

# Outcomes of laparoscopic sacrocolpopexy using self-cut mesh on pelvic organ prolapse

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## Abstract

**Objectives:** The objective of the study was to investigate the long-term outcome and complication rate of laparoscopic sacrocolpopexy (LSC) using self-cut mesh as pelvic organ prolapse treatment.

**Methods:** A retrospective cohort study on patients undergoing LSC was done at Kameda Medical Center from January 2013 to January 2018. Data for this study were taken from all women with pelvic organ prolapse who had undergone LSC using self-cut polypropylene mesh. Patients with a previous history of hysterectomy were excluded from the study. An evaluation was done preoperatively, on 6-month and 1-year postoperative follow-up period using Pelvic Organ Prolapse Quantification (POP-Q) and The International Consultation on Incontinence Questionnaire-short form (ICIQ-SF) questionnaire.

**Results:** There were 702 subjects who met the inclusion and exclusion criteria. The clinical characteristics of the subjects were recorded. The scores during admission, 6 months and 1 year postoperative are: POP Q scores:  $6.50 \pm 5.69$  vs.  $5.11 \pm 4.85$  vs.  $4.78 \pm 4.31$ ,  $P = 0.049$  and ICIQ SF scores:  $2.92 \pm 0.62$  vs.  $1.10 \pm 0.36$  vs.  $1.13 \pm 0.41$ ,  $P < 0.001$ . A total of 17 (2.4%) perioperative and postoperative complications were observed on subjects.

**Conclusion:** LSC using self-cut mesh could produce satisfactory results in pelvic organ prolapse patients on 6-month and 1-year follow-up period with minimal perioperative complications.

**Keywords:** Laparoscopy, pelvic organ prolapse, sacrocolpopexy, surgical mesh

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## INTRODUCTION

Pelvic organ prolapse (POP) is a debilitating problem suffered by many women, heavily affecting their quality of life. The magnitude of problems caused by POP in women is difficult to be determined, as most of patients suffering from POP would not complain until significant symptoms occur.<sup>[1,2]</sup> The descent of the pelvic organ would then induce various symptoms such as bulging

sensation, urinary incontinence, overactive bladder, and fecal incontinence.<sup>[1]</sup> Due to the arduous symptoms experienced by the patients, there are some discrepancies regarding its prevalence. Studies regarding anatomical prolapse without any symptoms reported a prevalence of up to 50% of all elderly women.<sup>[3]</sup> However, other studies on symptomatic POP patients reported a prevalence of between 3% and 50%.<sup>[3]</sup> A similar condition can be found

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in Indonesia, where the prevalence of POP was 26.4% of all elderly women.<sup>[4]</sup>

Standardized classifications for symptoms and signs of POP have developed in the past decade. Pelvic Organ Prolapse Quantification (POP-Q) system, along with other symptoms quantifications such as The International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ–UI SF) for urinary incontinence and Overactive Bladder Symptom Score for overactive bladder prove to be useful in determining the magnitude of symptoms and planning appropriate treatment for the patient.<sup>[5,6]</sup>

There are numerous techniques for the treatment of POP. Surgical treatments remain the mainstay treatment for symptomatic patients who have failed conservative treatments. There are various surgical techniques for POP surgery, such as abdominal sacrocolpopexy, uterosacral ligament suspension, sacrospinous fixation, anterior or posterior vaginal repair, and vaginal repair using synthetic mesh or biologic graft. Moreover, a hysterectomy can also be considered for eligible patients.<sup>[2]</sup>

Recently, the laparoscopic approach rather than laparotomy has gained more popularity along with better outcomes and cosmetic results. Due to minimal access to surgery, postoperative recovery would be quicker, ameliorating both complications and costs for patients.<sup>[7]</sup> Other studies also mentioned better functional outcomes and decreased length of stay for patients treated with a laparoscopic approach.<sup>[8]</sup>

Although currently there are no available US Food and Drug Administration (FDA)-approved transvaginal mesh for POP patients, its usage is still contemplated on high-risk individuals, especially patients with recurrent symptoms.<sup>[2]</sup> Sacrocolpopexy using transvaginal mesh such as polypropylene (PP) mesh is often determined as the treatment of choice for patients, despite having a high rate of complication, including mesh exposure.<sup>[7]</sup> However, there are currently only a few studies regarding its long-term outcome and complications, especially in Indonesia.

This study aims to assess the long-term outcome of laparoscopic sacrocolpopexy (LSC) using self-cut mesh on pelvic organ prolapse patients.

## METHODS

This study is an observational analytic study using a retrospective cohort method determined to assess the long-term outcomes of LSC using self-cut PP

mesh (Polyform; Boston Scientific, Marlborough, MA, USA). This study used a 5% error bound and 95% confidence interval limit, with the power of the test considered to be 90%.

Between January 2012 and December 2017, patients who were diagnosed with pelvic organ prolapse and had undergone LSC in our center were reviewed. Patients with a history of hysterectomy before the surgery were excluded from the study. All eligible patients and their medical records were reviewed for clinical characteristics data, preoperative examination results, and follow-up information. Preoperative diagnosis of POP was based on physical examination by urogynecologists in our center. The stage of POP was determined by the worst compartment descending.

Indications for LSC were recurrent POP, severe primary POP, and POP with apical prolapse. Surgery was done by a team of experienced urogynecologists using standard techniques. Subjects were primarily treated using standard LSC technique with conditional laparoscopic supracervical hysterectomy. Evaluation of POP symptoms was done using the Pelvic Organ Prolapse Quantification (POP-Q) examination and the ICIQ-SF questionnaire. The pelvic organ prolapse quantification score was determined by experienced urogynecologists at our center. All perioperative and postoperative complications were reported. Subjects were evaluated for POP symptoms using both POP-Q and ICIQ-SF during admission, at 6-month postoperative follow-up, and at 1-year postoperative follow-up.

The study was approved by the Kameda Medical Center, Chiba, Japan. All human studies had been done complied with the Declaration of Helsinki guidelines. Given the retrospective nature of the study, the requirement of written informed consent was waived. Collected data were then analyzed using IBM SPSS Statistics Version 20 (IBM Corp. Released 2011. IBM SPSS Statistics for Windows, Version 20.0. Armonk, NY: IBM Corp). Characteristics of subjects were analyzed descriptively. The comparison of outcomes in different time frames was analyzed using the Friedman test.

## RESULTS

A total of 702 patients met the inclusion criteria and had been further analyzed. The mean age of subjects was 66 years old, with a median parity of 2, and mostly had at least stage 2 POP. All subjects had completed 1-year follow-up period for this study. Among all subjects, a total of 591 (84.5%) subjects underwent concurrent LSC and laparoscopic hysterectomy, 62 (8.9%) subjects

underwent LSC on apical prolapse, 41 (5.9%) underwent sacrocolpopexy with uterine preservation, and 5 (0.7%) subjects underwent LSC with additional surgery. The general characteristics of subjects can be seen in Table 1.

After learning the general characteristics of subjects, a comparison of POP-Q and ICIQ-SF scores between preoperative value, 6-month follow-up value, and 1-year follow-up value was done. It was known that there was a significant decrease of values on both the POP-Q score and ICIQ-SF score in 6-month and 1-year follow-up period ( $P < 0.05$ ). The results can be found in Table 2.

During the course of the study, a total of 17 (2.4%) subjects experienced surgery-related complications. Most prevalent complication was vaginal wall injury, followed by umbilical hernia and postoperative ileus. There were also subjects experiencing severe complications, namely 2 (0.28%) subjects experiencing intestinal injury and 2 (0.28%) subjects experiencing bladder injury, both were treated accordingly. A total of 2 (0.28%) subjects experienced mesh exposure, which was immediately repaired. A list of perioperative and postoperative complications can be found in Table 3.

## DISCUSSION

It was known from this study that LSC using self-cut mesh would reduce the magnitude of POP descent and

its symptoms in 6-month and 1-year follow-up period with minimal complications.

Despite FDA warnings on the use of transvaginal mesh, its usage across countries is deemed safe and cost-effective.<sup>[9]</sup> The result of this study would also support this notion. The high complication rate of transvaginal mesh use might be ameliorated using various approaches, such as employing experienced operators, choosing eligible patients, choosing the right material for patients, and using standardized techniques.<sup>[10]</sup> In this study, it was found that transvaginal mesh usage might not only be limited as an alternative for recurrent POP patients but also as a definitive therapy for higher-stage POP patients.

The Pelvic Organ Prolapse Quantification (POP-Q) system is currently the most used standardized tool to objectively assess the extent of pelvic organ descent and surgical evaluation.<sup>[5]</sup> Another method of evaluation would be physical examination. However, using nonstandardized tools would create a possibility of examination bias. On the other hand, the use of the ICIQ-SF as a patient-reported outcome evaluation would be purely subjective. However, previous studies have shown that ICIQ-SF results highly correlate with patients' quality of life and degree of symptoms, especially if used along with other examinations.<sup>[11,12]</sup>

It was known that subjects in our study had similar age and body mass index with others investigating complications of LSC using synthetic mesh.<sup>[7,8]</sup> Hence, it should be comparable to studies with similar topics. There were a total of 17 (2.4%) subjects who experienced perioperative and postoperative complications in this study. The most complication is vaginal wall injury, followed by an umbilical hernia and postoperative ileus. Only 2 (0.28%) subjects were reported to have mesh exposure. Regardless of the approach, mesh exposure would pose a risk on all mesh-associated therapy. Previous studies have shown that its prevalence ranged from 6% to 19%.<sup>[10]</sup> However, previous study also stated that mesh exposure risk would be associated with the operator's experience and technique.<sup>[10]</sup> Another study also reported the rate of complication following LSC to be 1.3%.<sup>[7]</sup>

**Table 1: Characteristics of subjects**

Variable	n=702
Age (years), mean±SD	66±7.48
BMI (kg/m <sup>2</sup> ), mean±SD	23.58±2.96
Parity, median (range)	2 (0-6)
Stage of POP, n (%)	
1	1 (0.1)
2	142 (20.3)
3	454 (64.9)
4	99 (14.2)
Type of LSC, n (%)	
LSC LSH	591 (84.5)
LSC on apical prolapse	62 (8.9)
LSC with uterine preservation	41 (5.9)
Others	5 (0.7)
Operating time (min), mean±SD	229±50.51
Estimated blood loss (mL), mean±SD	23.08±37.63

SD: Standard deviation, LSC: Laparoscopic sacrocolpopexy, LSH: Laparoscopic supracervical hysterectomy, POP: Pelvic organ prolapse, BMI: Body mass index

**Table 2: Comparison of preoperative International Consultation on Incontinence Questionnaire short form and pelvic organ prolapse quantification scores versus 6 months and 1-year follow-up**

Instrument	Preoperative, mean±SD	Postoperative 6 months, mean±SD	Postoperative 1 year, mean±SD	P
ICIQ-SF	6.40±5.69	5.11±4.85	4.78±4.31	0.049 <sup>*,a</sup>
POP-Q	2.92±0.61	1.10±0.36	1.13±0.41	0.000 <sup>*,a</sup>

\*Significant at  $P < 0.05$ , <sup>a</sup>Friedman test. ICIQ-SF: International Consultation on Incontinence Questionnaire-short form, POP-Q: Pelvic organ prolapse quantification, SD: Standard deviation

**Table 3: Perioperative and postoperative complications of surgery**

Complication	Frequency (%)
Mesh exposure	2 (0.28)
Bladder injury	2 (0.28)
Intestinal injury	1 (0.14)
Subcutaneous emphysema	1 (0.14)
Umbilical hernia	3 (0.43)
Vaginal wall injury	4 (0.57)
Vascular injury	1 (0.14)
Postoperative ileus	3 (0.43)

In this study, we found that in a 6-month and 1-year follow-up period, both the POP-Q score as an objective finding and the ICIQ-SF score as a subjective score were significantly reduced. This result showed that there were both anatomical and symptomatic improvements following LSC using self-cut mesh. A previous study had also shown similar results, which stated that LSC is more preferable than open abdominal sacrocolpopexy due to its similar outcome but lower rate of complications.<sup>[8]</sup>

There are currently limited data on cost-effectiveness of mesh-associated treatment using a laparoscopic approach for POP patients. However, fewer complications and shorter length of stay would mean a lower cost for the patient.<sup>[8]</sup> The limitations of this study were its retrospective and single-center nature. Therefore, the generalization of this study might not be suitable for other health centers.

## CONCLUSION

It is concluded in this study that LSC using self-cut mesh could produce satisfactory results in pelvic organ prolapse patients on 6-month and 1-year follow-up period with minimal perioperative complications.

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## Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Iglesia CB, Smithling KR. Pelvic Organ Prolapse. *Am Fam Physician* 2017;96:179-85.
2. American College of Obstetricians and Gynecologists and the American Urogynecologic Society, INTERIM UPDATE: This Practice Bulletin is updated as highlighted to reflect the US Food and Drug Administration order to stop the sale of transvaginal synthetic mesh products for the repair of pelvic organ prolapse. *Pelvic organ prolapse. Female Pelvic Med Reconstr Surg* 2019;25:397-408.
3. Weintraub AY, Gliner H, Marcus-Braun N. Narrative review of the epidemiology, diagnosis and pathophysiology of pelvic organ prolapse. *Int Braz J Urol* 2020;46:5-14.
4. Santoso BI, Fauziah NR. Prevalence and Characteristics of Pelvic Floor Dysfunction in a Tertiary Care Center in Indonesia. *Indones J Obstet Gynecol* 2017. p. 168.
5. Boyd SS, O ydlivan D, Tulikangas P. Use of the pelvic organ quantification system (POP-Q) in published articles of peer-reviewed journals. *Int Urogynecol J* 2017;28:1719-23.
6. Sumardi R, Mochtar CA, Junizaf J, Santoso BI, Tjahjodjati T, Purwara BH, *et al.* Test - retest reliability of the Indonesian version of the Overactive Bladder Symptom Score (OABSS) and its correlation with standard assessment tools. *Acta Med Indones* 2012;44:214-21.
7. Baines G, Price N, Jefferis H, Cartwright R, Jackson SR. Mesh-related complications of laparoscopic sacrocolpopexy. *Int Urogynecol J* 2019;30:1475-81.
8. Coolen AW, van Oudheusden AM, Mol BW, van Eijndhoven HW, Roovers JW, Bongers MY. Laparoscopic sacrocolpopexy compared with open abdominal sacrocolpopexy for vault prolapse repair: A randomised controlled trial. *Int Urogynecol J* 2017;28:1469-79.
9. Zhu L, Zhang L, Xu T, Lang J. Long-term outcomes of the self-cut mesh-related modified total pelvic reconstructive surgical repair for pelvic organ prolapse in China: A 7-year prospective cohort study. *J Minim Invasive Gynecol* 2015;22:S245.
10. Gonocruz SG, Hayashi T, Tokiwa S, Sawada Y, Okada Y, Yoshio Y, *et al.* Transvaginal surgery using self-cut mesh for pelvic organ prolapse: 3-year clinical outcomes. *Int J Urol* 2019;26:731-6.
11. Kurzawa Z, Sutherland JM, Crump T, Liu G. Measuring quality of life in patients with stress urinary incontinence: Is the ICIQ-UI-SF adequate? *Qual Life Res* 2018;27:2189-94.
12. Tutolo M, Bianchi M, Castagna G, Briganti A, Salonia A, Joniau S, *et al.* Is the ICIQ-SF questionnaire reliable in predicting QoL outcomes? Results of a prospective single-center study. *Journal of Urology* 2018;199(4S).