077†	

Values are presented as counts (percentage)
† Chi Square test. Bold values denote statistical significance at the p<o.o5 level

patients who underwent SP are more satisfied with the surgery than those who underwent SSF.

Discussion

In the present study, SSF and SP are both surgical methods with high objective and subjective success rates in the treatment of POP. In the SP group, the rate of unsuccessful surgery and reoperation was lower than in the SSF group, dyspareunia was significantly less, and TVL was significantly longer. Postoperative urinary incontinence rates were significantly decreased in both groups. Postoperative hospitalization was found shorter in the SSF group compared to the SP group.

Maher et al. applied SP to 47 and SSF to 48 of 95 random patients with vaginal cuff prolapse after hysterectomy (4). Using the POP-Q classification, they defined prolapses up to half of the vagina (stages 0 and 1) as objective success and evaluated patients without prolapse-related vaginal symptoms as subjective success. When the quality-of-life scales were compared, similar results were seen between the two groups. Maher et al. suggested that abdominal SP and SSF are similarly effective surgeries for correcting vaginal cuff prolapse.

Table 3: The Surgery and Postoperative Information

	SSF (n:39)	SP (n:34)	P value
Operation time (hour)	143.21±26.54	121.91±32.64	0.003*
Hospitalization time (day)	4.15±0.75	5.35±1.77	0.001*
Time to return to daily activity (day)	26.31±17.07	28.85±22.42	0.584*
Difference between pre/post operative Hemoglobin (mg/dl)	2.39±1.01	1.99±1.2	0.123*
Total Vaginal Length (TVL) (cm)	7.38±0.99	7.97±1.0	0.014*

Values are presented as mean± standard deviation
*Independent t-test
Bold values denote statistical significance at the p<o.o5 level

Table 4: Concurrent Surgeries in SSF and SP Groups

Concurrent surgeries	SSF (n: 39)	SP (n:34)
TAH	0	22
VAH	34	0
CA	35	1
CP	36	22
BURCH	0	30
TVT	11	0
TOT	10	0
HALBAN	0	24

Values are presented as counts

Table 5: POP-Q Stage Distributions Before and After The Operation

	POP-Q Score	SSF (n:39)	SP (n:34)	P value
Pre-operative	1	0 (0.00%)	1 (2.90%)	
	2	0 (0.00%)	1 (2.90%)	
	3	14 (35.90%)	8 (23.50%)	0.343†
	4	25 (64.10%)	24 (70.60%)	
	0	16 (41.00%)	17 (50.00%)	
	1	14 (35.90%)	12 (35.30%)	
	2	5 (12.80%)	5 (14.70%)	
	3	3 (7.70%)	0 (0.00%)	0.425†
	4	1 (2.60%)	0 (0.00%)	
	P value	0.0001†	0.0001†	

Values are presented as counts (percentage)
† Chi Square test
Bold values denote statistical significance at the p<o.o5 level

Benson et al. investigated the success rates of SSF and abdominal SP operations (5). The NIH 2001 POP terminology was used for treatment success. This study suggested that the number of optimal anatomical and satisfactory anatomical results in the SP group was higher than in the SSF group; The rate of unsuccessful surgery and reoperation was lower than in the SSF group. In addition, urinary complications and dyspareunia were reported to be higher in the SSF group and complications such as vascular and organ injuries were more common in the SP group, and the operation time was longer for SP group.

The cure and recurrence rates are the main factors that determine the success criteria of the operation. In the literature, the treatment success rates of SSP and SP operations are in a wide range (19%-97%) (6). In addition, the history of

Table 6: Recurrence Rates in SSF and SP Groups

	SSF (n:39)	SP (n:34)	P value
Recurrence (-)	30 (76.90%)	9 (85.3%)	
Recurrence (+)	9 (23.10%)	5 (14.70%)	0.365†

Values are presented as counts (percentage)

Table 7: Patient Satisfaction With The Operation

Patient satisfaction	SSF (n:39)	SP (n:34)	P value
Satisfied	22 (56.4%)	28 (82.3%)	
Moderately satisfied	7 (17.9%)	5 (14.7%)	0.017†
Not Satisfied	10 (25.6%)	1 (2.56%)	

Values are presented as counts (percentage)
† Chi Square test
Bold values denote statistical significance at the p<o.o5 level.

previous pelvic floor operations and the presence of other concomitant surgeries in the patients included in the study are other factors that make it difficult to compare these studies with each other.

The follow-up time is another important point in evaluating the treatment success rate. In many studies, patients have a minimum follow-up time of two years when evaluating relapse rates (7, 8) The limitation of our study is that the follow-up times were different between the two groups. The mean follow-up time of the SP group was 35 months, and the mean follow-up time of the SSF group was 8 months. The reason why there is such a difference between the follow-up periods is that vaginal suspension operations have been preferred more frequently than abdominal suspension operations in recent years. The susceptibility to SSF has increased since it can be applied in other simultaneous vaginal operations, and the patient tolerates the vaginal operation more easily. Our data on the long-term outcomes of the SSF group are insufficient. However, as a result of studies, it was reported that most of the recurrences in patients who underwent SSF occurred before the 8th postoperative month (5).

In the present study, complications encountered in the SSF and SP groups were quite rare. In addition, both groups did not observe organ injuries such as bladder, rectum and ureter and large vessel injuries such as pudendal-middle sacral. Bleeding requiring transfusion was detected in 3/34 (8.82%) patients in the SP group and in 1/39 (2.56%) patients in the SSF group (4 patients were given two units of erythrocyte suspension). However, since simultaneous surgeries were performed in both groups, it was thought that bleeding could also be related to other surgeries.

Mesh erosion is one of the rare complications of sacrocolpopexy operation. In the present study, only one of 34 patients who underwent sacrocolpopexy had mesh erosion in the vagina. We have used macroporous polypropylene light mesh in sacrocolpopexy operations in our clinic, and mesh erosion was seen only in 1/34 (2.94%) patients. Many materials (autologous or synthetic) have been used as grafts in sacrocolpopexy (fascia lata, rectus fascia, dura matter/polypropylene mesh, polyester fiber mesh, mersilene). Culligan et al. compared objective anatomical results after SP operations using cadaver fascia lata graft and polypropylene mesh (9). It has been shown that repair with prolene mesh is superior to repair with fascia lata in terms of POP-Q stages and objective anatomical success. Extensive studies on SP have determined the average mesh erosion rate be 3.4-9% (6, 10-12).

There are randomized controlled studies comparing operation times, hospitalization time, amount of bleeding in operation, time to return to daily activities and cost in patients who underwent SSF and abdominal SP (8). In our study, the two groups were similar in terms of the amount of bleeding during the operation and the time to return to daily activities. The mean hospitalization time was longer in the SP group (5.35 days) than in the SSF group (4.15 days). Contrary to many studies, the operation times were longer in the SSF group (mean 143 minutes) compared to the SP group (mean 121 minutes), and this difference was thought to be due to other simultaneous operations in the SSF group. Maher et al. analyzed 14 randomized controlled trials in the Cochrane database which compared the results of SSF and SP operations in 1004 patients (8). They found a shorter operation time, shorter return to daily

activities, and lower cost in the SSF group compared to the SP group. However, it was reported that the rates of recurrent cuff prolapse, and dyspareunia were significantly lower in the SP group compared to the SSF group.

Women with POP often experience sexual dysfunction. Novi et al. compared 30 women with POP (especially stages II and III) and 30 women without POP in terms of sexual function in 2005. Avoidance of intercourse (70%), intercourse incontinence (57%), dyspareunia (37%), decreased frequency of intercourse (33%), inability to orgasm (10%), and less satisfaction (20%) were found in patients with POP (13). It has been reported that sexual functions may deteriorate further in patients with POP and urinary incontinence. However, studies investigating the effects of prolapse surgeries on sexual function are insufficient in the literature.

In the present study, most of the sexually active patients (37.5% in the SSF group and 65.5% in the CP group) decreased in sexual activity due to reasons such as dyspareunia, fear of urinary incontinence during intercourse, presence of prolapse outside the vagina, and a sense of shame and reluctance before the operation. The rate of decreased sexual activity in the SSF group did not change in the pre-and postoperative period. The rate of decrease in sexual activity in the SP group decreased from 65.5% (19/29) before the operation to 17.7% (5/29) after the operation, and this rate was statistically significant (p=0.001). After the operation, there was a significant improvement in the rate of decrease in sexual activity in the SP group compared to the SSF group (p=0.046). The rate of dyspareunia in the SSF group (41.7% -10/25% patients) was found to be significantly higher than in the SP group (17.7-5/29 patients) in the postoperative period (p=0.049). As a result of studies, a history of pelvic surgery results in a short vagina, which causes low sexual activity, but it has been determined that vaginal length affects sexual function and activity less than age (14).

The anatomical success of SP operations has been reported to be superior to SSF (12). Benson et al. found that dyspareunia was 0/15 in the SP group and 15/26 (58%) in the SSF group (5). Post-operative gluteal pain after SSF is also a common complication (15-18). Severe pain and motor and sensory damage have been reported due to damage to the pudendal and sciatic nerves located just above and lateral to the sacrospinous ligament. In our study, postoperative gluteal pain rates were found to be 35.9% (14/39) in the SSF group and 5.88% (2/34) in the CP group, and this difference between the groups was statistically significant (p=0.002).

Consequently, SSF and SP are two surgical methods that can be preferred in the treatment of pelvic organ prolapse with high anatomical success rates and low complication rates. Adequately powered randomized controlled clinical trials which has larger sample size and longer follow-up time, let us know more accurate knowledge.

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Conflict of Interests: The authors declare that there is no conflict of interests.

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