



# Medium-Term Anatomical and Functional Results of Isolated Laparoscopic Sacrocolpopexy for Female Pelvic Organ Prolapse during the Early Learning Curve

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## Abstract

**Background** Laparoscopic repair of female pelvic organ prolapse is a technically challenging surgery, especially for the beginners.

**Methods** We performed a follow-up study of women who underwent laparoscopic sacrocolpopexy or sacrohysteropexy (LSCP/LSHP) for pelvic organ prolapse between January 2015 and October 2019. We analysed anatomical and subjective success rates, peri-operative complications and medium-term complications.

**Results** Twenty women underwent LSCP/LSHP with average follow-up of 16 months. Anatomical success rate was 95%, and subjective success rate was 90%. Blood loss averaged at 24 ml. Majority of women (90%) reported improvement in their symptoms and 10% reported no change in symptoms. There were no mesh complications.

**Conclusion** Laparoscopic sacrocolpopexy is an effective and safe surgery for female pelvic organ prolapse even by beginners.

**Keywords** Pelvic organ prolapse · Laparoscopic sacrocolpopexy · Sacrohysteropexy

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## Introduction

Female pelvic organ prolapse (POP) is quite common; however, not all females undergo surgical correction of POP at present. The number of women undergoing POP repair surgery is expected to rise sharply in the next three decades due to increasing prevalence and demand. Moreover, because of ever increasing awareness, women will demand most durable and least morbid procedures. Female POP repair can be performed by vaginal, open or laparoscopic routes. Vaginal hysterectomy with pelvic floor repair remains the preferred treatment for female POP in India. Numerous factors might be responsible for overwhelming reliance on vaginal route surgery for POP other than the merit of the procedure, such as lack of awareness among patients and treating physicians,

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lack of laparoscopic training and higher cost of laparoscopic procedure. LSCP is considered the current gold standard for POP repair as it has been shown to combine the success and durability of abdominal repair and lesser morbidity of vaginal route repair [1]. However, it is a complex intervention which can be unnerving for beginners because of apprehension of complications and fear of failure of the procedure. Confidence of retroperitoneal dissection and endosuturing is essential for safe and successful repair. Endosuturing can be practised and perfected outside body; however, it is difficult to mimic and model dissection outside human body. A number of observational studies have reported the results of LSCP beyond the learning curve of surgeon(s) in a large cohort of patients [2]. We are reporting medium-term anatomical and functional results of LSCP performed by a single surgeon during the early learning curve.

## Materials and Methods

We included all women who underwent laparoscopic sacrocolpopexy (LSCP) or sacrohysteropexy (LSHP) from January 2015 to October 2019 after ethics approval. Patients were followed up to ascertain the surgical and functional outcomes of the surgery. Demographic and operative data were extracted from the medical charts of the patients. Archived videos of the procedure were revisited to calculate operating time. Genital prolapse stage was classified according to the simplified International Continence Society Pelvic Organ Prolapse Quantification system (POP-Q).

### Surgical Technique

LSCP and LSHP were performed by a single surgeon. A 12-mm supraumbilical port was used for 30° laparoscope, and two 5-mm ports on left side and one 10-mm port on right side were used as working ports. Surgery always began by peritoneal incision at sacral promontory which was carried downward to develop right pararectal space staying close to rectum. This was followed by dissection of rectovaginal and vesicovaginal spaces. In cases of LSCP non-absorbable soft polypropylene mesh was fashioned in a Y shape. Only the surgeon and assistant surgeon handled the mesh after a mandatory change of gloves. Anterior & posterior limbs of mesh were secured to respective vaginal walls by two to three rows of two delayed absorbable sutures by intracorporeal suturing. A conscious effort was made not to pierce and entrap vaginal mucosa with suture in any case. The straight limb of the mesh was then anchored to the anterior longitudinal ligament of the spine at sacral promontory with absorbable tackers and 1-0 prolene sutures. Mesh was buried by closure of peritoneum with 2-0 barbed sutures (V-Loc™). For LSHP

a peri cervical ring of poly-propylene mesh was fashioned and was suture fixed to the cervix and/or vaginal walls anteriorly and convergence of bilateral uterosacral ligament posteriorly. The vertical limb of the mesh was then anchored to the sacral promontory as described earlier (Fig. 1). We did not perform hysterectomy or procedure for stress urinary incontinence in any patient. All patients received laxatives for 6 weeks after the surgery. Anatomical outcomes were reported as ascertained at the time of discharge and last follow-up visit. Functional outcomes were documented by comparing the pre-operative symptoms as recorded in the case charts with post-operative interview based on quality of life questionnaires: the Pelvic Floor Distress Inventory (PFDI-20). Anatomical success was defined by correction of leading point of prolapse to a distance beyond – 1 cm from hymenal plane. Follow-up examinations were done at 6 weeks after surgery and thereafter every 6 months to 1 year to keep a watch on mesh complications and recurrences.

The primary analysis looking at peri-operative and post-operative adverse events was descriptive, and are reported for all groups as frequencies for categorical data and as mean or median (average) for quantitative data. The statistical analyses were performed with the SPSS version 21.0 software package for windows (SPSS Inc., Chicago, IL, USA).

## Results

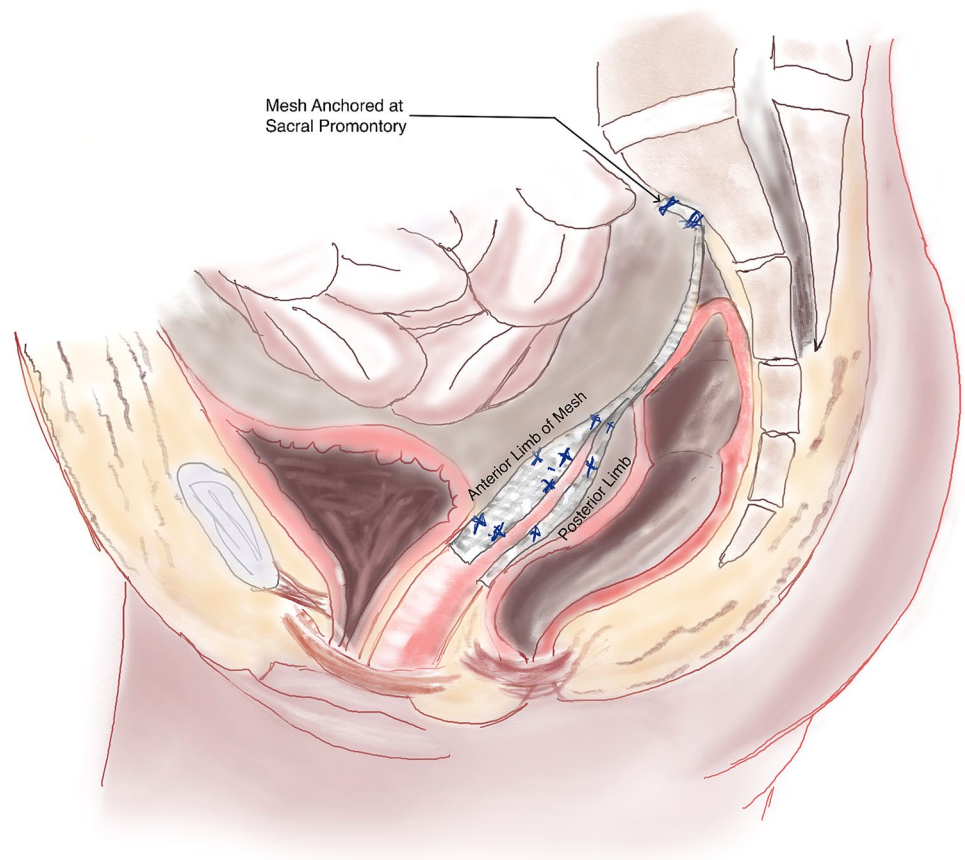
Between January 2015 and October 2019 a total of 20 LSCP/LSHP were performed. The mean age was  $42.3 \pm 15.9$  years. The mean BMI was  $24.7 \pm 3.3$  kg/m<sup>2</sup>. Twelve (60%) women had POP-Q stage III prolapse, and 8 (40%) had POP-Q stage II prolapse (Table 1). None of the subjects had clinically demonstrable stress urinary incontinence (SUI). The mean follow-up duration was  $16 \pm 10.4$  months. Mean operating time was  $173 \pm 17.4$  min.

### Anatomical and Functional Outcomes

At a mean follow-up time of 16 months, anatomical success rate was 95% with one failure and subjective cure rate was 90% (Table 2).

The blood loss averaged at 24 ml. The median hospital stay was 4.1 days. There were no mesh complications in any of the patient till the compilation of the report. Two patients (10%) developed de novo SUI after the surgery. Four patients (20%) reported appearance of new urinary symptoms (de novo SUI, urge incontinence, frequency) after the surgery. One patient developed chronic constipation, and one patient developed persistent low backache.

**Fig. 1** Artistic illustration of sacrocolpopexy using Y-shaped mesh



**Table 1** Pre- and post-operative POP-Q site measurements (cm)

	Pre-operative Median	Post-operative Median
POP-Q stage	II	I
C point	+2	-6
Aa	-3	-3
Ba	0	-3
Ap	-3	-3
Bp	-3	-3

POP-Q Pelvic Organ Prolapse Quantification

**Table 2** Surgical outcomes and peri-operative complications

Outcome	LSCP	LSHP	Total N (%)
Anatomical success	7 (87.5%)	12 (100%)	19 (95%)
Subjective success	6 (75%)	12 (100%)	18 (90%)
Serious post-op morbidity	1 (12.5%)	0	1 (5%)
Febrile morbidity	1 (12.5%)	1 (12.5%)	2 (10%)
De novo SUI	2 (25%)	0	2 (10%)
Mesh complications	0	0	0

SUI stress urinary incontinence, LSCP laparoscopic sacrocolpopexy, LSHP laparoscopic sacrohysteropexy

## Discussion

This study reports medium-term results of isolated LSCP by a single surgeon during early learning curve. Our anatomical success rate of 94.5% is equivalent to success rates of experienced surgeons beyond the learning curve [3]. Average operating time of 173 min for a beginner is quick as compared to most of published literature [4]. The shorter operating time in the present study can be attributed to the fact that we did not include anaesthesia time and the patient positioning time in operating time. Also, we did not perform additional procedures such as burch colposuspension or concomitant hysterectomy in the present series. Blood loss of 24 ml in our study is quite meagre compared to reported blood loss of 100–250 ml in published literature [5]. Majority of women in these studies underwent concomitant hysterectomy or urinary continent procedures which explain higher blood loss. Moreover, we performed dissection in all cases with Harmonic® scalpel shears (ETHICON, Johnson & Johnson, USA) focussing on meticulous haemostasis prior to dissection. No mesh complications were detected till the compilation of this report. In the published literature mesh complication rate of 1–10% has been reported [3]. Though the number of procedures is too modest to derive definite

conclusions, we believe many factors might help in avoiding mesh complications such as absence of a concomitant hysterectomy, minimalistic handling of mesh, mandatory change of gloves before handling the mesh and the use of delayed monofilament sutures as much as possible. Additionally, absence of vaginal mucosal entrapment in the suture and viscus injury might have helped as well.

## Conclusion

LSCP is effective and safe for female POP repair even by a beginner, especially when concomitant procedure is not done.

## Compliance with ethical standards

**Conflict of interest** Authors have no conflicts of interests to report.

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