

Vaginal sacrospinous ligament fixation versus abdominal sacrocolpopexy for the treatment of vaginal cuff prolapse: A retrospective study

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Abstract

Aim: The aim of this study was to retrospectively compare the objective and the subjective results of native tissue sacrospinous ligament fixation (SSLF) and abdominal sacrocolpopexy (ASC) operation for the treatment of vaginal cuff prolapse (VCP).

Material and Methods: 25 patients who underwent native tissue SSLF and 20 patients who underwent mesh ASC procedure for VCP were evaluated with pelvic organ prolapse quantification (POP-Q) system and pelvic floor distress inventory-20 (PFDI-20) before the surgery and 12 months after surgery. The patients were asked about surgical satisfaction, postoperatively. Demographic data, intra- and postoperative complications, operation duration and hospital stay were also recorded.

Results: No difference was detected between SSLF and ASC in terms of objective success rate (88% vs. 95%; $p=0.617$). PFDI-20 score improved significantly after the ASC and SSLF ($p<0.001$). The median change of the PFDI-20 score, the pelvic organ prolapse distress inventory-6 (POPDI-6) score, the colorectal-anal distress inventory-8 (CRADI-8) score and the urinary distress inventory-6 (UDI-6) score of the groups were not different ($p=0.14$; $p=0.44$; $p=0.65$; $p=0.53$, respectively). The median operation time of the ASC group was 34 minutes longer than the SSLF group (90 vs 56 min.) ($p<0.001$). Similar satisfaction rates (96% in ASC and 95% in SSLF) were found among the groups ($p=1$).

Conclusion: Objective and subjective results of SSLF and ASC operations were equal at 12-months after operation. SSLF can be a good option for patients with obesity and co-morbidity, and for whom general anesthesia is risky.

Keywords: Pelvic Organ Prolapse; Vaginal Vault Prolapse, Sacrocolpopexy.

INTRODUCTION

Vaginal cuff prolapse (VCP) is defined as clinically evident descent of the vaginal vault (cuff scar after hysterectomy) according to International Continence Society and International Urogynecology Association (1). Hysterectomy is the most frequent gynecologic surgical procedure. The incidence of vaginal cuff prolapse after hysterectomy has been estimated as 36 per 10,000 person-years (2). Vaginal sacrospinous fixation (SSLF) surgery and abdominal sacrocolpopexy (ASC) surgery are frequently performed for VCP reconstruction (3). After these operations, recurrences can be seen and surgery repetitions may be required due to both aging and menopause. Since these patients are usually elderly and may have accompanying systemic diseases, the choice of the operation with low risk of recurrence and minimum

intra- and postoperative complications is very important for the quality of life of the patients.

In ASC surgery, the vaginal cuff is fixed to sacrum with the help of mesh. It can be applied by laparoscopic, robotic or laparotomy. ASC is the gold standard operation due to its least reoperation and recurrence rate (4).

In VCP, the suspension of the cuff to sacrospinous ligament (SSL) is performed with mesh or sutures. Although the use of mesh in SSLF surgeries has been common in the past, the native tissue SSLF ratio has increased again especially after the warnings of Food and Drug Administration (FDA) regarding the use of vaginal mesh in 2011(5). However, both the usage of a vaginal route and the applicability without the use of mesh are the advantages of the operation, there are 2 prospective randomized controlled trials and 4 retrospective studies,

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comparing the objective and subjective outcomes of ASC and SSLF (6-11). In these studies, it is difficult to draw a common conclusion due to the fact that the methods used to evaluate the effects of ASC and SSLF surgery on bowels, low urinary tract and sexual function are different from each other (12).

In this study, we aimed to evaluate the postoperative 1-year objective and subjective results of the SSLF and ASC operations performed in the post-hysterectomy VCP cases and the intraoperative and postoperative complication rates retrospectively.

MATERIAL and METHODS

45 patients who were admitted to Urogynecology Outpatient Clinic in Inonu University due to complaint of post-hysterectomy VCP in between 2013 and 2017, who underwent ASC or SSLF surgery, and who presented for follow-up were included in the study. In the light of the literature, the patients were informed about the intraoperative, postoperative complications of ASC and SSLF operation, early and late recurrence and reoperation rates, and duration of hospital stay. In the light of this information, 25 patients preferred ASC and 20 patients preferred SSLF surgery. Demographic characteristics (age, gravid must be gravidity, parity, menopausal status, systemic diseases, and previous surgery) were recorded preoperatively and staging of cuff prolapsed was performed with POP-Q (pelvic organ prolapse quantification) system (13). Pelvic floor distress inventory -20 (PFDI-20) questionnaire with Turkish validation was applied to the patients (14). The patients were re-evaluated with POP-Q and PFDI-20 on annual postoperative follow-up and the patients were asked if they were satisfied with the results of the surgery. The results were evaluated over two responses. 1. Satisfied 2. Not satisfied. The rate of patients who said 'I am satisfied with the results of the surgery' was given as percentage. The files of the patients were reviewed retrospectively; in the postoperative first year, the changes of POP-Q results were evaluated for objective success, and the PFDI-20 score changes were evaluated for subjective success and postoperative satisfaction rates. Ethics approval was achieved from the Inonu University Ethical committee (approval number is 2018/15-3).

In the postoperative first year, POP-Q stage ≥ 2 status was evaluated as recurrence (the objective failure).

PFDI-20 consists of 20 questions and 3 subscales: Pelvic organ prolapse distress inventory-6 (POPDI-6), colorectal-anal distress inventory-8 (CRADI-8) and urinary distress inventory-6 (UDI-6). When the severity of the complaints increases, the total score also increases for three of the subscales. The scoring of subscales was calculated by dividing the total score of each subscale by the number of questions available in the subscale and multiplying by 25. The total score was calculated by summing the subscale scores. Preoperative and postoperative median score

changes of ASC and SSLF groups were also calculated.

Surgical procedure

ASC

Under general anesthesia, while in the lithotomic position, the abdomen was entered with a Pfannenstiel incision. The vaginal cuff was elevated through the vaginal route with the elevator. The peritoneum on the sacral promontorium was dissected and S1-S3 level anterior longitudinal ligament was visualized. The right ureter was visualized by opening the peritoneum and the peritoneal opening was advanced to the vaginal cuff. 2x10 cm macroporous polypropylene two separate pieces of mesh were fixed to the anterior longitudinal ligament with No 2/0 Prolene™ suture (Ethicon); the vaginal cuff was fixed to the anterior and posterior vagina with No. 1 PDS™ suture (Ethicon). Peritonea was closed with 2/0 absorbable suture. Four patients underwent colporrhaphy anterior, 8 patients underwent colporrhaphy anterior and posterior and 4 patients underwent tension free transobturator tape (TOT) operation concomitantly.

SSLF

Under general anesthesia or spinal anesthesia, the vaginal cuff was suspended to the right SSL unilaterally, with the curved needle holder and 2 pieces of No. 1 PDS™ sutures (Ethicon). 8 patients underwent colporrhaphy posterior, 7 underwent colporrhaphy anterior, 5 underwent colporrhaphy anterior and posterior and 6 patients underwent TOT operation, concomitantly.

Statistical analysis

Data are presented as medians, range or percentages. We used Student's t-test or Mann-Whitney U-test as appropriate for continuous variables and Chi-square or Fisher's exact test as appropriate for categorical variables. A p-value <0.05 was considered to reflect statistical significance. All data were analysed with the IBM SPSS Statistics version 22, 2013 (IBM Corp, Armonk, NY). In the power analysis, when $\alpha = 0.05$ $1-\beta$ (power) = 0.80 was taken, it was calculated that there should be at least 13 patients in each group in order to have the difference of PFDI-20 score as 51.6 (14).

RESULTS

65 patients underwent operation for VCP. 45 patients presented for follow-up. 20 patients were included in the ASC group and 25 patients were included in the SSLF group. POP-Q scores were >2 for all patients preoperatively. The mean age for ASC was lower than SSLF [54.4 (± 7.7) vs. 57.6 (± 7.6)] but the difference was not significant ($p=0.845$). The other parameters were similar. Demographic data of the patients are shown in Table 1.

All of ASC and 40% of SSLF were performed under general anesthesia, 60% of SSLF procedures were performed under spinal anesthesia. Median operation time was longer in the ASC group (90 vs. 56 min., $p<0.001$). Wound infection was 10% for ASC and 4% for SSLF ($p=0.577$). No major bleeding, bladder perforation, rectal injury and urinary retention were seen in the SSLF and ASC group.

One patient suffered from buttock pain after SSLF. It was resolved after the stick was removed. The duration of hospital stay ($p=0.173$) and the median hemoglobin change ($p=0.308$) in the groups were similar (Table 2).

The objective success rate was 88% in the SSLF group and 95% in the ASC group ($p=0.617$). 95% of the patients in the ASC group and 96% of the patients in the SSLF group told that they were satisfied with the results of the surgery ($p=1$).

The recurrence rate in the SSLF group was 12% (1 patient's Aa point = 0.1 patient's Ba point = 0 and 1 patient's C point = 0) and 5% in the ASC group (C point = -1) ($p=0.617$). The reoperation rate was 4% in SSLF group and 5% in the ASC group ($p=1$).

PFDI-20 score and the score of all subscales (POPDI-6, CRADE-8, UDE-6) were improved significantly in both groups. The median score changes in PFDI-20 and subgroups were not different significantly ($p=0.14$; $p=0.44$; $p=0.65$; $p=0.53$; respectively). The median total score change in PFDI-20 was not significant between the groups. (Table 3-4)

Table 1. Patient demographic data

	ASC n:20 median (min-max)	SSLF n:25 median (min-max)	p
Age	54.7 (± 7.7)	57.6 (± 7.6)	0.845
BMI kg/m ²	25.7 (20-43)	30 (20-40)	0.069
Gravida (n)	4 (1-9)	5 (2-12)	0.053
Parity (n)	3 (1-9)	4 (2-12)	0.313
Menopause (n)	19	24	
Smoking (n)	1	1	
Morbidity (n)			
Ht	8	9	
DM	6	5	
COPD	2	1	
RA	2	0	
History of pelvic surgery (n)			
TAH	17	23	
VAH	3	2	
CA	5	4	
CP	3	0	
CA+CP	7	2	
TOT	3	3	
BURCH	0	0	

*Data is mean (\pm SD). ASC abdominal sacrocolpopexy, SSLF sacrospinous ligament fixation, BMI Body mass index, Ht Hypertension, DM Diabetes Mellitus, COPD Chronic obstructive pulmonary disease, RA Rheumatoid arthritis, TAH total abdominal hysterectomy, VAH Vaginal hysterectomy, CA Colporrhaphy anterior, CP colporrhaphy posterior, TOT transobturator tape

Table 2. Intraoperative and postoperative complications in two groups

	ASC n:20 median (min-max)	SSLF n:25 median (min-max)	p
Operation time (minutes)	90 (30-150)	56 (30-100)	<0.001
Mean hemoglobin change gr/dL	1.4 (0-5)	1.6 (0-2.4)	0.308
Bladder perforation(n)	0	0	
Major bleeding (n)	0	0	
Pulmonary emboli (n)	0	0	
Wound infection (n)	2	1	0.577
Urinary retention (n)	0	0	
Concomitant surgery (n)			
CA	6	4	
CA+CP	7	8	
TOT	4	6	
Rectal injury (n)	0	0	
Buttock pain (n)	0	1	0.371
Hospital stay (day)	2 (2-4)	2 (1-3)	0.73
Recurrans (n)	1 (5%)	3 (12%)	0.617
Vault	1	1	
Cystocel	0	2	
Rectocel	0	0	
Reoperation for prolapse (n)	1	1	
Satisfaction of patients	96%	95%	1

Data are median (range). ASC abdominal sacrocolpopexy, SSLF sacrospinous ligament fixation. CA Colporrhaphy anterior, CP colporrhaphy posterior, TOT transobturator tape

Table 3. The score of POPDI-6, CRADI-8, UDI-6 and PFDI-20 preoperatively and postoperatively

	ASC			SSLF		
	Preoperative	Postoperative	p	Preoperative	Postoperative	p
POPDI-6	60.2 (20.8-100)	20.2 (0-83)	<0.01	41.3 (12.5-83)	8.7 (0-37)	<0.01
CRADI-8	28.4 (0-46)	11.2 (0-43)	<0.01	21.3 (0-50)	4.1 (0-18)	<0.01
UDI-6	54.3 (8.3-95.8)	16.4 (0-50)	<0.01	44 (0-75)	11(0-62)	<0.01
PFDI-20	123 (29.1-167)	37.1(0-168)	<0.01	99.4 (12.5-132)	15.9 (0-92)	<0.01

Data are median (range). ASC abdominal sacrocolpopexy, SSLF sacrospinous ligament fixation, POPDI-6 Pelvic organ prolapse distress inventory -6, CRADI-8 Colorectal-anal distress inventory-8, UDI-6 Urinary distress inventory-6, PFDI-20 pelvic floor distress inventory-20

Table 4. Median change of POPDI-6, CRADI-8, UDI-6 and PFDI-20 scores in the ASC ve SSLF groups (Δ values)

	ASC Δ Median (min-max)	SSLF Δ Median (min-max)	p
POPDI-6	41.6(-54-100)	37.5(0-75)	0.442
CRADI-8	21(0-40)	17.2 (-6-50)	0.65
UDI-6	45.8(0-83)	28.3(-29-75)	0.53
PFDI-20	101.5(-34-125)	67(-27-118)	0.146

ASC abdominal sacrocolpopexy. SSLF sacrospinous ligament fixation. Min Minimum. Max maximum. POPDI-6 Pelvic organ prolapse distress inventory -6. CRADI-8 Colorectal-anal distress inventory-8. UDI-6 Urinary distress inventory-6. PFDI-20 pelvic floor distress inventory-20

DISCUSSION

This retrospective study showed that subjective and objective success rate of ASC and SSLF are similar on the 1st year after surgery. The demographic data between the two groups was similar. There was no difference between median hemoglobin change, duration of hospital stay, minor and major complication rate. The operation duration was 34 minutes longer in the ASC group.

The first prospective randomised trial (RCT) was published in 1996 by Benson et al. (6) They showed that the operation duration and hospital charge was lower in SSLF group, but the reoperation rate is higher in SSLF group than ASC group (40% vs. 13%). In their study, vaginal or abdominal hysterectomy also performed in some patients concomitantly. The recurrent rate due to cystocele is 76% in SSLF and 80% in the ASC group. The second randomised RCT was published in 2004 by Maher et al. and their finding contrasts to the Benson et al. (7). The study included the patients who have postoperative vaginal cuff prolapse. Two years after the operation, objective (76% vs. 69%) and subjective success rate (94% vs. 91%) were similar between the ASC and the SSLF groups. Marcickiewicz et al. showed that the objective and the subjective success rate were similar in ASC and SSLF in their retrospective study. The follow-up period was average 36-months (10). Another retrospective study showed that 95.6 % of the patients in the ASC group and 79.7% patients in the SSLF group cured in average 13.2-months follow-up period ($p < 0.001$) (9). In 2007, a systematic review and meta-analysis showed that objective success rates ranged from 68 to 93% for ASC and from 35 to 81% for SSLF in 12-months follow-up periods. No significant differences were seen for the subjective success and quality of life (16).

Recurrence risk was increased in the SSLF procedure when

the surgeon had experienced <20 operations according to the Nieminen et al. study (17). However, our objective and subjective success rates were satisfactory in the SSLF group.

One patient suffered from buttock pain in the SSLF group. Buttock pain can be related to levator ani nerve which crosses the SSL at 0–4 cm medial to the ischial spine (18-20) or the pudental nerve which lies inferior to the SSL, has 4–11 mm distance from levator ani nerve (18). We observed the patients for two weeks, but it became worse. Therefore, we removed the sticks. After that, the pain stopped. Also, there are cases that the buttock pain resolves spontaneously within 3-6 months (21).

In our study, there were 3 recurrences (12%) in the SSLF group. 1 was cuff prolapse (POP-Q C point=0), and 2 were cystocele (POP-Q Aa point=0, and Ba point= 0). It was known that the most recurrence after SSLF is developed from the anterior vaginal wall which lost the support because of excessive posterior deviation of the vaginal axis (21-23). The overall risk for cystocele is 23% (22). In our study, the cystocele recurrence rate was 8%, and all of the patients had cystocele previously, and colporrhaphy anterior was performed at SSLF operation concomitantly. The patients were asymptomatic, therefore reoperation was not performed. Risk factors for recurrence after SSLF are as follows: C or D point at stage >1 postoperatively, vaginal cuff infection, urinary tract infection (24) (17). ASC can be the preferred operation for the patients who have stage ≥ 2 anterior vaginal wall prolapse.

FDA reclassified surgical mesh for transvaginal pelvic organ prolapse (POP) repair from class II to class III. However, the abdominal POP repair with mesh related to less mesh specific complication than vaginal POP repair with mesh. Jia et al.'s mesh erosion rates for ASC

ranged from 0 to 12%. Shepherd et al. have found that if monofilament delayed absorbable suture (PDS, Ethicon, Sommerville, New Jersey) was used in ASC, there would be no suture and mesh erosion. (25) We use PDS suture for fixing the mesh to the vaginal vault, and there was no mesh specific complication. ASC is the most effective procedure for POP and gold standard procedure with high anatomic success and low reoperation rate (4) (25).

In 2004, Nygaard et al. have reported the cure rates of ASC in their review. According to this study, the cure rate has been defined as lack of apical prolapse postoperatively, and it was ranged from 78 to 100% in 6-months to 3-years follow-up period. When they defined the cure rate as no postoperative prolapse, the cure rate was ranged from 58 to 100% (26). In our study, the objective cure rate was 95% after ASC.

ASC was performed under general anesthesia while SSLF was performed usually under spinal anesthesia. Operation time was longer in the ASC group. Therefore SSLF can be a good option for patients who are obese and have medical co-morbidities.

The effect of ASC on bowel symptoms are obscure (27). Fox et al. showed the worsening in constipation but improvement in fecal soilage after ASC in their prospective study (28). In 2004, Extended Colpopexy and Urinary Reduction Efforts (E-CARE) trial results were published. According to this study, overall obstructed defecation symptoms may improve after ASC (29). In our study CRADE-8 score improved significantly in both ASC and SSLF groups. POPDI-6 and UDE-6 scores were also improved significantly in both groups.

One limitation of this study is that there was no data about the sexual activity of patients. Another limitation of our study is that the follow-up duration was only 12 months.

CONCLUSION

In conclusion, objective and subjective results of the ASC and the SSLF operation are similar at postoperative 1 year. The ASC has longer operation time and needs general anesthesia. Therefore the SSLF procedure can be preferred for the patients who have medical co-morbidities and obesity. At the same time, for the patients whose anterior vaginal wall prolapse stage is ≥ 2 , ASC procedure can be preferred for the treatment of vaginal vault prolapse. Further prospective studies are required to evaluate the effect of the procedures on bowels, urinary and sexual functions. Long term results of the procedures (3-5-10 years) can also be evaluated.

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